Microsoft Security

SC-300

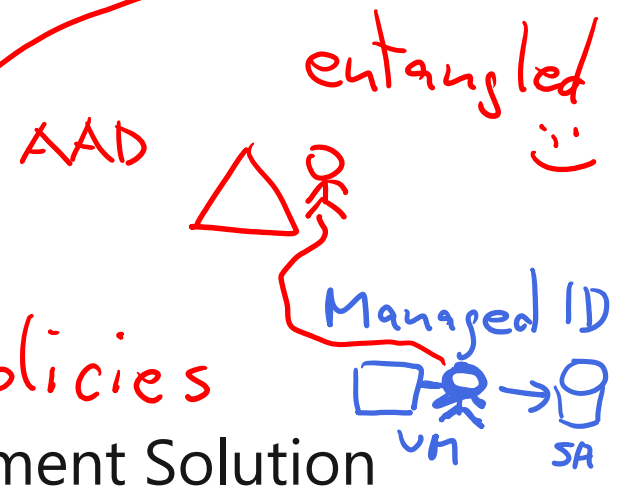
Tag 2

Guten Morgen!

Microsoft Identity and Access Administrator

SC-300 Agenda

- LP1: Implement an Identity Management Solution
- LP2: Implement an Authentication and Access Management Solution
- LP3: Implement Access Management for Apps
- LP4: Plan and Implement an Identity Governance Strategy



Microsoft Security

Implement an Authentication and Access Management solution

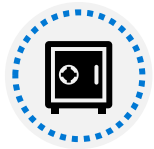
LP 2

Outline

Plan and implement Azure Multifactor Authentication (MFA)

Manage user authentication

Plan, implement, and administer conditional access CA



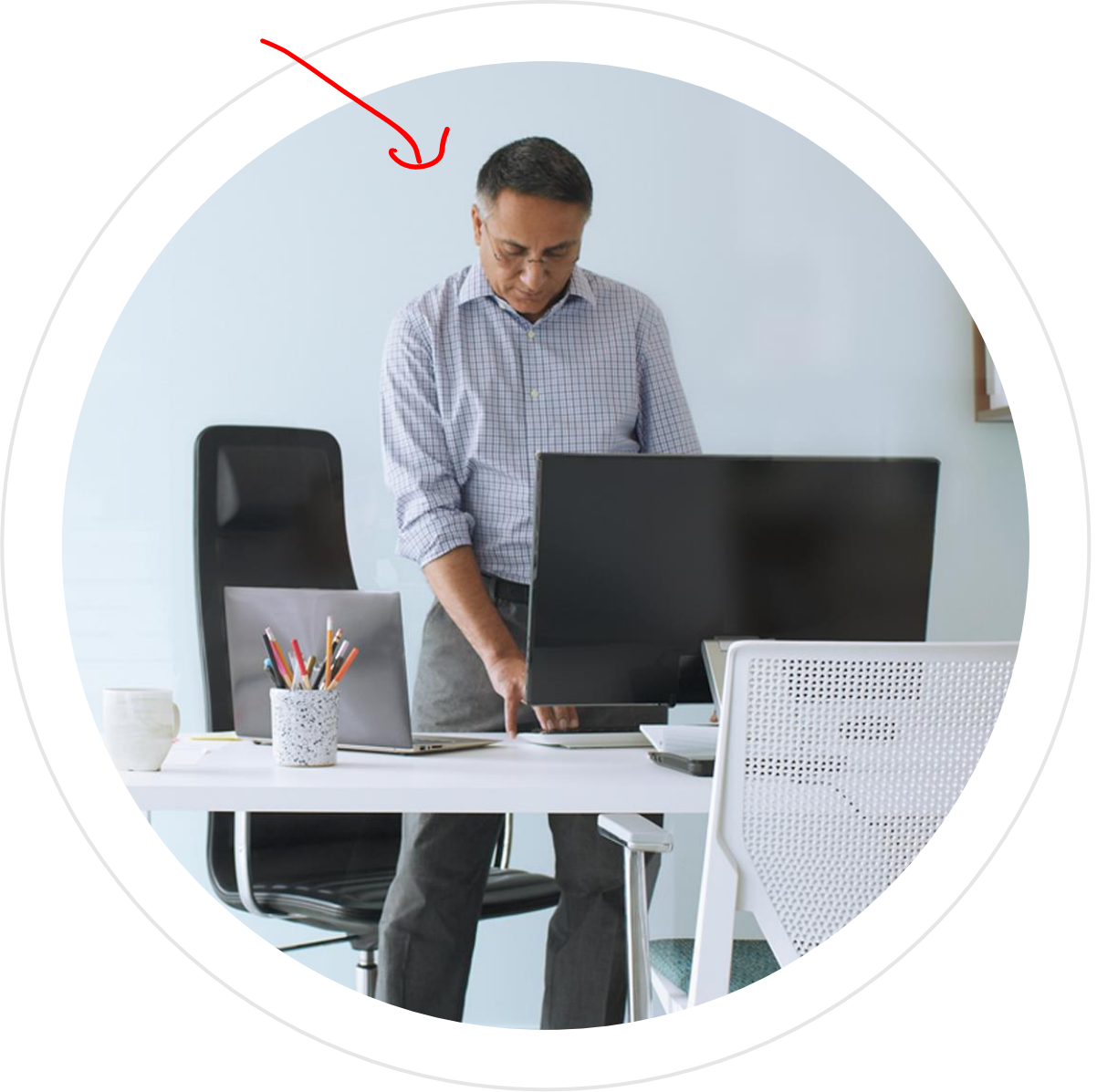
Manage Azure AD Identity Protection

Implement access management for Azure resources

UAA
Managed ID

Microsoft Security

Secure Azure Active Directory users with multifactor Authentication

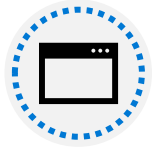


Objectives

What is Azure AD multifactor Authentication?

Configure and deploy self-service password reset

Plan your multifactor authentication



Configure multifactor authentication methods

Azure AD Features to protect cloud assets

- Password complexity rules
- Password expiration rules
- Self-service password reset (SSPR)
- Azure AD Identity Protection
- Azure AD password protection

- Azure AD smart lockout
- Azure AD Application Proxy
- Single sign-on (SSO)
- Azure AD Connect
- Azure AD MFA & Conditional Access

Always think **Zero Trust**

Always Verify – Use Least Privilege Access – Assume Breach

Identity ist der neue Perimeter!?

What is Azure AD multifactor Authentication?

Value and Capabilities of Azure AD MFA

free "per user MFA"

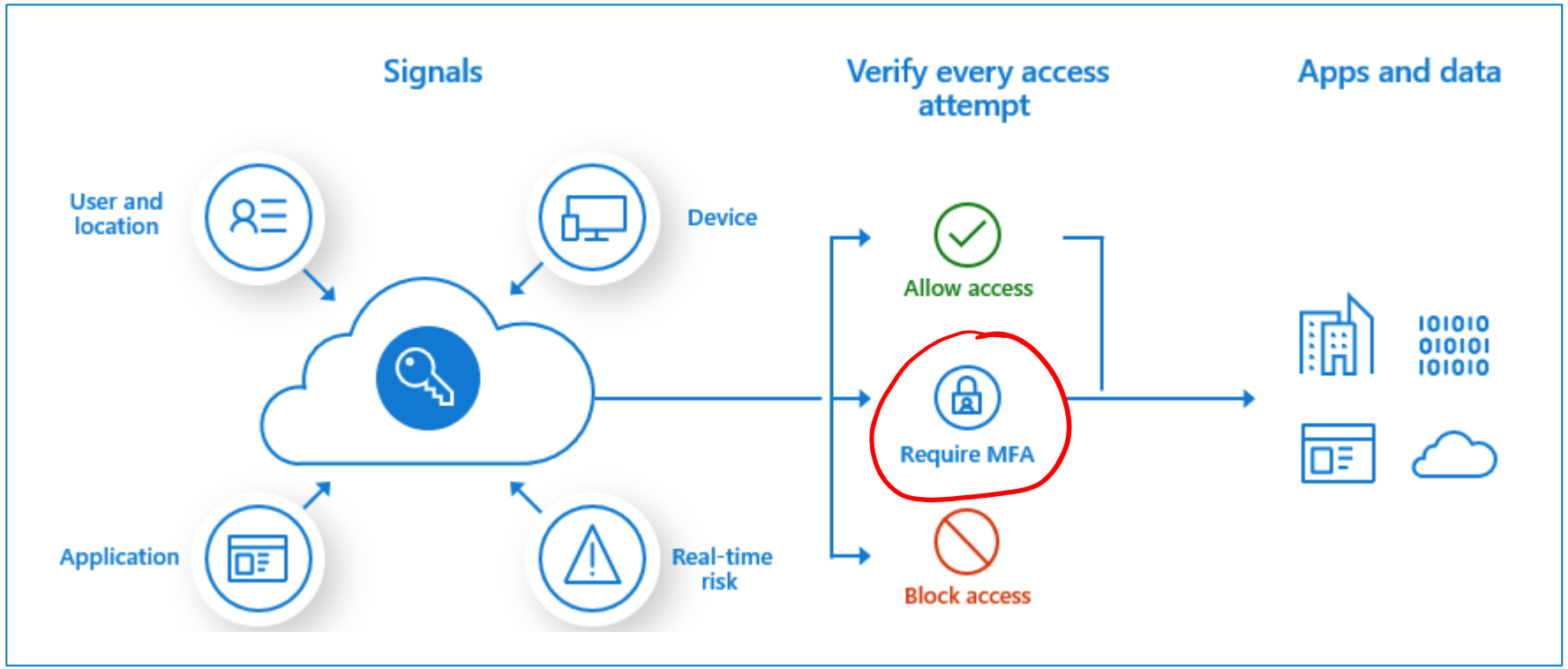
Value

- More secure than passwords
- Quick and easy to setup and manage
- Strong Identity verification
- Stronger security
- Often support compliance goals
- Many different types of Authentication methods, with different levels of security

Categories of authentication factors

Something you know • Something you possess • Something you are

Enabling MFA with Conditional Access



Set up a Conditional Access policy that requires a user / group to have MFA required for access to specific resources.

User States of MFA

Disabled – Default state, user not enrolled in MFA

Enabled – User is enrolled in MFA, but can still use their password. At each login they are prompted to register for an MFA authentication method.

Enforced – User is enrolled in MFA, and has either completed their MFA registration; or will be forced to complete it on their next login.

Considerations for Azure AD MFA based on the infrastructure

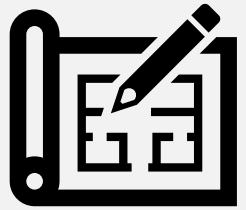
Cloud Only setup – Nothing additional required to set up Azure AD MFA

Hybrid Identity – Azure AD Connect must be deployed and synchronized / federated with your on-premises Active Directory Domain Services

Need on-premises legacy apps – Azure AD Proxy must be deployed.

Use Azure AD MFA with a RADIUS Authentication – A Network Policy Server (NPS) must be set up and configured

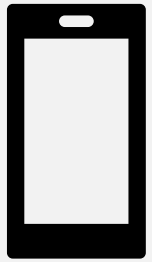
Plan your multifactor authentication deployment



Deployment considerations

- Get employee buy-in
  - User Communications (posters, emails, and other support items)
- Consider rolling MFA out in waves
- Create a full communications plan
- Tie your MFA roll-out with Conditional Access compliance
  - Specific devices, Working location, Application or Data Access
- Select your Authentication methods
- Plan MFA Registration process
- Add on-premises systems after MFA is established

Supported authentication methods



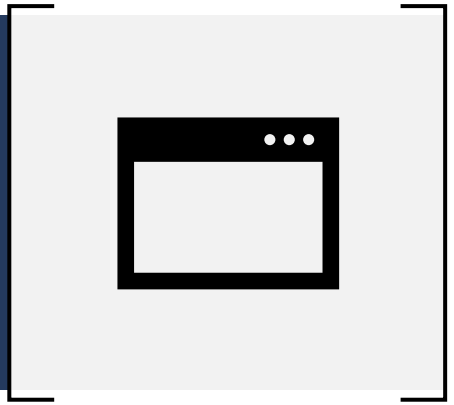
Mobile app verification

Call to a phone

Text message to a phone

SMS

Configure multifactor authentication methods



Azure authentication methods

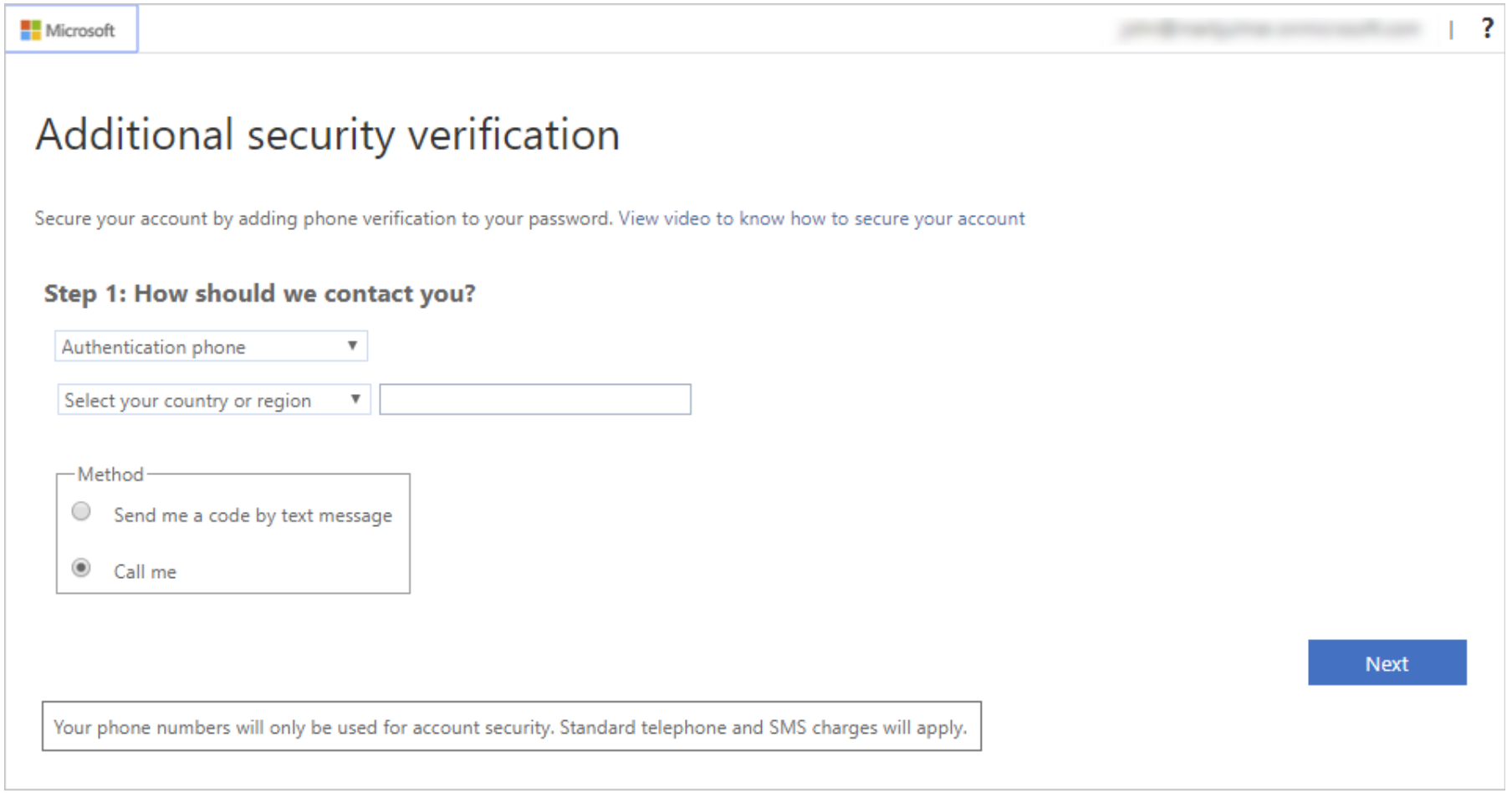
AuthN Methods when deploying MFA

- Microsoft Authenticator app
- Windows Hello for Business
- FIDO2 security key
- OATH hardware token (preview)
- OATH software token
- SMS
- Voice call

Supplemental AuthN for niche use

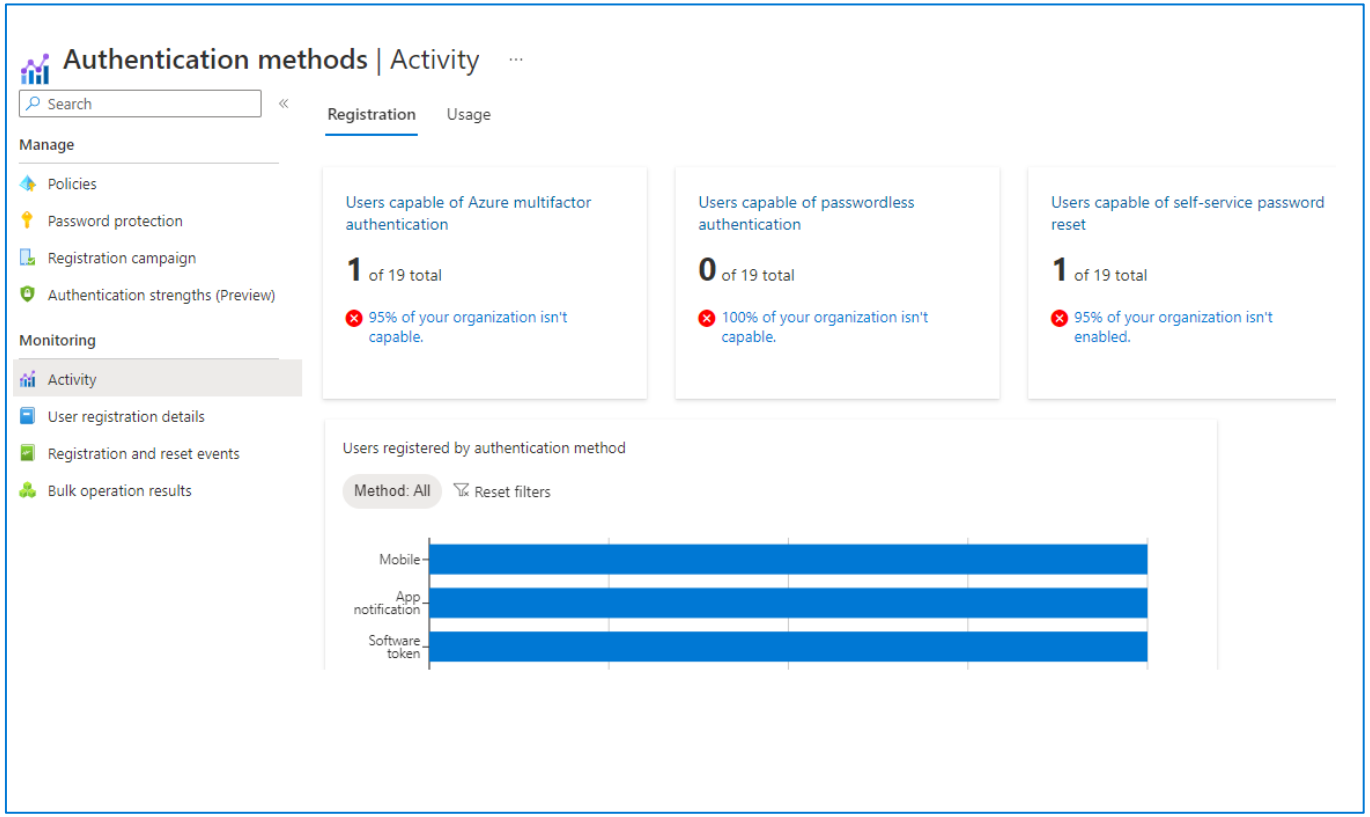
- Security questions
  - Non-admins only
- Email address
  - Part of SSPR if enabled
- App passwords
  - For legacy apps that don't directly support Azure MFA

Registering an authentication method

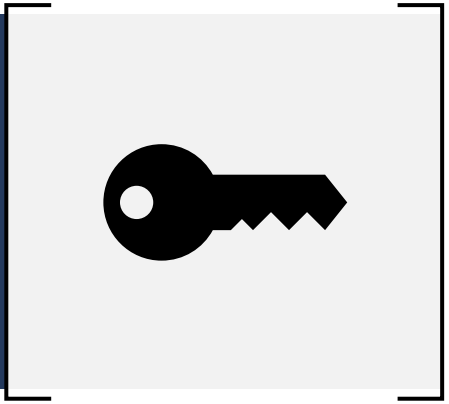


Monitoring adoption

- Azure AD includes a **Usage & insights** view in the **Monitoring** section where you can monitor the authentication methods activity. From here you can view the adoption of MFA.
- In addition to the overall registration numbers, you can also see the success and failure of registrations per authentication method.
- You can also learn more about MFA usage in your organization through the **Usage** tab on the main view.

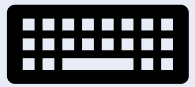


Configure and deploy self-service password reset

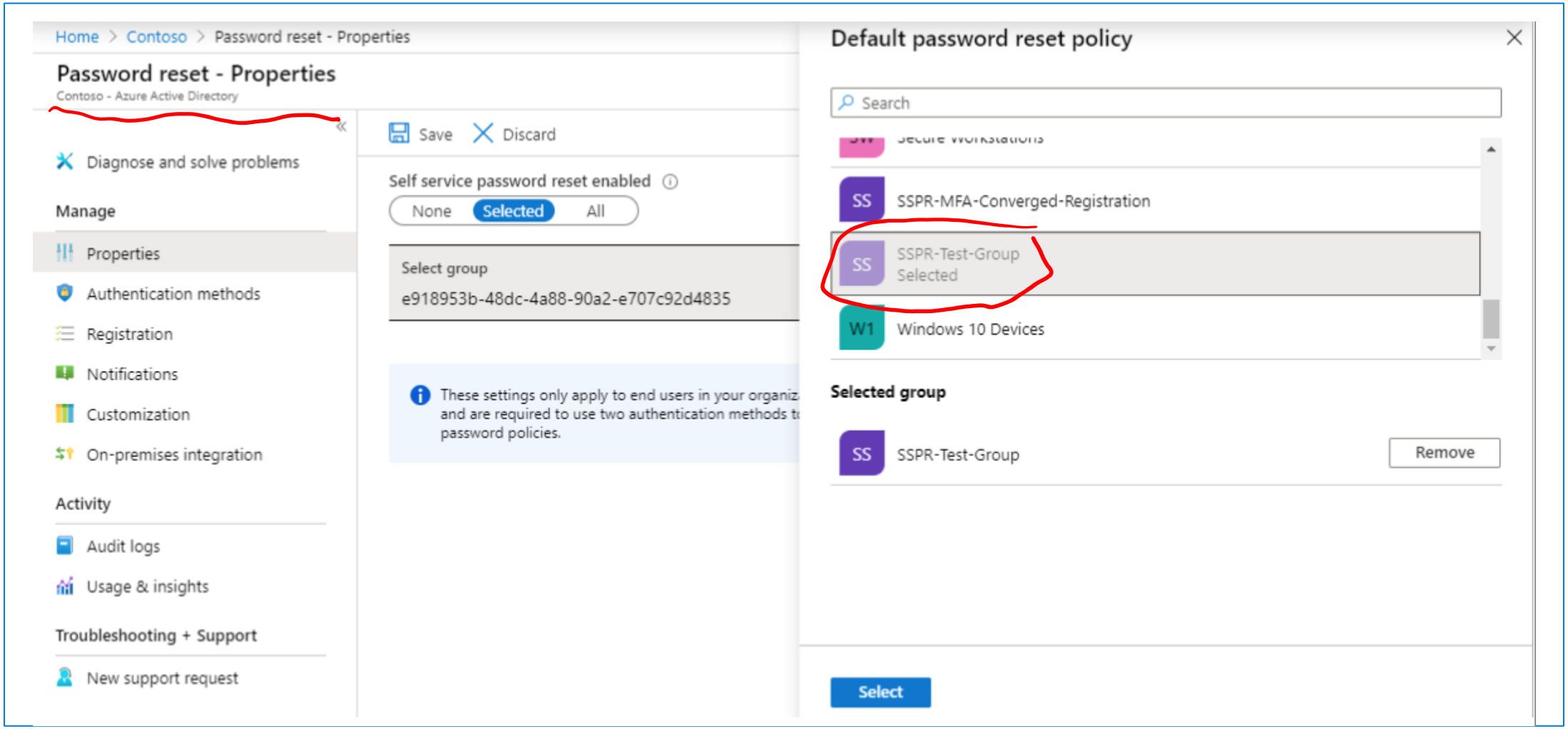


Azure AD self-service password reset

SSPR

Users can reset their own password	
	No admin / IT intervention
Reduces the loss of user productivity	
	Reduces helpdesk efforts
Users must be enrolled first	
	Requires an assigned license

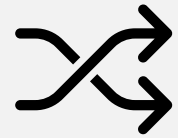
Enabling SSPR



SSPR Licensing options

Feature	Azure AD Free	Microsoft 365 Business Standard	Microsoft 365 Business Premium	Azure AD Premium P1 or P2
Cloud-only user password change When a user in Azure AD knows their password and wants to change it	●	●	●	●
Cloud-only user password reset When a user in Azure AD has forgotten their password		●	●	●
Hybrid user password change or reset with on-prem writeback When a user in Azure AD that's synchronized from an on-premises directory using Azure AD Connect			●	●

Extend MFA to devices

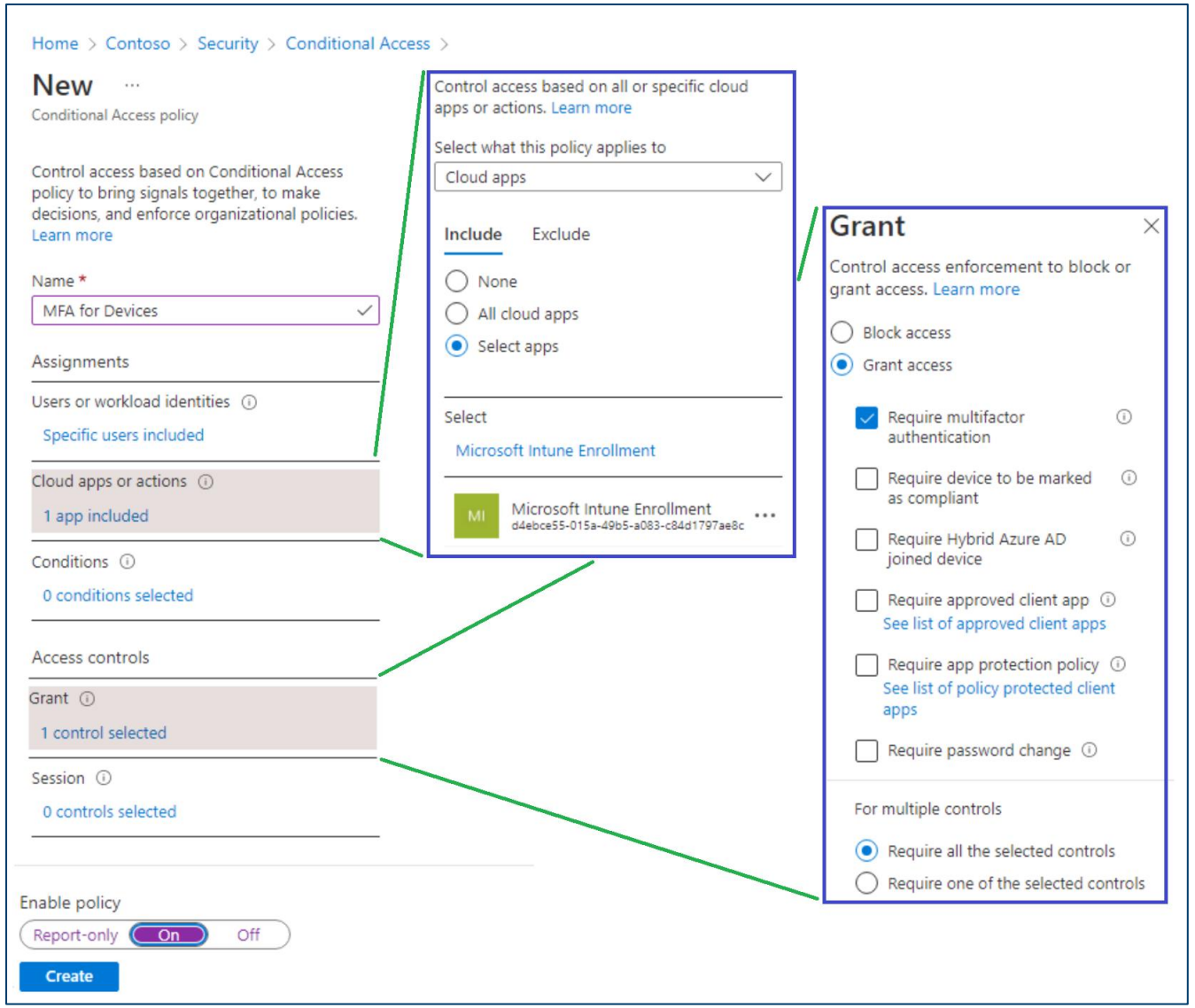


Require MFA for devices

Use conditional access rules to extend MFA to devices and device enrollment.

