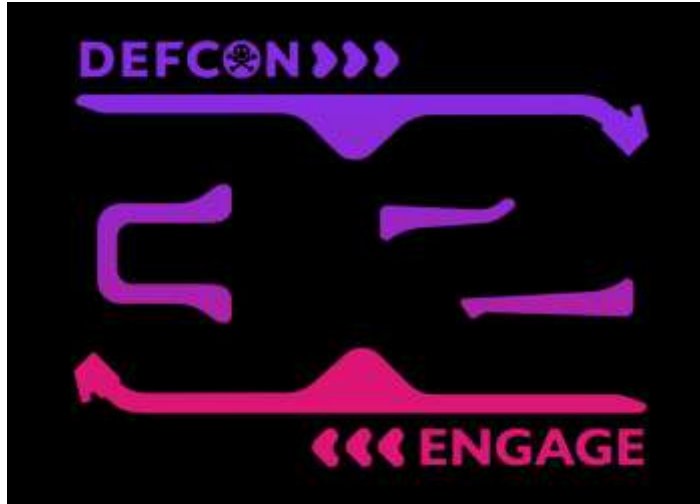




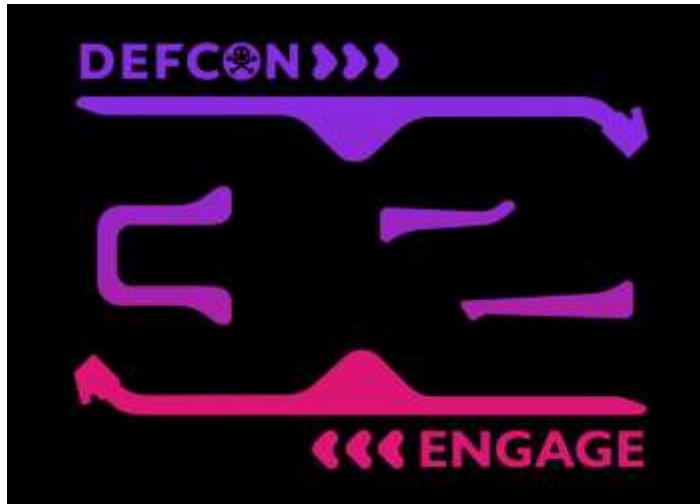
Gone in 60 Seconds... How Azure AD/Entra ID Tenants are Compromised

Sean Metcalf
(@PyroTek3)



Trimarc LinkTree:
[Linktr.ee/Trimarc](https://linktr.ee/Trimarc)





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TRIMARC







About

- Founder & CTO @ Trimarc ([Trimarc.co](https://trimarc.co)), a professional services company that helps organizations better secure their Microsoft Identity systems (Active Directory & Azure AD/Entra ID).
- Microsoft Certified Master (MCM) Directory Services
- Speaker: Black Hat, Blue Hat, Blue Team Con, BSides Charm, BSides DC, BSides PR, DEFCON, DerbyCon, TEC, Troopers
- Former Microsoft MVP
- Security Consultant / Researcher
- AD Enthusiast - Own & Operate ADSecurity.org (Microsoft identity security info)



Agenda

- Introduction
- Entra ID Highly Privileged Roles & Applications
- Azure AD/Entra ID Security Posture
- Conditional Access Policy & CAP Gaps
- Attacking Azure AD/Entra ID
- Microsoft Blizzard
(Midnight Blizzard Attack on Microsoft)
- Securing Entra ID Administration
- Conclusion



Entra ID Level 0

Like Tier 0, but Different!



There are 100 Entra ID Roles!

Role	Description
Application Administrator	Can create and manage all aspects of app registrations and enterprise apps.
Application Developer	Can create application registrations independent of the 'Users can register applications' setting.
Attack Payload Author	Can create attack payloads that an administrator can initiate later.
Attack Simulation Administrator	Can create and manage all aspects of attack simulation campaigns.
Attribute Assignment Administrator	Assign custom security attributes keys and values to supported Microsoft Entra objects.
Attribute Assignment Reader	Read custom security attributes keys and values for supported Microsoft Entra objects.
Attribute Definition Administrator	Define and manage the definition of custom security attributes.
Attribute Definition Reader	Read the definition of custom security attributes.
Attribute Log Administrator	Read audit logs and configure diagnostic settings for events related to custom security attributes.
Attribute Log Reader	Read audit logs related to custom security attributes.
Authentication Administrator	Can access to view, set and reset authentication method information for any non-admin user.
Authentication Extensibility Administrator	Customize sign in and sign up experiences for users by creating and managing custom authentication extensions.
Authentication Policy Administrator	Can create and manage the authentication methods policy, tenant-wide MFA settings, password protection policy, and ve
Azure DevOps Administrator	Can manage Azure DevOps policies and settings.
Azure Information Protection Administrator	Can manage all aspects of the Azure Information Protection product.
B2C IEF Keyset Administrator	Can manage secrets for federation and encryption in the Identity Experience Framework (IEF).
B2C IEF Policy Administrator	Can create and manage trust framework policies in the Identity Experience Framework (IEF).
Billing Administrator	Can perform common billing related tasks like updating payment information.
Cloud App Security Administrator	Can manage all aspects of the Defender for Cloud Apps product.
Cloud Application Administrator	Can create and manage all aspects of app registrations and enterprise apps except application proxy.
Cloud Device Administrator	Limited access to manage devices in Microsoft Entra ID.
Compliance Administrator	Can read and manage compliance configurations and reports in Microsoft Entra ID and Microsoft 365.
Compliance Data Administrator	Creates and manages compliance content.
Conditional Access Administrator	Can manage Conditional Access capabilities.
Customer LockBox Access Approver	Can approve Microsoft support requests to access customer organizational data.
Desktop Analytics Administrator	Can access and manage Desktop management tools and services.
Directory Readers	Can read basic directory information. Commonly used to grant directory read access to applications and guests.
Directory Synchronization Accounts	Only used by Microsoft Entra Connect service.
Directory Writers	Can read and write basic directory information. For granting access to applications, not intended for users.
Domain Name Administrator	Can manage domain names in cloud and on-premises.
Dynamics 365 Administrator	Can manage all aspects of the Fabric and Power BI products.
Dynamics 365 Business Central Administrator	Can access Dynamics 365 Business Central environments and perform all administrative tasks on the environments.
Edge Administrator	Manage all aspects of Microsoft Edge.
Exchange Administrator	Can manage all aspects of the Exchange product.
Exchange Recipient Administrator	Can create or update Exchange Online recipients within the Exchange Online organization.
External ID User Flow Administrator	Can create and manage all aspects of user flows.
External ID User Flow Attribute Administrator	Can create and manage the attribute schema available to all user flows.
External Identity Provider Administrator	Can configure identity providers for use in direct federation.
Fabric Administrator	Can manage all aspects of the Fabric and Power BI products.
Global Administrator	Can manage all aspects of Microsoft Entra ID and Microsoft services that use Microsoft Entra identities.
Global Reader	Can read everything that a Global Administrator can, but not update anything.
Global Secure Access Administrator	Create and manage all aspects of Microsoft Entra Internet Access and Microsoft Entra Private Access, including managin
Groups Administrator	Members of this role can create/manage groups, create/manage groups settings like naming and expiration policies, and v
Guest Inviter	Can invite guest users independent of the 'members can invite guests' setting.
Helpdesk Administrator	Can reset passwords for non-administrators and Helpdesk Administrators.
Hybrid Identity Administrator	Can manage Active Directory to Microsoft Entra cloud provisioning, Microsoft Entra Connect, Pass-through Authentica
Identity Governance Administrator	Manage access using Microsoft Entra ID for identity governance scenarios.
Insights Administrator	Has administrative access in the Microsoft 365 Insights app.
Insights Analyst	Access the analytical capabilities in Microsoft Viva Insights and run custom queries.
Insights Business Leader	Can view and share dashboards and insights via the Microsoft 365 Insights app.
Intune Administrator	Can manage all aspects of the Intune product.
Kaizala Administrator	Can manage settings for Microsoft Kaizala.
Knowledge Administrator	Can configure knowledge, learning, and other intelligent features.
Knowledge Manager	Can organize, create, manage, and promote topics and knowledge.
License Administrator	Can manage product licenses on users and groups.
Lifecycle Workflows Administrator	Create and manage all aspects of Microsoft Dynamics 365 Schemas associated with Lifecycle Workflows in Microsoft Entra ID.
Message Center Privacy Reader	Can read security messages and updates in Office 365 Message Center only.
Message Center Reader	Can read messages and updates for their organization in Office 365 Message Center only.
Microsoft 365 Migration Administrator	Perform all migration functionality to migrate content to Microsoft 365 using Migration Manager.
Microsoft Entra Joined Device Local Administ	Users assigned to this role are added to the local administrators group on Microsoft Entra joined devices.
Microsoft Hardware Warranty Administrator	Create and manage all aspects warranty claims and entitlements for Microsoft manufactured hardware, like Surface and Hc
Microsoft Hardware Warranty Specialist	Create and read warranty claims for Microsoft manufactured hardware, like Surface and HoloLens.
Modern Commerce Administrator	Can manage commercial purchases for a company, department or team.
Network Administrator	Can manage network locations and review capabilities network design insights for Microsoft 365 Software as a Service ap
Office Apps Administrator	Can manage Office apps cloud services, including policy and settings management, and manage the ability to select, unsele
Organizational Branding Administrator	Manage all aspects of organizational branding in a tenant.
Organizational Messages Approver	Review, approve, or reject new organizational messages for delivery in the Microsoft 365 admin center before they are se
Organizational Messages Writer	Write, publish, manage, and review the organizational messages for end-users through Microsoft product surfaces.
Partner Tier1 Support	Do not use - not intended for general use.
Partner Tier2 Support	Do not use - not intended for general use.
Password Administrator	Can reset passwords for non-administrators and Password Administrators.
Permissions Management Administrator	Manage all aspects of Microsoft Entra Permissions Management.
Power Platform Administrator	Can create and manage all aspects of Microsoft Dynamics 365, Power Apps and Power Automate.
Printer Administrator	Can manage all aspects of printers and printer connectors.
Printer Technician	Can register and unregister printers and update printer status.
Privileged Authentication Administrator	Can access to view, set and reset authentication method information for any user (admin or non-admin).
Privileged Role Administrator	Can manage role assignments in Microsoft Entra ID, and all aspects of Privileged Identity Management.
Reports Reader	Can read sign-in and audit reports.
Search Administrator	Can create and manage all aspects of Microsoft Search settings.
Search Editor	Can create and manage the editorial content such as bookmarks, G and A's, locations, floorplan.
Security Administrator	Can read security information and reports, and manage configuration in Microsoft Entra ID and Office 365.
Security Operator	Creates and manages security events.
Security Reader	Can read security information and reports in Microsoft Entra ID and Office 365.
Service Support Administrator	Can read service health information and manage support tickets.
SharePoint Administrator	Can manage all aspects of the SharePoint service.
Skype for Business Administrator	Can manage all aspects of the Skype for Business product.
Teams Administrator	Can manage the Microsoft Teams service.
Teams Communications Administrator	Can manage calling and meetings features within the Microsoft Teams service.
Teams Communications Support Engineer	Can troubleshoot communications issues within Teams using advanced tools.
Teams Communications Support Specialist	Can troubleshoot communications issues within Teams using basic tools.
Teams Devices Administrator	Can perform management related tasks on Teams certified devices.
Tenant Creator	Create new Microsoft Entra or Azure AD B2C tenants.
Usage Summary Reports Reader	Read Usage reports and Adoption Score, but can't access user details.
User Administrator	Can manage all aspects of users and groups, including resetting passwords for limited admins.
Virtual Visits Administrator	Manage and share Virtual Visits information and metrics from admin centers or the Virtual Visits app.
Viva Goals Administrator	Manage and configure all aspects of Microsoft Viva Goals.
Viva Pulse Administrator	Can manage all settings for Microsoft Viva Pulse app.
Windows 365 Administrator	Can provision and manage all aspects of Cloud PCs.
Windows Update Deployment Administrator	Can create and manage all aspects of Windows Update deployments through the Windows Update for Business deploym
Yammer Administrator	Manage all aspects of the Yammer service.

