

Multitenant organizations documentation

A multitenant organization is an organization that has more than one instance of Microsoft Entra ID. Describes ways that users can have a seamless experience accessing resources and collaborating across multiple tenants.

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Multitenant organization capabilities in Microsoft Entra ID

Article • 04/23/2024

This article provides an overview of the multitenant organization scenario and the related capabilities in Microsoft Entra ID.

What is a tenant?

A *tenant* is an instance of Microsoft Entra ID in which information about a single organization resides including organizational objects such as users, groups, and devices and also application registrations, such as Microsoft 365 and third-party applications. A tenant also contains access and compliance policies for resources, such as applications registered in the directory. The primary functions served by a tenant include identity authentication as well as resource access management.

From a Microsoft Entra perspective, a tenant forms an identity and access management scope. For example, a tenant administrator makes an application available to some or all the users in the tenant and enforces access policies on that application for users in that tenant. In addition, a tenant contains organizational branding data that drives end-user experiences, such as the organizations email domains and SharePoint URLs used by employees in that organization. From a Microsoft 365 perspective, a tenant forms the default collaboration and licensing boundary. For example, users in Microsoft Teams or Microsoft Outlook can easily find and collaborate with other users in their tenant, but don't have the ability to find or see users in other tenants.

Tenants contain privileged organizational data and are securely isolated from other tenants. In addition, tenants can be configured to have data persisted and processed in a specific region or cloud, which enables organizations to use tenants as a mechanism to meet data residency and handling compliance requirements.

What is a multitenant organization?

A *multitenant organization* is an organization that has more than one instance of Microsoft Entra ID. Here are the primary reasons why an organization might have multiple tenants:

- **Conglomerates:** Organizations with multiple subsidiaries or business units that operate independently.

- **Mergers and acquisitions:** Organizations that merge or acquire companies.
- **Divestiture activity:** In a divestiture, one organization splits off part of its business to form a new organization or sell it to an existing organization.
- **Multiple clouds:** Organizations that have compliance or regulatory needs to exist in multiple cloud environments.
- **Multiple geographical boundaries:** Organizations that operate in multiple geographic locations with various residency regulations.
- **Test or staging tenants:** Organizations that need multiple tenants for testing or staging purposes before deploying more broadly to primary tenants.
- **Department or employee-created tenants:** Organizations where departments or employees have created tenants for development, testing, or separate control.

Multitenant challenges

Your organization may have recently acquired a new company, merged with another company, or restructured based on newly formed business units. If you have disparate identity management systems, it might be challenging for users in different tenants to access resources and collaborate.

The following diagram shows how users in other tenants might not be able to access applications across tenants in your organization.



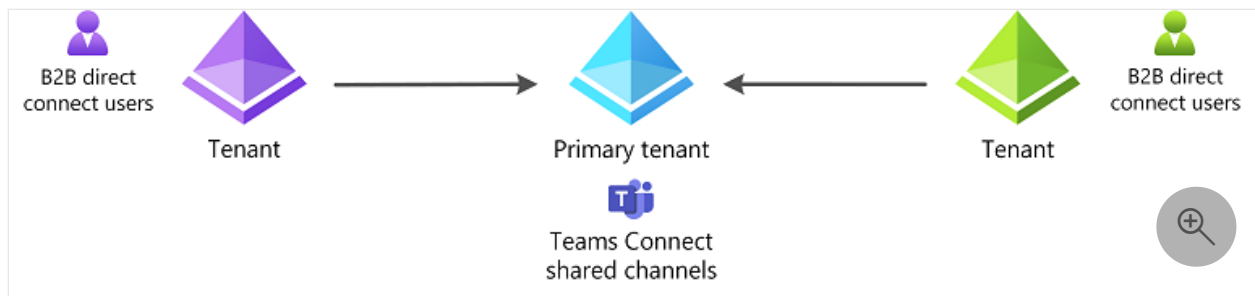
As your organization evolves, your IT team must adapt to meet the changing needs. This often includes integrating with an existing tenant or forming a new one. Regardless of how the identity infrastructure is managed, it's critical that users have a seamless experience accessing resources and collaborating. Today, you may be using custom scripts or on-premises solutions to bring the tenants together to provide a seamless experience across tenants.