Two methods:

1) Policy for Windows Intune or Windows Intune Enrollment (seen in picture).
2) Policy within Intune device settings



Protecting Azure AD from device attacks

Monitor the device:

- Device registration and Azure AD join
- Non-compliant devices accessing applications
- BitLocker key retrieval
- Device administrator roles
- Sign-ins to virtual machines

Logs with device data:

- Azure AD Audit logs
- Sign-in logs
- Microsoft 365 Audit logs
- Azure Key Vault logs

Tools to use:

- Microsoft Sentinel
- Azure Monitor
- Azure Event Hubs

Monitor MFA

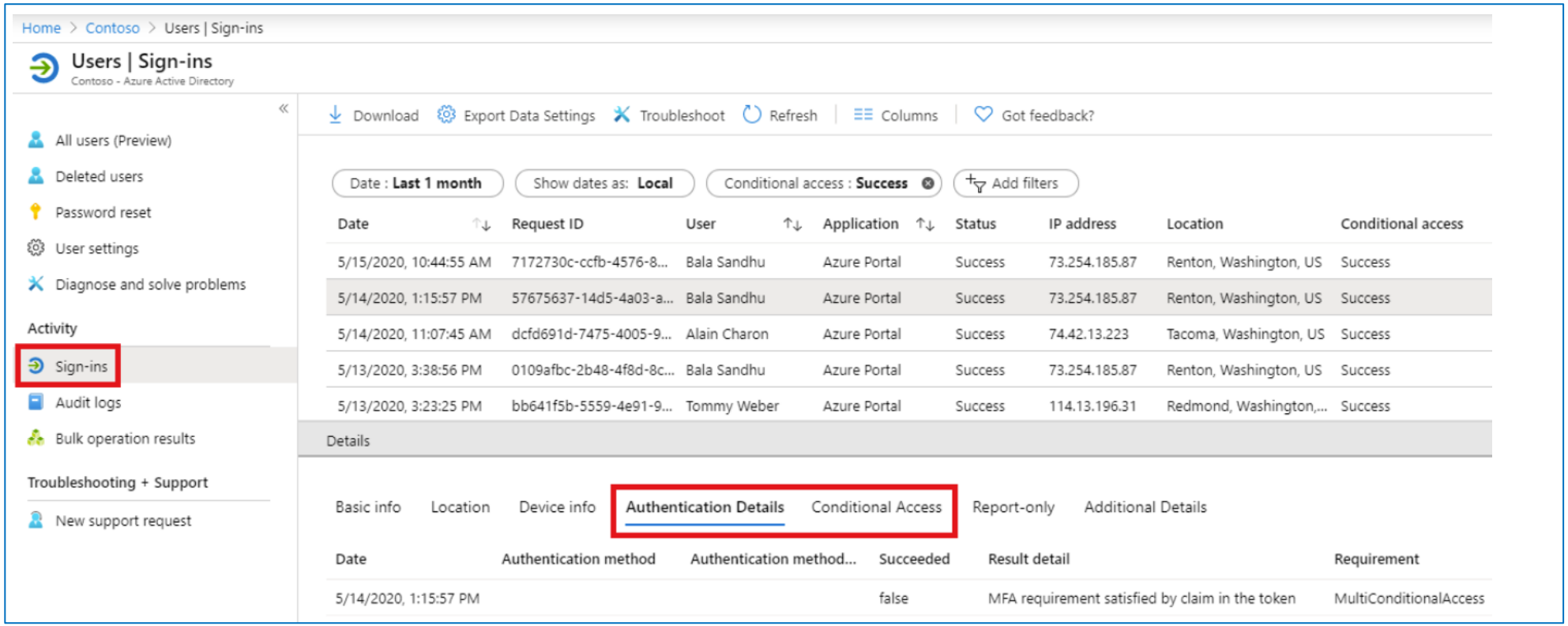
Monitor Azure AD MFA activity

Use the Azure AD sign-in report to review MFA usage.

Data available in the report:

- Was the sign-in challenged with MFA?
- How did the user complete MFA?
- Which authentication methods were used during a sign-in?
- Why was the user unable to complete MFA?
- How many users are challenged for MFA?
- How many users are unable to complete the MFA challenge?
- What are the common MFA issues end users are running into?

User – Sign-ins report



The **Authentication Details** or **Conditional Access** tab of the event details shows you the status code or which policy triggered the MFA prompt.

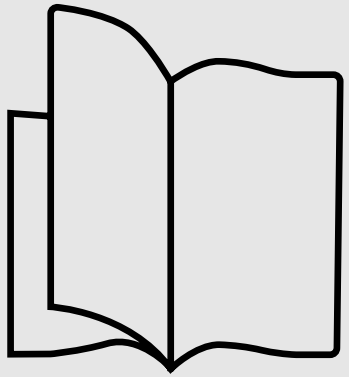
References

Planning a cloud-based Azure AD multifactor Authentication deployment

https://docs.microsoft.com/azure/active-directory/authentication/howto-mfa-getstarted

Deploy Azure AD self-service password reset

https://docs.microsoft.com/azure/active-directory/authentication/howto-sspr-deployment



Microsoft Security

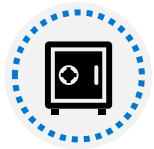
Manage user authentication

Objectives

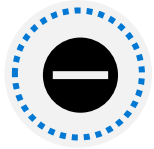
Administer authentication methods (FIDO2/Passwordless)

Implement an authentication solution based on Windows Hello for Business

Disable accounts and revoke sessions



Deploy and manage password protection



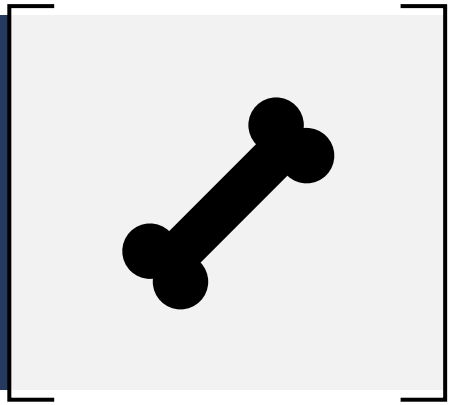
Configure smart lockout thresholds

Kerberos in Azure AD

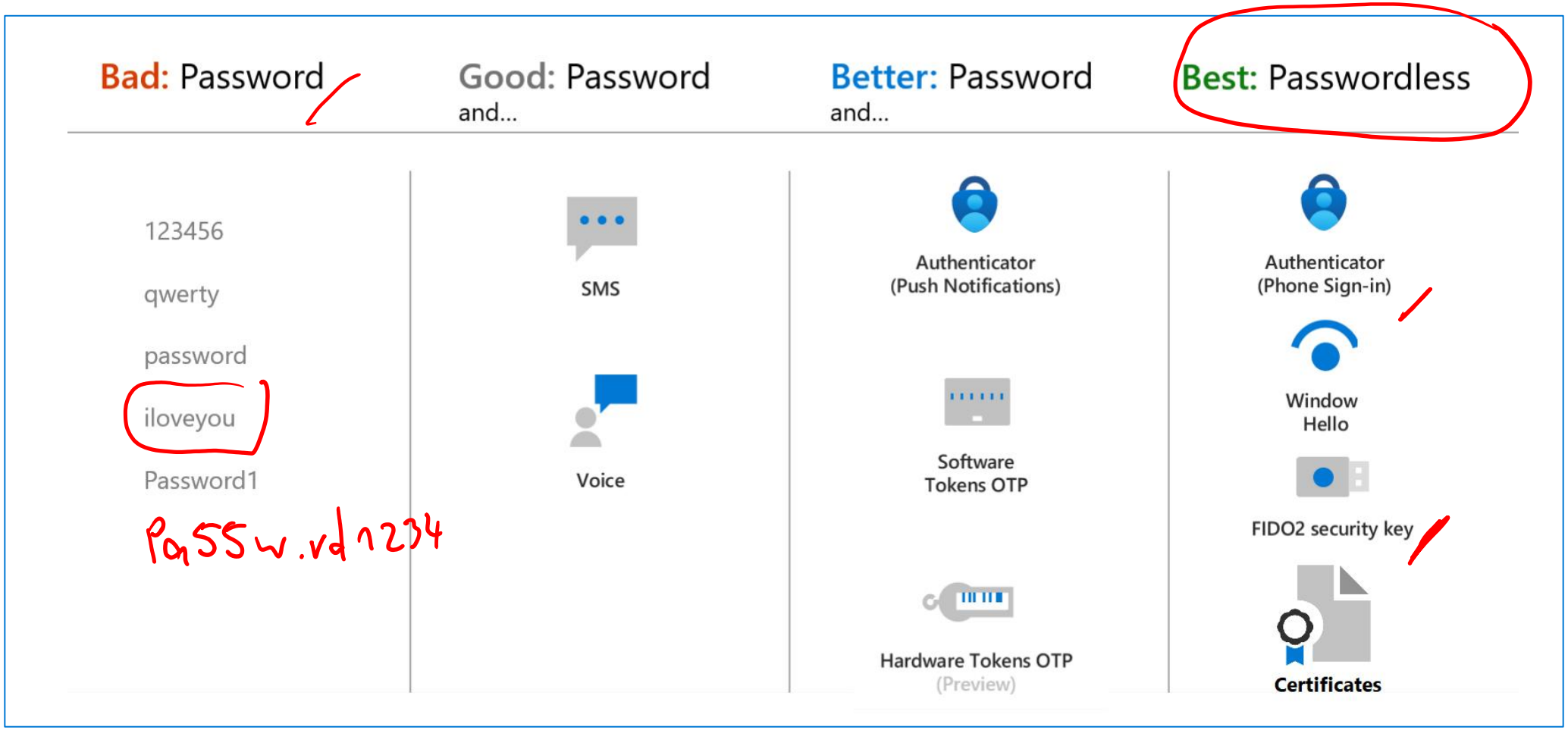
Certification based authentication

Azure AD user authentication in Virtual Machines (VMs)

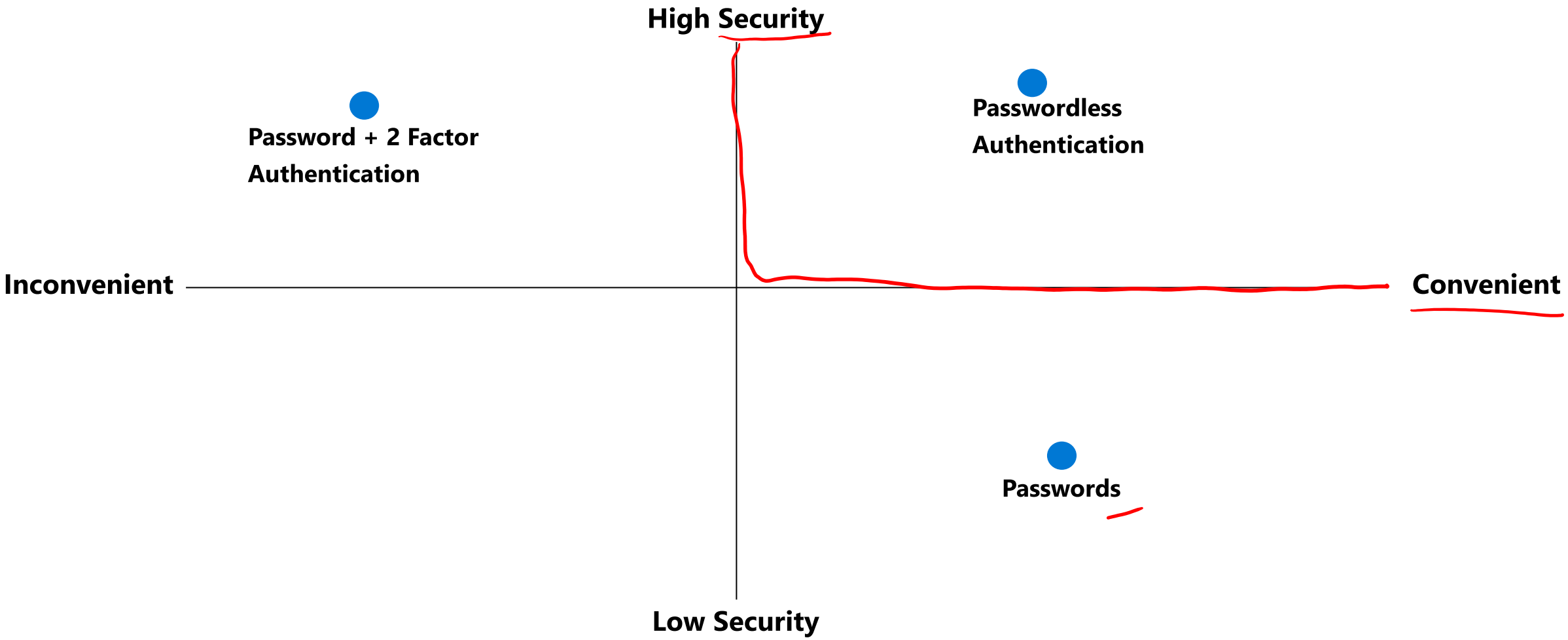
Administer authentication methods



Authentication methods

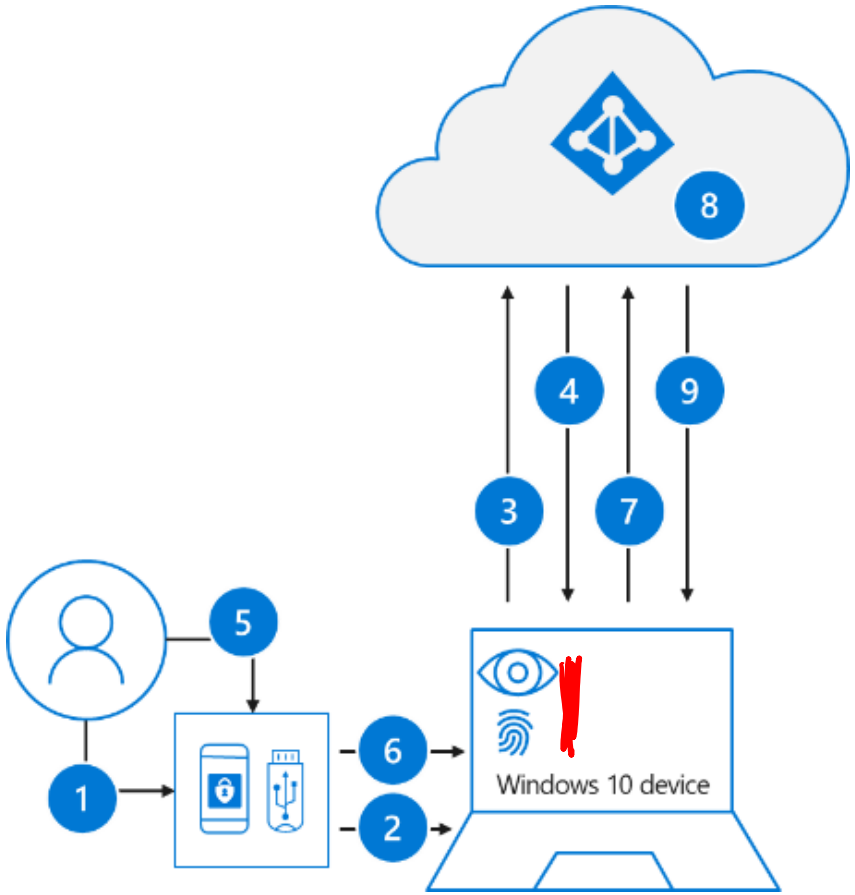


Authentication Method strength and security



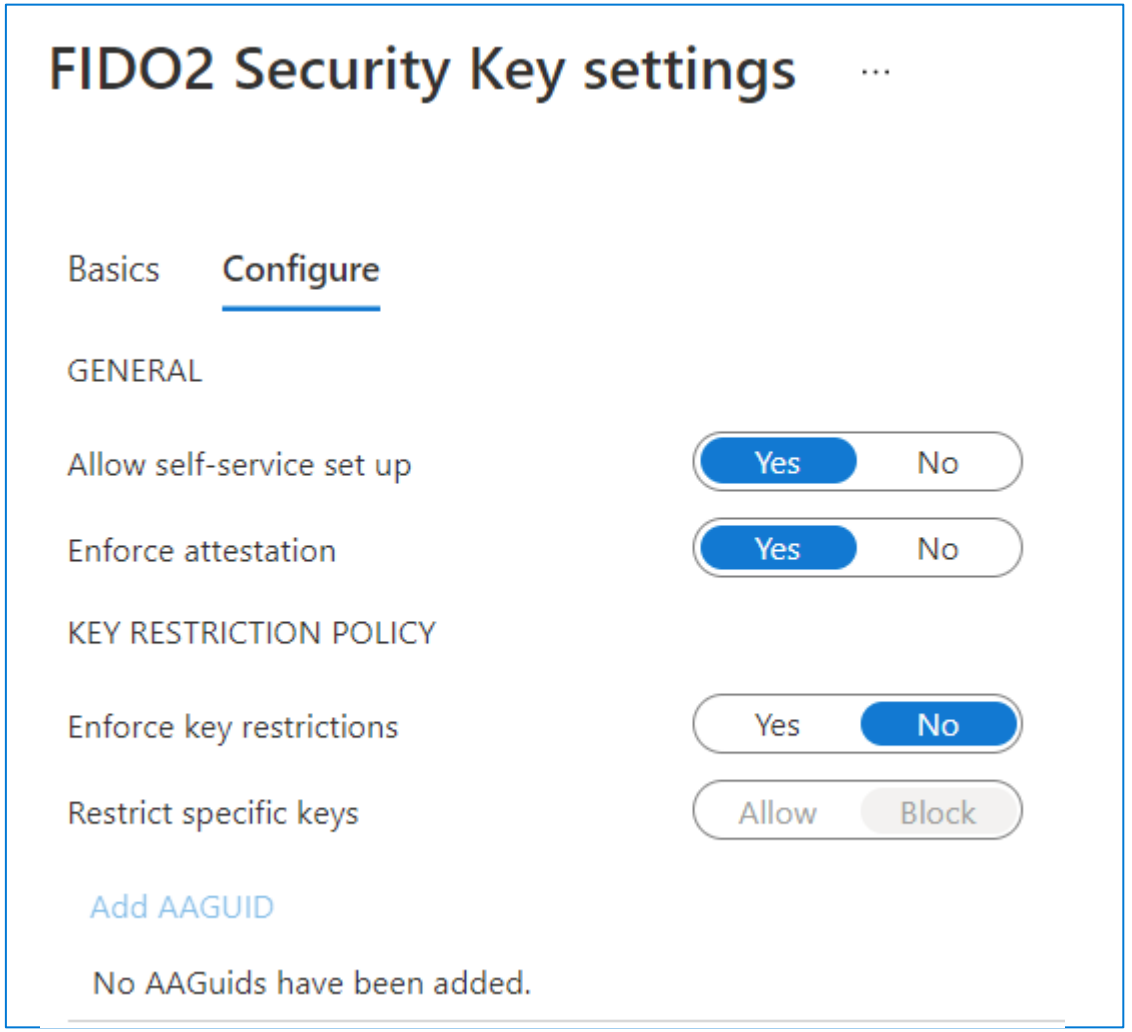
What is FIDO2?

- FIDO2 security keys are an unphishable specification-based passwordless authentication method that can come in any form factor
- Fast Identity Online (FIDO) is an open specification for passwordless authentication
- FIDO allows users and organizations to leverage the specification to sign in to their resources without a username or password using an external security key or a platform key built into a device



Implement FIDO2 security keys

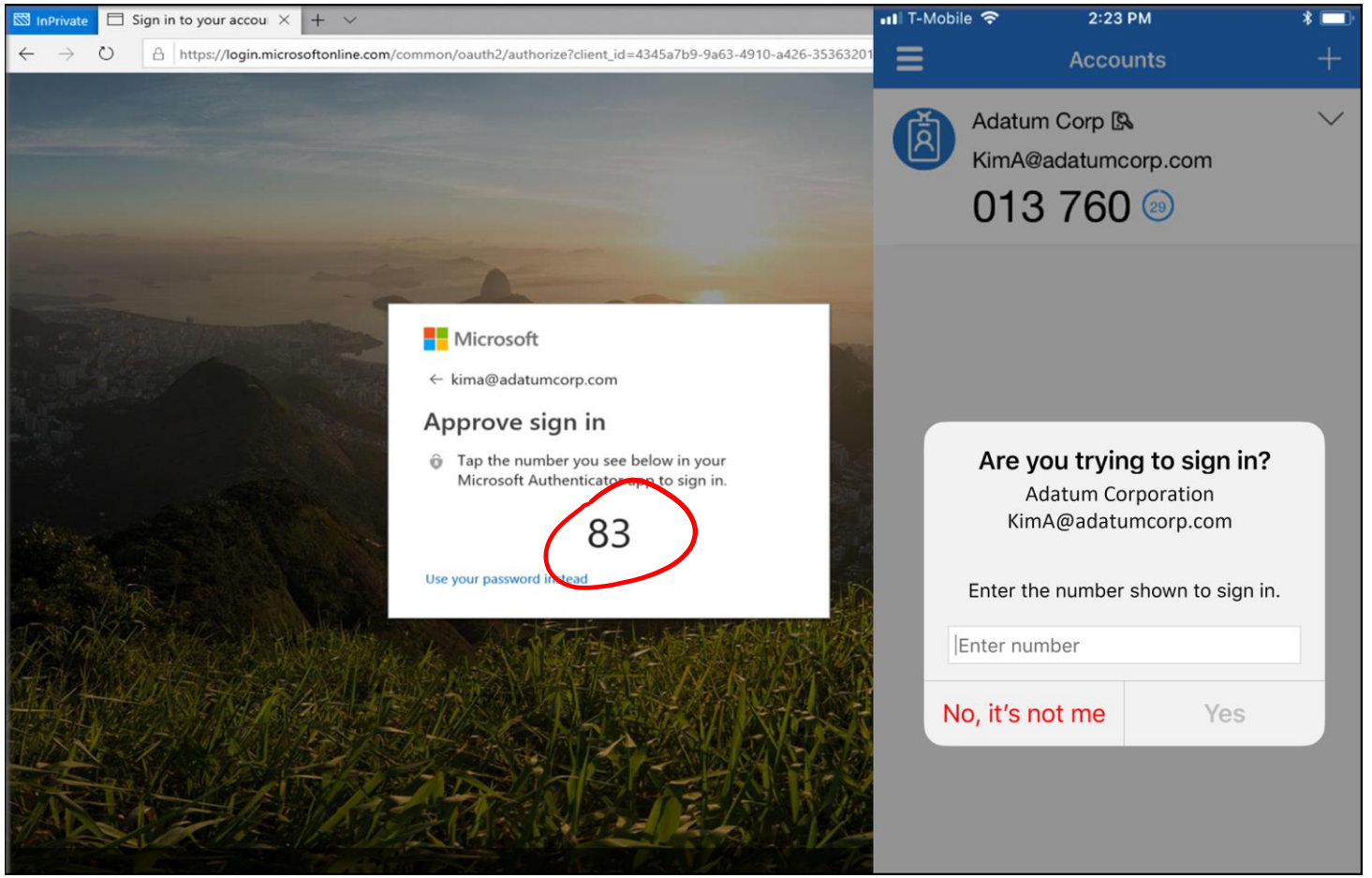
- **Allow self-service setup –** if set to NO, users cannot register a FIDO key.
- **Enforce attestation –** if set to YES, the FIDO key has to be published and verified with FIDO-Alliance.
- **Enforce key restrictions –** Only set to YES if your organization wants to specify valid keys via AAGuids.