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Microsoft's Privileged Entra ID Roles List [PRIVILEGED]

- Application Administrator
- Application Developer
- Authentication Administrator
- Authentication Extensibility Administrator
- B2C IEF Keyset Administrator
- Cloud Application Administrator
- Cloud Device Administrator
- Conditional Access Administrator
- Directory Synchronization Accounts
- Directory Writers
- Domain Name Administrator
- External Identity Provider Administrator
- Global Administrator
- Global Reader
- Helpdesk Administrator
- Hybrid Identity Administrator
- Intune Administrator
- Partner Tier1 Support
- Partner Tier2 Support
- Password Administrator
- Privileged Authentication Administrator
- Privileged Role Administrator
- Security Administrator
- Security Operator
- Security Reader
- User Administrator

As of:
4/22/2024

Microsoft's Privileged Entra ID Roles List [PRIVILEGED]

- *Application Administrator*
- Application Developer
- Authentication Administrator
- Authentication Extensibility Administrator
- B2C IEF Keyset Administrator
- *Cloud Application Administrator*
- Cloud Device Administrator
- Conditional Access Administrator
- Directory Synchronization Accounts
- **Directory Writers**
- Domain Name Administrator
- External Identity Provider Administrator
- **Global Administrator**
- Global Reader
- Helpdesk Administrator
- **Hybrid Identity Administrator**
- Intune Administrator
- Partner Tier1 Support
- **Partner Tier2 Support**
- Password Administrator
- **Privileged Authentication Administrator**
- **Privileged Role Administrator**
- Security Administrator
- Security Operator
- Security Reader
- User Administrator

As of:
4/22/2024

Trimarc Level 0 Entra ID Roles (5)

Effective Full Admin Rights or Capability to Gain Full Admin to Entra ID

- **Global Administrator**

- Full admin rights to the Entra ID, Microsoft 365, and 1-click full control of all Azure subscriptions
[From Azure AD to Active Directory \(via Azure\) – An Unanticipated Attack Path \(2020\)](#)

- **Hybrid Identity Administrator**

- *“Can create, manage and deploy provisioning configuration setup from Active Directory to Microsoft Entra ID using Cloud Provisioning as well as manage Microsoft Entra Connect, Pass-through Authentication (PTA), Password hash synchronization (PHS), Seamless Single Sign-On (Seamless SSO), and **federation settings**.”*
<https://medium.com/tenable-techblog/roles-allowing-to-abuse-entra-id-federation-for-persistence-and-privilege-escalation-df9ca6e58360>

- **Partner Tier2 Support**

- *“The Partner Tier2 Support role can reset passwords and invalidate refresh tokens for all non-administrators and administrators (including Global Administrators).”*

“not quite as powerful as Global Admin, but the role does allow a principal with the role to promote themselves or any other principal to Global Admin.”

[The Most Dangerous Entra Role You’ve \(Probably\) Never Heard Of](#)

- **Privileged Authentication Administrator**

- Microsoft: “do not use.”
“Set or reset any authentication method (including passwords) for any user, including Global Administrators. ... Force users to re-register against existing non-password credential (such as MFA or FIDO) and revoke remember MFA on the device, prompting for MFA on the next sign-in of all users.”

- **Privileged Role Administrator**

- *“Users with this role can manage role assignments in Microsoft Entra ID, as well as within Microsoft Entra Privileged Identity Management. ... This role grants the ability to manage assignments for all Microsoft Entra roles including the Global Administrator role.”*

<https://learn.microsoft.com/en-us/entra/identity/role-based-access-control/permissions-reference>

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Trimarc Level 1 Entra ID Roles (1 of 2)

Highly Privileged Rights that have Privilege Escalation Potential Depending on Tenant Configuration or ability to reconfigure the security posture of the tenant

Role	Microsoft Description
Application Administrator	This is a privileged role. Users in this role can create and manage all aspects of enterprise applications, application registrations, and application proxy settings.
Authentication Administrator	This is a privileged role. Set or reset any authentication method (including passwords) for non-administrators and some roles. Require users who are non-administrators or assigned to some roles to re-register against existing non-password credentials (for example, MFA or FIDO), and can also revoke remember MFA on the device, which prompts for MFA on the next sign-in. Perform sensitive actions for some users.
Domain Name Administrator	This is a privileged role. Users with this role can manage (read, add, verify, update, and delete) domain names. Can be used in federation attacks.
Microsoft Entra Joined Device Local Administrator	During Microsoft Entra join, this group is added to the local Administrators group on the device.
Cloud Application Administrator	This is a privileged role. Users in this role have the same permissions as the Application Administrator role, excluding the ability to manage application proxy. This role grants the ability to create and manage all aspects of enterprise applications and application registrations.
Conditional Access Administrator	This is a privileged role. Users with this role have the ability to manage Microsoft Entra Conditional Access settings.
Directory Synchronization Accounts	This is a privileged role. Do not use. This role is automatically assigned to the Microsoft Entra Connect service, and is not intended or supported for any other use. Privileged rights: Update application credentials, Manage hybrid authentication policy in Microsoft Entra ID, Update basic properties on policies, & Update credentials of service principals
Directory Writers	This is a privileged role. Users in this role can read and update basic information of users, groups, and service principals. Privileged rights: Create & update OAuth 2.0 permission grants, add/disable/enable users, Force sign-out by invalidating user refresh tokens, & Update User Principal Name of users.

Trimarc Level 1 Entra ID Roles (1 of 2)

Highly Privileged Rights that have Privilege Escalation Potential Depending on Tenant Configuration or ability to reconfigure the security posture of the tenant

Role	Microsoft Description
Exchange Administrator	Users with this role have global permissions within Microsoft Exchange Online. Trimarc flags this role since it is a role that threat actors target.
External Identity Provider Administrator	This is a privileged role. This administrator manages federation between Microsoft Entra organizations and external identity providers. With this role, users can add new identity providers and configure all available settings (e.g. authentication path, service ID, assigned key containers). This user can enable the Microsoft Entra organization to trust authentications from external identity providers.
Helpdesk Administrator	This is a privileged role. Users with this role can change passwords, & invalidate refresh tokens, Invalidating a refresh token forces the user to sign in again.
Intune Administrator	This is a privileged role. Users with this role have global permissions within Microsoft Intune Online, when the service is present. Additionally, this role contains the ability to manage users and devices in order to associate policy, as well as create and manage groups. Privileged rights: Read Bitlocker metadata and key on devices
Password Administrator	This is a privileged role. Users with this role have limited ability to manage passwords.
Partner Tier1 Support	This is a privileged role. Do not use. The Partner Tier1 Support role can reset passwords and invalidate refresh tokens for only non-administrators. Privileged rights: Update application credentials, Create and delete OAuth 2.0 permission grants, & read and update all properties
Security Administrator	This is a privileged role. Users with this role have permissions to manage security-related features in the Microsoft 365 Defender portal, Microsoft Entra ID Protection, Microsoft Entra Authentication, Azure Information Protection, and Microsoft Purview compliance portal.
User Administrator	This is a privileged role. Can reset passwords for users.

Azure Privilege Escalation via Service Principal Abuse



Andy Robbins · [Follow](#)

Published in [Posts By SpecterOps Team Members](#) · 10 min read · Oct 12, 2021

Can a User with Role in Column A reset a password for a user with a Role in Row 2?

	(No Role)	Global Administrator	Privileged Authentication Administrator	Helpdesk Administrator	Authentication Administrator	User Administrator	Password Administrator	Directory Readers	Guest Inviter	Message Center Reader	Privileged Role Administrator	Reports Reader	Groups Administrator	(Any Other Role)
Global Administrator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Privileged Authentication Administrator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Helpdesk Administrator	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	No
Authentication Administrator	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	No
User Administrator	Yes	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No
Password Administrator	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No

<https://posts.specterops.io/azure-privilege-escalation-via-service-principal-abuse-210ae2be2a5>

From TEC 2022

Background

Highly Sensitive Application Permissions:

- Directory.ReadWrite.All: Effective Global Admin rights to AAD
- RoleManagement.ReadWrite.Directory: Ability to add members to Global Administrator and other roles
- Application.ReadWrite.All: Provides full rights to applications which could result in compromise if there are apps with highly privileged permissions
- AppRoleAssignment.ReadWrite.All: Provides the application the right to grant additional permissions to itself!



<https://learn.microsoft.com/en-us/graph/permissions-reference>

Trimarc Level 0 Applications

Effective Full Admin Rights or Capability to Gain Full Admin to Entra ID

Directory.ReadWrite.All

- “Directory.ReadWrite.All grants access that is broadly equivalent to a global tenant admin.” *

AppRoleAssignment.ReadWrite.All

- Allows the app to manage permission grants for application permissions to any API & application assignments for any app, on behalf of the signed-in user. **This also allows an application to grant additional privileges to itself, other applications, or any user.**

RoleManagement.ReadWrite.Directory

- Allows the app to read & manage the role-based access control (RBAC) settings for the tenant, without a signed-in user. This includes instantiating directory roles & **managing directory role membership**, and reading directory role templates, directory roles and memberships.

Application.ReadWrite.All

- Allows the calling app to create, & manage (read, update, update application secrets and delete) applications & service principals without a signed-in user. This also allows an application to act as other entities & use the privileges they were granted.



Azure AD/Entra ID Security Posture

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Azure AD

Unfortunate Defaults



Users:

- Can register applications
- Can consent to applications
- Can create new tenants
- Can join/hybrid join devices to the tenant & no MFA is required



Guests/External Accounts

- Guests have the same view rights as users
- Guests can invite other guests



Azure AD / Entra ID Common Security Issues

Privileged Account Issues

- Standard user accounts are members
- Service Accounts / Service Principals are members
- Account(s) authenticate from user workstations
- Using PIM, but all/most are permanently active, not eligible.
- MFA not configured on highly privileged role members

Applications with Highly Privileged Permissions

- Highly privileged applications (Trimarc Level 0) with standard user account as owner
- Standard user account in Application Administrator and/or Cloud Application Administration role(s).


Group Nesting

- Role Assignable Groups in highly privileged roles (Trimarc Level 0)

Partner Access - Delegated Access Permissions




- Global Administrator
- Helpdesk Administrator

Highly Privileged User Accounts

 **Global Administrator** | Assignments ...
Privileged Identity Management | Azure AD roles

<< + Add assignments ⚙ Settings 🔄 Refresh ↓ Export 🗣 Got feedback?

Manage


-  Assignments
-  Description
-  Role settings

Eligible assignments **Active assignments** Expired assignments

Name	Principal name	Type	Scope	Membership	State	St...	End time
Global Administrator							
Shayla Young	Shayla.Young@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Seana Brennan	Seana.Brennan@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Janeya Craig	Janeya.Craig@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Annalina Herman	Annalina.Herman@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Cadence Sparks	Cadence.Sparks@BigMegaCorp.onmicrosoft.com	User	Directory	Direct	Assigned	9/...	Permanent
Sean Metcalf	sean@bigmegacorp.com	User	Directory	Direct	Assigned	-	Permanent
Chrissa Bradley	Chrissa.Bradley@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Kenya Bryan	Kenya.Bryan@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Aafiyah Rodgers	Aafiyah.Rodgers@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent




Showing 1 - 9 of 9 results. Sean Metcalf | @PyroTek3 | sean@trimarcsecurity.com

PIM Members are Permanent, Not Eligible

 **Global Administrator** | Assignments ...
Privileged Identity Management | Azure AD roles

« + Add assignments ⚙ Settings ↻ Refresh ↓ Export | 🗨 Got feedback?

Manage

-  Assignments
-  Description
-  Role settings

Eligible assignments **Active assignments** Expired assignments

🔍 Search by member name or principal name

Name	Principal name	Type	Scope	Membership	State	St...	End time
Global Administrator							
Shayla Young	Shayla.Young@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Seana Brennan	Seana.Brennan@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Janeya Craig	Janeya.Craig@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Annalina Herman	Annalina.Herman@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Cadence Sparks	Cadence.Sparks@BigMegaCorp.onmicrosoft.com	User	Directory	Direct	Assigned	9/...	Permanent
Sean Metcalf	sean@bigmegacorp.com	User	Directory	Direct	Assigned	-	Permanent
Chrissa Bradley	Chrissa.Bradley@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Kenya Bryan	Kenya.Bryan@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent
Aafiyah Rodgers	Aafiyah.Rodgers@BigMegaCorp.com	User	Directory	Direct	Assigned	9/...	Permanent

Showing 1 - 9 of 9 results. Sean Metcalf | @PyroTek3 | sean@trimarcsecurity.com

Admin Accounts without MFA

The Following ☐ Global Admin Account(s) have MFA Successfully Configured:

UserDisplayName	UserPrincipalName	IsMfaCapable	IsMfaRegistered	IsPasswordlessCapable	MethodsRegistered
Sean Metcalf	sean@bigmegacorp.com	True	True	True	{microsoftAuthenticatorPasswordless,

The Following 7 Global Admin Account(s) don't have MFA Configured:

Cadence.Sparks@BigMegaCorp.onmicrosoft.com
Kenya.Bryan@BigMegaCorp.com
Janeya.Craig@BigMegaCorp.com
Annalina.Herman@BigMegaCorp.com
Seana.Brennan@BigMegaCorp.com
Chrissa.Bradley@BigMegaCorp.com
Shayla.Young@BigMegaCorp.com


Role Assignable Groups (RAGs)

- Role Assignable Groups are Security or Microsoft 365 group with the `isAssignableToRole` property set to true and cannot be dynamic.
- Created to solve the potential issue where groups are added to an Azure AD role and a group admin could modify membership.
- Only Global Administrators or Privileged Role Administrators can create Role Assignable Groups and manage them (membership).
- Role Assignable Group owners can manage them.
- There is an application permission (`Graph:RoleManagement.ReadWrite.Directory`) that provides management rights as well.
- 500 role-assignable groups maximum in an Azure AD tenant (creation maximum).