B2B direct connect

To enable users across tenants to collaborate in [Teams Connect shared channels](#), you can use [Microsoft Entra B2B direct connect](#). B2B direct connect is a feature of External Identities that lets you set up a mutual trust relationship with another Microsoft Entra organization for seamless collaboration in Teams. When the trust is established, the B2B direct connect user has single sign-on access using credentials from their home tenant.

Here's the primary constraint with using B2B direct connect across multiple tenants:

- Currently, B2B direct connect works only with Teams Connect shared channels.



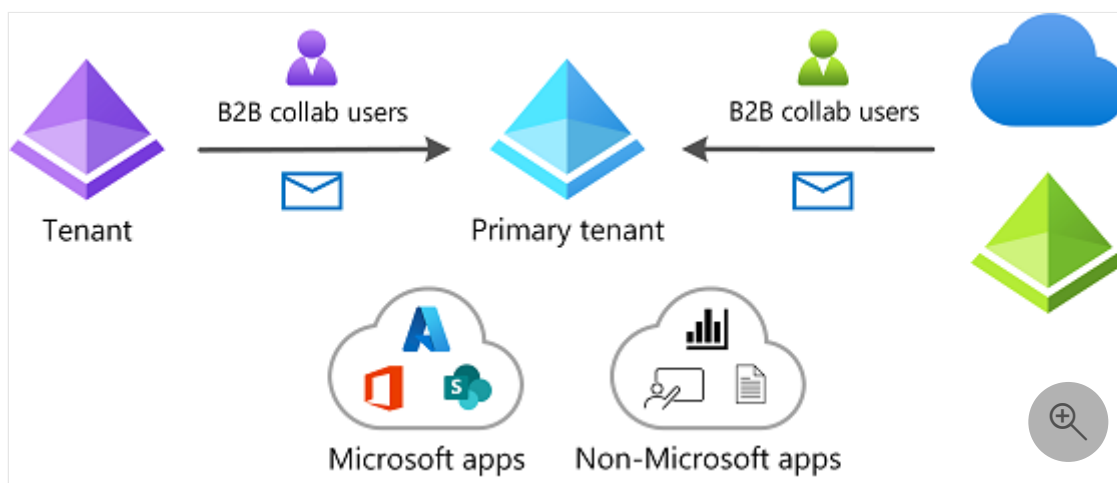
For more information, see [B2B direct connect overview](#).

B2B collaboration

To enable users across tenants to collaborate, you can use [Microsoft Entra B2B collaboration](#). B2B collaboration is a feature within External Identities that lets you invite guest users to collaborate with your organization. Once the external user has redeemed their invitation or completed sign-up, they're represented in your tenant as a user object. With B2B collaboration, you can securely share your company's applications and services with external users, while maintaining control over your own corporate data.

Here are the primary constraints with using B2B collaboration across multiple tenants:

- Administrators must invite users using the B2B invitation process or build an onboarding experience using the [B2B collaboration invitation manager](#).
- Administrators might have to synchronize users using custom scripts.
- Depending on automatic redemption settings, users might need to accept a consent prompt and follow a redemption process in each tenant.
- By default, users are of type external guest, which has different permissions than external member and might not be the desired user experience.



For more information, see [B2B collaboration overview](#).