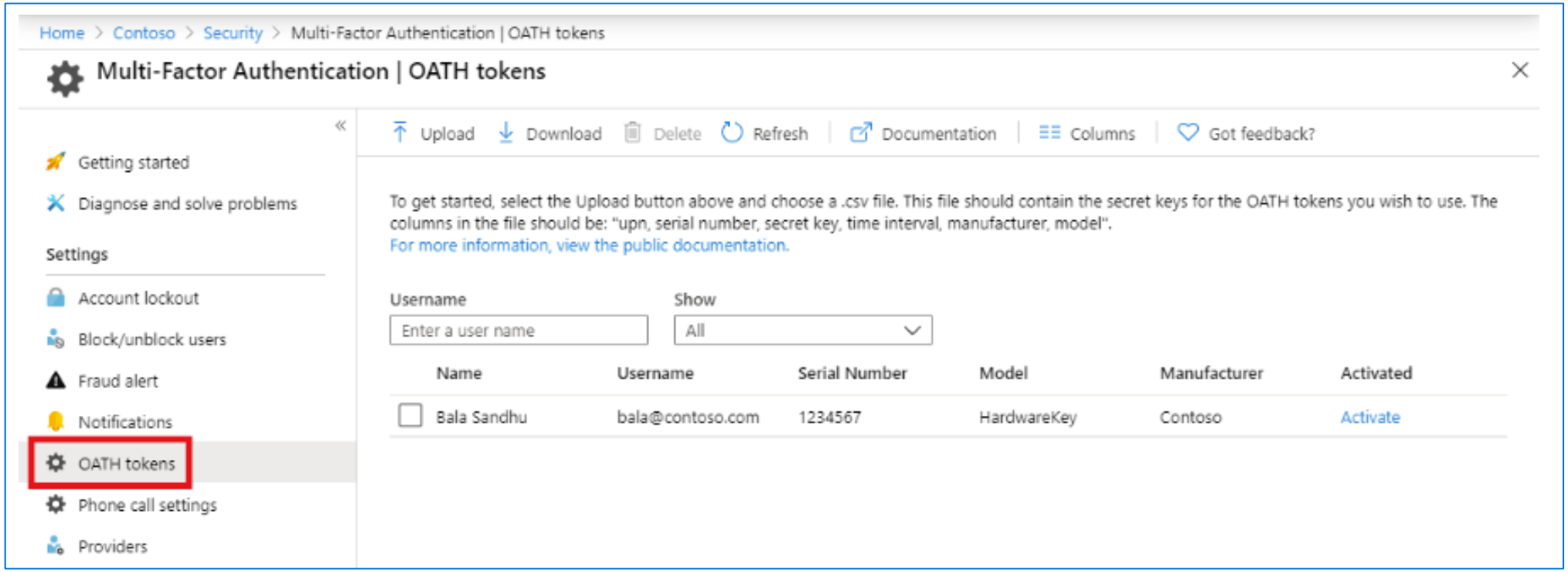
Signing in with passwordless credential

Microsoft Authenticator

- **Approve through mobile app** – use a pin and or verify a number
- **Generate an OATH verification code** – one-time code entered into sign-in UI
- **Enforce with policy and governance**



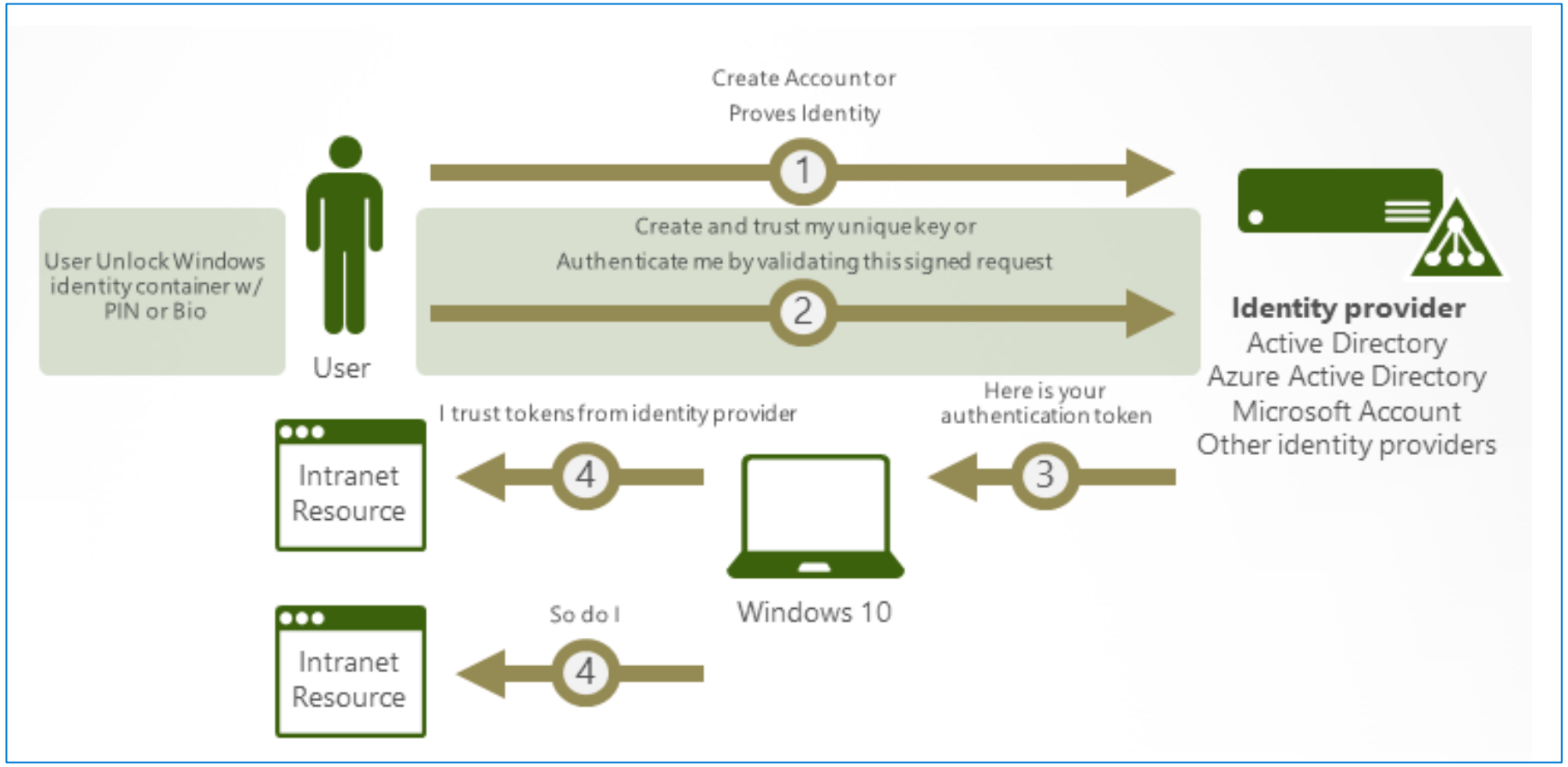
OATH tokens



OATH - Open Authentication
TOTP – Time-based One Time Password
Software or hardware implementations available in Azure AD

Implement an authentication solution based on Windows Hello for Business

Authentication in Windows Hello



Windows Hello for Business – Key Points

Key Points
• Credentials are based on certificate or asymmetrical key pair.
• Credentials can be bound to the device, and the token that is obtained using the credential is also bound to the device.
• Identity providers (such as Active Directory, Azure AD, or a Microsoft account) validate user identity and maps the Windows Hello public key to a user account.
• Keys can be generated in hardware (TPM 1.2 or 2.0 for enterprises, and TPM 2.0 for consumers) or software.
• Two-factor authentication with the combination of a key or certificate tied to a device and something that the person knows (a PIN) or something that the person is (biometrics).
• The private key never leaves a device when using TPM.
• Personal (Microsoft account) and corporate (Active Directory or Azure AD) accounts use a single container for keys.

Disable accounts and revoke user sessions

Describe how to disable accounts and revoke user sessions

There are occasions when you need to disable an account and/or revoke an existing user session.

- **Access tokens and refresh token**
  - When a user authenticates, they are issued an Access (Valid for 1 hour) and Refresh tokens.

Primary steps that you need to take:

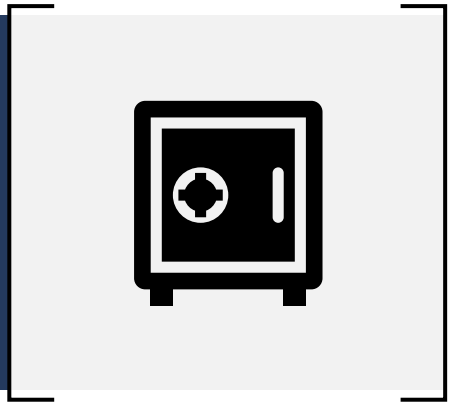
1) Disable the account
2) Reset the password
3) Disable any devices, tokens, or other references

Disable accounts: On-premises and Azure AD users

Disabling and Revoking access (PowerShell)

- On-premises user
  - Disable account → `Disable-ADAccount -Identity johndoe`
  - Reset password → `Set-ADAccountPassword -Identity johndoe -Reset -NewPassword (ConvertTo-SecureString -AsPlainText "p@ssw0rd1" -Force)`
    - Recommended to run password reset twice to avoid pass-the-hash style attacks
- Azure AD user
  - Disable account → `Set-AzureADUser -ObjectId johndoe@contoso.com -AccountEnabled $false`
  - Revoke refresh token → `Revoke-AzureADUserAllRefreshToken -ObjectId johndoe@contoso.com`
  - Disable user devices → `Get-AzureADUserRegisteredDevice -ObjectId johndoe@contoso.com | Set-AzureADDevice -AccountEnabled $false`

Deploy and manage password protection



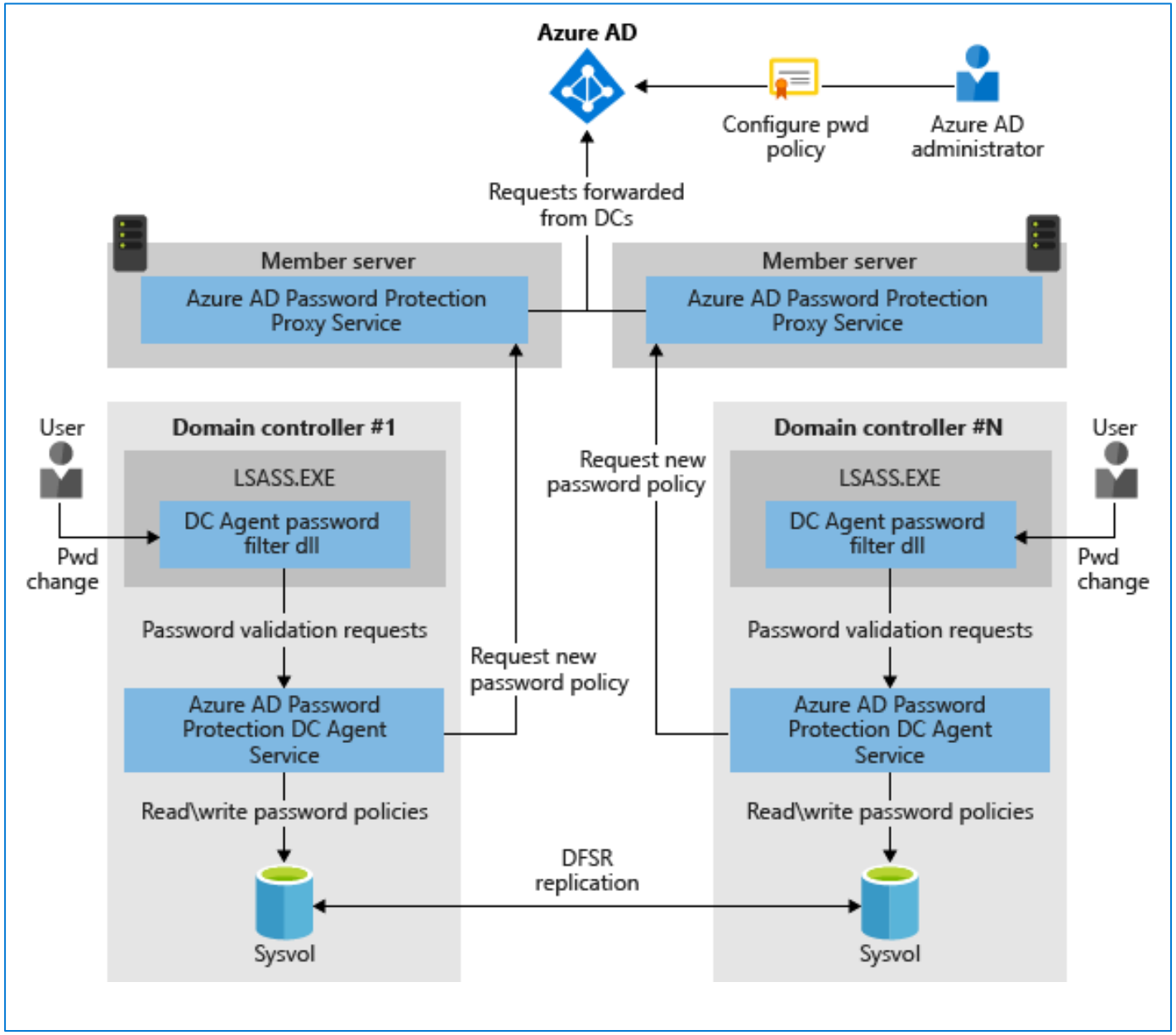
Azure AD Password Protection

Users often create easy to guess passwords that are weak against dictionary-based attacks. To help you enforce strong passwords, Azure AD Password Protection provides a global and custom banned password list. Benefits include:

- Domain controllers (DCs) never have to communicate directly with the internet
- No new network ports
- No AD DS schema changes required
- No minimum AD DS domain or forest functional level (DFL/FFL) required
- The software doesn't create or require accounts in the AD DS domains that it protects.
- User clear-text passwords never leave the DC
- The software isn't dependent on other Azure AD features
- Incremental deployment is supported

Deployment technology

How the basic components of Azure AD Password Protection are configured and work together



Deployment approach

Strategy for rolling out Password Protection – don’t just turn it on

Audit mode

Audit mode is the default initial setting, where passwords can continue to be set. Passwords that would be blocked are recorded in the event log. After you deploy the proxy servers and DC agents in audit mode, monitor the impact that the password policy will have on users when the policy is enforced.

Common findings

During the audit stage, many organizations find :

- They need to improve existing operational processes to use more secure passwords.
- Users often use unsecure passwords.
- They need to inform users about the upcoming change in security enforcement, possible impact on them, and how to choose more secure passwords.

Considerations

- Multiple forest considerations
- Read-only domain controller considerations
- High availability considerations

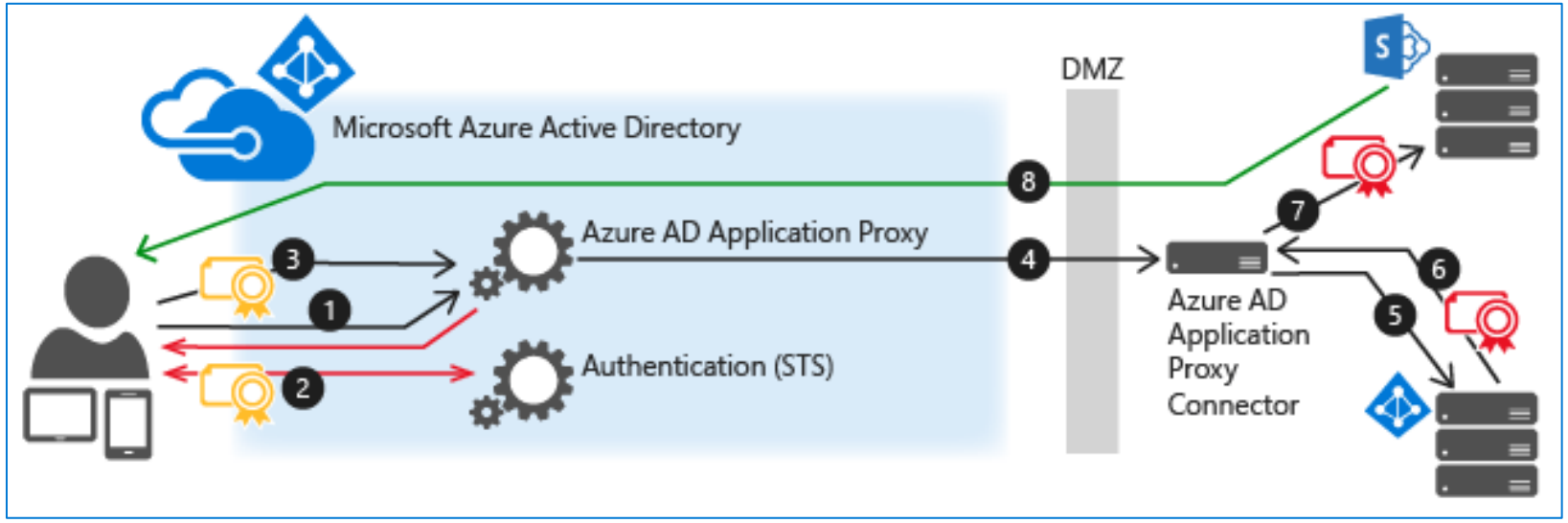
Configure smart lockout thresholds

How smart lockout works

- By default, smart lockout locks the account for one minute after 10 failed attempts
- The account is locked again after subsequent attempts, for increasing periods
- Smart lockout is always on for all Azure AD customers
- The default configuration can be customized
- Smart lockout doesn’t guarantee that a genuine user is never locked out, but it is tailored to resisting bad actors
- Smart lockout can be integrated with hybrid deployments

Kerberos in Azure AD

Configure Kerberos for use in Azure AD



Environment setup needed:

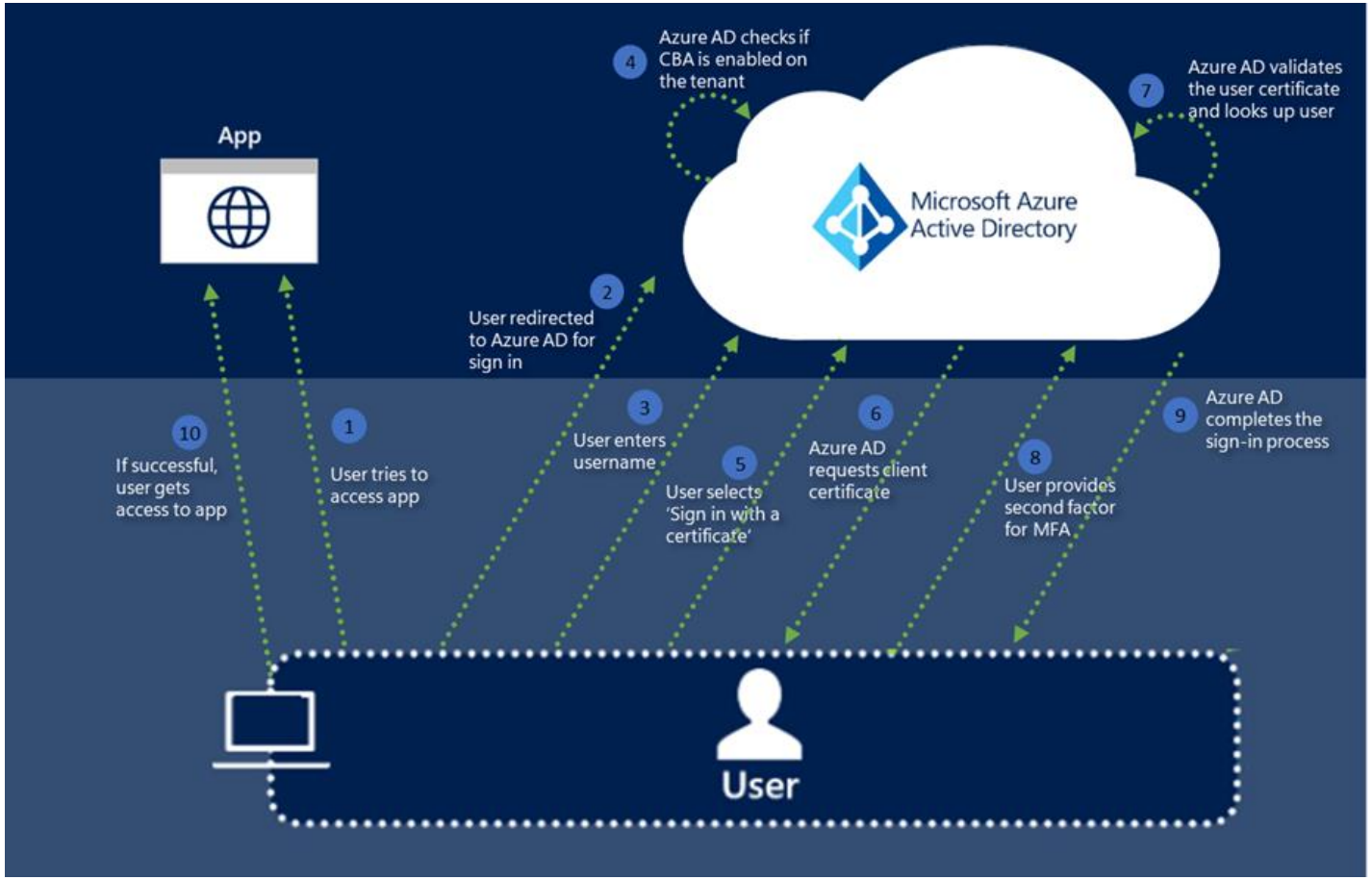
- Integrated Windows Authentication enabled on web apps
- All apps must have a Service Principal
- Server running the Kerberos connector must be in domain joined

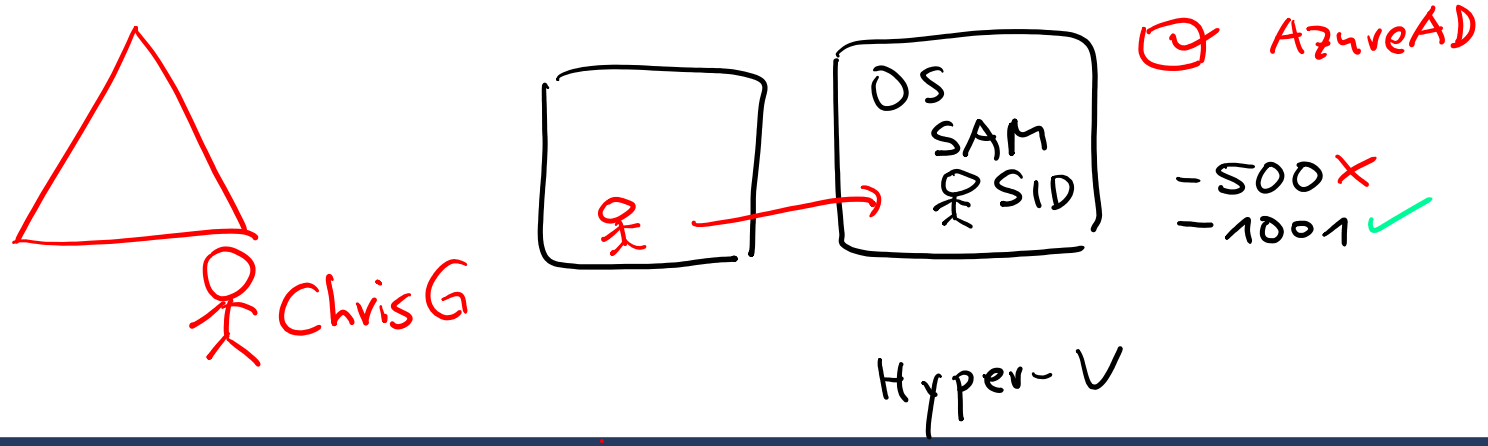
Certificate based authentication

Implement certificate-based authentication in Azure AD

The following scenarios are supported:

- User sign-ins to web browser-based applications on all platforms.
- User sign-ins on mobile native browsers.
- Support for granular authentication rules for multifactor authentication by using the certificate issuer **Subject** and **policy OIDs**.
- Configuring certificate-to-user account bindings by using the certificate Subject Alternate Name (SAN) principal name and SAN RFC822 name.





Azure AD user auth for VMs

Benefits of Azure AD user authentication in VMs

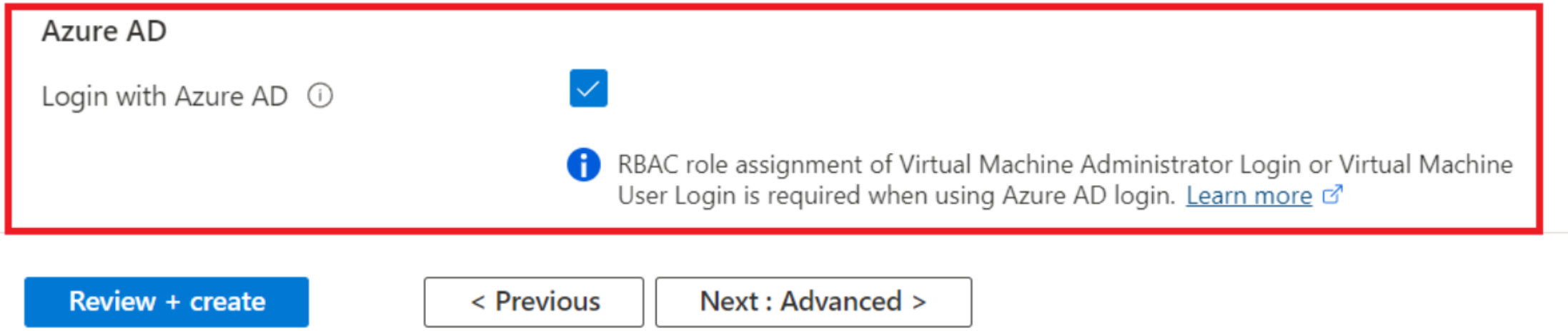
Benefits:

- Use Azure AD credentials to sign into Windows VMs in Azure.
- Reduce reliance on local administrator accounts.
- Password complexity and password lifetime policies configured for your Azure AD.
- Configure Conditional Access policies to require multifactor authentication and other signals such as risky-user or sign-in risk.

Supported operation systems:

- Windows Server 2019 Datacenter edition and later.
- Windows 10 1809 and later.
- Windows 11.
- Linux virtual machine.

Configure Windows VMs



To use Azure AD sign-in for Windows VM in Azure, you must:

- First enable the Azure AD sign-in option for your Windows VM.
- Then configure Azure role assignments for users who are authorized to sign into the VM.

Configure Azure AD sign-in for Linux VMs

You can enable Azure AD sign-in for any of the supported Linux distributions mentioned using the Azure portal. As an example, to create an Ubuntu Server 18.04 Long Term Support (LTS) VM in Azure with Azure AD authentication:

1. Sign into the Azure portal, with an account that has access to create VMs, and select + Create a resource.
2. Select Create under Ubuntu Server 18.04 LTS in the Popular view.
3. On the Management tab, Check the box to enable **Login with Azure Active Directory (Preview)**.
4. Ensure System assigned managed identity is checked.
5. Complete the Linux virtual machine setup.

References (1 of 2)

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https://docs.microsoft.com/azure/active-directory/authentication/howto-registration-mfa-sspr-combined

Create a resilient access control management strategy with Azure Active Directory
https://docs.microsoft.com/azure/active-directory/authentication/concept-resilient-controls

Azure AD authentication methods API overview
https://docs.microsoft.com/graph/api/resources/authenticationmethods-overview

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https://docs.microsoft.com/windows/security/identity-protection/hello-for-business/hello-overview

Authentication methods in Azure Active Directory - Microsoft Authenticator app
https://docs.microsoft.com/azure/active-directory/authentication/concept-authentication-authenticator-app

Passwordless authentication options for Azure Active Directory
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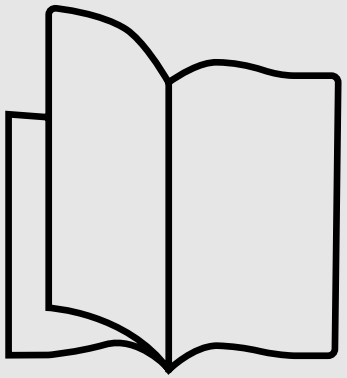

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Authentication methods in Azure Active Directory - OATH tokens
https://docs.microsoft.com/azure/active-directory/authentication/concept-authentication-oath-tokens

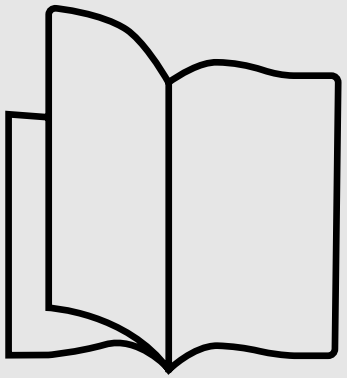
Configure and enable users for SMS-based authentication using Azure Active Directory
https://docs.microsoft.com/azure/active-directory/authentication/howto-authentication-sms-signin

Authentication methods in Azure Active Directory - phone options
https://docs.microsoft.com/azure/active-directory/authentication/concept-authentication-phone-options

Enforce on-premises Azure AD Password Protection for Active Directory Domain Services
https://docs.microsoft.com/azure/active-directory/authentication/concept-password-ban-bad-on-premises

Enable on-premises Azure Active Directory Password Protection
https://docs.microsoft.com/azure/active-directory/authentication/howto-password-ban-bad-on-premises-operations

Step-By-Step: Implementing Azure AD Password Protection On-Premises
https://techcommunity.microsoft.com/t5/itops-talk-blog/step-by-step-implementing-azure-ad-password-protection-on/ba-p/563342



Microsoft Security

Plan, implement, and administer conditional access

Objectives

Plan and implement security defaults

Plan conditional access policies

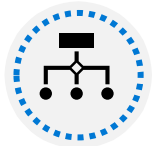
Implement conditional access policy controls and assignments (targeting, applications, and conditions)

Template based conditional access

Test and troubleshoot conditional access policies

Implement application controls and session management

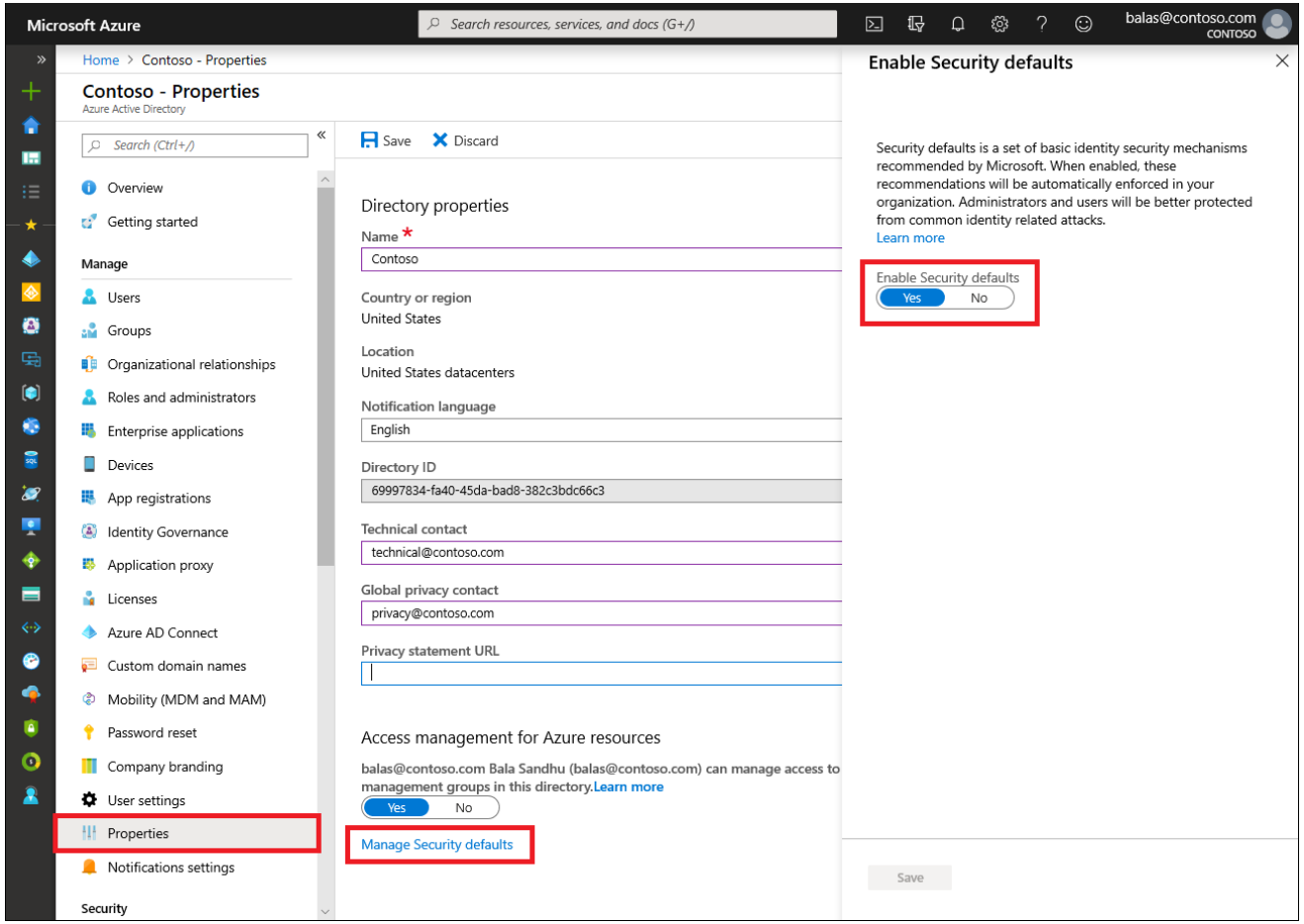
Continuous Access Evaluation



Authentication Context

Explore security defaults

Security defaults



Who's it for?