NOTE:




Only a Privileged Authentication Administrator or a Global Administrator can change the credentials or reset MFA or modify sensitive attributes for members & owners of a role-assignable group.

Privileged Roles with Group Nesting


 **Global Administrator** | Assignments ...
Privileged Identity Management | Azure AD roles

« [+ Add assignments](#) [Settings](#) [Refresh](#) [Export](#) [Got feedback?](#)

Manage

-  Assignments
-  Description
-  Role settings

Eligible assignments **Active assignments** Expired assignments

Name	Principal name	Type	Scope	Membership	State	Start time	End time
Global Administrator							
Shayla Young	Shayla.Young@BigMegaCorp.com	User	Directory	Direct	Assigned	9/11/202...	Permanent
Seana Brennan	Seana.Brennan@BigMegaCorp.com	User	Directory	Direct	Assigned	9/11/202...	Permanent
Janeya Craig	Janeya.Craig@BigMegaCorp.com	User	Directory	Direct	Assigned	9/11/202...	Permanent
 BigMegaCorp Global Admins	-	Group	Directory	Direct	Assigned	-	Permanent
Annalina Herman	Annalina.Herman@BigMegaCorp.com	User	Directory	Direct	Assigned	9/11/202...	Permanent
Cadence Sparks	Cadence.Sparks@BigMegaCorp.onmicrosoft.com	User	Directory	Direct	Assigned	9/11/202...	Permanent
Sean Metcalf	sean@bigmegacorp.com	User	Directory	Direct	Assigned	-	Permanent
Chrissa Bradley	Chrissa.Bradley@BigMegaCorp.com	User	Directory	Direct	Assigned	9/11/202...	Permanent
Kenya Bryan	Kenya.Bryan@BigMegaCorp.com	User	Directory	Direct	Assigned	9/11/202...	Permanent
Aafiyah Rodgers	Aafiyah.Rodgers@BigMegaCorp.com	User	Directory	Direct	Assigned	9/11/202...	Permanent

Showing 1 - 10 of 10 results. Sean Metcalf | @PyroTek3 | sean@trimarcsecurity.com

Group Nesting – Have to Open Groups

Home > BigMegaCorp Global Admins

BigMegaCorp Global Admins Members

Group

+ Add members × Remove ↺ Refresh 📄 Bulk operations Columns 🗨️ Got feedback?







Overview
Diagnose and solve problems

Manage

Properties
Members
Owners
Roles and administrators
Administrative units
Group memberships
Assigned roles
Applications

Direct members All members

Search by name Add filters

	Name	Type	Email	User type
<input type="checkbox"/>	 Aadit White	User	Aadit.White@BigMegaCorp.com	Member
<input type="checkbox"/>	 Cadence Mclean	User	Cadence.Mclean@BigMegaCorp.com	Member
<input type="checkbox"/>	 Dane Pineda	User	Dane.Pineda@BigMegaCorp.com	Member
<input type="checkbox"/>	 Dirk Lester	User	Dirk.Lester@BigMegaCorp.com	Member
<input type="checkbox"/>	 Tyrek Miller	User	Tyrek.Miller@BigMegaCorp.com	Member
<input type="checkbox"/>	 Wilson Merritt	User	Wilson.Merritt@BigMegaCorp.com	Member

Role Assignable Group Owners



Home > BigMegaCorp Global Admins

BigMegaCorp Global Admins | Owners

Group

« + Add owners ✕ Remove ↺ Refresh ≡ Columns 🗨 Got feedback?

Search by name Add filters

	Name	Type	Email	User type
<input type="checkbox"/>	 Kate Pena	User	Kate.Pena@BigMegaCorp.com	Member
<input type="checkbox"/>	 Robert Marquez	User	Robert.Marquez@BigMegaCorp.com	Member

Overview
Diagnose and solve problems

Manage

- Properties
- Members
- Owners

Role Assignable Group Owners can manage group membership

What if the Role
Assignable
Group is in a
Different
Tenant?



Privileged Role Administrator | Assignments ...

Privileged Identity Management | Microsoft Entra roles

Manage

Assignments

Description

Role settings

+ Add assignments ⚙ Settings ↻ Refresh ↓ Export | 👤 Got feedback?

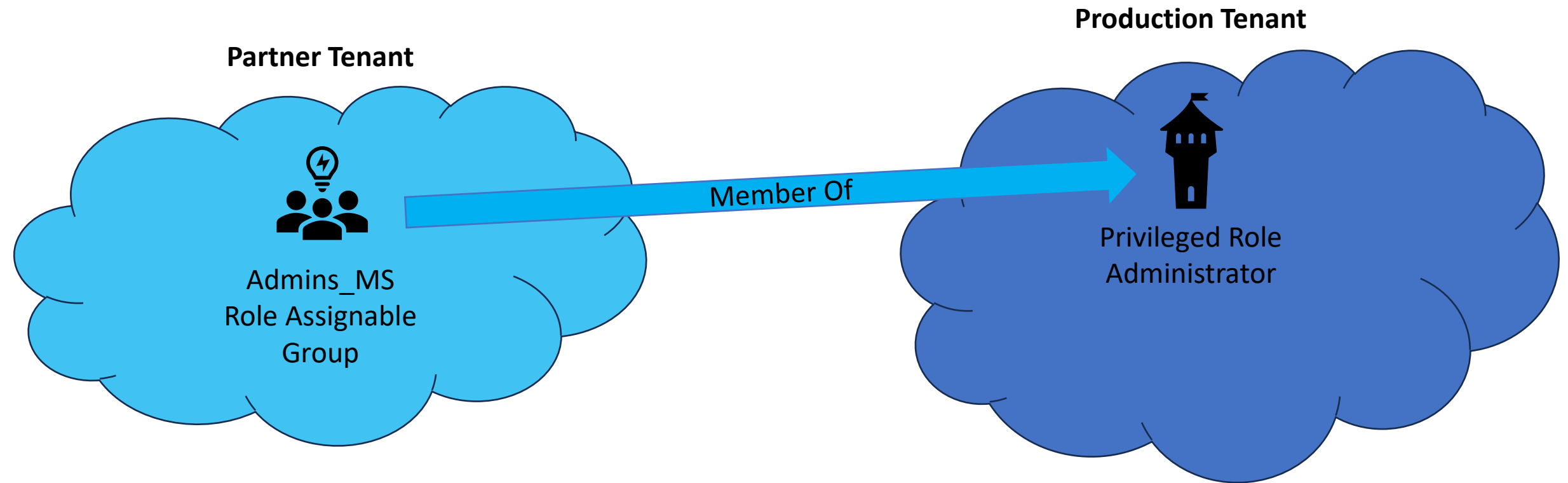
Eligible assignments Active assignments Expired assignments

🔍 Search by member name or principal name

Name	Principal name	Type	Scope	Membership	State
Privileged Role Administrator					
Admins_MS1	-	Group	Directory	Direct	Assigned
Cadence Sparks	Cadence.Sparks@BigM	User	Directory	Direct	Assigned

Showing 1 - 2 of 2 results.

Privileged Role with Group in another Tenant



Role Group Member Not Shown in PS



```
PS C:\Data\_MCSA> Get-AzureADDirectoryRoleMember -ObjectId '23e215c3-a6c9-4a57-a883-49d953cdba62' ;  
# Privileged Role Administrator
```

ObjectId	DisplayName	UserPrincipalName	UserType
-----	-----	-----	-----
7f194050-68fe-47d3-a111-5a898ffe7849	Cadence Sparks	Cadence.Sparks@BigMegaCorp.onmicrosoft.com	Member

```
PS C:\Data\_MCSA>
```



Conditional Access Policies

Policies apply after (first-factor) authentication

Requires P1 licensing

Rules based on:

- Who is connecting?
- Where are they connecting (from)?
- What app and/or device is connecting?
- When does this apply?



Signal



Decision



Enforcement

Identities



Microsoft
Entra ID



Microsoft
Defender
for Identity

Endpoints



Microsoft
Defender



Microsoft
Endpoint
Manager

Continuous risk assessment & Automation

Zero Trust
policy enforcement



Microsoft Conditional
Access

Threat intelligence & Telemetry

Applications



Microsoft
Defender for
Cloud

Data



Microsoft
Information
Protection

Infrastructure



Microsoft
Cloud App
Security

Network



◊ << [+ New policy](#) [+ New policy from template](#) [↑ Upload policy file](#) [🔍 What if](#) [🔄 Refresh](#) [⚙️ Preview features](#) [🗨️ Got feedback?](#)

📘 Overview

☰ Policies

💡 Insights and reporting

🔧 Diagnose and solve problems

▼ Manage

↔️ Named locations

🖨️ Custom controls (Preview)

📄 Terms of use

⚙️ VPN connectivity

👤 Authentication contexts

🛡️ Authentication strengths

☰ Classic policies

> Monitoring

> Troubleshooting + Support

Microsoft Entra Conditional Access policies are used to apply access controls to keep your organization secure. [Learn more](#)

All policies

8

Total

Microsoft-managed policies

🏆 0

out of 8

🔍 Search

🔍 Add filter

8 out of 8 policies found

Policy name	State	Creation date	Modified date
CA001: Require multi-factor authentication for admins	Report-only	5/29/2022, 11:10:03 PM	5/29/2022, 11:19:17 PM
CA003: Block legacy authentication	Report-only	5/29/2022, 11:10:15 PM	
CA005: Require multi-factor authentication for guest access	Report-only	5/29/2022, 11:10:28 PM	
CA007: Require multi-factor authentication for risky sign-ins	Report-only	5/29/2022, 11:10:39 PM	
Require compliant or hybrid Azure AD joined device or multifactor authentic...	Report-only	1/19/2024, 3:13:25 PM	
Require multifactor authentication for Azure management	Report-only	1/19/2024, 3:13:13 PM	
Require multifactor authentication for all users	Report-only	1/19/2024, 3:12:52 PM	
Securing security info registration	Report-only	1/19/2024, 3:12:31 PM	

Common Conditional Access Policies



Require users to use MFA when connecting outside of the corporate network



Require MFA for users with certain administrative roles



Block legacy authentication (username & password auth)



Block/Grant access from specific locations

CA Policy Gap #1:

Users Require MFA Outside of Corp Network

- CAP requires users to MFA when they are working remotely (not on the corporate network or connected via VPN)
- Assumes no attacker would be on the corporate network
- Attacker can use username/password without having to MFA
- Fun Fact: Attackers love SSO!



CA Policy Gap #2:

Admins don't require MFA

- MFA is required for certain users to access specific applications
- However, there is no CAP that requires MFA for Admins
- Or... CAP only requires members of a few roles use MFA
- Attacker can use username/password without having to MFA
- Fun Fact: Attackers love SSO!



CA Policy Gap #3: Exclusions

- CAP includes several security controls
 - MFA required
 - AAD Joined & Compliant device
 - Location based access
- However, there are exclusions:
 - Admins
 - VIPs
 - Executives
 - HR
 - Etc
- This creates a significant gap in security posture
- Attackers love being excluded from security controls!



Microsoft Provided Conditional Access Policies



Baseline Policies



Conditional Access Templates



Microsoft Managed Policies



Baseline Policies

Policy Name	State
Baseline policy: Require MFA for admins (Preview)	On
Baseline policy: End user protection (Preview)	On
Baseline policy: Block legacy authentication (Preview)	On
Baseline policy: Require MFA for Service Management (...)	On



Security Defaults

Security defaults

Security defaults are basic identity security mechanisms recommended by Microsoft. When enabled, these recommendations will be automatically enforced in your organization. Administrators and users will be better protected from common identity-related attacks.

[Learn more](#) 



Your organization is protected by security defaults.