Cross-tenant synchronization

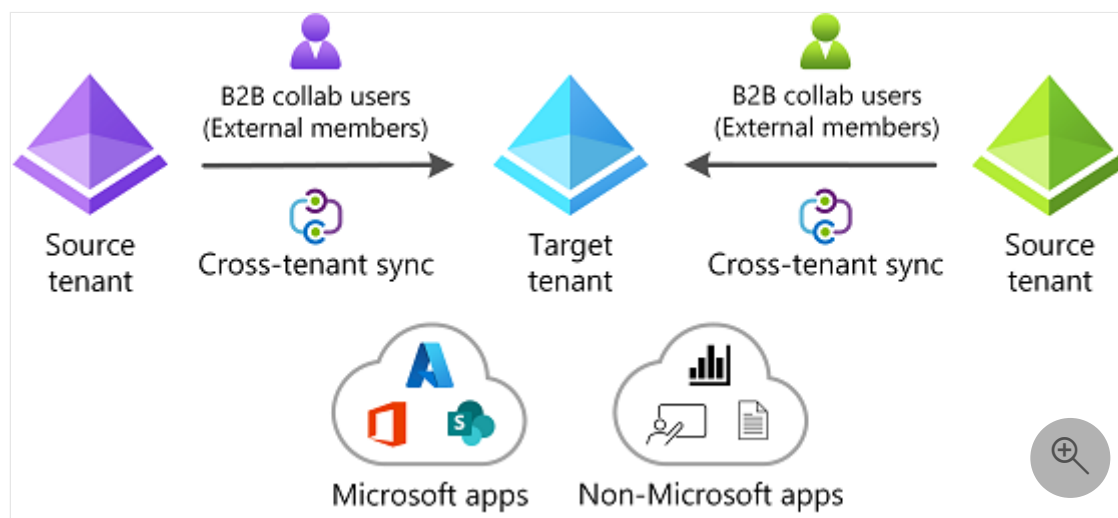
If you want users to have a more seamless collaboration experience across tenants, you can use [cross-tenant synchronization](#). Cross-tenant synchronization is a one-way synchronization service in Microsoft Entra ID that automates creating, updating, and deleting B2B collaboration users across tenants in an organization. Cross-tenant synchronization builds on the B2B collaboration functionality and utilizes existing B2B cross-tenant access settings. Users are represented in the target tenant as a B2B collaboration user object.

Here are the primary benefits with using cross-tenant synchronization:

- Automatically create B2B collaboration users within your organization and provide them access to the applications they need, without creating and maintaining custom scripts.
- Improve the user experience and ensure that users can access resources, without receiving an invitation email and having to accept a consent prompt in each tenant.
- Automatically update users and remove them when they leave the organization.

Here are the primary constraints with using cross-tenant synchronization across multiple tenants:

- Doesn't enhance the current Teams or Microsoft 365 experiences. Synchronized users will have the same cross-tenant Teams and Microsoft 365 experiences available to any other B2B collaboration user.
- Doesn't synchronize groups, devices, or contacts.



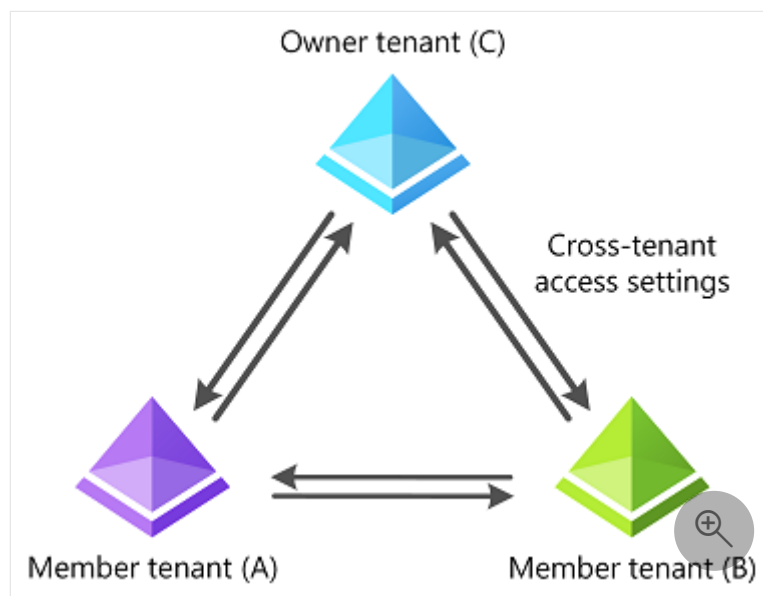
For more information, see [What is cross-tenant synchronization?](#).