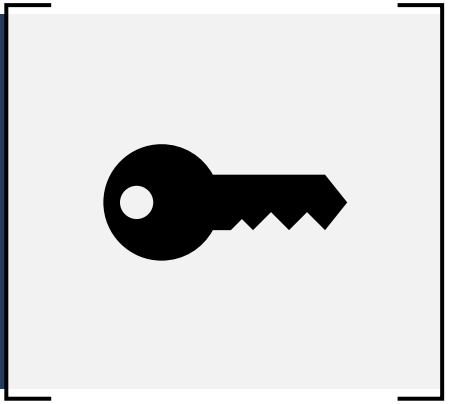
Who should use security defaults?

- Organizations that want to increase their security posture but don't know how or where to start
- Organizations utilizing the free tier of Azure Active Directory Licensing

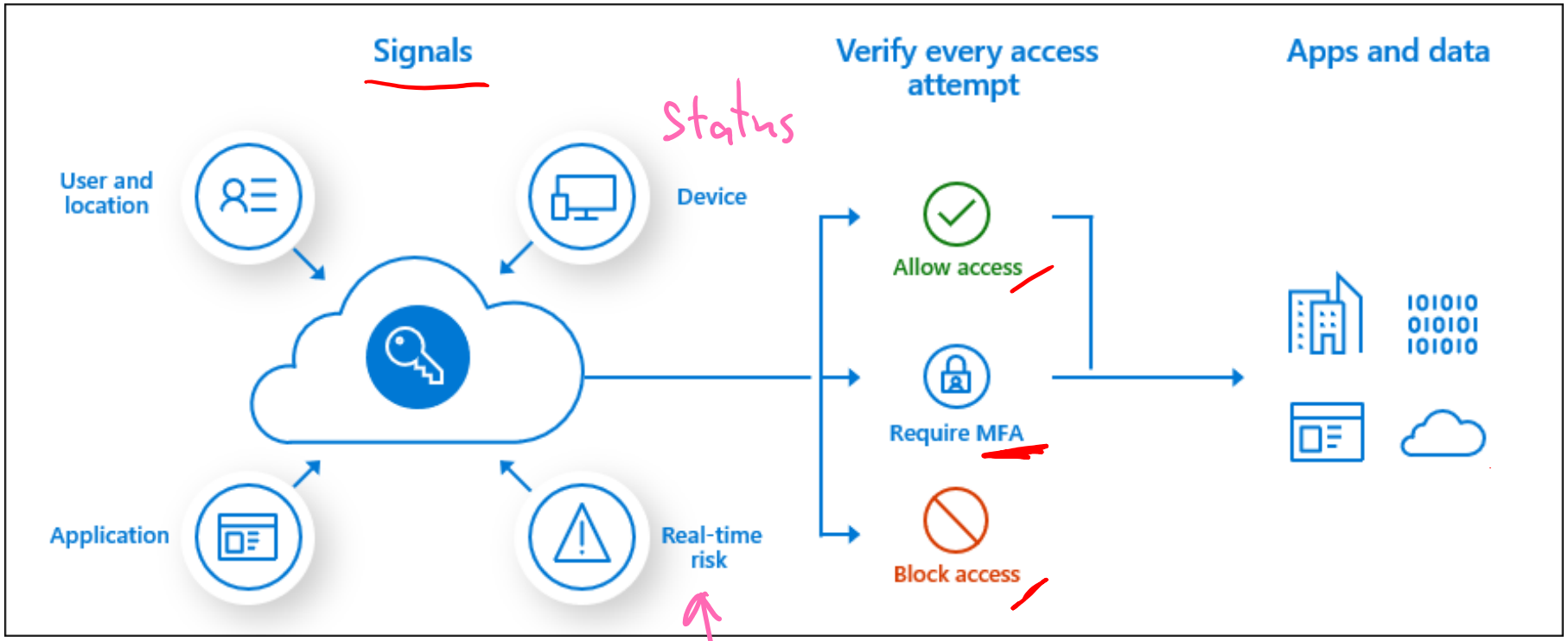
Who shouldn't use security defaults?

- Organizations currently using Conditional Access policies to bring signals together, make decisions, and enforce organizational policies
- Organizations with Azure Active Directory Premium licenses
- Organizations with complex security requirements that warrant using Conditional Access

Plan conditional access policies



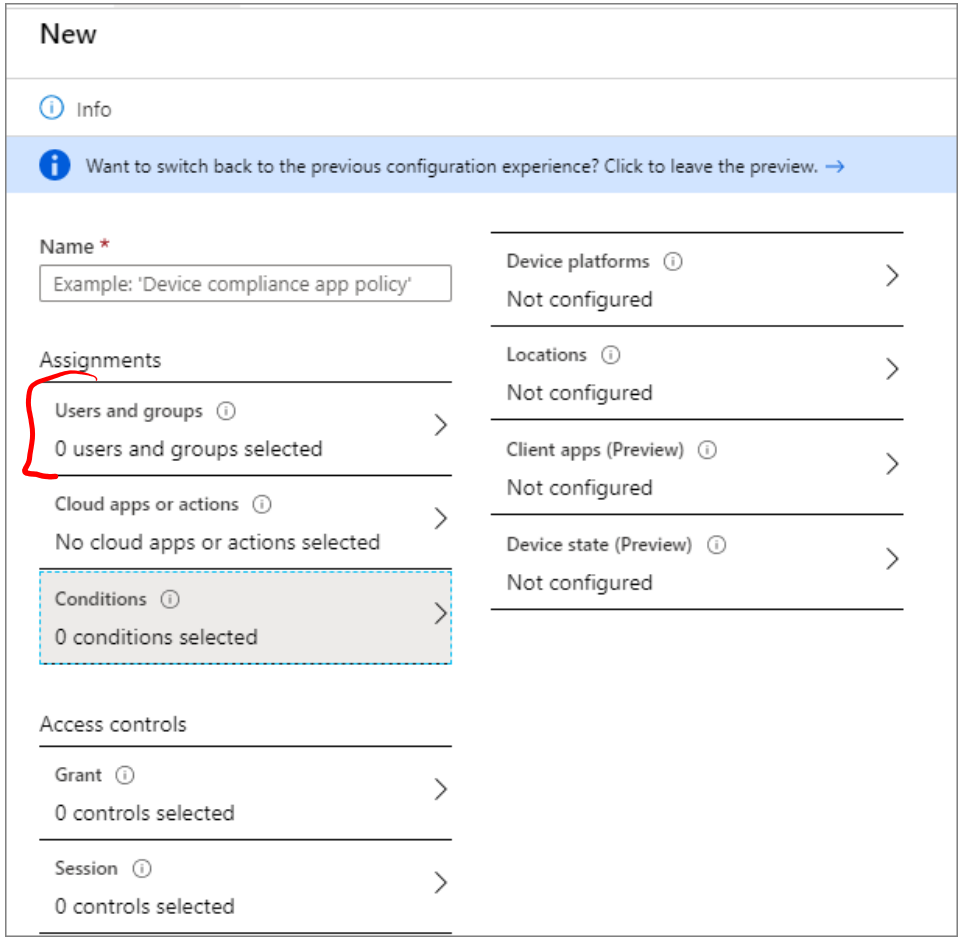
About conditional access policies



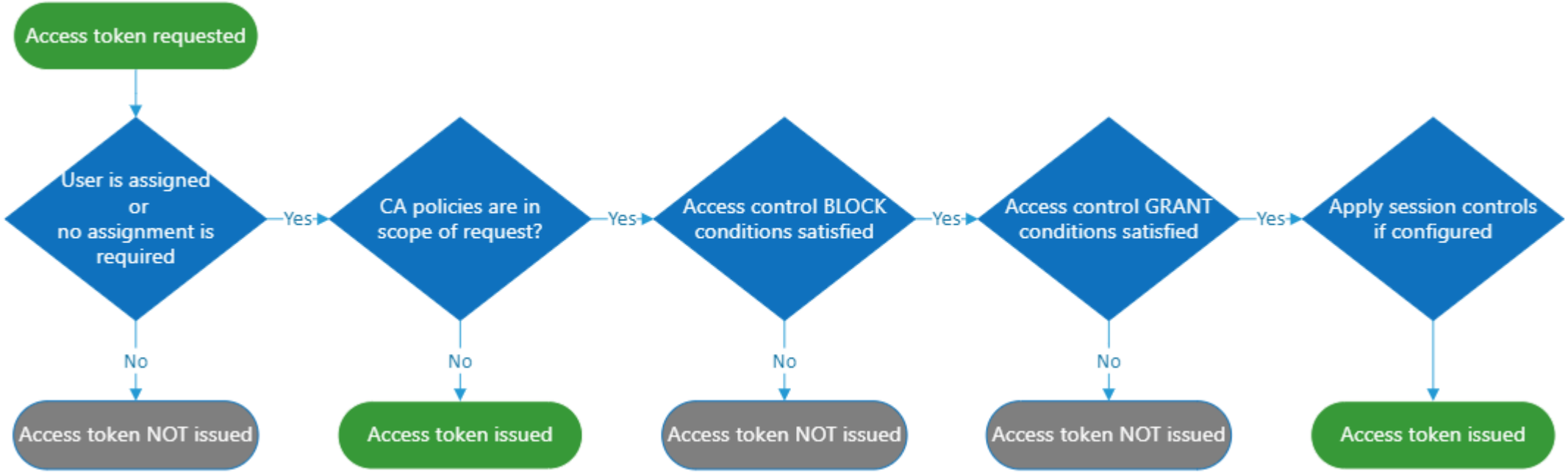
Benefits of Conditional Access

- Increase productivity
- Manage risk
- Address compliance and governance
- Manage cost
- Zero trust

Understanding Conditional Access policy components

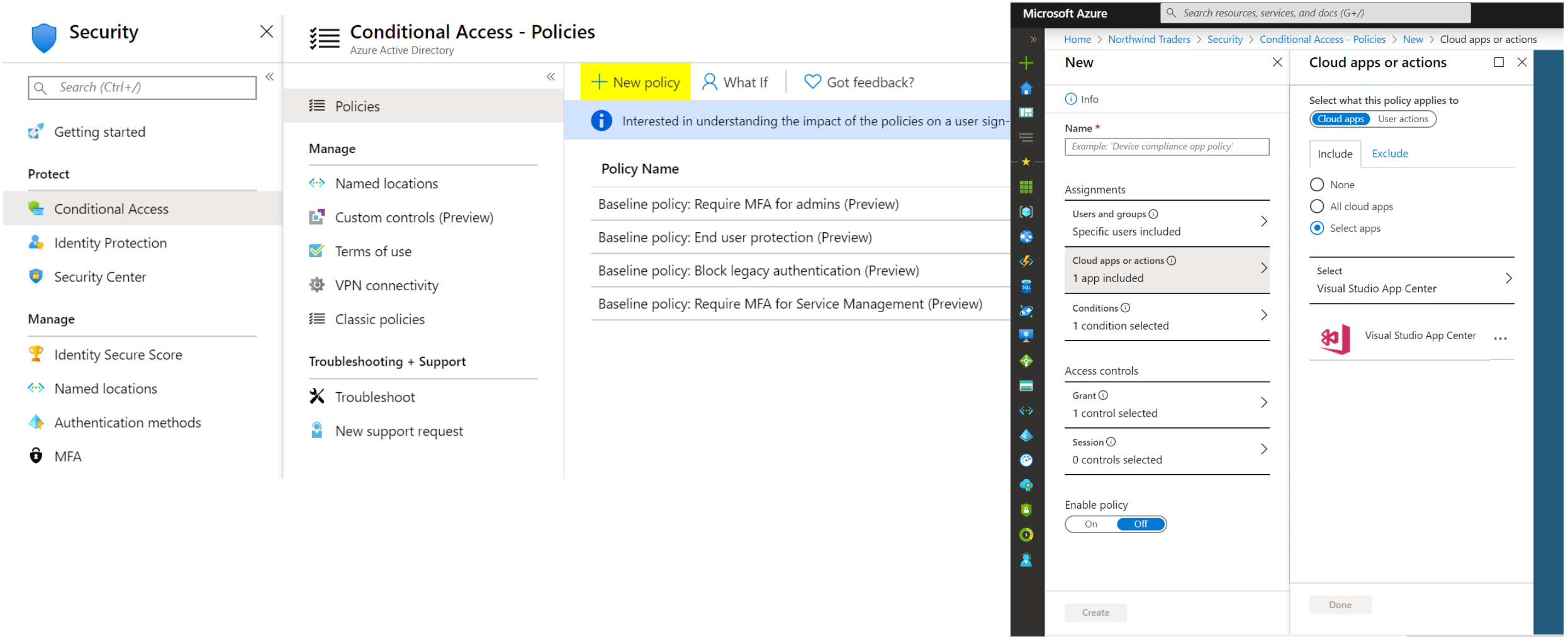


Access token issuance



Implement conditional access policies and assignments

Setting up Conditional Access



Grant / Block Access controls

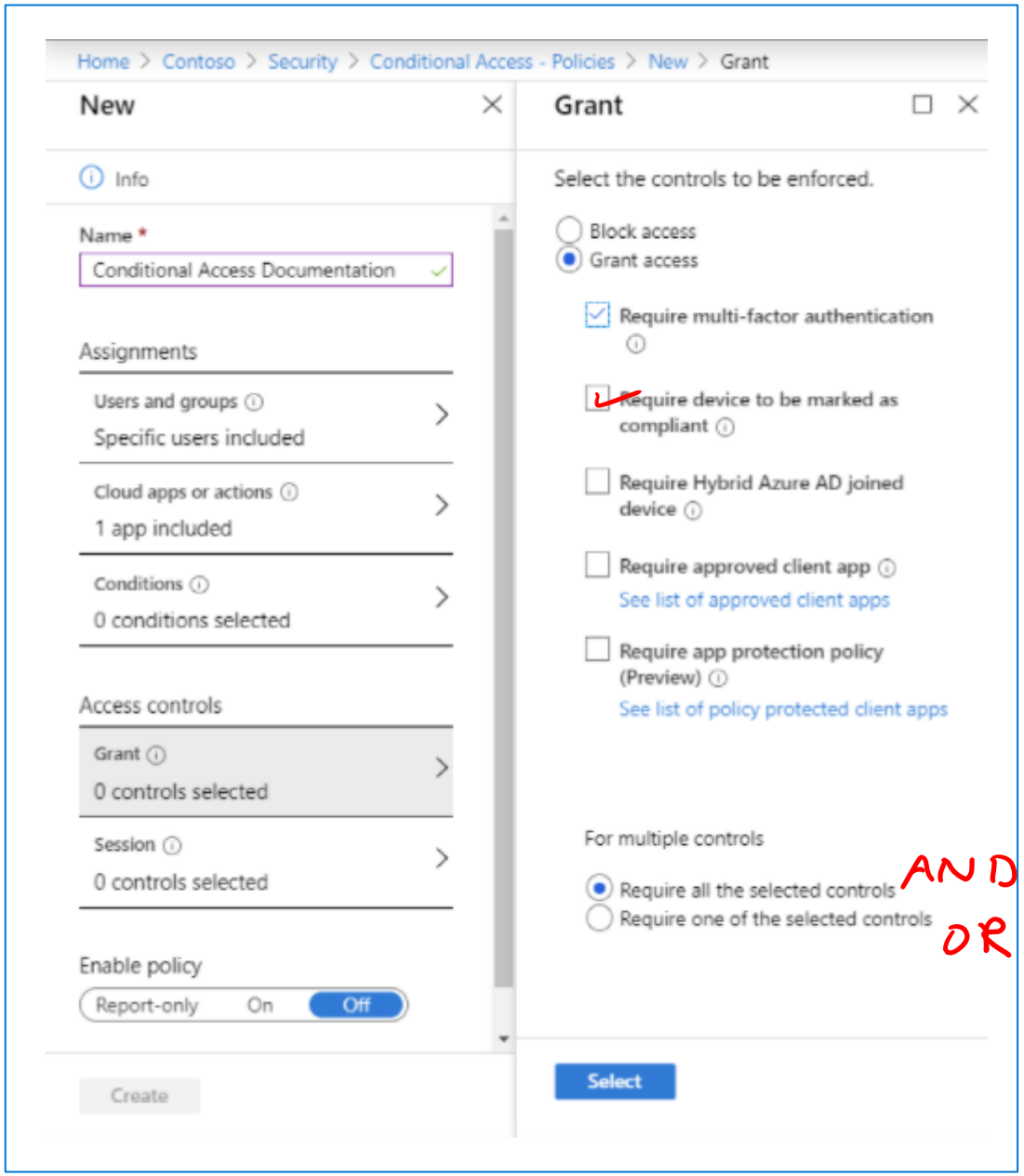
Block access

- Use carefully or you could block your system
- Always test with What-If and Report-Only mode

Grant access

- Enforce several different controls before allowing access

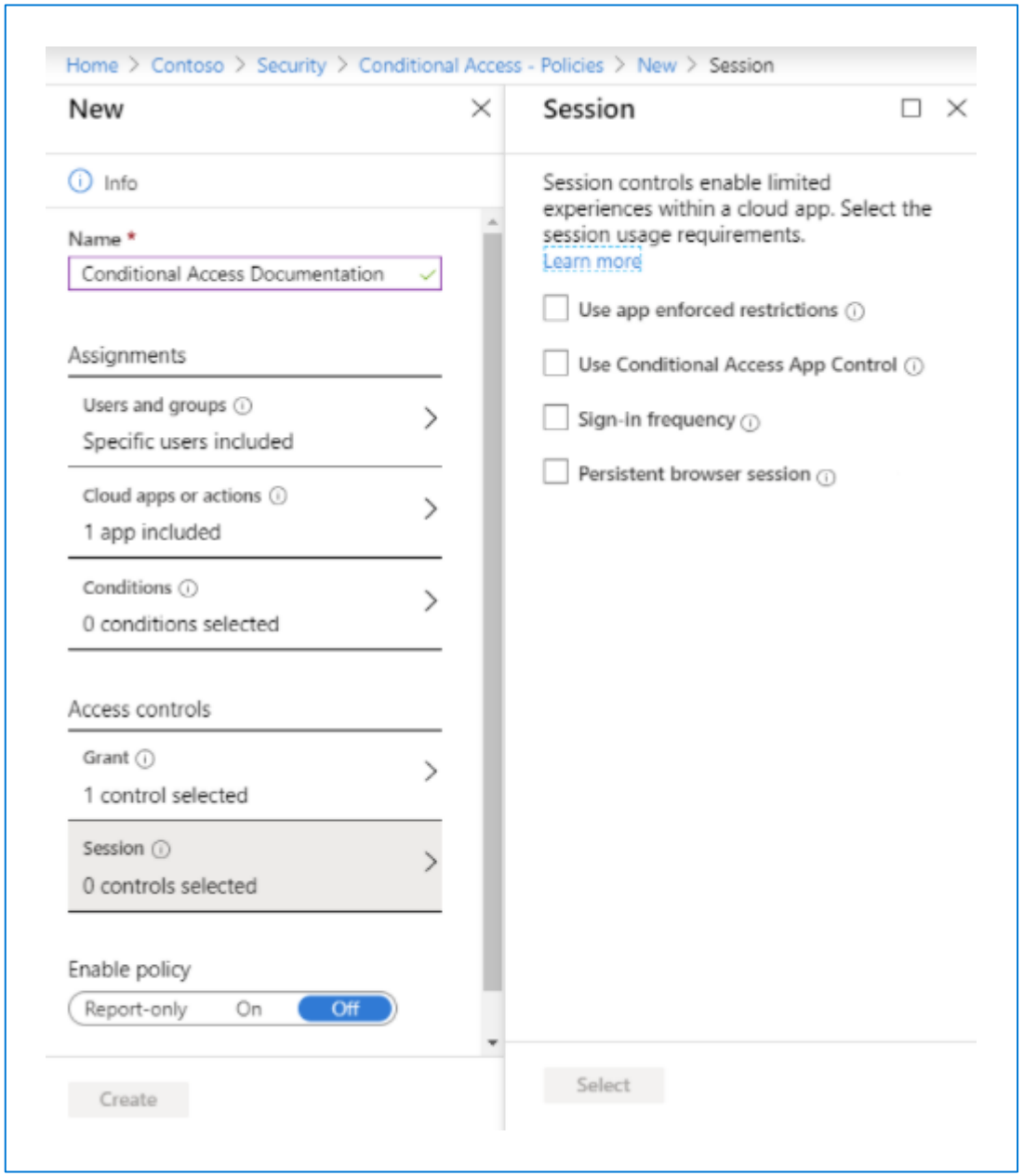
NOTE – Require All / Require One



Session Access control

Limit the experience of the user / application within specific cloud application.

Base the experience off specific conditions the user has met or failed to meet.



Types of Conditional Access policies

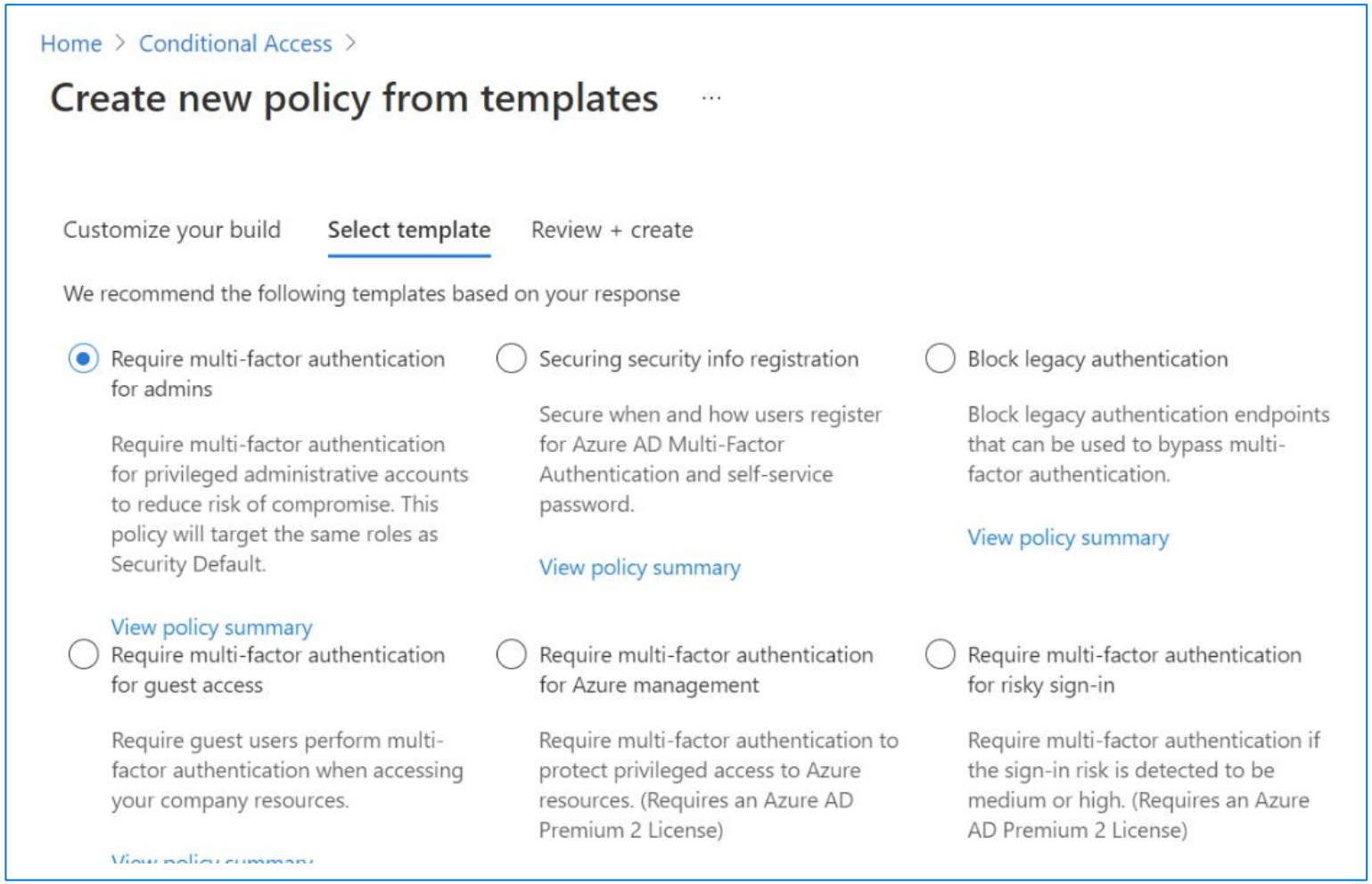
- Sign-in risk-based Conditional Access
- User risk-based Conditional Access

Template based Conditional Access

Conditional Access Templates

14 policy templates:

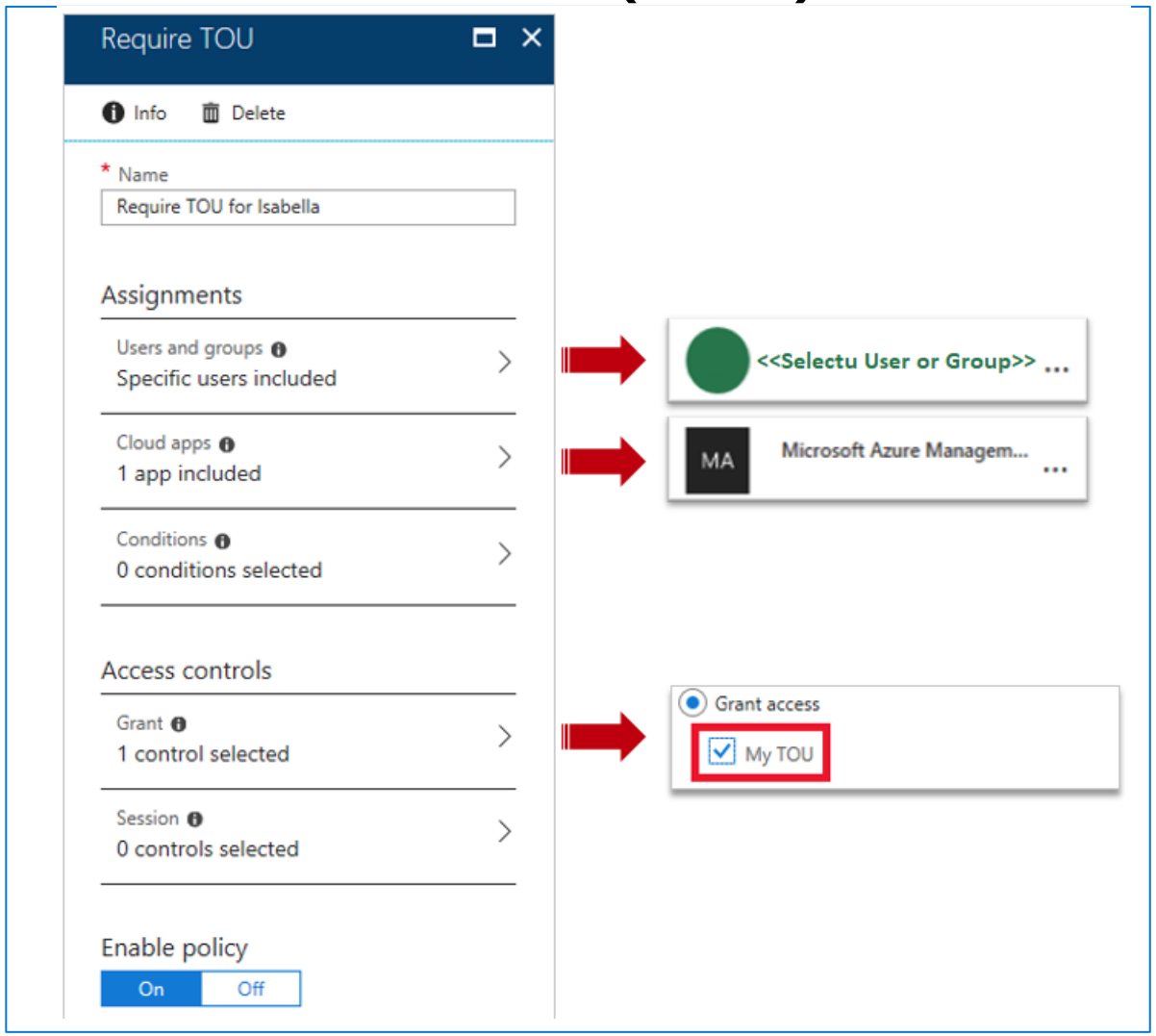
1. Azure portal
2. Azure Active Directory
3. Security
4. Conditional Access
5. Create new policy from template