[Manage security defaults](#)

Microsoft Provided Conditional Access Policies



~~Baseline Policies~~



Conditional Access Templates



Microsoft Managed Policies

Microsoft Managed Policies (MMP)

- Deployed automatically in reporting mode
- Modification is limited:
 - Exclude users
 - Turn on or set to Report-only mode
 - Can't rename or delete any Microsoft-managed policies
 - Can duplicate the policy to make custom versions
- Microsoft might update these policies in the future
- MMPs turn on (set to enabled) 90 days after introduced to the tenant
- Currently focuses on 3 areas:
 - MFA for admins accessing Microsoft Admin Portals
 - MFA for per-user MFA configured on users
 - MFA and reauthentication for risky sign-ins

<https://learn.microsoft.com/en-us/entra/identity/conditional-access/managed-policies>





WOULD YOU LIKE TO KNOW MORE?

Finding Holes in Conditional Access Policies

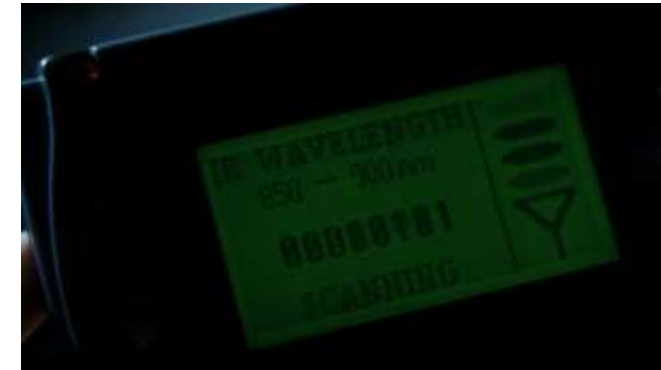
Speaker: Brandon Colley

Date: 10 Aug

Time: 12:15 – 12:40 PDT

X: @techBrandon

Attacking Azure AD/Entra ID



Phishing for Admins

Re: Office 365 Licenses Expired. - Message (HTML)


FILE MESSAGE <https://www.bleepingcomputer.com/news/security/phishers-target-office-365-admins-with-fake-admin-alerts/>



Fri 4/12/2019 1:55 PM

Customer Support <xbox_live.ww.00.en.vmc.rmd.ts.t03.spt.ua.pi@outlook.com>

Re: Office 365 Licenses Expired.

To [redacted]

 This message was sent with High importance.

®Office 365- Check Your Payment Information

[Sign in to the Office 365 Admin center](#) To Check Your Payment Information

[View this message in the Office 365 message center](#)

To customize what's included in this email, who gets it, or to unsubscribe, [set your Message center preferences](#).

[Edit release preferences](#)

Choose the release track for your organization. Use these settings to join First Release if you haven't already.

Microsoft respects your privacy. To learn more, please read our [Privacy Statement](#).

*Microsoft Corporation
One Microsoft Way
Redmond, WA, USA 98052*



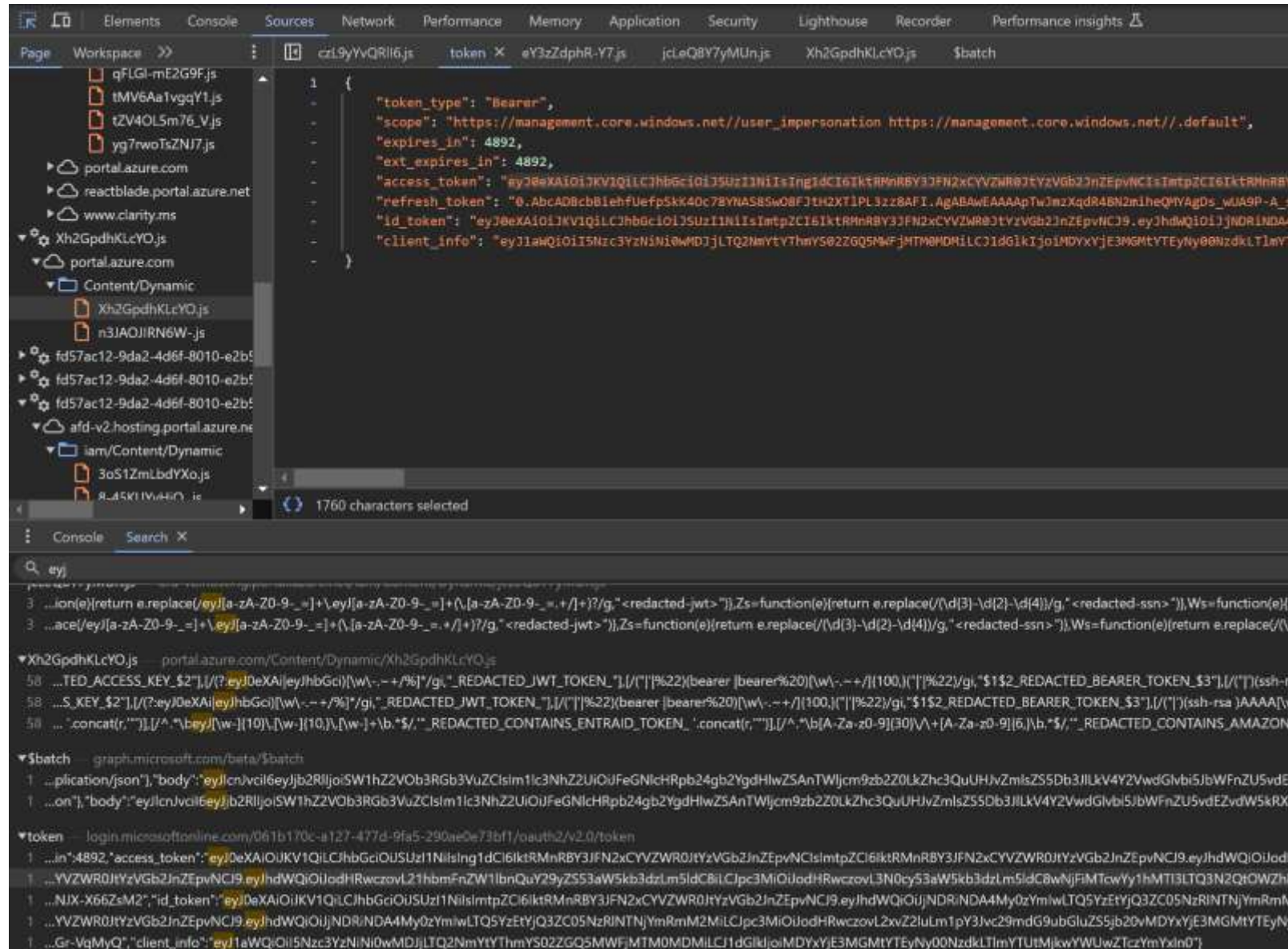
Stealing Tokens from the Web Browser

The image is a composite screenshot. The left portion shows the Microsoft Azure portal interface. At the top, the 'Microsoft Azure' header is visible with a search bar. Below it, the 'Monarch | Overview' page is displayed. The left sidebar contains navigation links: 'Overview', 'Preview features', 'Diagnose and solve problems', and 'Manage'. Under 'Manage', there are links for 'Users', 'Groups', and 'External Identities'. The main content area shows a notification about 'Azure Active Directory is now Microsoft Entra ID' and tabs for 'Overview', 'Monitoring', 'Properties', 'Recommendations', and 'Tutorials'. A search bar for 'Search your tenant' is present. Below this, a 'Basic information' section shows the 'Name' as 'Monarch'.

The right portion of the image shows a browser's developer tools network tab. It displays a list of network requests with columns for Name, Status, Type, Initiator, Size, and Time. The requests include:

Name	Status	Type	Initiator	Size	Time
isDirectoryFeatureEnabled?api...	200	xhr	lvQE5u0JAQOI.js:1	1.3 kB	127 ms
count	204	preflight	Preflight	0 B	625 ms
data:image/svg+xml;...	200	svg+xml	wwgRmzcFQmrg.js (memor...		0 ms
single-file-hooks-frames.js	200	script	VM151 single-file-	9.9 kB	40 ms
Index?reactView=true&retryCo...	200	docum...	(disk ca...		12 ms
\$batch	200	xhr	lvQE5u0JAQOI.js:1	946 B	77 ms
single-file-hooks-frames.js	200	script	single-file-extensi	9.9 kB	8 ms

Stealing Tokens from the Web Browser



Stealing Access Token from the Web Browser

```
jwt.ms
Decoded Token Claims
{
  "typ": "JWT",
  "alg": "RS256",
  "x5t": "KQ2tAcrE7lBaVVGBmc5FobE",
  "kid": "KQ2tAcrE7lBaVVGBmc5F",
}.{
  "aud": "https://management.core.windows.net/",
  "iss": "https://sts.windows.net/061b170c-a127-477d-9fa5-290ae0e73bf1/",
  "iat": 1723060777,
  "nbf": 1723060777,
  "exp": 1723065970,
  "acr": "1",
  "aio": "AVQAq/8XAAAAIqLZWy2NuIj",
  "amr": [
    "pwd",
    "mfa"
  ],
  "appid": "c44b4083-3bb0-",
  "appidacr": "0",
  "groups": [
    "fe1bc310-"
  ],
  "idtyp": "user",
  "ipaddr": "136.179.21.70",
  "name": "Sean Metcalf",
  "oid": "9777c3b6-002c-46-",
  "puid": "100320037D4!",
  "rh": "0.AbcADBcbBiehfUefpSkK40c7",
  "scp": "user_impersonation",
  "sub": "bT0T7_pKncPMRCvZbs-WtRwC",
  "tid": "061b170c-a127-477d-9fa5-",
  "unique_name": "sean@monarchsciences.org",
  "upn": "sean@monarchsciences.org",
  "uti": "QrkBIwbMpeC",
  "ver": "1.0"
}
```

That's It!
Now we have the Access Token



Stealing Tokens from the Web Browser



AADInternals.com

The ultimate Entra ID (Azure AD) / Microsoft 365 hacking and admin toolkit



[AAD KILL CHAIN](#) [DOCUMENTATION](#) [LINKS](#) [OSINT](#) [TALKS](#) [TOOLS](#)



Exfiltrating NTHashes by abusing Microsoft Entra Domain Services

🕒 January 13, 2024 (Last Modified: January 14, 2024)

Last year I gave a presentation titled [Dumping NTHashes from Azure AD](#) at TROOPERS conference. The talk was about how the [Microsoft Entra Domain Services](#) (formerly Azure AD Domain Services) works and how it enabled dumping NTHashes from Entra ID (formerly Azure AD).

In this blog, I'll show how Microsoft Entra Domain Services (MEDS) can be (ab)used to exfiltrate NTHashes from on-prem Active Directory.



DoSing Azure AD

🕒 July 02, 2023

My recent talk at the great [T2](#) conference on DoSing Azure AD gained a lot of attention. Unfortunately, the talk was not recorded, so I decided to write a blog for those who couldn't attend. So here we go!



Deploying users with pre-registered MFA

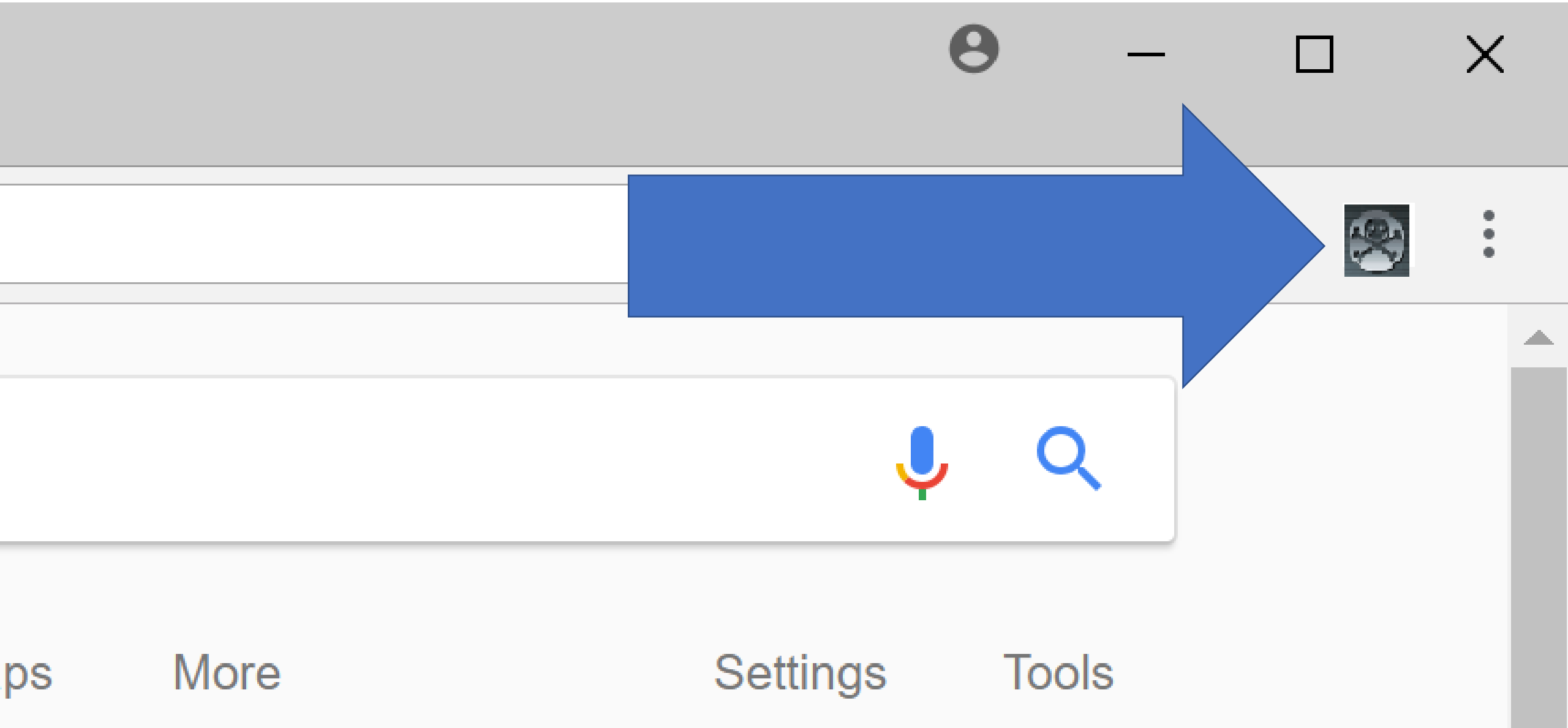
🕒 May 23, 2023 (Last Modified: May 24, 2023)

A couple of weeks ago a friend of mine asked would it be possible to pre-register MFA for users in Azure AD. For short, yes it is!