Multitenant organization

[Multitenant organization](#) is a feature in Microsoft Entra ID and Microsoft 365 that enables you to form a tenant group within your organization. Each pair of tenants in the group is governed by cross-tenant access settings that you can use to configure B2B or cross-tenant synchronization.

Here are the primary benefits of a multitenant organization:

- Differentiate in-organization and out-of-organization external users
- Improved collaborative experience in new Microsoft Teams
- Improved people search experience across tenants



For more information, see [What is a multitenant organization in Microsoft Entra ID?](#).

Compare multitenant capabilities

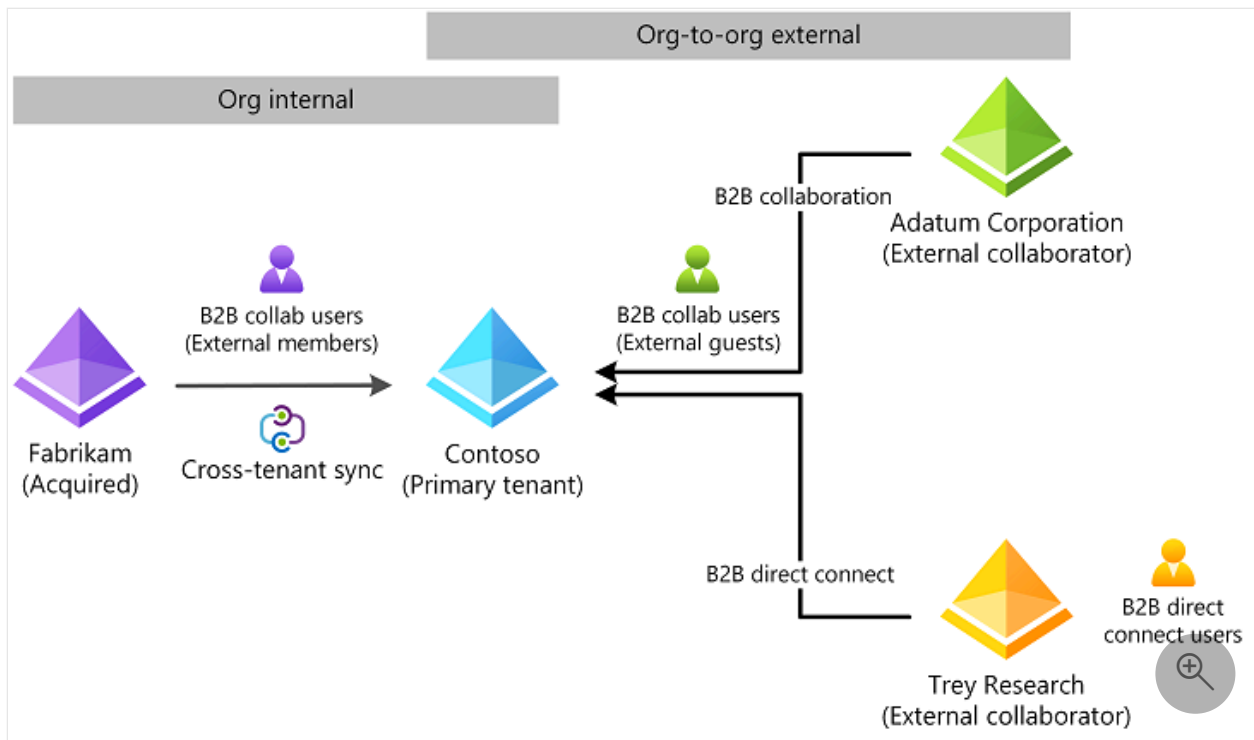
Depending on the needs of your organization, you can use any combination of B2B direct connect, B2B collaboration, cross-tenant synchronization, and multitenant organization capabilities. B2B direct connect and B2B collaboration are independent capabilities, while cross-tenant synchronization and multitenant organization capabilities are independent of each other, though both rely on underlying B2B collaboration.