Examples of Conditional Access scenarios

- Require registration from a trusted location
- Block access by location
- Require compliant devices
- Exclude access from emergency and service accounts

Conditional Access Terms of Use (TOU)



Test and troubleshoot conditional access policies

Configurations to avoid

For all users, all cloud apps:

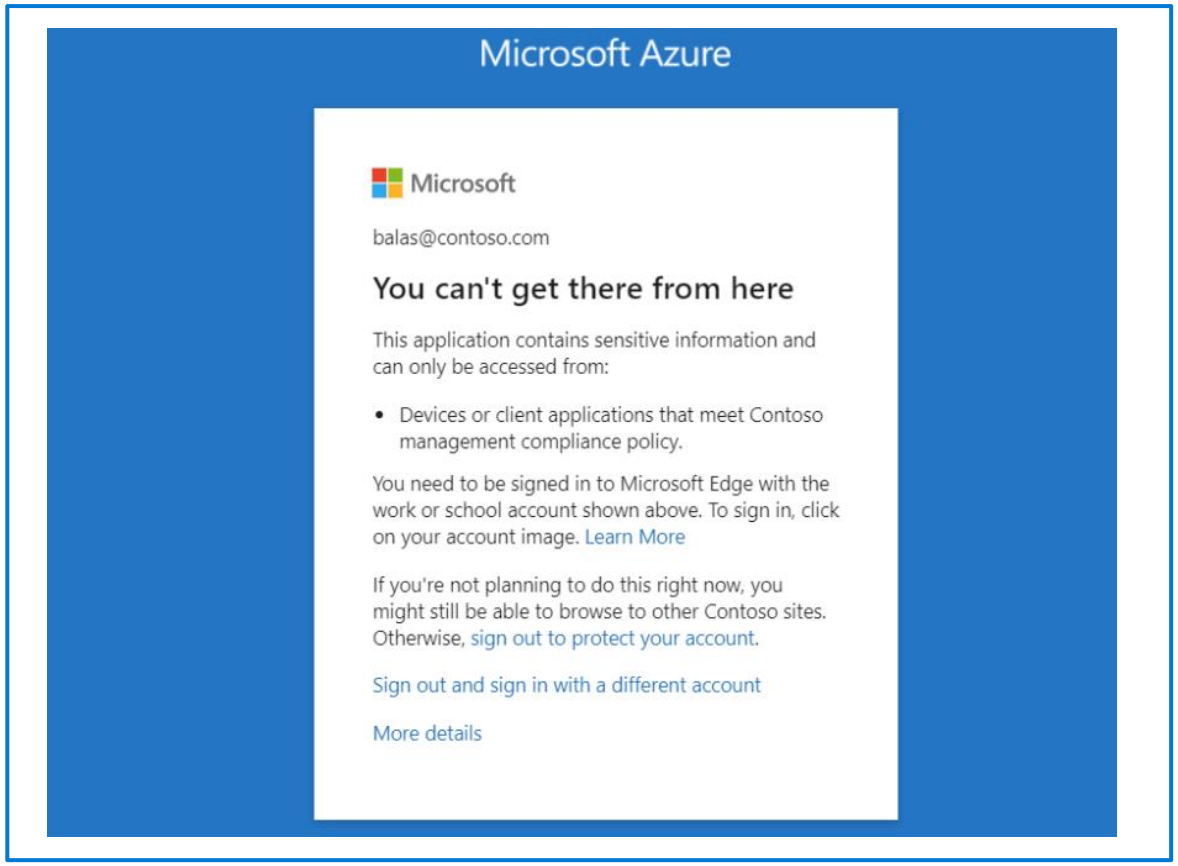
- Block access
- Require device to be marked as compliant
- Require Hybrid Azure AD domain joined device
- Require app protection policy

For all users, all cloud apps, all platforms:

- Block access

Troubleshooting sign-in interrupts

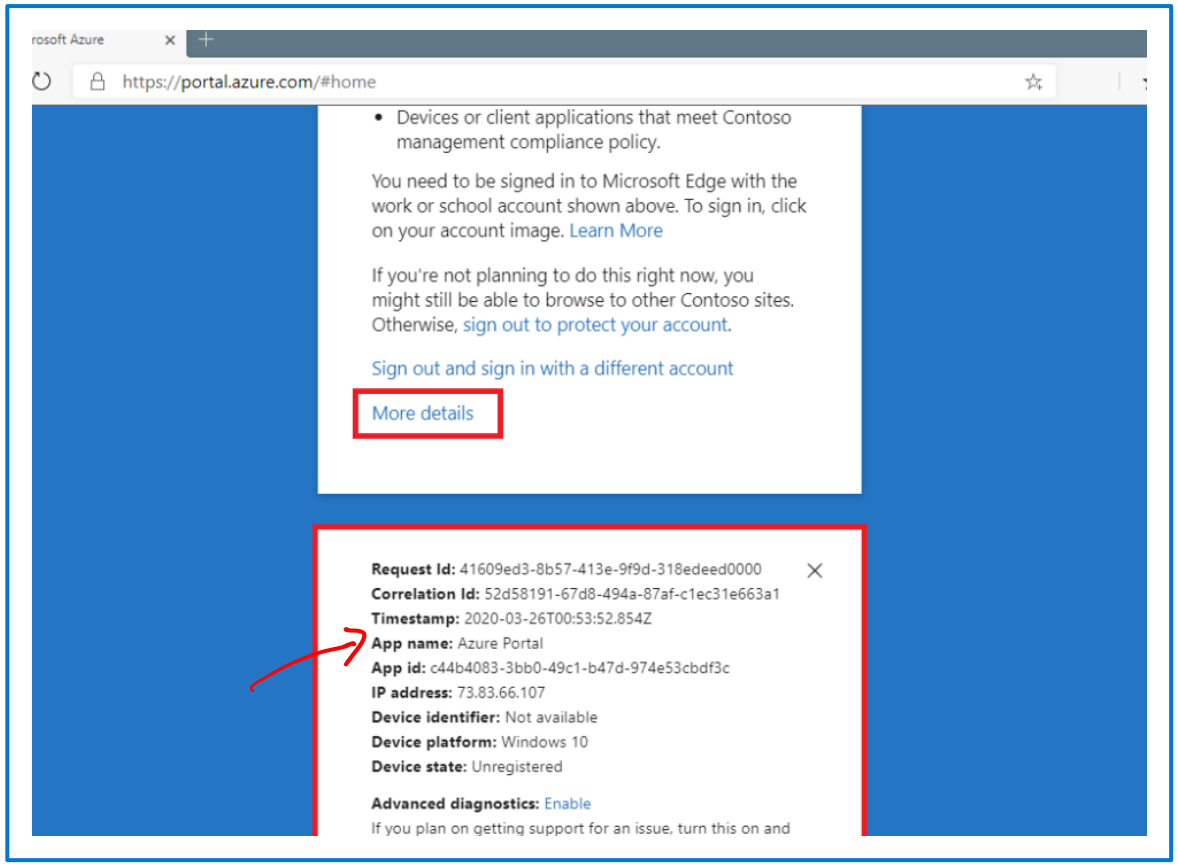
In this error, the message states that the application can only be accessed from devices or client applications that meet the company's mobile device management policy. In this case, the application and device do not meet that policy.



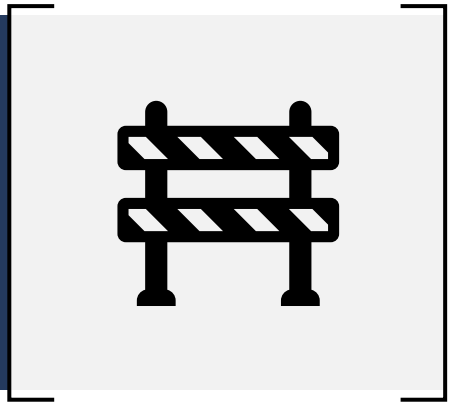
Troubleshooting Active Directory sign-in events

Find more information about the problem by clicking **More Details** in the initial error page.

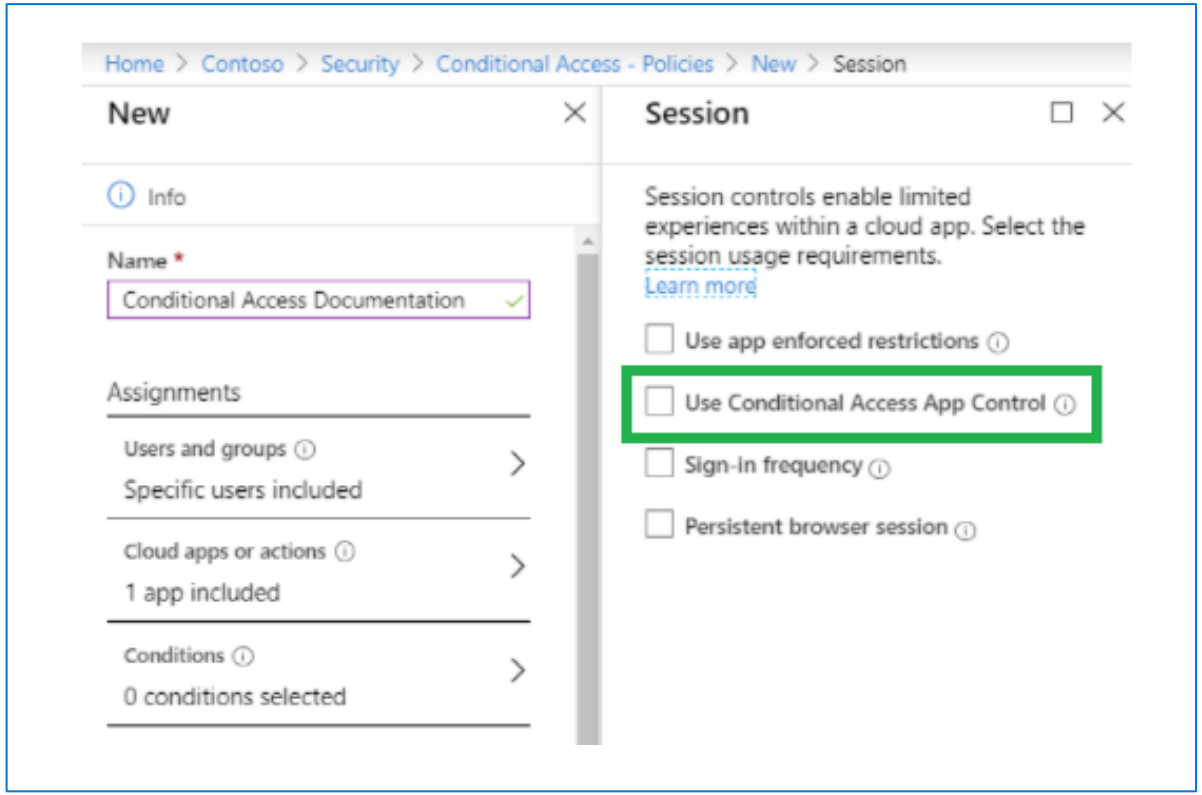
Clicking **More Details** will reveal troubleshooting information that is helpful when searching the Azure AD sign-in events for the specific failure event the user saw or when opening a support incident with Microsoft.



Implement application controls



Conditional Access – App Control



Block download, cut, copy and print

Enforce document labeling with Azure Information Protection

Prevent file uploads

Monitor / Log sessions for compliance

Block app access based on risk factors

CA-App Control works with Microsoft Defender for Cloud Apps

Defender for Cloud (ASC)

Defender M365

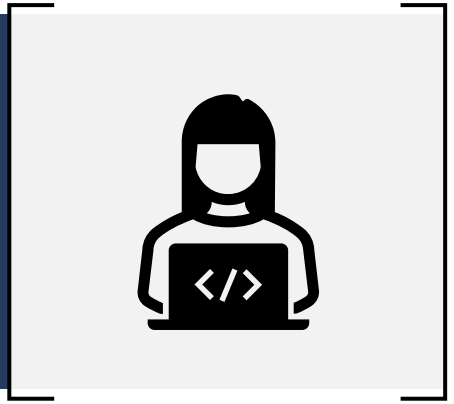
Cloud Id

Endpoints

Benefits of using app protection policies (MDM/MAM)

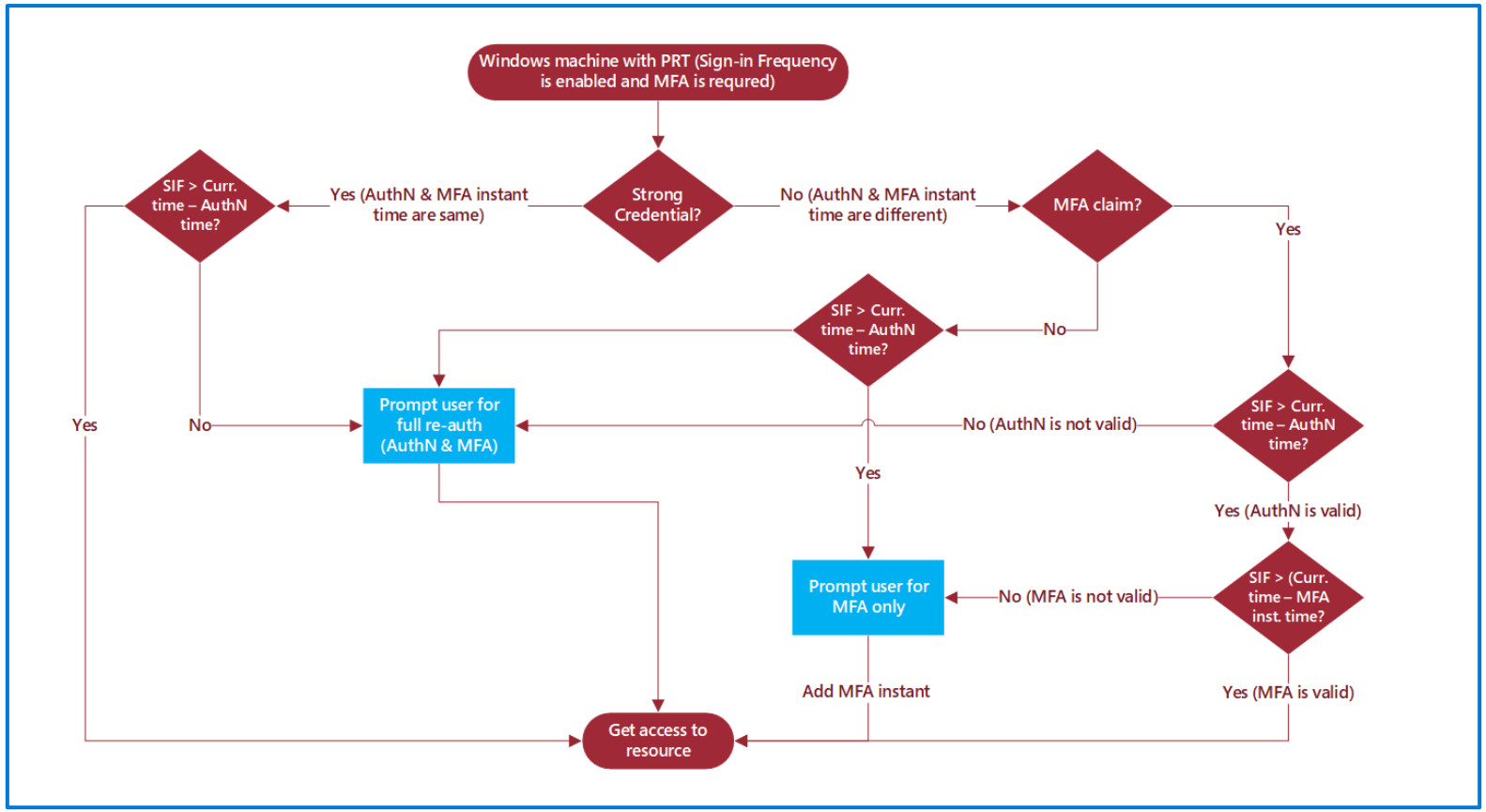
- Protecting your company data at the app level
- End-user productivity isn't affected, and policies don't apply when using the app in a personal context
- App protection policies ensure that the app-layer protections are in place
- MDM, in addition to MAM, ensures that the device is protected

Implement session management



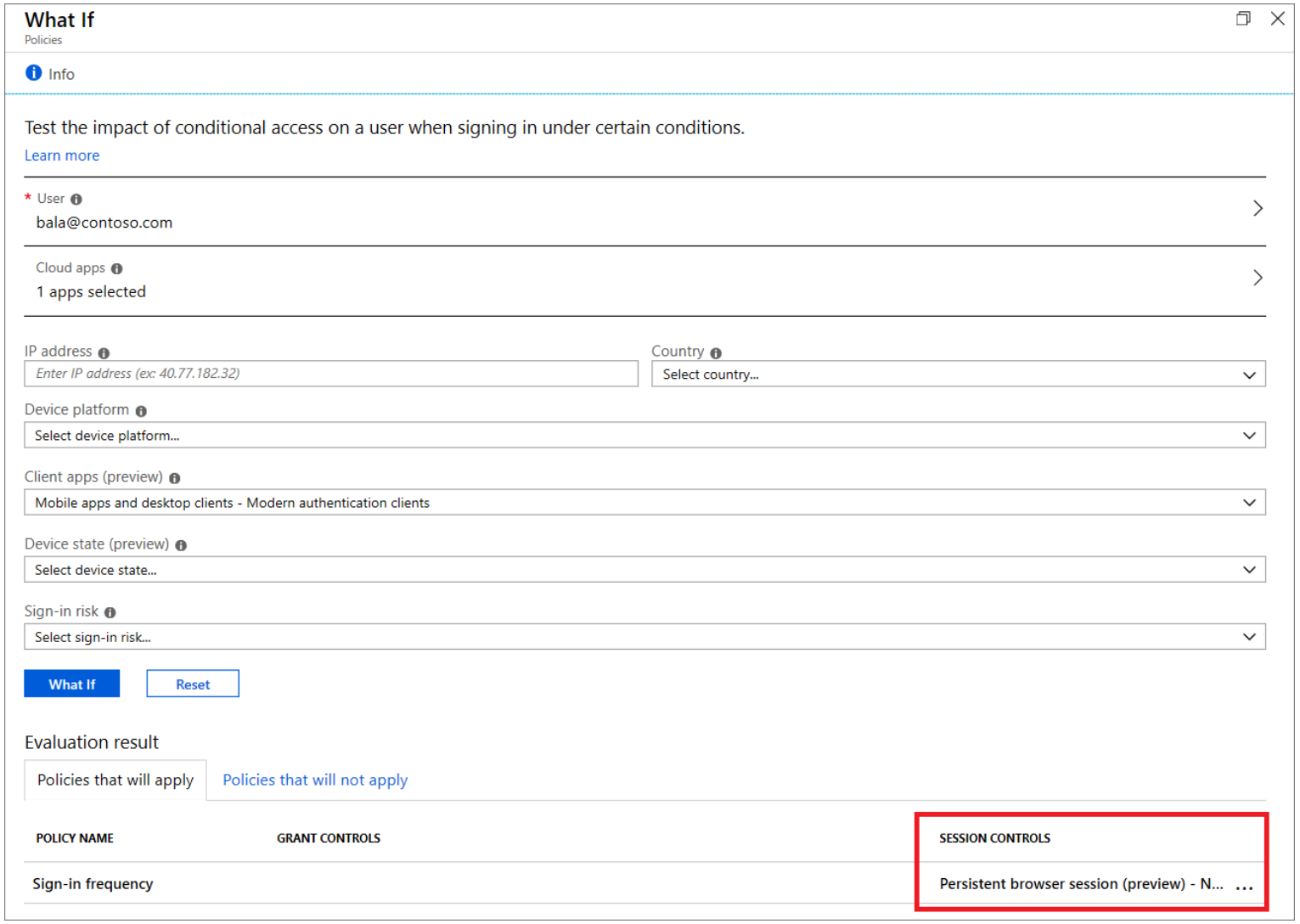
User sign-in frequency and multifactor authentication

Sign-in frequency previously applied only to the first factor authentication on devices that were Azure AD joined, Hybrid Azure AD joined, and Azure AD registered. There was no easy way for our customers to re-enforce multifactor authentication (MFA) on those devices. Based on customer feedback, sign-in frequency will apply for MFA as well



Validation

Use the What-If tool to simulate a login from the user to the target application and other conditions based on how you configured your policy. The authentication session management controls show up in the result of the tool.

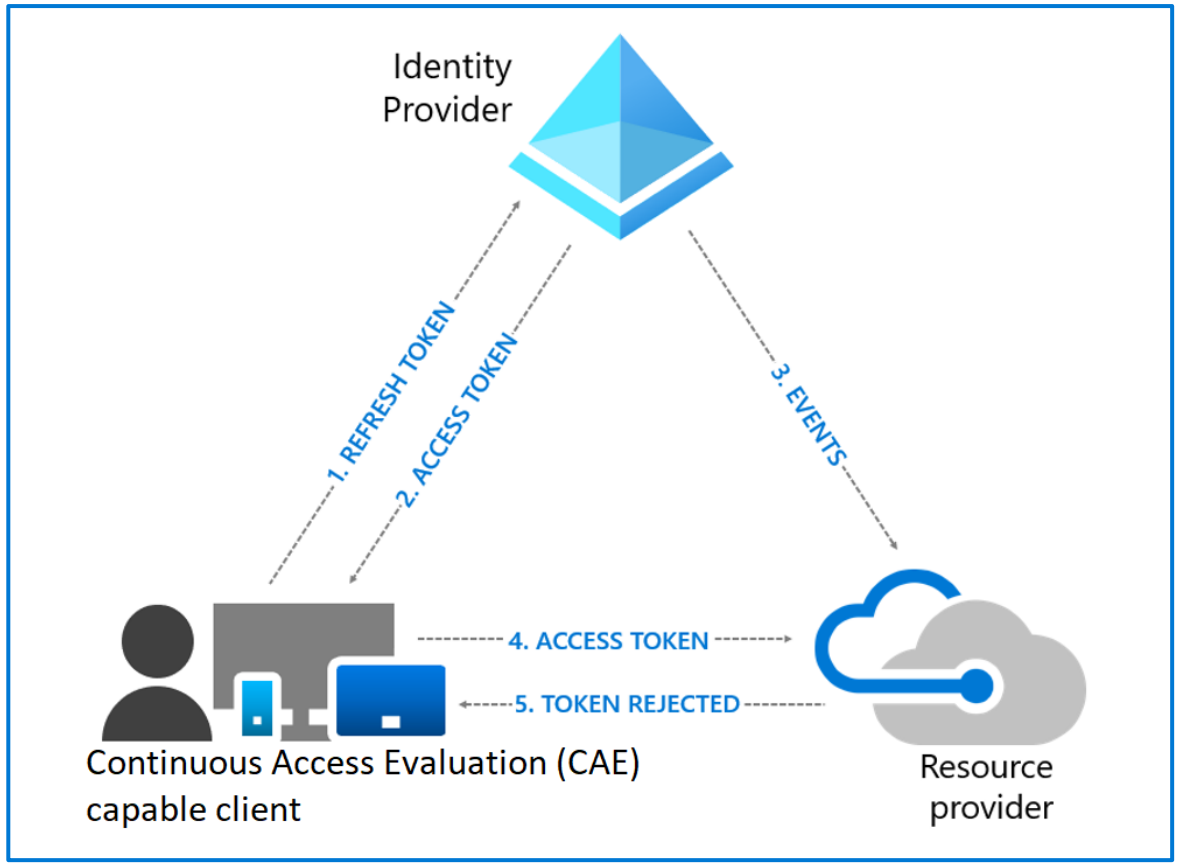


Continuous access evaluation

Continuous Access Evaluation

Benefits

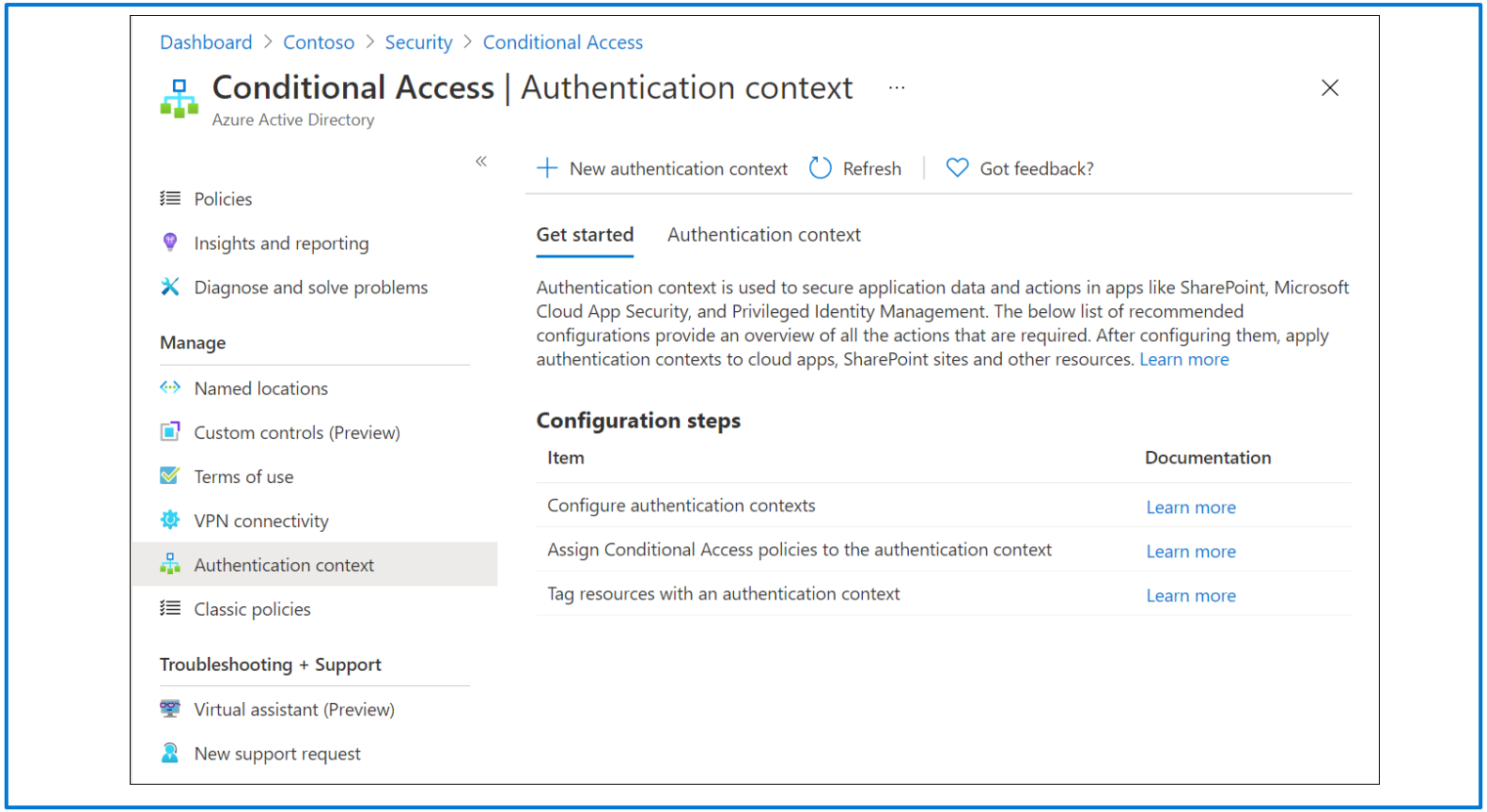
- There are several key benefits to continuous access evaluation.
- User termination or password change/reset: User session revocation will be enforced in near real time.
- Network location change: Conditional Access location policies will be enforced in near real time.
- Token export to a machine outside of a trusted network can be prevented with Conditional Access location policies.