In this blog, I'll show how to pre-register [OTP](#) and [SMS](#) MFA methods using [AADInternals' Register-AADIntMFAApp](#) and [Set-AADIntUserMFA](#).

**Special THANK YOU
to DrAzureAD
himself, Dr. Nestori
Syynimaa for his help
with this section!**

Token Theft with Browser Extension



Token Theft with evilginx

<https://aad.portalazure.com/>

Home > Acme Corporation - Overview

Acme Corporation - Overview
Azure Active Directory

Switch directory Delete directory

theacme.io

Acme Corporation
Azure AD for Office 365

Sign-ins

To see sign-in data, your organization needs a Premium P1 or P2.
[Start a free trial](#)

What's new in Azure AD
Stay up to date with the latest release notes and blog posts.
26 entries since April 20, 2018. [View archive](#)

☒ All services (26) New feature

☐ Identity Security & Protection (8) Identity Protection - Identity Security & Protection

☐ 3rd Party Integration (3) June 20, 2019

☐ Monitoring & Reporting (5) New riskDetections API for Microsoft Graph (Public preview)

☐ Identity Lifecycle Management

Azure AD Connect sync

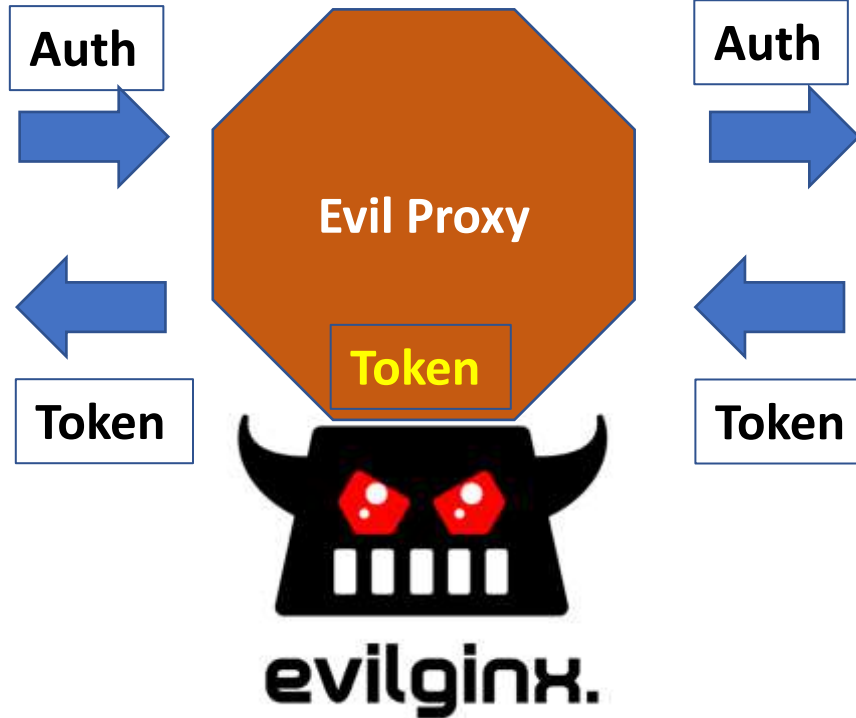
Status	Not enabled
Last sync	Sync has never run

Create

- User
- Guest user
- Group
- Enterprise application
- App registration

Other capabilities

- Identity Protection
- Privileged Identity Management
- Tenant restrictions



<https://github.com/kgretzky/evilginx2>

<https://aad.portal.azure.com/>

Microsoft Azure

Microsoft

sean@theacmeio.onmicrosoft.com

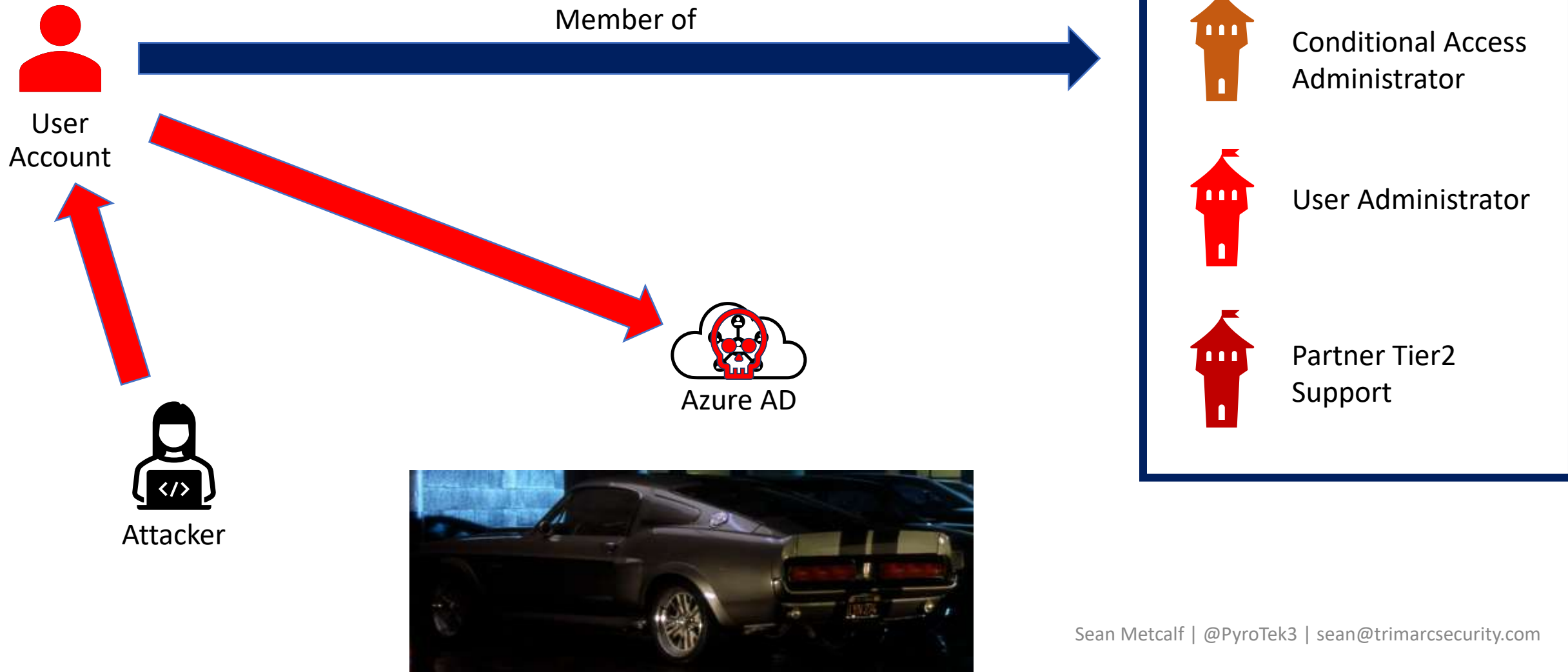
Approve sign in request

We've sent a notification to your mobile device.
Please respond to continue.

Having trouble? [Sign in another way](#)

[More information](#)

Overprivileged User



Application Escalation

```
PS C:\Data\_MCSA> get-azureadpspermissions -ApplicationPermissions|select ClientObjectID,ClientDisplayName,ResourceDisplayName,Permission
```

ClientObjectID	ClientDisplayName	ResourceDisplayName	Permission
9211cb77-c065-4fd9-a80b-bb3a3015caee	Lots 'o Privs!	Microsoft Graph	DelegatedPermissionGrant.ReadWrite.All
9211cb77-c065-4fd9-a80b-bb3a3015caee	Lots 'o Privs!	Microsoft Graph	Directory.ReadWrite.All
01438f2c-8d6d-4f11-9f76-f179fd3246fa	Overpermissioned App	Microsoft Graph	Application.ReadWrite.All
01438f2c-8d6d-4f11-9f76-f179fd3246fa	Overpermissioned App	Microsoft Graph	AppRoleAssignment.ReadWrite.All
01438f2c-8d6d-4f11-9f76-f179fd3246fa	Overpermissioned App	Microsoft Graph	DelegatedPermissionGrant.ReadWrite.All
01438f2c-8d6d-4f11-9f76-f179fd3246fa	Overpermissioned App	Microsoft Graph	Directory.ReadWrite.All
01438f2c-8d6d-4f11-9f76-f179fd3246fa	Overpermissioned App	Microsoft Graph	RoleManagement.ReadWrite.Directory

<https://gist.github.com/psignoret/9d73b00b377002456b24fcb808265c23>

Application Escalation: Find the App Owner

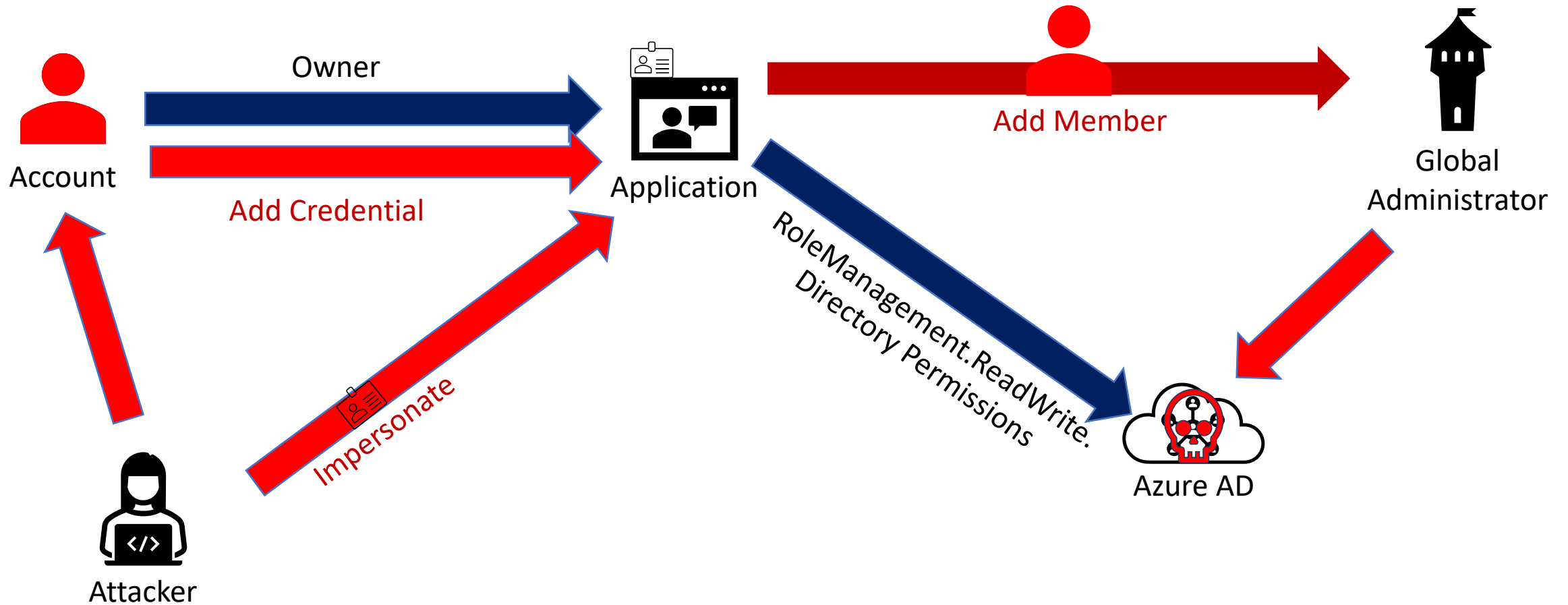
```
PS C:\Data\_MCSA> Get-AzureADApplication -SearchString 'overpermissioned'
```