The following table compares the capabilities of each feature. For more information about different external identity scenarios, see [Comparing External Identities feature sets](#).

	B2B direct connect (Org-to-org external or internal)	B2B collaboration (Org-to-org external or internal)	Cross-tenant synchronization (Org internal)	Multitenant organization (Org internal)
Purpose	Users can access Teams Connect shared channels hosted in external tenants.	Users can access apps/resources hosted in external tenants, usually with limited guest privileges. Depending on automatic redemption settings, users might need to accept a consent prompt in each tenant.	Users can seamlessly access apps/resources across the same organization, even if they're hosted in different tenants.	Users can more seamlessly collaborate across a multitenant organization in new Teams and people search.
Value	Enables external collaboration within Teams Connect shared channels only. More convenient for administrators because they don't have to manage B2B users.	Enables external collaboration. More control and monitoring for administrators by managing the B2B collaboration users. Administrators can limit the access that these external users have to their apps/resources.	Enables collaboration across organizational tenants. Administrators don't have to manually invite and synchronize users between tenants to ensure continuous access to apps/resources within the organization.	Enables collaboration across organizational tenants. Administrators continue to have full configuration ability via cross-tenant access settings. Optional cross-tenant access templates allow pre-configuration of cross-tenant access settings.
Primary administrator workflow	Configure cross-tenant access to provide external users inbound access to tenant the credentials for their home tenant.	Add external users to resource tenant by using the B2B invitation process or build your own onboarding experience using the B2B collaboration	Configure the cross-tenant synchronization engine to synchronize users between multiple tenants as B2B collaboration users.	Create a multitenant organization, add (invite) tenants, join a multitenant organization. Leverage existing B2B collaboration users or use cross-tenant synchronization to

	B2B direct connect (Org-to-org external or internal)	B2B collaboration (Org-to-org external or internal)	Cross-tenant synchronization (Org internal)	Multitenant organization (Org internal)
		invitation manager .		provision B2B collaboration users.
Trust level	Mid trust. B2B direct connect users are less easy to track, mandating a certain level of trust with the external organization.	Low to mid trust. User objects can be tracked easily and managed with granular controls.	High trust. All tenants are part of the same organization, and users are typically granted member access to all apps/resources.	High trust. All tenants are part of the same organization, and users are typically granted member access to all apps/resources.
Effect on users	Users access the resource tenant using the credentials for their home tenant. User objects aren't created in the resource tenant.	External users are added to a tenant as B2B collaboration users.	Within the same organization, users are synchronized from their home tenant to the resource tenant as B2B collaboration users.	Within the same multitenant organization, B2B collaboration users, particularly member users, benefit from enhanced, seamless collaboration across Microsoft 365.
User type	B2B direct connect user - N/A	B2B collaboration user - External member - External guest (default)	B2B collaboration user - External member (default) - External guest	B2B collaboration user - External member (default) - External guest

The following diagram shows how B2B direct connect, B2B collaboration, and cross-tenant synchronization capabilities could be used together.



Terminology

To better understand multitenant organization scenario related Microsoft Entra capabilities, you can refer back to the following list of terms.

[Expand table](#)

Term	Definition
tenant	An instance of Microsoft Entra ID.
organization	The top level of a business hierarchy.
multitenant organization	An organization that has more than one instance of Microsoft Entra ID, as well as a capability to group those instances in Microsoft Entra ID.
creator tenant	The tenant that created the multitenant organization.
owner tenant	A tenant with the owner role. Initially, the creator tenant.
added tenant	A tenant that was added by an owner tenant.
joiner tenant	A tenant that is joining the multitenant organization.
join request	A joiner or added tenant submits a join request to join the multitenant organization.
pending tenant	A tenant that was added by an owner but that hasn't yet joined.
active tenant	A tenant that created or joined the multitenant organization.