Authentication context

Configure authentication context – conditional access

Authentication context can be used to further secure data and actions in applications. These applications can be your own custom applications, custom line of business (LOB) applications, applications like SharePoint, or applications protected by Microsoft Defender for Cloud Apps.



References (1 of 2)

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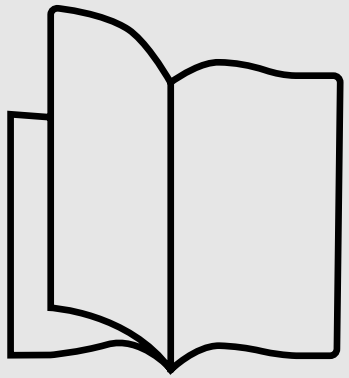
How to deploy Conditional Access
https://www.youtube.com/watch?v=c_izIRNJNuk

How to roll out CA policies to end users
https://www.youtube.com/watch?v=0_Fze7Zpyvc

Conditional Access with device controls
https://www.youtube.com/watch?v=NcONUf-jeS4

Conditional Access with Azure AD MFA
https://www.youtube.com/watch?v=Tbc-SU97G-w



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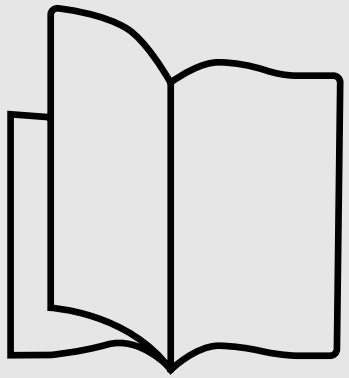
Using the location condition in a Conditional Access policy
https://docs.microsoft.com/azure/active-directory/conditional-access/location-condition

Use compliance policies to set rules for devices you manage with Intune
https://docs.microsoft.com/mem/intune/protect/device-compliance-get-started

Introducing security defaults
https://techcommunity.microsoft.com/t5/azure-active-directory-identity/introducing-security-defaults/ba-p/1061414

Plan a Conditional Access deployment
https://techcommunity.microsoft.com/t5/azure-active-directory-identity/introducing-security-defaults/ba-p/1061414



Microsoft Security

Manage Azure AD Identity Protection

Objectives

Review identity protection basics

Implement and manage user risk policy

Implement MFA registration policy

Monitor, investigate, and remediate elevated risky users

Security for Workload Identities

Microsoft Defender for Identity

Review identity protection basics

Identity protection basics

Identity Protection is a service that enables organizations to view the security posture of any account.

Key tasks:

- Automate the detection and remediation of identity-based risks.
- Investigate risks using data in the portal.
- Export risk detection data to third-party utilities for further analysis.

Risk Detection, Remediation, and Investigation

Common risks detected and remediated

- Anonymous IP address / Atypical travel
- Malware-linked IP address
- Unfamiliar sign-in properties
- Leaked credentials
- Password spray
- Azure AD threat intelligence
- New country
- Suspicious inbox forwarding

Risk Investigation

Reports:

- Risky users
- Risky sign-ins
- Risk detections

Risk levels – low / medium / high

- Each level represents a higher likelihood that a user or sign-in is compromised

Licensing for Identity Protection

Capability		Azure AD Free / Microsoft 365 Apps	Azure AD Premium P1	Azure AD Premium P2
User risk policy (via Identity Protection)		No	No	Yes
Sign-in risk policy (via identity protection)		No	No	Yes
Security reports	Overview	No	No	Yes
	Risky users	Limited Information. *	Limited Information.*	Full access
	Risky sign-ins	Limited Information. *	Limited Information. *	Full access
	Risk detection	No	Limited Information. *	Full access
Notifications	User at risk alert	No	No	Yes
	Weekly digest	No	No	Yes
MFA registration policy		No	No	Yes

* See notes or student materials for details.

Identity Protection permissions

Role	Can do	Cannot do
Global Administrator	Full access to Identity Protection	
Security Administrator	Full access to Identity Protection	Reset password for a user
Security Operator	View all Identity Protection reports and Overview blade Dismiss user risk, confirm safe sign-in, confirm compromise	Configure or change policies Reset password for a user Configure alerts
Security Reader	View all Identity Protection reports and Overview blade	Configure or change policies Reset password for a user Configure alerts Give feedback on detections

Azure AD P2 license required

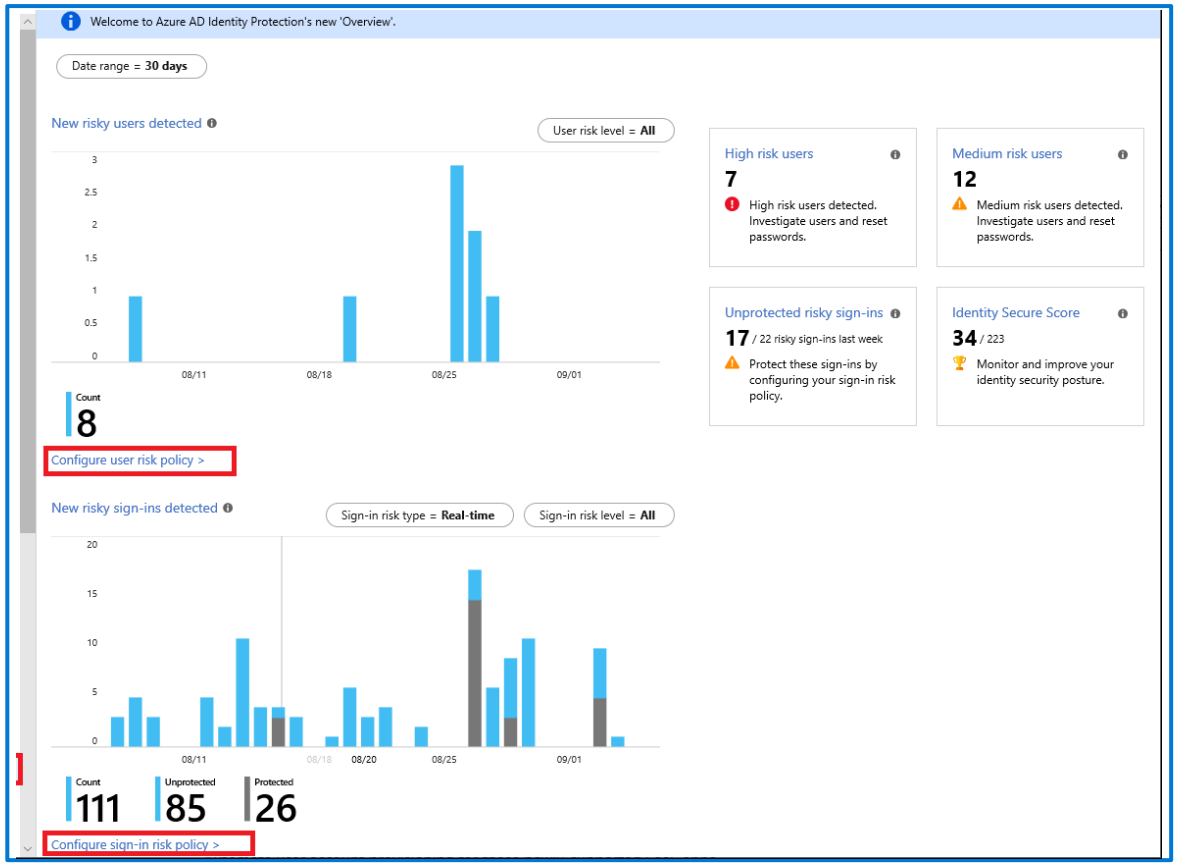
Implement and manage user risk policy

User risk policies

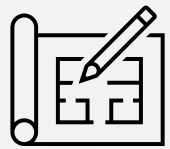
Both sign-in risk policies and user risk policies can be enabled to automate the response to risk detections and allow users to self-remediate

Organizations must decide the level of risk they are willing to accept, balancing user experience and security posture

Azure Portal → Azure AD → Security → Identity Protection



Implement MFA registration policy



What is MFA registration policy

Azure AD Multi-Factor Authentication provides a means to verify who you are using more than just a username and password. It provides a second layer of security to user sign-ins. In order for users to be able to respond to MFA prompts, they must first register for Azure AD Multi-Factor Authentication.

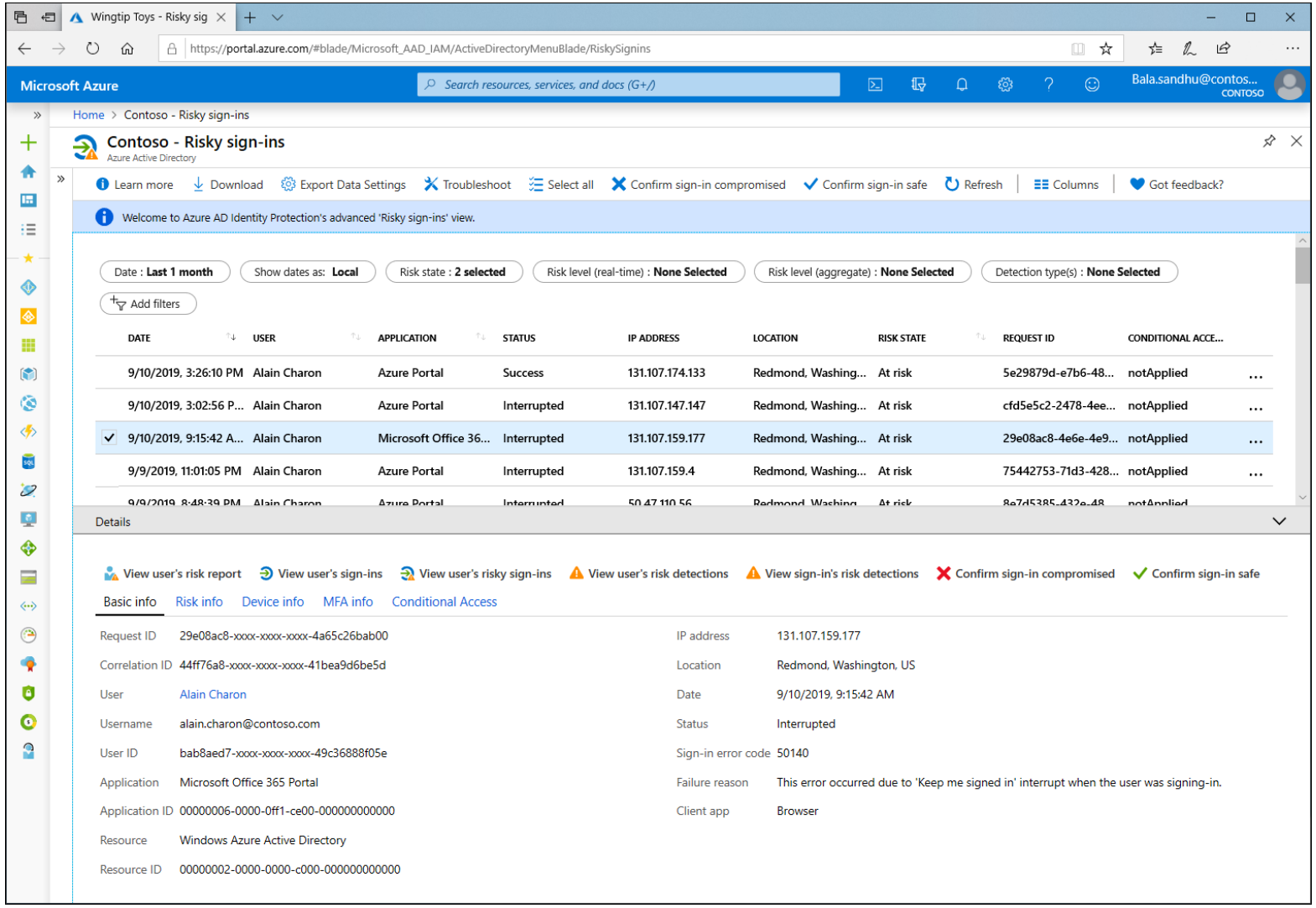
We recommend that you require Azure AD Multi-Factor Authentication for user sign-ins because it:

- Delivers strong authentication through a range of verification options.
- Plays a key role in preparing your organization to self-remediate from risk detections in Identity Protection.

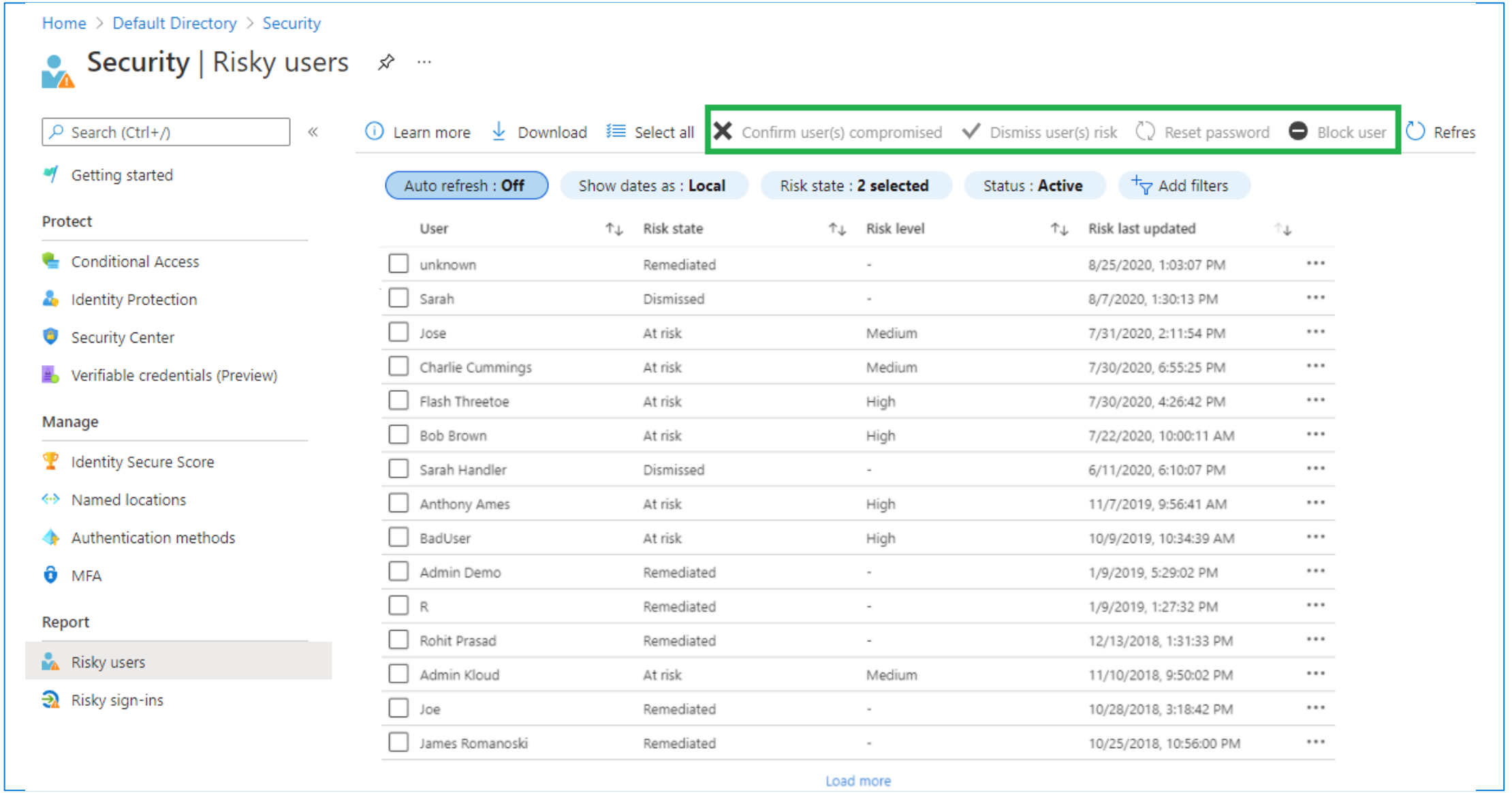
Monitor, investigate, and remediate elevated risky users

Risk reports

Each report launches with a list of all detections for the period shown at the top of the report. Each report allows for the addition or removal of columns based on administrator preference. Administrators can choose to download the data in .CSV or .JSON format. Reports can be filtered using the filters across the top of the report



Report details – example Risky Users Report



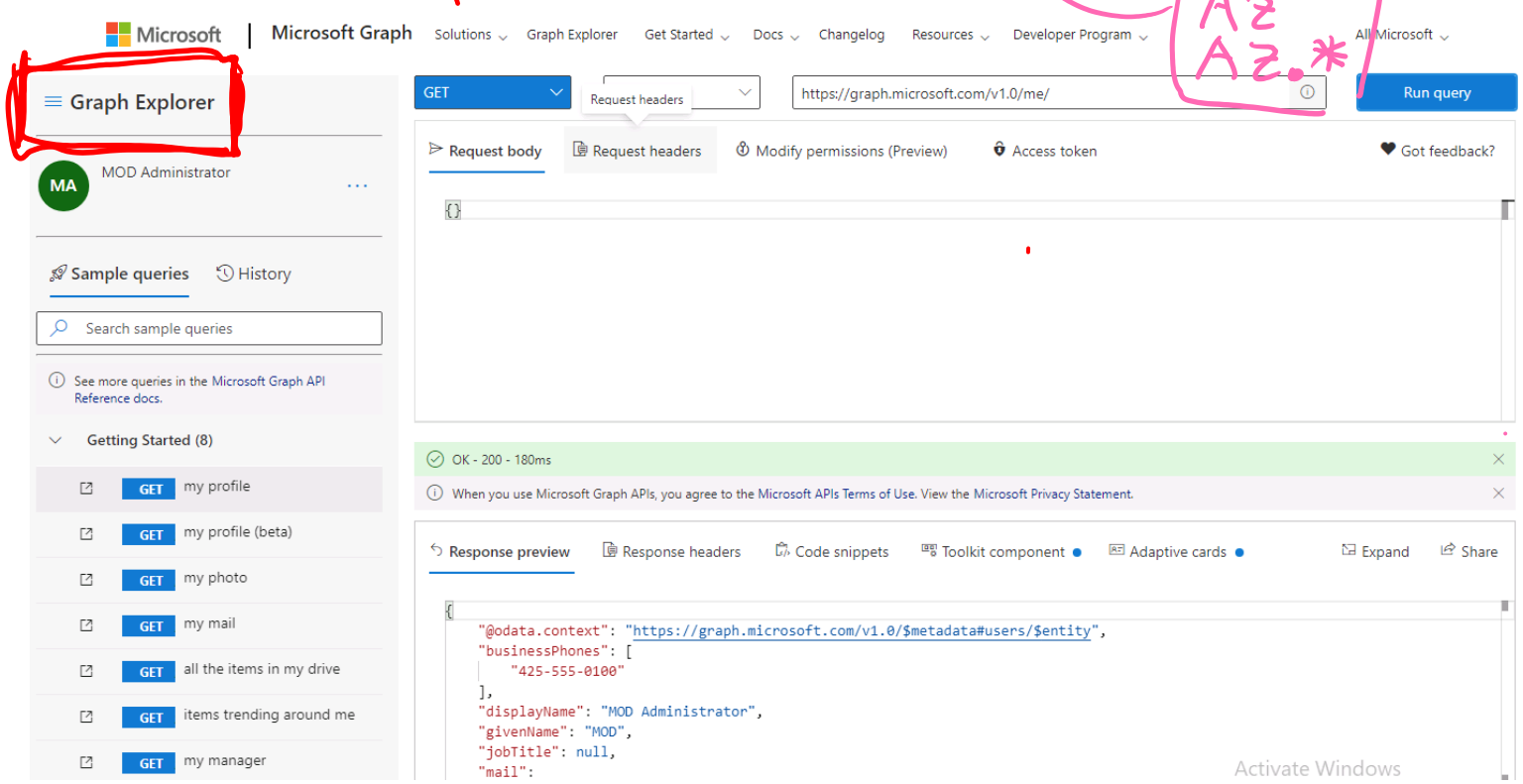
Remediate risks and unblock users

Administrators have the following options to remediate:

- Self-remediation with risk policy
- Manual password reset
- Dismiss user risk
- Close individual risk detections manually

Use the Microsoft Graph API

- Microsoft Graph - unified API endpoint and the home of Azure Active Directory Identity Protection APIs
- Three Microsoft Graph APIs expose information about risky users and sign-ins:
  - riskDetection
  - riskyUsers
  - signIn



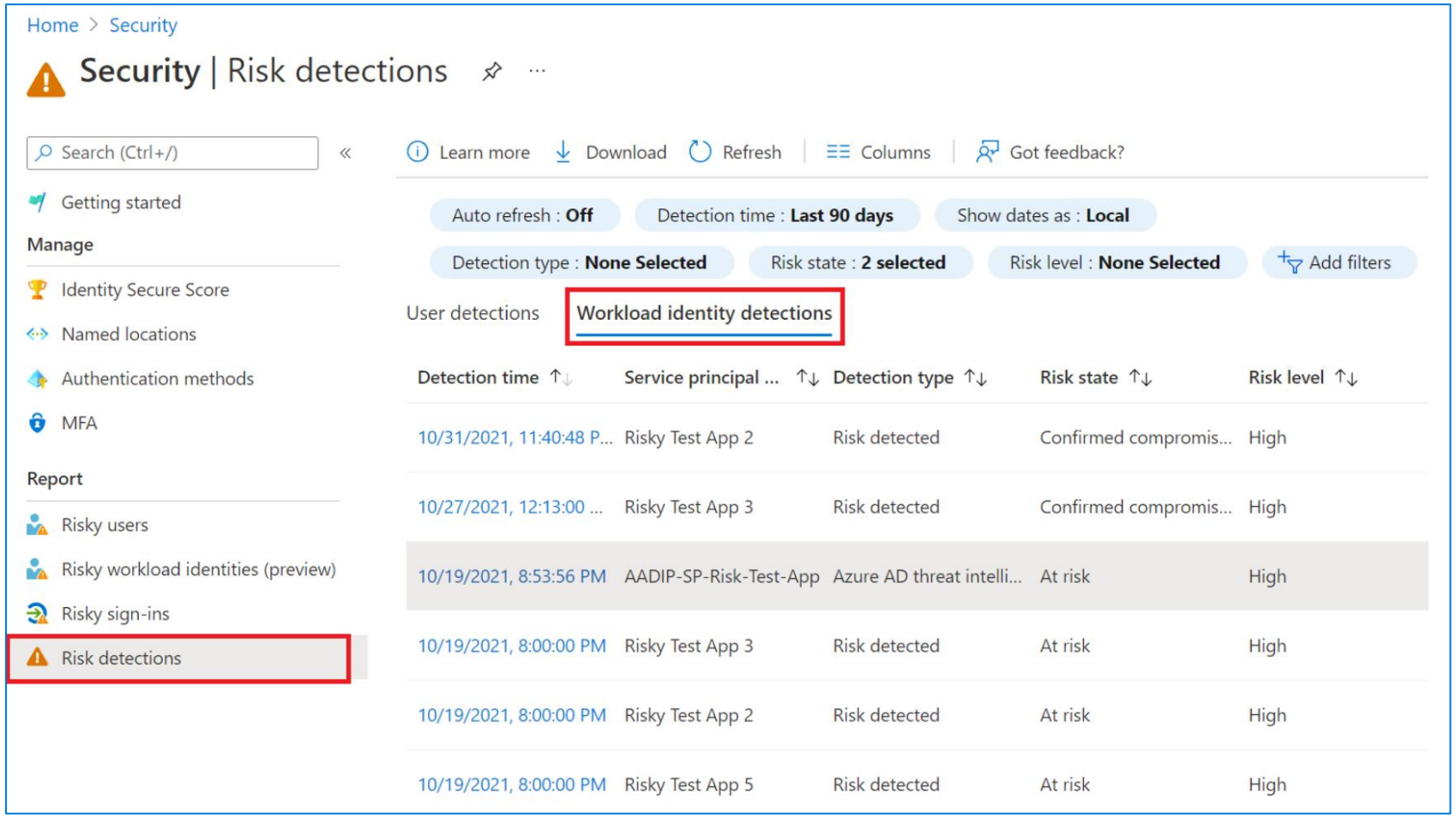
Security for Workload identities

Workload identities risk

A workload identity is an identity that allows an application or service principal access to resources.

These workload identities differ from traditional user accounts as they:

- Can't perform multi-factor authentication.
- Often have no formal lifecycle process.
- Need to store their credentials or secrets.



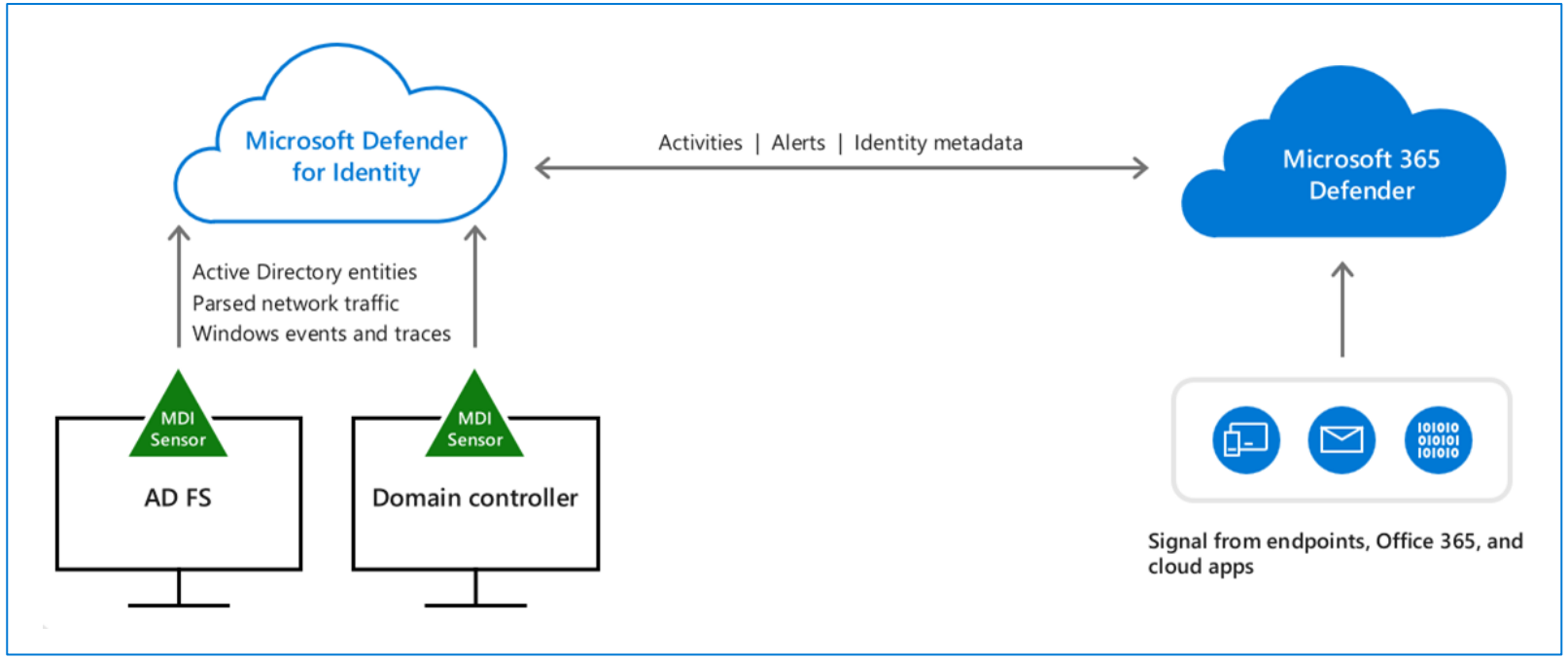
Workload identity risks detected

Detection Name	Description
Azure AD threat intelligence	This risk detection indicates some activity that is consistent with known attack patterns based on Microsoft's internal and external threat intelligence sources.
Suspicious Sign-ins	This risk detection indicates sign-in properties or patterns that are unusual for this service principal.
Unusual addition of credentials to an OAuth app	This detection identifies the suspicious addition of privileged credentials to an OAuth app. This can indicate that an attacker has compromised the app, and is using it for malicious activity.
Admin confirmed account compromised	This detection indicates an admin has selected 'Confirm compromised' in the Risky Workload Identities UI or using riskyServicePrincipals API.