ObjectId	AppId	DisplayName
-----	-----	-----
fbe4ea6c-0ae4-46b2-a6f0-5f96e3f4858f	5e356a56-f302-4987-923a-0e282ea31d39	overpermissioned App

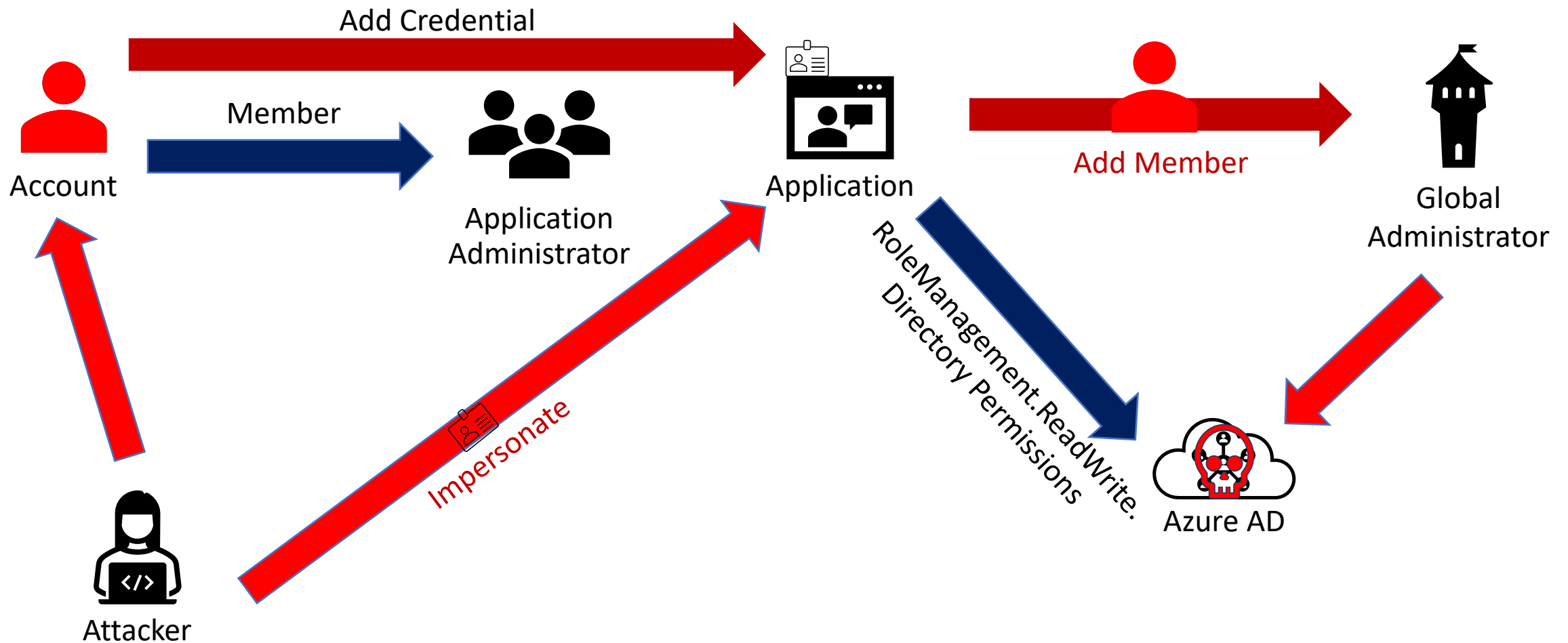
```
PS C:\Data\_MCSA> get-azureadapplicationowner -ObjectId 'fbe4ea6c-0ae4-46b2-a6f0-5f96e3f4858f'
```

ObjectId	DisplayName	UserPrincipalName	UserType
-----	-----	-----	-----
ab2365a7-24a1-4ac0-9cd0-2d529d759323	Kenyatta Yoder	Kenyatta.Yoder@BigMegaCorp.onmicrosoft.com	Member
70d9a5f5-7190-4452-a743-4f2bede82c06	Shayla Santana	Shayla.Santana@BigMegaCorp.com	Member
7d8afa78-d799-4bdc-8e33-3dff42fbbac3	Cadence McLean	Cadence.McLean@BigMegaCorp.com	Member

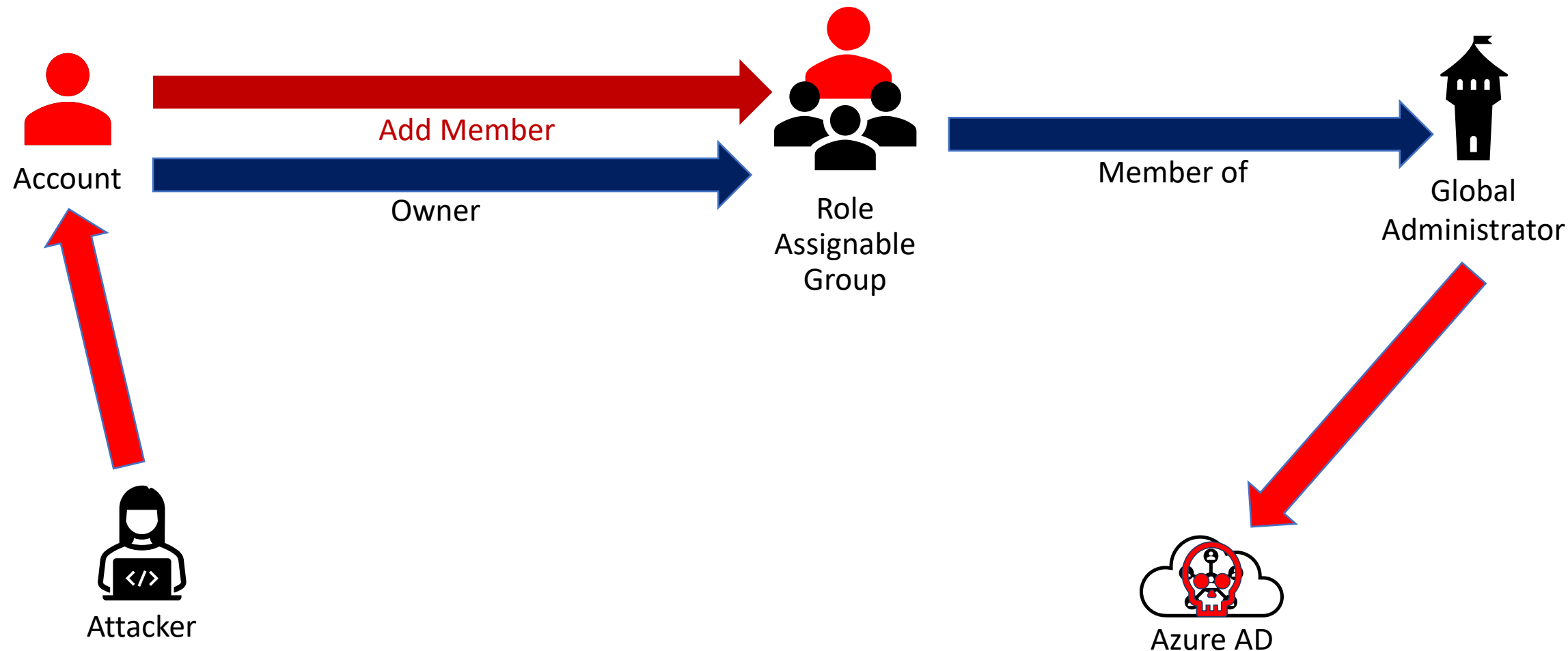
Compromise Azure AD through Application Permissions



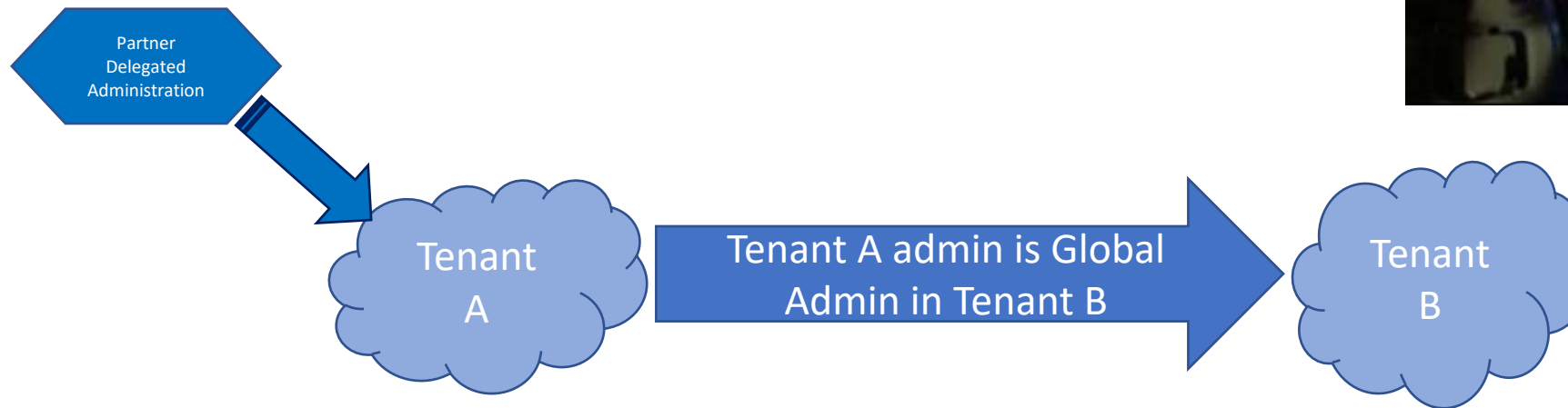
Compromise Azure AD through Application Permissions



Compromise Azure AD through Role Assignable Group Owner Rights



Solarigate “Tenant Hopping”



- Tenant Hopping (patent pending 🤪) is when an attacker compromises one tenant to jump to another, often with privileged rights.
- Similar to trust hopping in Active Directory.
- Solarigate attackers leveraged partner connections.

Delegated Admin

Microsoft Entra ID

- Overview
- Preview features
- Diagnose and solve problems
- Manage
 - Users
 - Groups
 - External Identities
 - Roles and administrators
 - Administrative units
 - Delegated admin partners

Got feedback?