Term	Definition
member tenant	A tenant with the member role. Most joiner tenants start as members.
multitenant organization tenant	An active tenant of the multitenant organization, not pending.
cross-tenant synchronization	A one-way synchronization service in Microsoft Entra ID that automates creating, updating, and deleting B2B collaboration users across tenants in an organization.
cross-tenant access settings	Settings to manage collaboration for specific Microsoft Entra organizations.
cross-tenant access settings template	An optional template to preconfigure cross-tenant access settings that are applied to any partner tenant newly joining the multitenant organization.
organizational settings	Cross-tenant access settings for specific Microsoft Entra organizations.
configuration	An application and underlying service principal in Microsoft Entra ID that includes the settings (such as target tenant, user scope, and attribute mappings) needed for cross-tenant synchronization.
provisioning	The process of automatically creating or synchronizing objects across a boundary.
automatic redemption	A B2B setting to automatically redeem invitations so newly created users don't receive an invitation email or have to accept a consent prompt when added to a target tenant.

Next steps

- [What is a multitenant organization in Microsoft Entra ID?](#)
- [What is cross-tenant synchronization?](#)

What is a multitenant organization in Microsoft Entra ID?

Article • 04/24/2024

Multitenant organization is a feature in Microsoft Entra ID and Microsoft 365 that enables you to form a tenant group within your organization. Each pair of tenants in the group is governed by cross-tenant access settings that you can use to configure B2B or cross-tenant synchronization.

Why use multitenant organization?

Here are the primary goals of multitenant organization:

- Define a group of tenants belonging to your organization
- Collaborate across your tenants in new Microsoft Teams
- Enable search and discovery of user profiles across your tenants through Microsoft 365 people search

Who should use it?

Organizations that own multiple Microsoft Entra tenants and want to streamline intra-organization cross-tenant collaboration in Microsoft 365.

The multitenant organization capability is built on the assumption of reciprocal provisioning of B2B member users across multitenant organization tenants.

As such, the multitenant organization capability assumes the simultaneous use of Microsoft Entra cross-tenant synchronization or an alternative bulk provisioning engine for [external identities](#).

Benefits

Here are the primary benefits of a multitenant organization:

- Differentiate in-organization and out-of-organization external users

In Microsoft Entra ID, external users originating from within a multitenant organization can be differentiated from external users originating from outside the multitenant organization. This differentiation facilitates the application of different policies for in-organization and out-of-organization external users.

- Improved collaborative experience in Microsoft Teams

In new Microsoft Teams, multitenant organization users can expect an improved collaborative experience across tenants with chat, calling, and meeting start notifications from all connected tenants across the multitenant organization. Tenant switching is more seamless and faster. For more information, see [Announcing more seamless collaboration in Microsoft Teams for multitenant organizations](#) and [Microsoft Teams: Advantages of the new architecture](#).

- Improved people search experience across tenants

Across Microsoft 365 services, the multitenant organization people search experience is a collaboration feature that enables search and discovery of people across multiple tenants. Once enabled, users are able to search and discover synced user profiles in a tenant's global address list and view their corresponding people cards. For more information, see [Microsoft 365 multitenant organization people search](#).

How does a multitenant organization work?

The multitenant organization capability enables you to form a tenant group within your organization. The following list describes the basic lifecycle of a multitenant organization.

- Define a multitenant organization

One tenant administrator defines a multitenant organization as a grouping of tenants. The grouping of tenants isn't reciprocal until each listed tenant takes action to join the multitenant organization. The objective is a reciprocal agreement between all listed tenants.

- Join a multitenant organization

Tenant administrators of listed tenants take action to join the multitenant organization. After joining, the multitenant organization relationship is reciprocal between each and every tenant that joined the multitenant organization.

- Leave a multitenant organization

Tenant administrators of listed tenants can leave a multitenant organization at any time. While a tenant administrator who defined the multitenant organization can add and remove listed tenants they don't control the other tenants.