Microsoft Defender for Identity

Microsoft Defender for Identity

- Monitor users, entity behavior, and activities with learning-based analytics
- Protect user identities and credentials stored in Active Directory
- Identify and investigate suspicious user activities and advanced attacks throughout the kill chain
- Provide clear incident information on a simple timeline for fast triage



Log into Defender for Identity:

- https://security.microsoft.com/settings/identities
- Formerly - https://portal.atp.azure.com/

References

Conditional Access for workloads

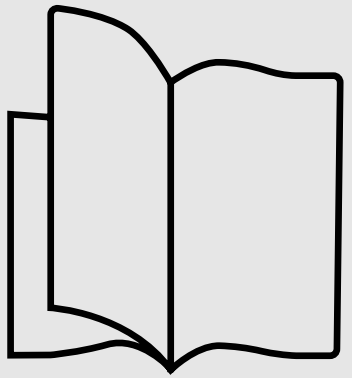
https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/workload-identity

Require MFA for all users

https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/howto-conditional-access-policy-all-users-mfa

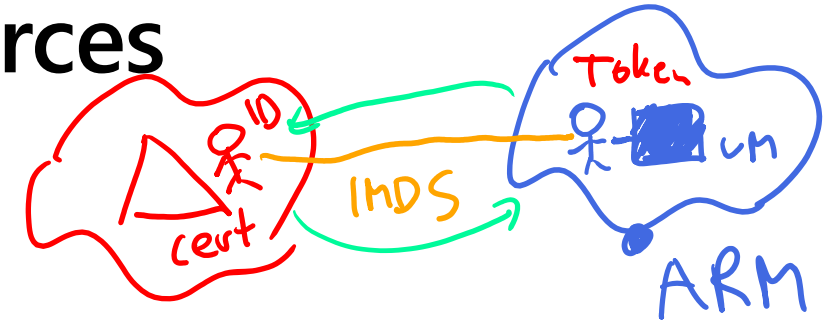
Defender for Identity

https://docs.microsoft.com/en-us/defender-for-identity/



Microsoft Security

Implement access management for Azure resources



Objectives

Assign Azure roles

Configure a custom Azure role

Create and configure Managed Identities

Access Azure resources with Managed Identities

Analyze Azure role permissions

UAA Owner

Configure Azure Key Vault policies and access objects

Explore Microsoft Entra Permissions Management

Assign Azure roles

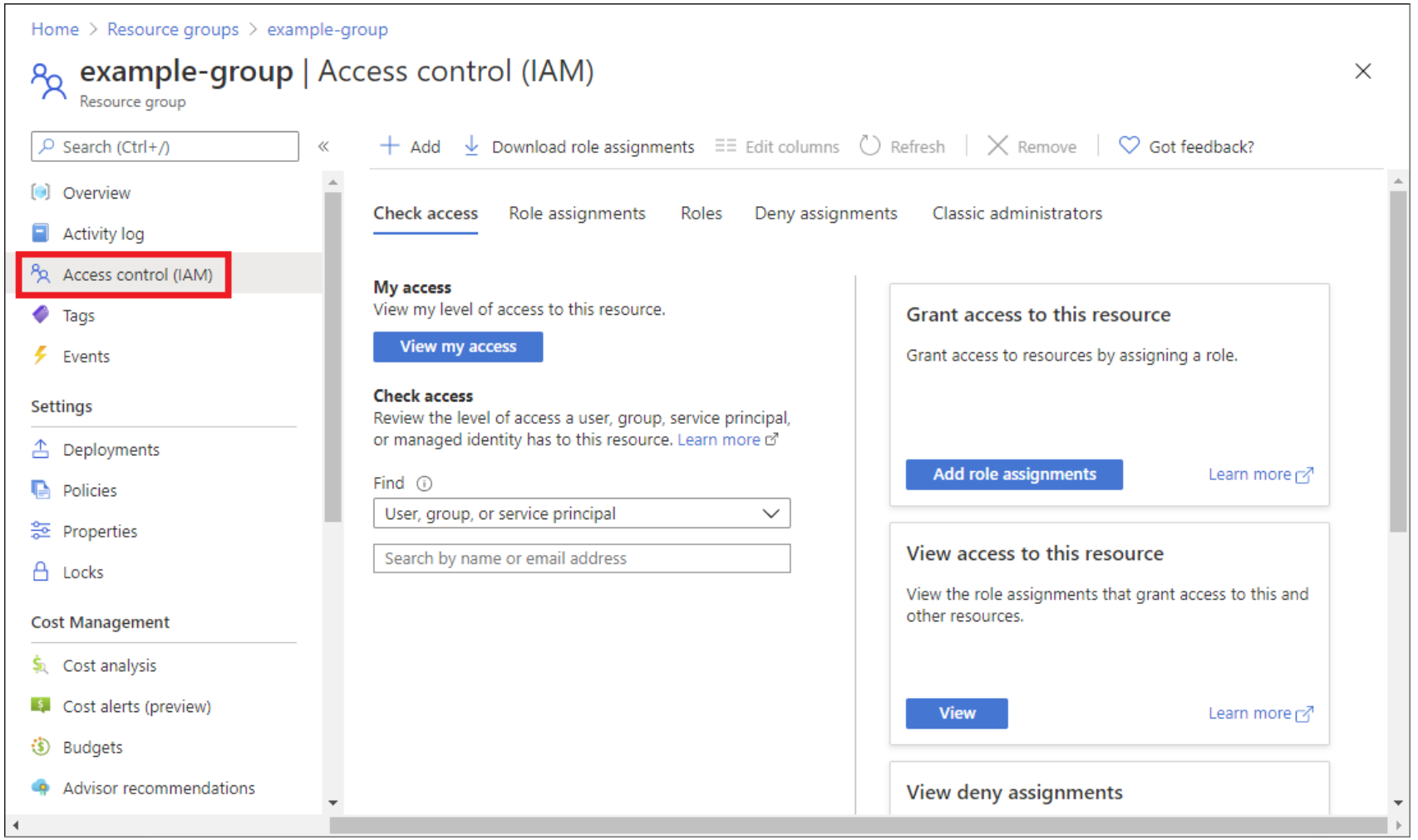
Identities and Roles

Azure role-based access control (Azure RBAC) is the authorization system to manage access to Azure resources. Assign roles to users, groups, service principals, or managed identities at a particular scope.

Who needs access	What role to assign
Identities • User • Group • Service Principal • Managed Identity	Built-in Azure roles • Owner - full access to all resources. • Contributor - Can create and manage all types of Azure resources, but can't grant access. • Reader - Can view the available Azure resources. • User Access Administrator - Assign access to Azure resources. • Other task specific roles, like Virtual Machine Contributor, can be assigned.

What Scope to Assign
Management group – Subscription - resource group – resource

Assign a role in the Azure portal



Assign a role using script

PowerShell

```
New-AzRoleAssignment -ObjectId <objectId> `
-RoleDefinitionName <roleName> `
-Scope
/subscriptions/<subscriptionId>/resourcegroups/<resourceGroupName>/providers/<providerName>/<resourceType>/<resourceSubType>/<resourceName>
```

CLI scripting

```
az role assignment create --assignee "{assignee}" \
--role "{roleNameOrId}" \
--resource-group "{resourceGroupName}"
```

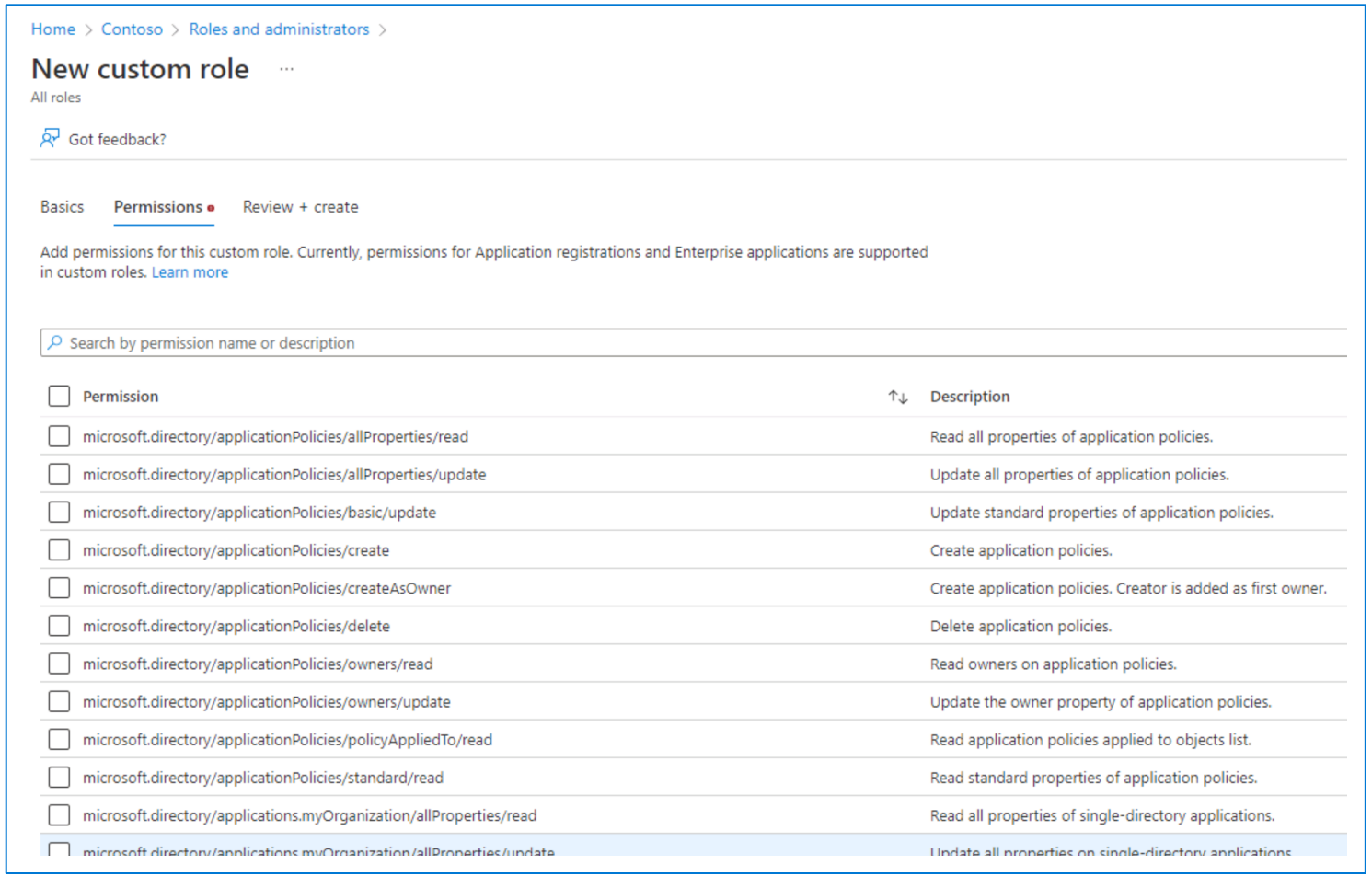
Configure a Custom Azure Role

Create a custom role

The principle of least privilege let's you pick just the capabilities you need.

To create the custom role:

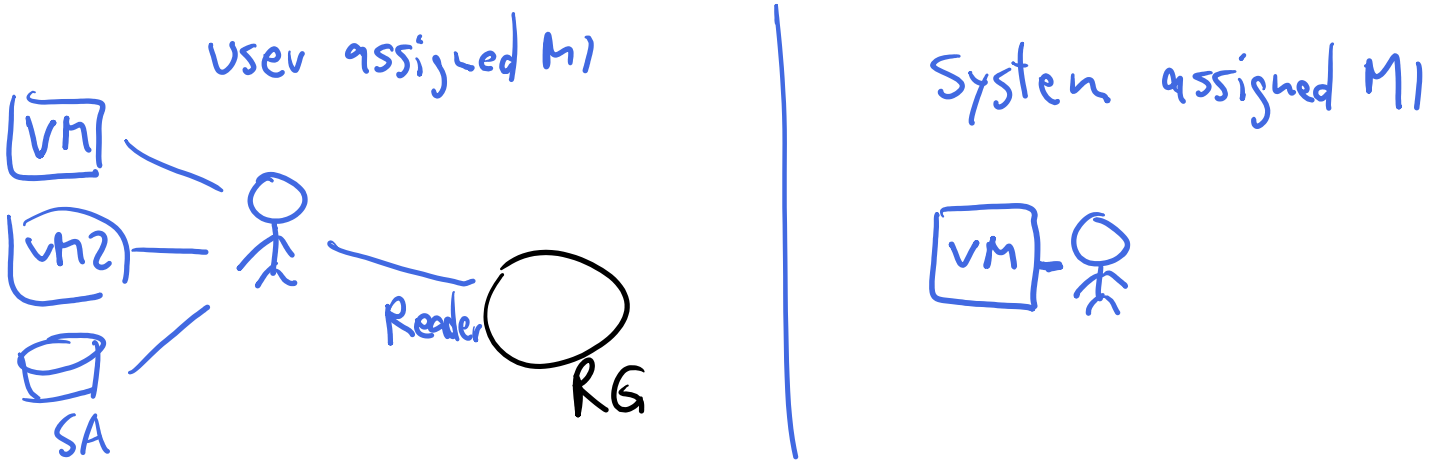
1. Open Azure AD in the Azure portal.
2. Select **Roles and administration**.
3. Select **+ New custom role**.
4. Then name and assign the capabilities needed.



Create a custom role using JSON

The asterisk (*) is used as a wildcard. If you need to assign all of the read permissions from the Billing resource that use this command Microsoft/Billing/*/read. The wildcard can exist at any level.

```
{
    "properties": {
        "roleName": "Billing Reader Plus",
        "description": "Read billing data and download invoices",
        "assignableScopes": [
            "/subscriptions/your-subscription-number"
        ],
        "permissions": [
            {
                "actions": [
                    "Microsoft.Authorization/*/read",
                    "Microsoft.Billing/*/read",
                    "Microsoft.Commerce/*/read",
                    "Microsoft.Consumption/*/read",
                    "Microsoft.Management/managementGroups/read",
                    "Microsoft.CostManagement/*/read",
                    "Microsoft.Support/*"
                ],
                "notActions": [],
                "dataActions": [],
                "notDataActions": []
            }
        ]
    }
}
```



Create and configure Managed Identities

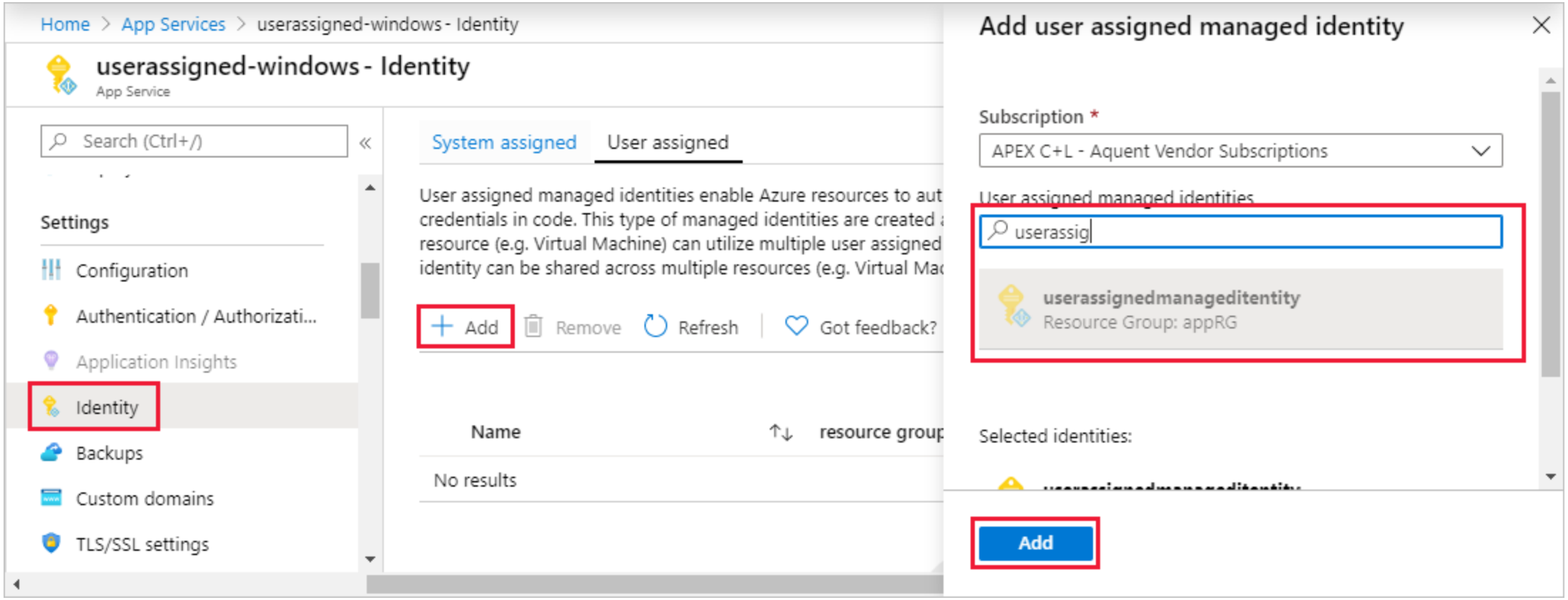
Types of Managed Identities

Identity type	Description and usage
System-assigned	Some Azure services allow you to enable a managed identity directly on a service instance. When you enable a system-assigned managed identity, an identity is created in Azure AD. The identity is tied to the lifecycle of that service instance. When the resource is deleted, Azure automatically deletes the identity for you. By design, only that Azure resource can use this identity to request tokens from Azure AD.
User-assigned	You may also create a managed identity as a standalone Azure resource. You can create a user-assigned managed identity and assign it to one or more instances of an Azure service. For user-assigned managed identities, the identity is managed separately from the resources that use it.

Benefits of using managed identities

- You don't need to manage credentials. Credentials aren’t even accessible to you.
- You can use managed identities to authenticate to any resource that supports Azure AD authentication, including your own applications. Managed identities can be used without any extra cost.

Use a managed identity in the Azure portal



Assign a managed identity in script

CLI

```
az webapp identity assign --resource-group <group-name> --name <app-name> --identities <identity-name>
```

PowerShell

```
Update-AzFunctionApp -Name <app-name> -ResourceGroupName <group-name> -IdentityType UserAssigned -IdentityId $userAssignedIdentity.Id
```

Within a template ARM (Bicep)

```
"identity": {
    "type": "UserAssigned",
    "userAssignedIdentities": {
        "<RESOURCEID>": {}
    }
}
```

Access Azure resources with Managed Identities

Managed Identities and Azure Resources

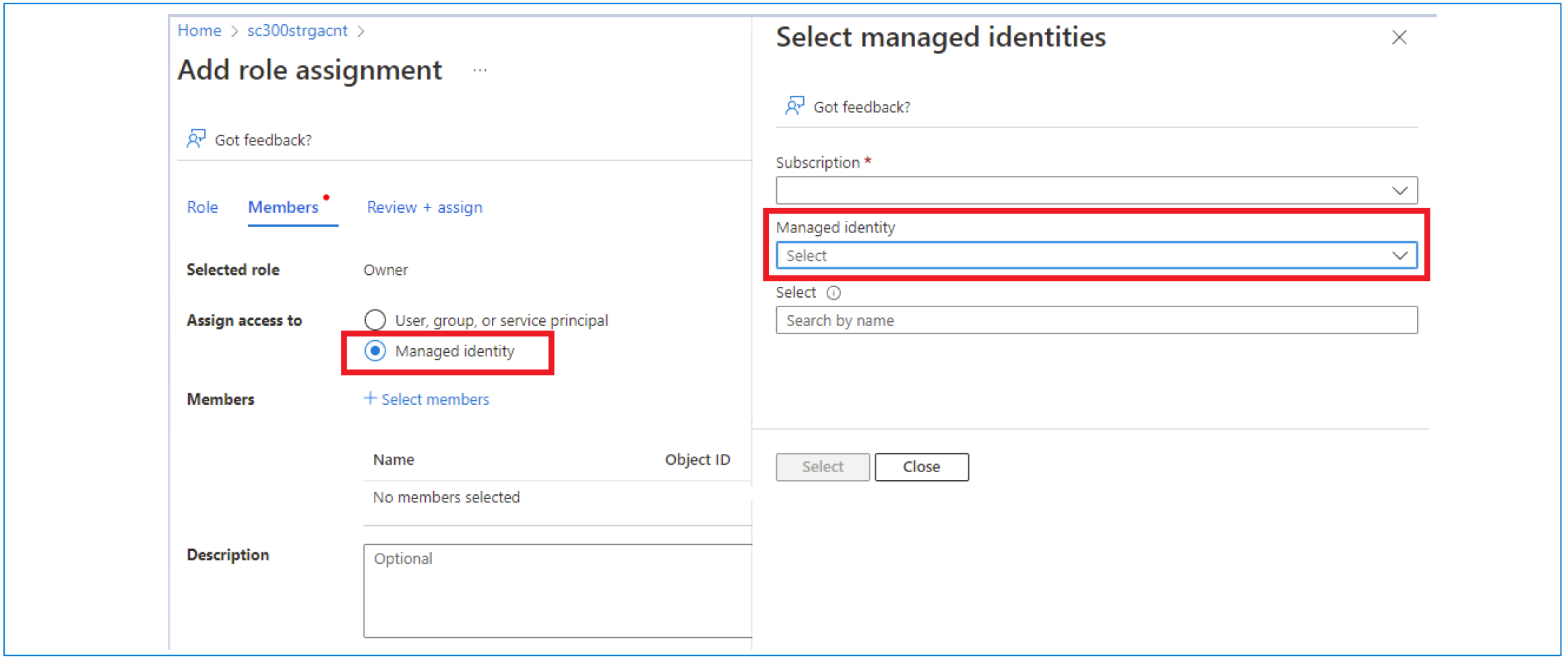
Scenario:

- Application needs to access outside resources like a database or storage account
- How can a developer do this securely?
- You don’t want to embed an account / password into the application.

Use a managed identity:

- Assign a managed identity to an application or virtual machine.
- Open the applications properties.
- Launch the Access Control (IAM).
- Add a role assignment to grant the needed access and resource.

Assigning a resource and managed identity



Analyze Azure AD role permissions

What is a permission?

The dictionary definition of permission is the **consent or authorization to perform a specific action.**

In Azure Active Directory:

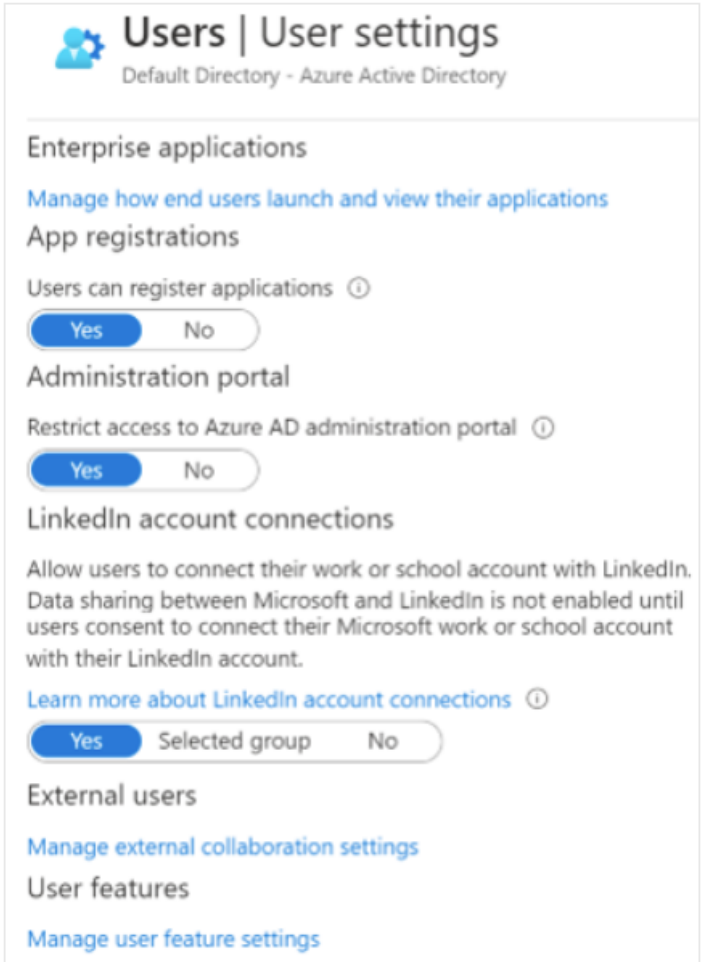
- Permissions for each of the operations you're able to do.
- Permission can range from viewing your settings:
  - Ability to change your setting.
  - All the way up to granting permission to add or remove users and beyond.

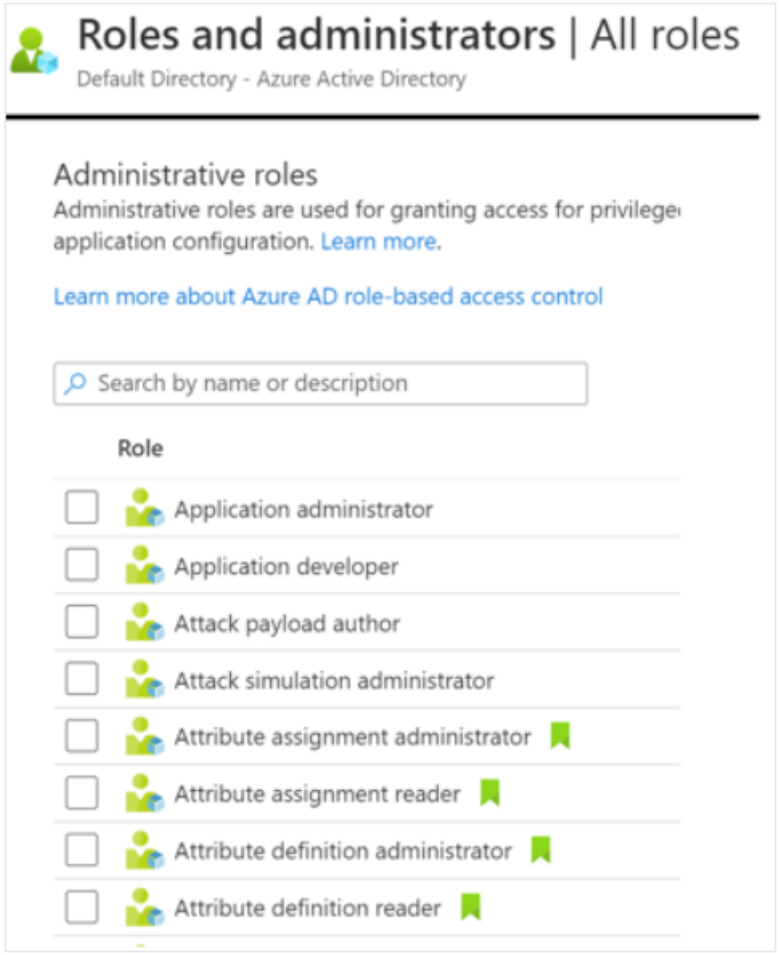
There are two primary places where permission can be assigned, at a user or group level.