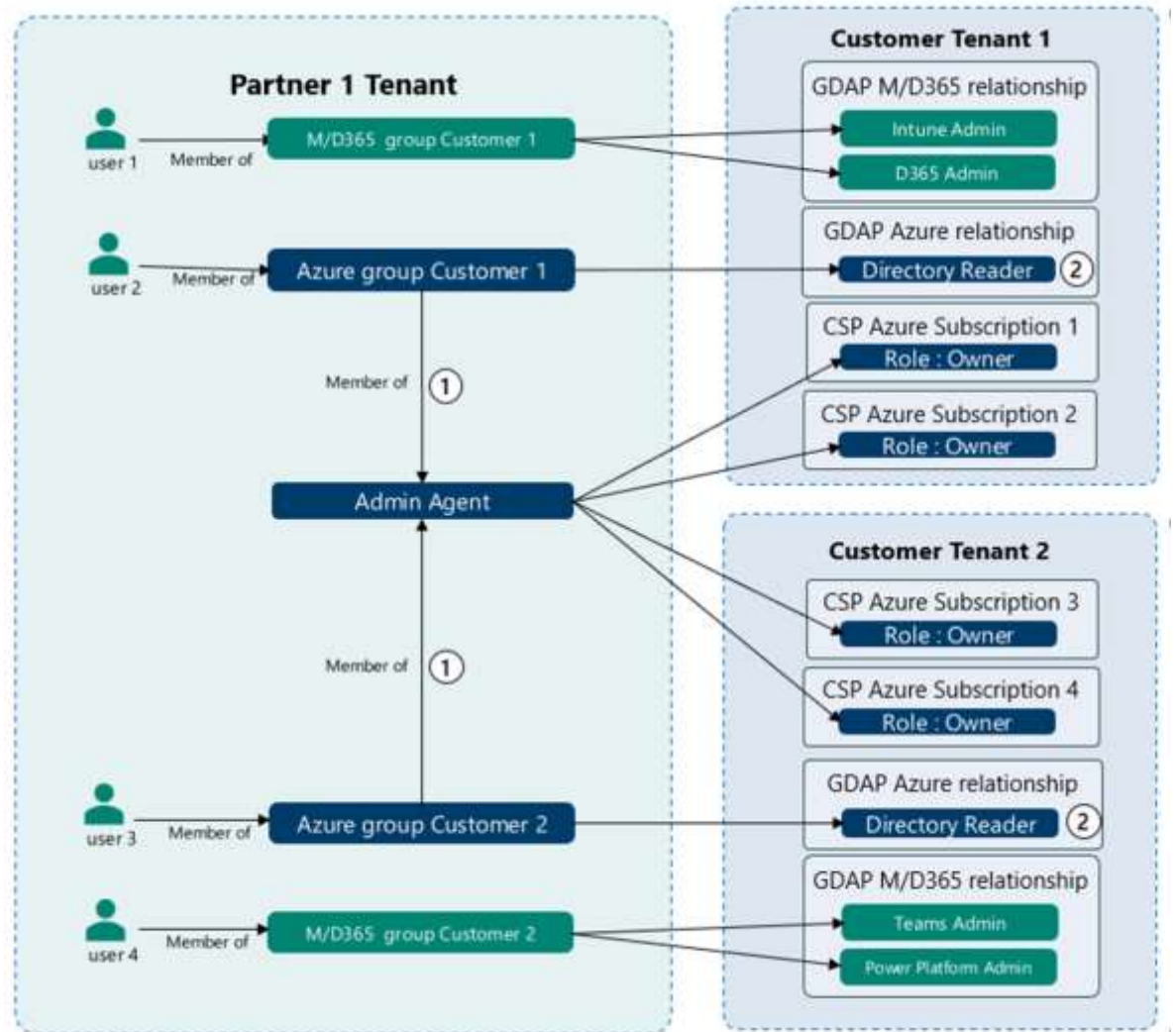
Delegated admin partners are Microsoft partners that you have authorized to administer Microsoft services in your tenant using delegated administration permission. [Learn about partners.](#)

Partner	Relationship type	Roles	Expiration
None			

Entra ID Menu Item: Delegated admin partners

https://portal.azure.com/#view/Microsoft_AAD_IAM/ActiveDirectoryMenuBlade/~/_/PartnerRelationships

Move to Granular Delegated Admin Privileges (GDAP)



Partner Relationships – aka Delegated Administration

- A configured partner can have admin rights to a customer tenant (“delegated administration”).
- This is provided when the partner requests access to the customer environment.
- When the customer accepts this request:
 - “Admin agent” role in partner tenant is provided effective “Global Administrator” rights to customer tenant.
 - “Helpdesk Agent” role in partner tenant is provided effective “Helpdesk Administrator” (Password Administrator) rights to customer tenant.
 - These are the only options.
 - They **apply to all customer environments** – there is no granular configuration.
- A partner with dozens of customers will result in all partner accounts in these groups having elevated rights in all customer environments.

Shift to granular delegated admin privileges (GDAP) ASAP!

Check Partner Configuration for your tenant here:

https://portal.azure.com/#view/Microsoft_AAD_IAM/ActiveDirectoryMenuBlade/~/PartnerRelationships



What about
Admins
Synchronized
from On-Prem
AD?

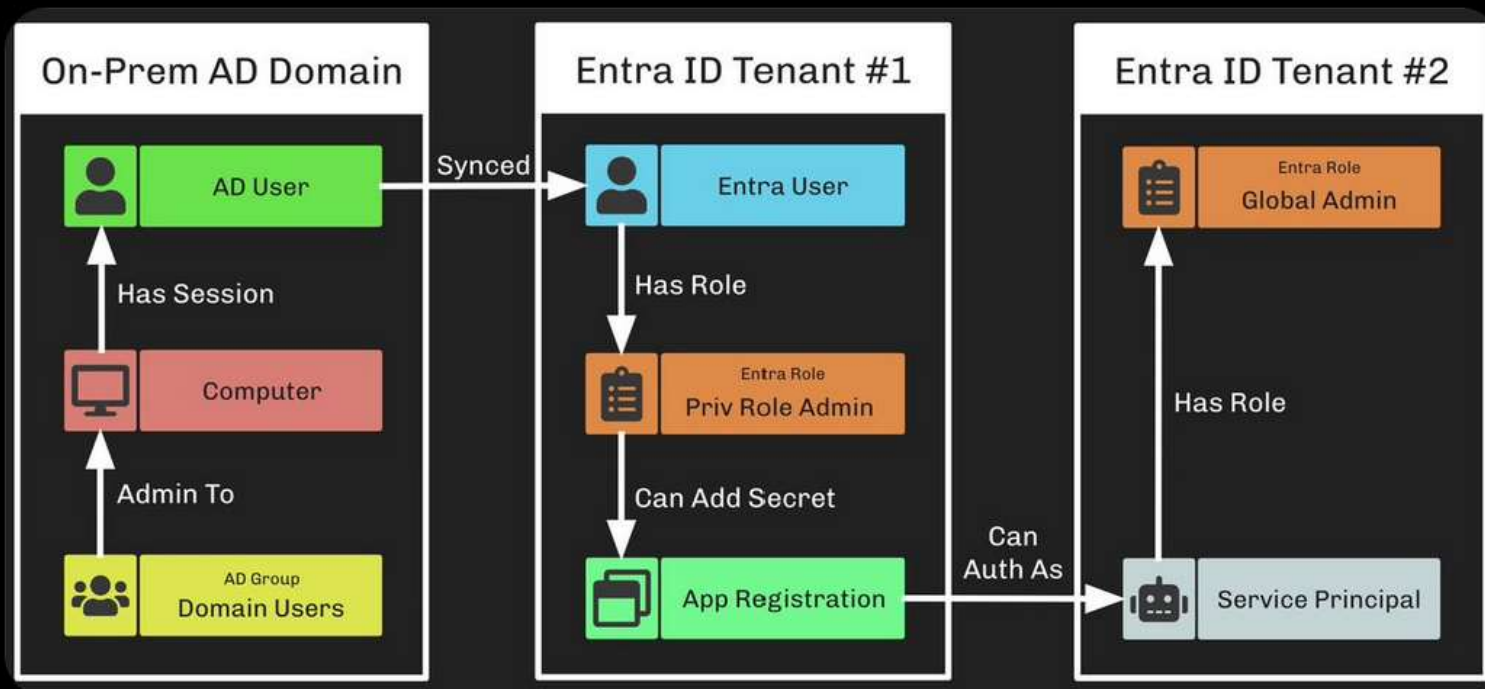


Andy Robbins

@_wald0

From Domain User to Global Admin. A real example from a real environment.

We found this path with free and open source BloodHound Community Edition: medium.com/p/335652a164df



<https://posts.specterops.io/hybrid-attack-paths-new-views-and-your-favorite-dog-learns-an-old-trick-335652a164df?gi=543e6e7a310d>



Yeah,
don't do that

Midnight Blizzard

January 12, 2024



Microsoft

Microsoft Actions Following Attack by Nation State Actor Midnight Blizzard

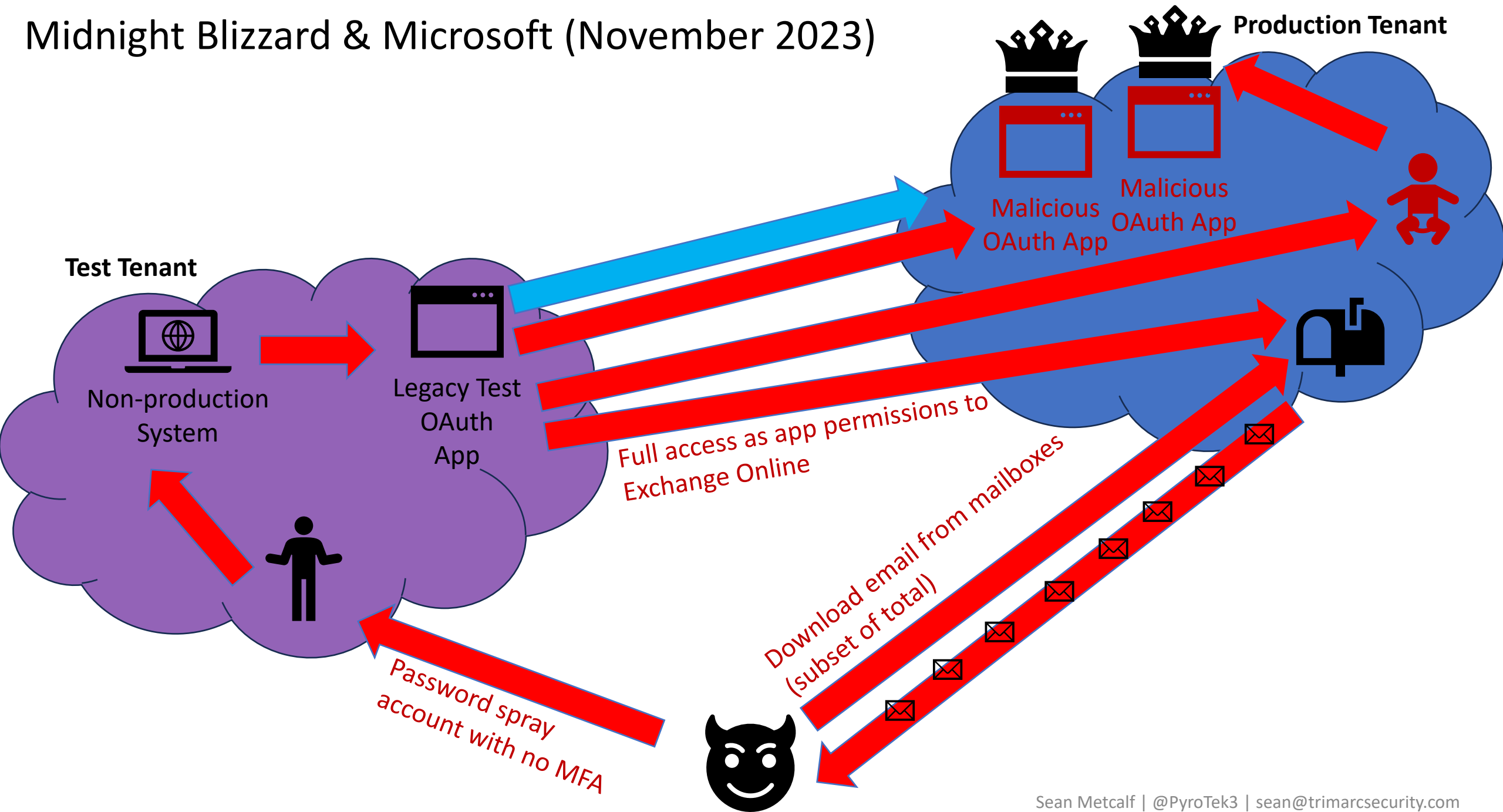
/ By [MSRC](#) / January 19, 2024 / 2 min read

The Microsoft security team detected a nation-state attack on our corporate systems on January 12, 2024, and immediately activated our response process to investigate, disrupt malicious activity, mitigate the attack, and deny the threat actor further access. Microsoft has identified the threat actor as [Midnight Blizzard](#), the Russian state-sponsored actor also known as Nobelium. As part of our ongoing commitment to responsible transparency as recently affirmed in our [Secure Future Initiative](#) (SFI), we are sharing this update.

Beginning in late November 2023, the threat actor used a password spray attack to compromise a legacy non-production test tenant account and gain a foothold, and then used the account's permissions to access a very small percentage of Microsoft corporate email accounts, including members of our senior leadership team and employees in our cybersecurity, legal, and other functions, and exfiltrated some emails and attached documents. The investigation indicates they were initially targeting email accounts for information related to Midnight Blizzard itself. We are in the process of notifying employees whose email was accessed.

The attack was not the result of a vulnerability in Microsoft products or services. To date, there is no evidence that the threat actor had any access to customer environments, production systems, source code, or AI systems. We will notify customers if any action is required.