A multitenant organization is established as a collaboration of equals. Each tenant administrator stays in control of their tenant and their membership in the multitenant organization.

Cross-tenant access settings

Administrators staying in control of their resources is a guiding principle for multitenant organization collaboration. Cross-tenant access settings are required for each tenant-to-tenant relationship. Tenant administrators explicitly configure, as needed, the following policies:

- Cross-tenant access partner configurations

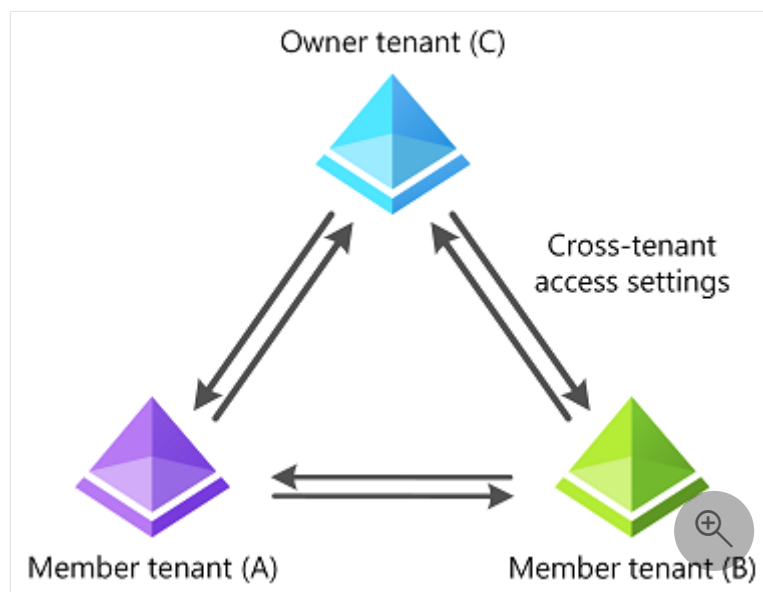
For more information, see [Configure cross-tenant access settings for B2B collaboration](#) and `crossTenantAccessPolicyConfigurationPartner` resource type.

- Cross-tenant access identity synchronization

For more information, see [Configure cross-tenant synchronization](#) and `crossTenantIdentitySyncPolicyPartner` resource type.

Multitenant organization example

The following diagram shows three tenants A, B, and C that form a multitenant organization.



Tenant	Description
A	Administrators see a multitenant organization consisting of A, B, C. They also see cross-tenant access settings for B and C.
B	Administrators see a multitenant organization consisting of A, B, C. They also see cross-tenant access settings for A and C.
C	Administrators see a multitenant organization consisting of A, B, C. They also see cross-tenant access settings for A and B.

Templates for cross-tenant access settings

To ease the setup of homogenous cross-tenant access settings applied to partner tenants in the multitenant organization, the administrator of each multitenant organization tenant can configure optional cross-tenant access settings templates dedicated to the multitenant organization. These templates can be used to preconfigure cross-tenant access settings that are applied to any partner tenant newly joining the multitenant organization.

Tenant role and state

To facilitate the management of a multitenant organization, any given multitenant organization tenant has an associated role and state.

 Expand table

Tenant role	Description
Owner	One tenant creates the multitenant organization. The multitenant organization creating tenant receives the role of owner. The privilege of the owner tenant is to add tenants into a pending state as well as to remove tenants from the multitenant organization. Also, an owner tenant can change the role of other multitenant organization tenants.
Member	Following the addition of pending tenants to the multitenant organization, pending tenants need to join the multitenant organization to turn their state from pending to active. Joined tenants typically start in the member role. Any member tenant has the privilege to leave the multitenant organization.