Default user permissions

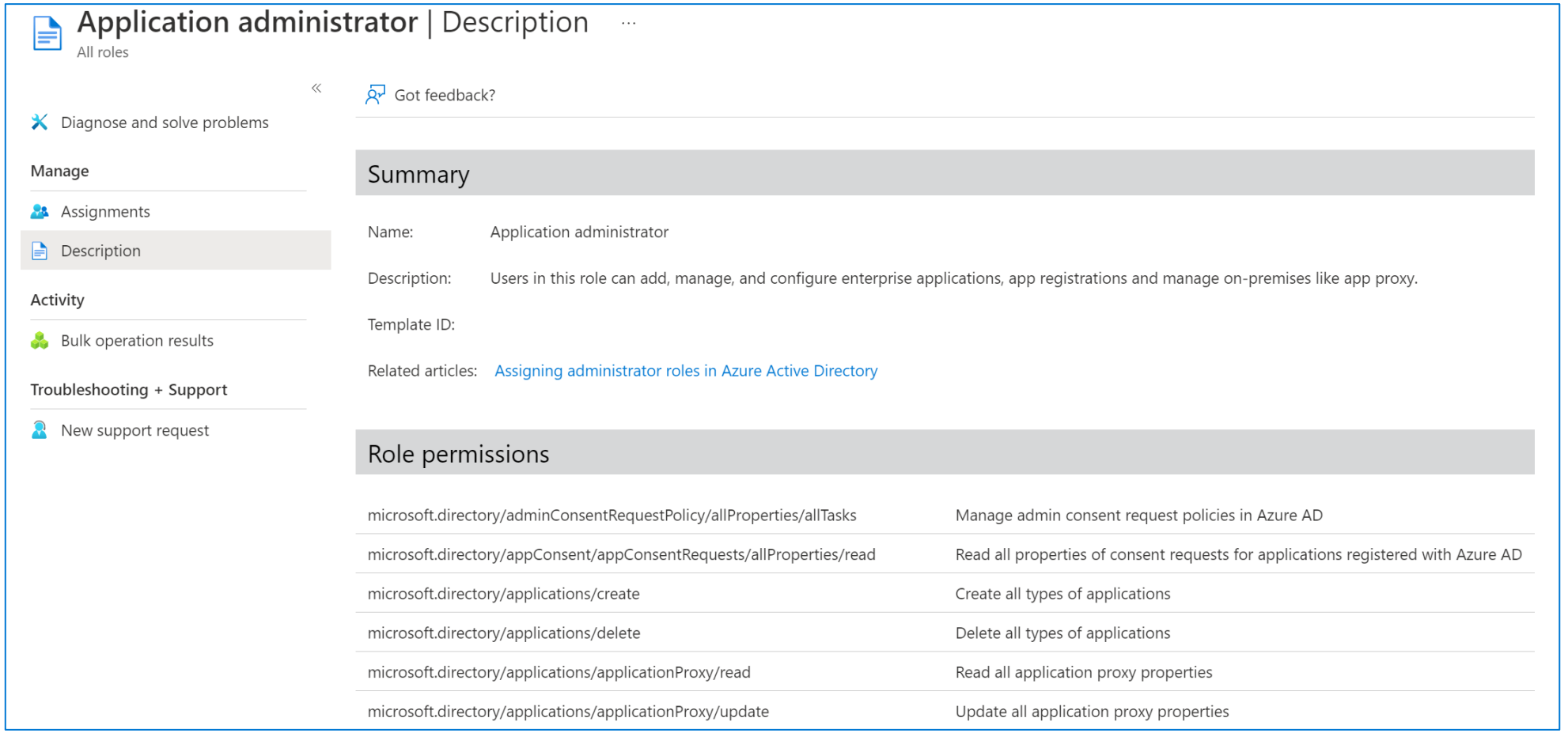
Member Users	Guest Users
Enumerate list of users and their contacts	Read own properties
Invite guest users	Invite guest users
Can create Security and Microsoft 365 Groups	Can search for non-hidden groups by name
Register new applications	Read properties of registered and enterprise applications

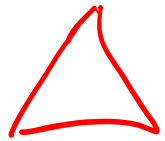
Add or restrict permissions





Exploring available permissions





MFA ← Fido on
sms off

ID Protection ← User Risk Policy
Sign in Risk

CA Policies

Configure Azure Key Vault RBAC policy

Role

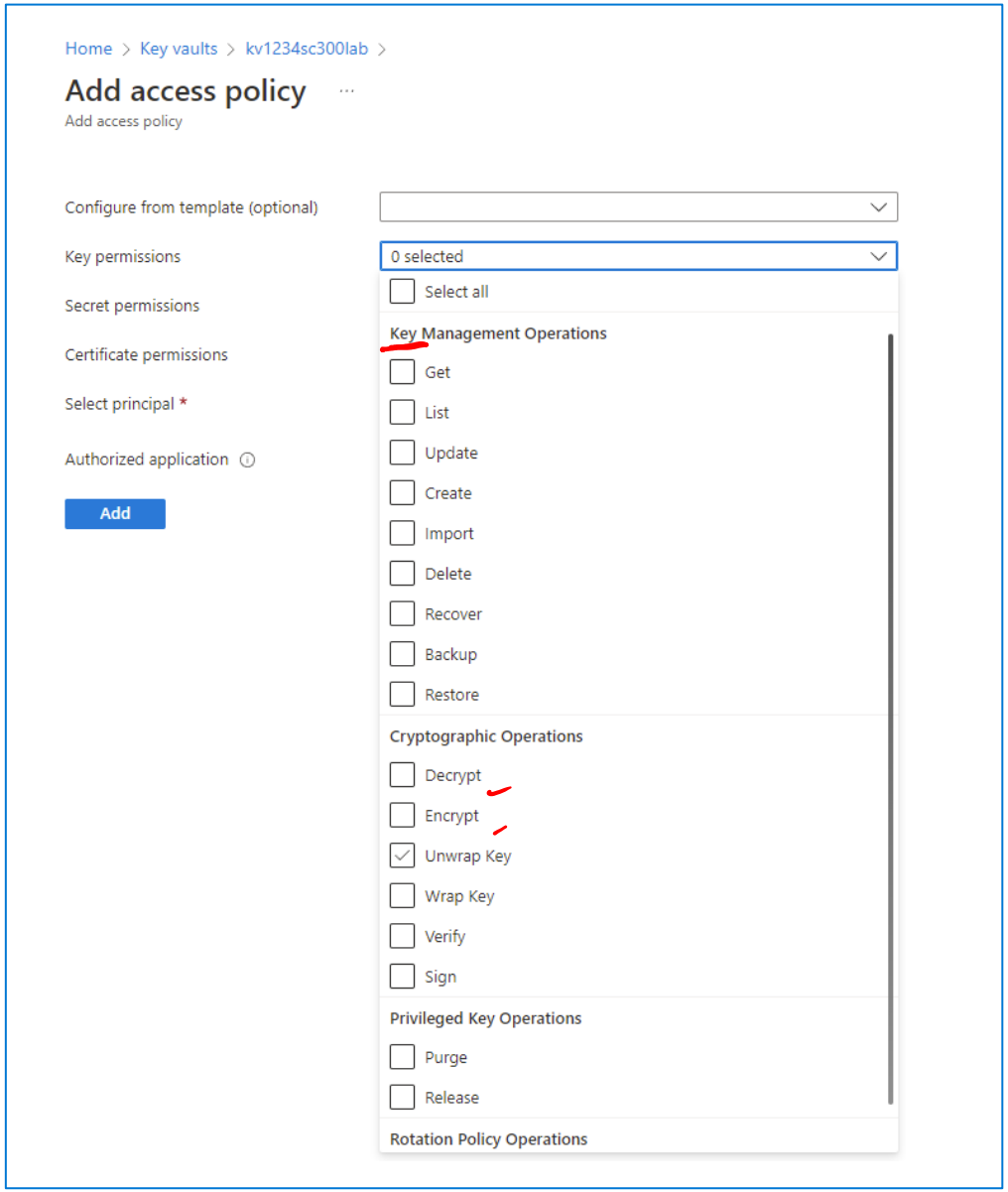
Owner
Contributor
Reader
UAA

MI

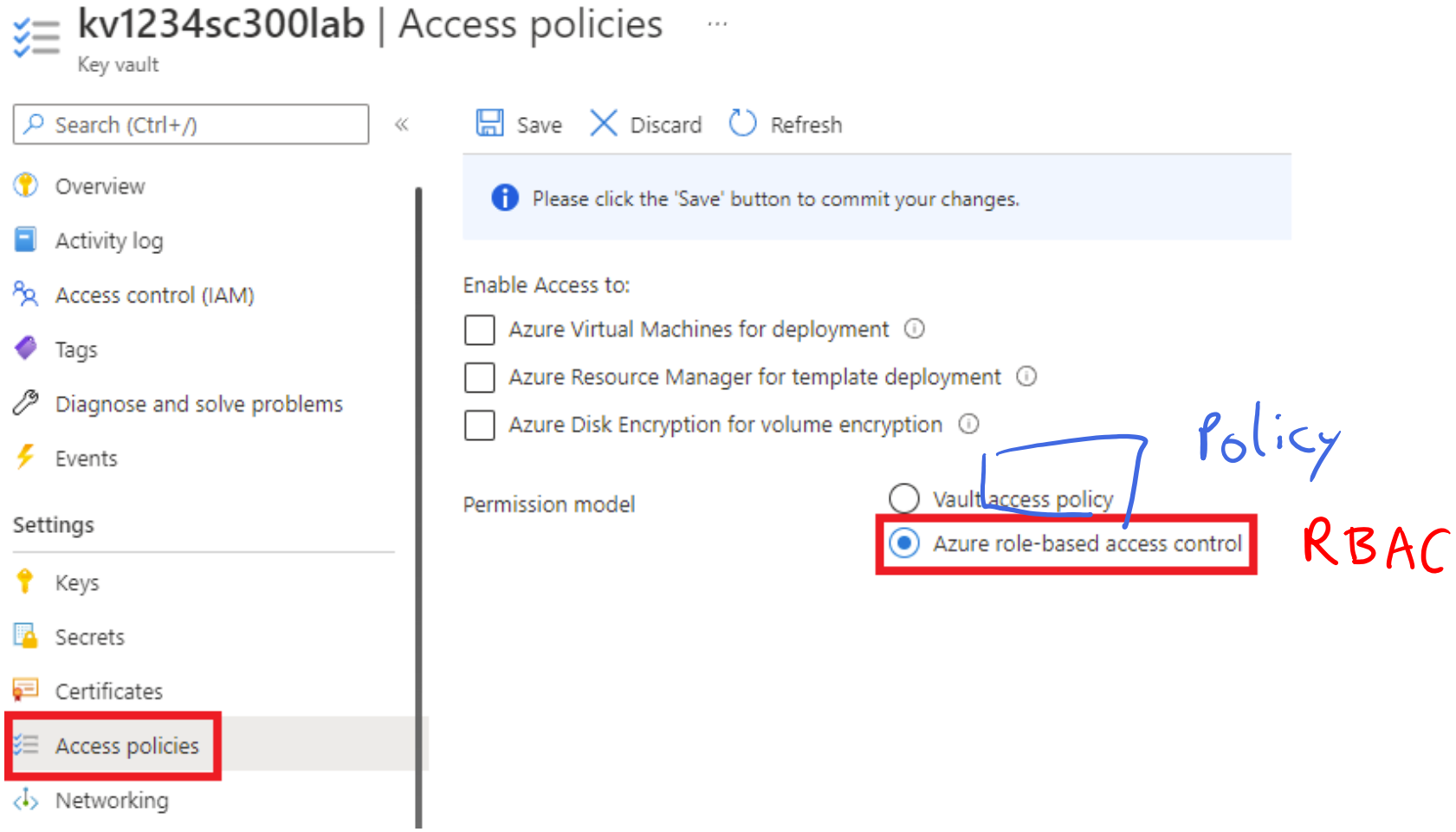
KV

Key Vault Access Policy

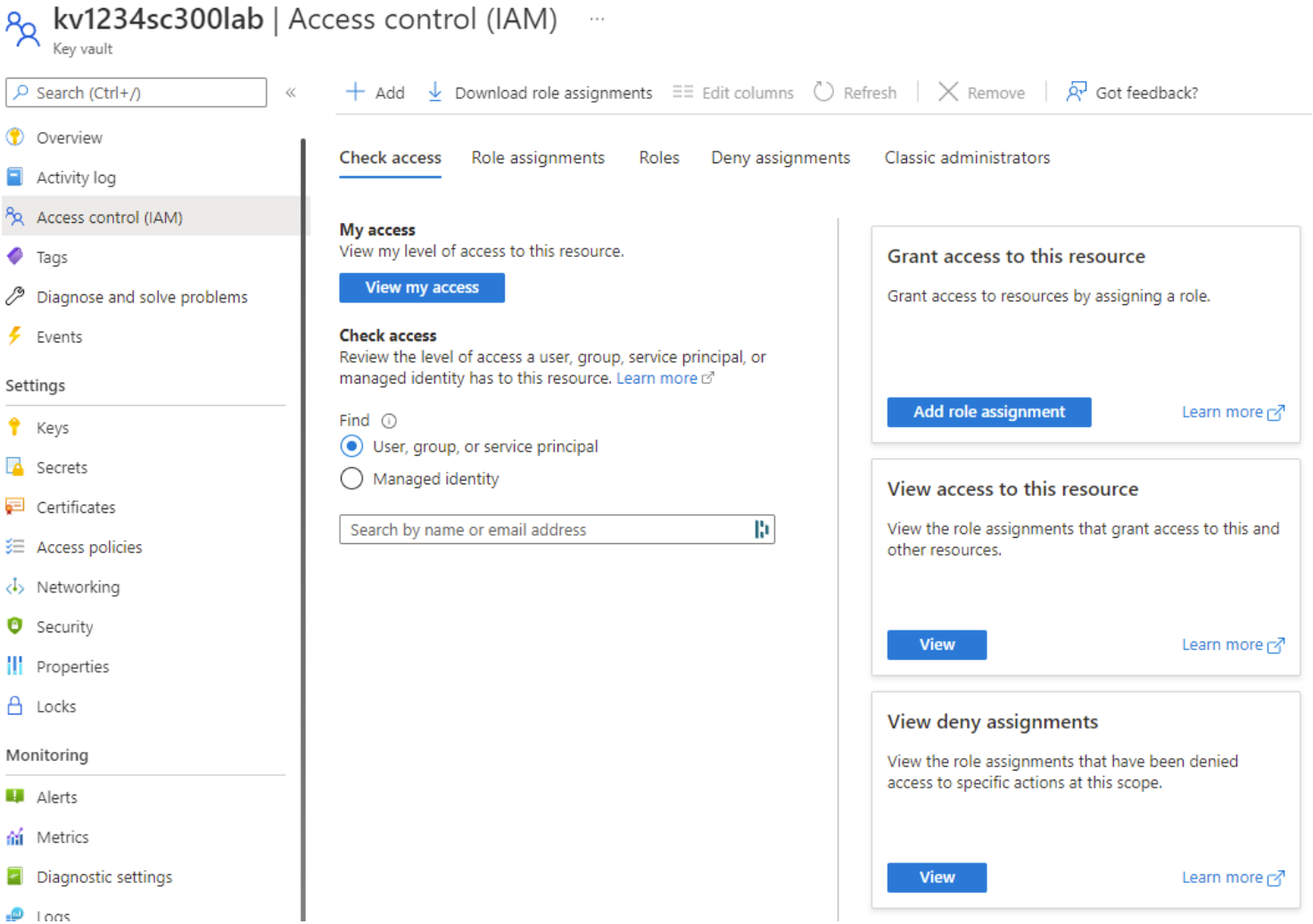
- You can grant access to Azure Key Vault using either role-based access control (RBAC) or using Key Vault access policies.
- Either method works to protect your secrets, certificates, and keys.
- Access policies give you a little more granular control, but can be harder to manage.
- Choose the best option based on your security posture needs.



Key Vault and RBAC policies



Assign access with RBAC to Key Vault



Built in Azure Key Vault roles

Built-in role	Description
Key Vault Administrator	Perform all data plane operations on a key vault and all objects in it, including certificates, keys, and secrets. Can't manage key vault resources or manage role assignments.
Key Vault Certificates Officer	Perform any action on the certificates of a key vault, except manage permissions.
Key Vault Crypto Officer	Perform any action on the keys of a key vault, except manage permissions.
Key Vault Crypto Service Encryption User	Read metadata of keys and perform wrap/unwrap operations.
Key Vault Crypto User	Perform cryptographic operations using keys.
Key Vault Reader	Read metadata of key vaults and its certificates, keys, and secrets. Can't read sensitive values such as secret contents or key material.
Key Vault Secrets Officer	Perform any action on the secrets of a key vault, except manage permissions.
Key Vault Secrets User	Read secret contents.

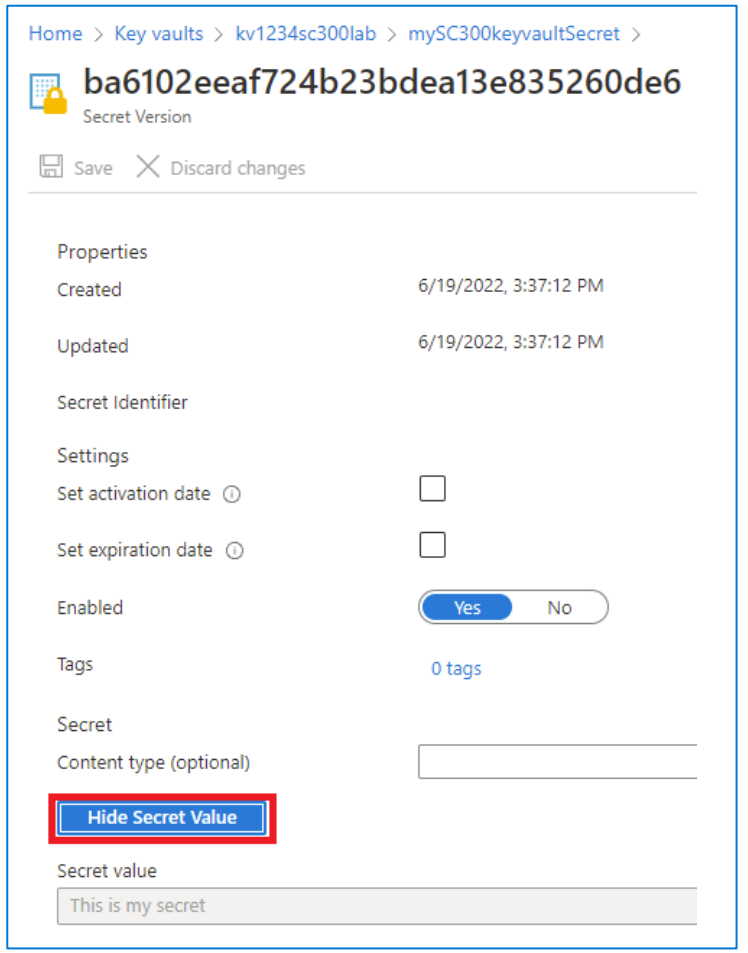
Retrieve objects from Azure Key Vault

Retrieve a secret using from Key Vault in the Azure portal

- Azure Key Vault is a secure tool for storing secrets, keys, and certificate.
- Once stored, these items can be used by users and applications to perform actions and operations in a secure method.

Retrieval methods:

- Key Vault UI
- Scripting / Code



Retrieve a secret from Key Vault in code / script

Azure CLI

```
az keyvault secret show --name "mySC300keyvaultSecret" --vault-name "<your-unique-keyvault-name>" --query "value"
```

PowerShell

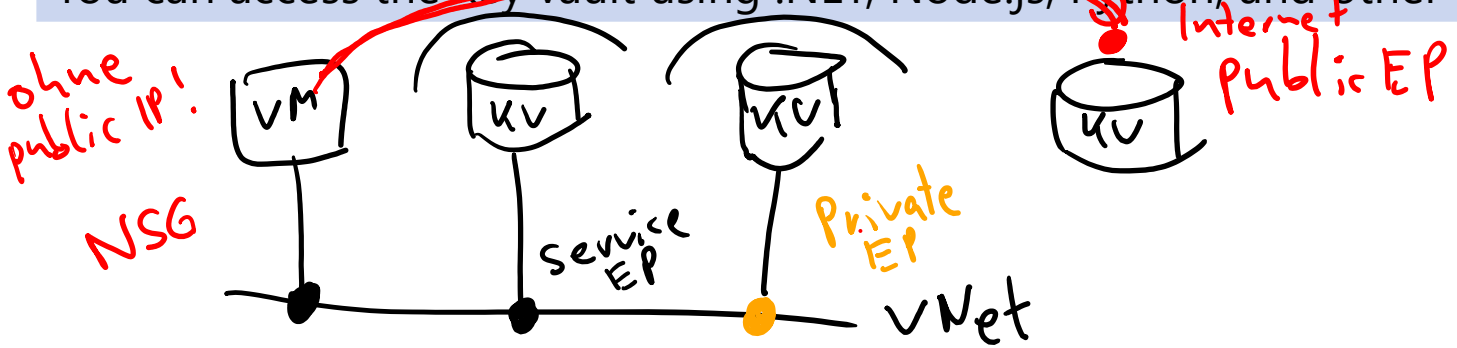
```
$secret = Get-AzKeyVaultSecret -VaultName "<your-unique-keyvault-name>" -Name "mySC300keyvaultSecret" -AsPlainText
```

-Debug

Application code

If you're building an application that needs access to your key vault secrets, certificates, and keys that can be done. You can access the key vault using .NET, Node.js, Python, and other languages.

SDK

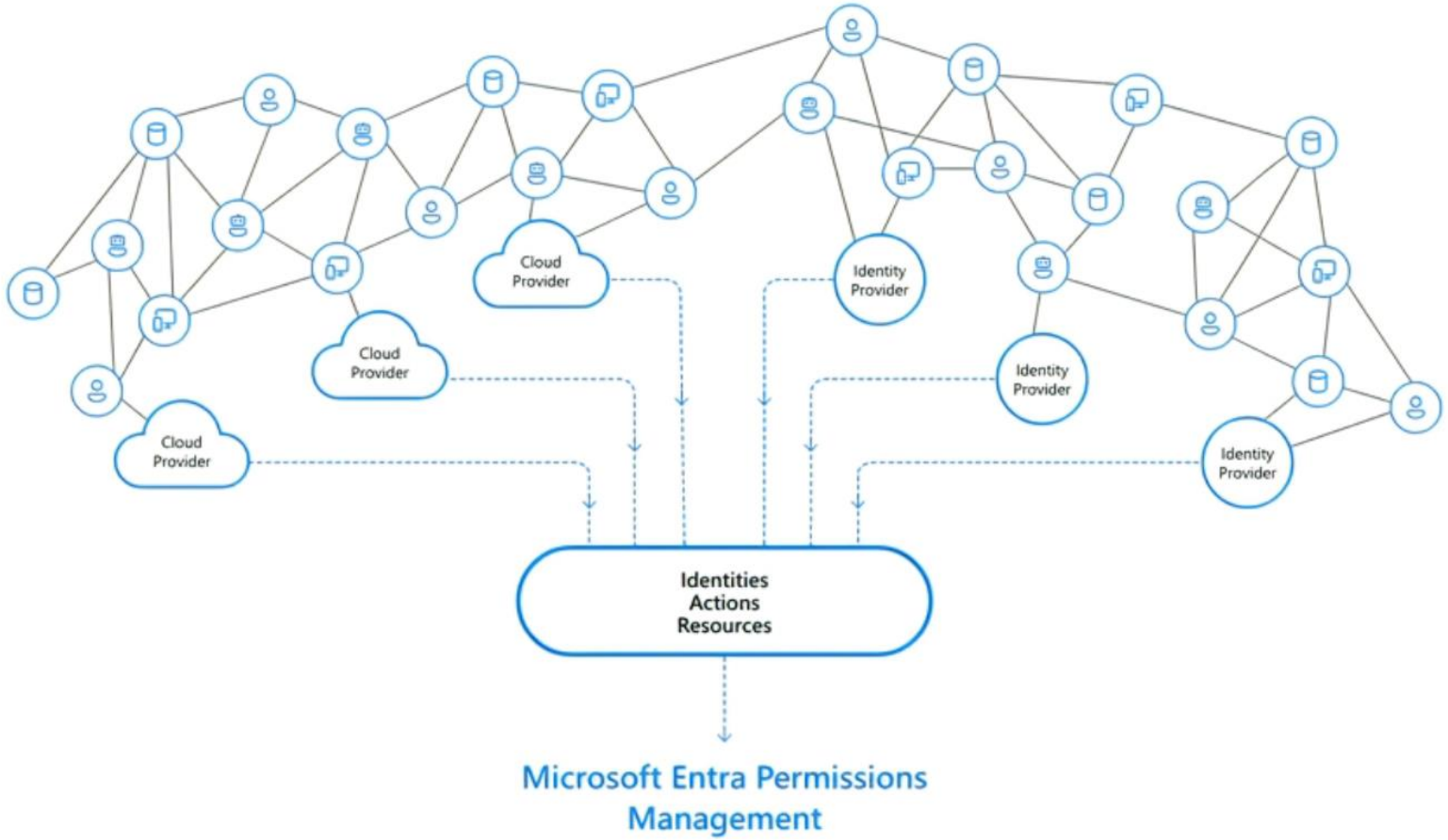


Explore Microsoft Entra Permissions Management (formerly Cloudknox)

Key use cases for Permissions Management

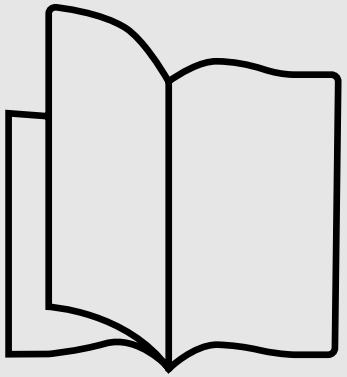
Use case	Description
Discover	Customers can assess permission risks by evaluating the gap between permissions granted and permissions used.
Remediate	Customers can right-size permissions based on usage, grant new permissions on-demand, and automate just-in-time access for cloud resources.
Monitor	Customers can detect anomalous activities with machine language-powered (ML-powered) alerts and generate detailed forensic reports.

Permissions Management process flow



References

- Assign Azure roles using the Azure portal - Azure RBAC | Microsoft Docs
- Create or update Azure custom roles using the Azure portal - Azure RBAC | Microsoft Docs
- Configure managed identities using the Azure portal - Azure AD | Microsoft Docs
- Assign a managed identity access to a resource using the Azure portal - Azure AD | Microsoft Docs
- Understand Azure role definitions - Azure RBAC | Microsoft Docs
- Grant permission to applications to access an Azure key vault using Azure RBAC | Microsoft Docs
- Create and access a secret in Azure Key Vault



Summary

Plan and implement MFA

- Plan your MFA deployment
- Configure and manage MFA settings
- Manage MFA for users
- Core piece of Zero Trust

Conditional Access

- Conditional Access policies
- Testing and troubleshooting CA
- Implement application controls
- Session Management

Manage user authentication

- Configure authentication methods (passwords to passwordless)
- Windows Hello for Business
- Use Password Protection and Smart Lockout
- Implement tenant restrictions

Identity Protection

- Implement User risk policy
- Configure sign-in risk policies
- Manage MFA registration policy
- Remediate elevated risky users

Access Azure resources

- Built-in and Custom roles
- Managed identities
- Key Vault identity level access
- Entra Permissions Management

Labs

Lab	Brief description	Length
8. Enable MFA	Configure Multifactor Authentication policies, set up conditional access rules, and configure Azure AD MFA for passwords.	10 minutes
9. Configure and deploy SSPR	Enable self-service password reset, register a mobile phone number, and test self-service password reset.	15 minutes
10. Azure AD Authentication for Windows and Linux VMs	Configure Azure AD authentication on a virtual machine running Windows or Linux.	15 minutes
11. Assign Azure resources	Use PIM to assign Azure resource roles	10 minutes
12. Manage Azure AD smart lockout values.	Customize the Azure AD smart lockout values.	5 minutes
13. Implement Conditional Access	Create and test a conditional access policy.	10 minutes
14. Enable sign-in risk policy	Enable a user risk policy and a sign-in risk policy.	10 minutes
15. Configure MFA registration policy	Configure a multifactor authentication registration policy.	5 minutes
16. Key Vault and Managed Identities	Configure an Azure Key Vault for access from a Managed Identity	10 minutes

End of presentation