Midnight Blizzard & Microsoft (November 2023)



What We Know

- Midnight Blizzard – a Moscow-supported espionage team also known as APT29 or Cozy Bear – **"utilized password spray attacks that successfully compromised a legacy, non-production test tenant account that did not have multifactor authentication (MFA) enabled."**
- After gaining initial access to a **non-production** Microsoft system, the intruders **compromised a legacy test OAuth application that had access to Microsoft's corporate IT environment.**
- The actor **created additional malicious OAuth applications.**
- **They created a new user account to grant consent in the Microsoft corporate environment to the actor controlled malicious OAuth applications.**
- The threat actor then used the **legacy test OAuth application to grant them the Office 365 Exchange Online full_access_as_app role, which allows access to mailboxes.**
- They then used this access to **steal emails and other files from corporate inboxes belonging to top Microsoft executives and other staff.**
- They used residential broadband networks as proxies to make their traffic look like it was all legitimate traffic from work-from-home staff, since it was coming from seemingly real users' IP addresses.
- This **all happened in late November, Microsoft didn't spot the intrusion until January 12**, and the compromised email accounts included those of senior leadership and cybersecurity and legal employees.
- "If the same team were to deploy the legacy tenant today, mandatory Microsoft policy and workflows would ensure MFA and our active protections are enabled to comply with current policies and guidance, resulting in better protection against these sorts of attacks."

Update on Microsoft Actions Following Attack by Nation State Actor Midnight Blizzard

MSRC / By [MSRC](#) / March 08, 2024 / 2 min read

This blog provides an update on the nation-state attack that was detected by the Microsoft Security Team on January 12, 2024. As we [shared](#), on January 19, the security team detected this attack on our corporate email systems and immediately activated our response process. The Microsoft Threat Intelligence investigation identified the threat actor as [Midnight Blizzard](#), the Russian state-sponsored actor also known as NOBELIUM.

As we said at that time, our investigation was ongoing, and we would provide additional details as appropriate.

In recent weeks, we have seen evidence that Midnight Blizzard is using information initially exfiltrated from our corporate email systems to gain, or attempt to gain, unauthorized access. This has included access to some of the company's source code repositories and internal systems. To date we have found no evidence that Microsoft-hosted customer-facing systems have been compromised.

It is apparent that Midnight Blizzard is attempting to use secrets of different types it has found. Some of these secrets were shared between customers and Microsoft in email, and as we discover them in our exfiltrated email, we have been and are reaching out to these customers to assist them in taking mitigating measures. Midnight Blizzard has increased the volume of some aspects of the attack, such as password sprays, by as much as 10-fold in February, compared to the already large volume we saw in January 2024.

Midnight Blizzard's ongoing attack is characterized by a sustained, significant commitment of the threat actor's resources, coordination, and focus. It may be using the information it has obtained to accumulate a picture of areas to attack and enhance its ability to do so. This reflects what has become more broadly an unprecedented global threat landscape, especially in terms of sophisticated nation-state attacks.

Across Microsoft, we have increased our security investments, cross-enterprise coordination and mobilization, and have enhanced our ability to defend ourselves and secure and harden our environment against this advanced persistent threat. We have and will continue to put in place additional enhanced security controls, detections, and monitoring.

Our active investigations of Midnight Blizzard activities are ongoing, and findings of our investigations will continue to evolve. We remain committed to sharing what we learn.

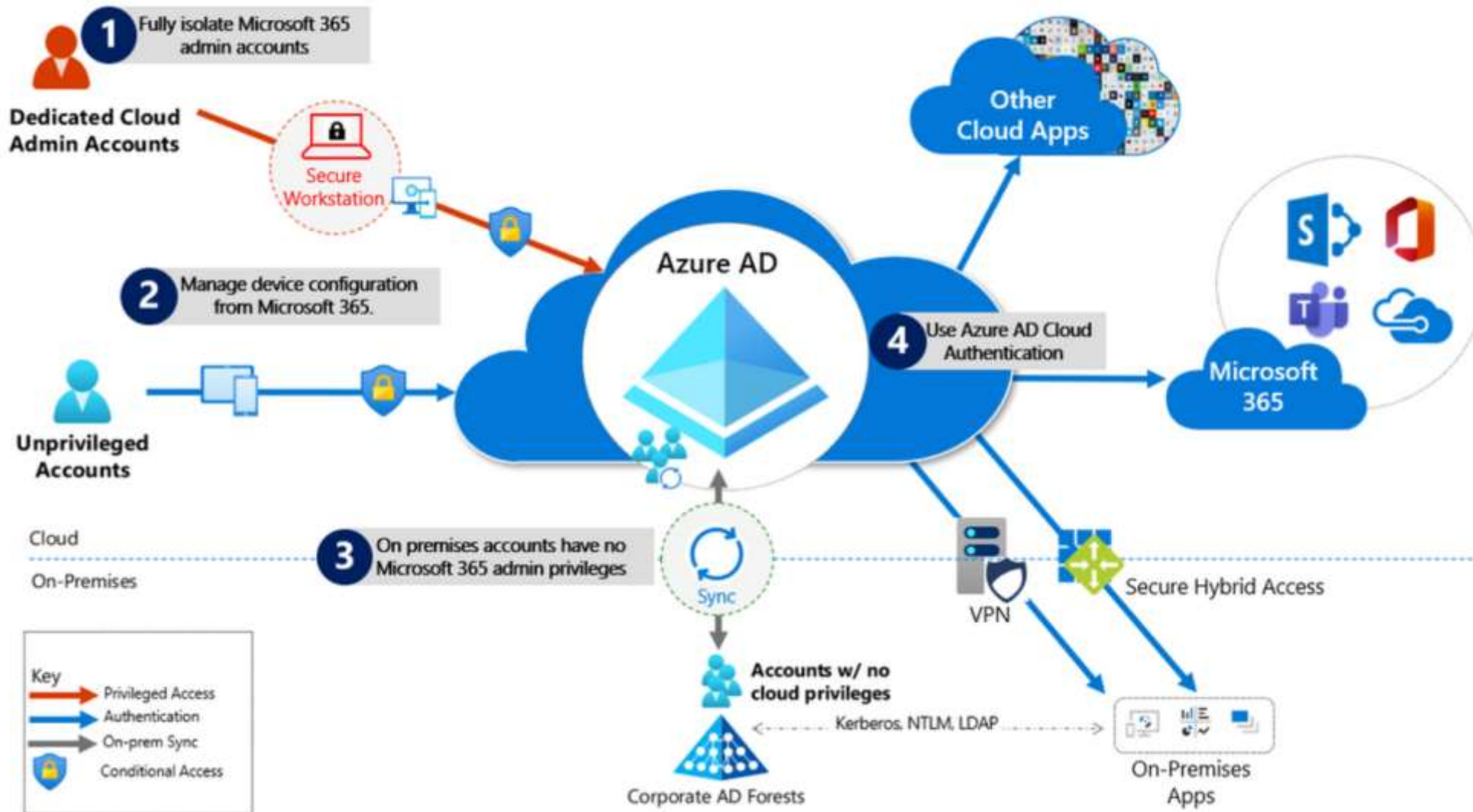
Sean Metcalf | [@PyroTek3](#) | sean@trimarcsecurity.com



Securing Entra ID Administration



Securing Azure AD/Entra ID



Securing Azure AD/Entra ID - Microsoft Summary



Fully Isolate Azure AD / Microsoft Office 365 admin accounts

They should be:

1. Created in Entra ID.
2. Required to use Multi-factor authentication (MFA).
3. Secured by conditional access.
4. Accessed only by using Azure Managed Workstations.

There should be no on-prem accounts with highly privileged Azure AD/Entra ID rights.

Securing Azure AD/Entra ID - Microsoft Summary



Manage from Cloud controlled Devices

Use Azure AD Join and cloud-based mobile device management (MDM) to eliminate dependencies on your on-premises device management infrastructure, which can compromise device and security controls.



No on-prem account has Azure AD / Microsoft Office 365 privileges

Privileged on-premises software must not be capable of impacting Azure AD privileged accounts or roles.



Use Azure AD cloud authentication to eliminate on-prem credential dependencies.

Always use strong authentication, such as Windows Hello, FIDO, the Microsoft Authenticator, or Azure AD MFA.

On-Prem: Entra Password Protection

- Prevent users from selecting known bad passwords
- Start in audit mode to get an idea how bad it is

<https://aka.ms/deploypasswordprotection>

Custom smart lockout

Lockout threshold ⓘ

10

Lockout duration in seconds ⓘ

70

Custom banned passwords

Enforce custom list ⓘ

Yes

No

Custom banned password list ⓘ

seahawks
mariners
sounders
redmond
washington

Password protection for Windows Server Active Directory

Enable password protection on Windows Server Active Directory ⓘ

Yes

No

Mode ⓘ

Enforced

Audit

Phishing Defensive Layers

Require Users to MFA, preferably FIDO2

- Authenticator App recommended. Better performance and less prompts (behaves as authentication token broker)

Conditional Access Policy

- MFA, Location, App, etc

Risk Based Policy

- Only prompt when Risk detected

People will fall to Phishing no matter what so we must monitor...

Key Cloud Administration Security Controls

- Use admin systems for cloud administration
- Enforce FIDO2 for Trimarc Level 0 & 1 roles
- FIDO2 keys for Emergency “Break Glass” Accounts
- Leverage Conditional Access policies to enforce MFA for admins from all locations



What are the most resilient MFA methods?

Folks, the **Azure MFA** enforcement will soon start rolling out and there will be **NO EXCEPTIONS** for **emergency access** accounts!

Here's a quick guide to help you pick the most resilient MFA method for your emergency access accounts 📌

TLDR: Use FIDO2 security key for emergency accounts

Depends on
Entra Auth Service

1st Place Medal

Certificate based authentication

FIDO2 security key

Windows Hello for Business

Depends on
Entra Auth Service
+
Azure MFA Service

2nd Place Medal

Password
+ Hardware Tokens OTP

3rd Place Medal

Password
+ Software Tokens OTP

Depends on
Entra Auth Service
+
Azure MFA Service
+
Phone carrier /
Mobile OS /
Internet

3rd Place Medal

Microsoft Authenticator Passwordless

Password + Microsoft Authenticator Number match

Password + Voice

Password + SMS

<https://x.com/merill/status/1821027962864726249/photo/1>

Common Persistence Method Checks

Review Illicit Consent Grants

<https://docs.microsoft.com/en-us/microsoft-365/security/office-365-security/detect-and-remediate-illicit-consent-grants?view=o365-worldwide>

Review Exchange Forms/Rules for potentially malicious settings.

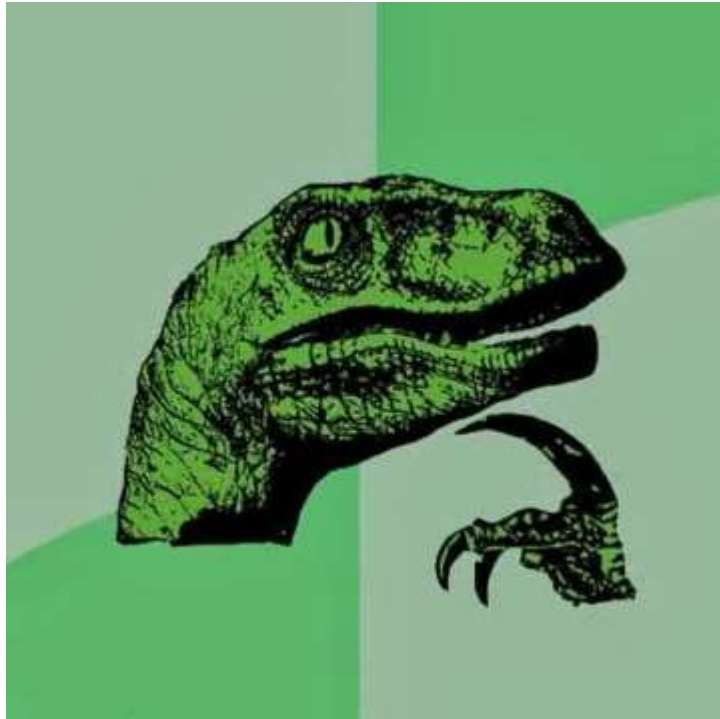
<https://docs.microsoft.com/en-us/microsoft-365/security/office-365-security/detect-and-remediate-outlook-rules-forms-attack?view=o365-worldwide>

Review Exchange Online mailbox permissions for unusual/unintended configuration (Get-ExoMailboxPermission)

<https://docs.microsoft.com/en-us/powershell/module/exchange/powershell-v2-module/get-exomailboxpermission?view=exchange-ps>

Conclusion

Sean Metcalf | @PyroTek3 | sean@trimarcsecurity.com



Attackers are targeting the cloud

Identifying common security issues and resolving them improves system security.

Fixing these issues provides improved breach resilience.



Presentation Link:

Trimarc.co/SeanTalkDEFCONCV2024

Slides, Video & Security Articles:

Hub.TrimarcSecurity.com





Questions?



Presentation Link:
Trimarc.co/SeanTalkDEFCONCV2024