 Expand table

Tenant state	Description
Pending	A pending tenant has yet to join a multitenant organization. While listed in an administrator's view of the multitenant organization, a pending tenant isn't yet part of the multitenant organization, and as such is hidden from an end user's view of a multitenant organization.
Active	Following the addition of pending tenants to the multitenant organization, pending tenants need to join the multitenant organization to turn their state from pending to active. Joined tenants typically start in the member role. Any member tenant has the privilege to leave the multitenant organization.

Constraints

The multitenant organization capability has been designed with the following constraints:

- Any given tenant can only create or join a single multitenant organization.
- Any multitenant organization must have at least one active owner tenant.
- Each active tenant must have cross-tenant access settings for all active tenants.
- Any active tenant may leave a multitenant organization by removing themselves from it.
- A multitenant organization is deleted when the only remaining active (owner) tenant leaves.

Limits

 Expand table

Resource	Limit	Notes
Maximum number of active tenants, including the owner tenant	100	The owner tenant can add more than 100 pending tenants, but they won't be able to join the multitenant organization if the limit is exceeded. This limit is applied at the time a pending tenant joins a multitenant organization. This limit is specific to the number of tenants in a multitenant organization. It does not apply to cross-tenant synchronization by itself. To increase this limit, submit a support request in the Microsoft Entra or Microsoft 365 admin center. In the Microsoft Graph APIs, the default limit of 100 tenants is only enforced at the time of joining. In Microsoft 365 admin center, the default limit is enforced at multitenant organization creation time and at time of joining.

External user segmentation

By defining a multitenant organization, as well as pivoting on the Microsoft Entra user property of userType, [external identities](#) are segmented as follows:

- External members originating from within a multitenant organization
- External guests originating from within a multitenant organization
- External members originating from outside of your organization
- External guests originating from outside of your organization

This segmentation of external users, due to the definition of a multitenant organization, enables administrators to better differentiate in-organization from out-of-organization external users.

External members originating from within a multitenant organization are called multitenant organization members.

Multitenant collaboration capabilities in Microsoft 365 aim to provide a seamless collaboration experience across tenant boundaries when collaborating with multitenant organization member users.

Choosing between Microsoft 365 admin center and cross-tenant synchronization

- If you haven't previously used Microsoft Entra cross-tenant synchronization, and you intend to establish a [collaborating user set](#) topology where the same set of users is shared to all multitenant organization tenants, you might want to use the Microsoft 365 admin center share users functionality.
- If you're already using Microsoft Entra cross-tenant synchronization, for various [multi-hub multi-spoke topologies](#), you don't need to use the Microsoft 365 admin center share users functionality. Instead, you might want to continue using your existing Microsoft Entra cross-tenant synchronization jobs.

Get started

Here are the basic steps to get started using multitenant organization.

Step 1: Plan your deployment

For more information, see [Plan for multitenant organizations in Microsoft 365](#).

Step 2: Create your multitenant organization

Create your multitenant organization using [Microsoft 365 admin center](#), [Microsoft Graph PowerShell](#), or [Microsoft Graph API](#):

- First tenant, soon-to-be owner tenant, creates a multitenant organization.
- Owner tenant adds one or more joiner tenants.

Step 3: Join a multitenant organization

Join a multitenant organization using [Microsoft 365 admin center](#) or [Microsoft Graph PowerShell](#), or [Microsoft Graph API](#):

- Joiner tenants submit a join request to join the multitenant organization of owner tenant.
- To allow for asynchronous processing, wait **up to 2 hours**.

Your multitenant organization is formed.

Step 4: Synchronize users

Depending on your use case, you may want to synchronize users using one of the following methods:

- [Synchronize users in multitenant organizations in Microsoft 365](#)
- [Configure cross-tenant synchronization](#)
- [Configure cross-tenant synchronization using PowerShell or Microsoft Graph API](#)
- Your alternative bulk provisioning engine

License requirements

The multitenant organization capability requires Microsoft Entra ID P1 licenses. Only one Microsoft Entra ID P1 license is required per employee per multitenant organization. Also, you must have at least one Microsoft Entra ID P1 license per tenant. To find the right license for your requirements, see [Compare generally available features of Microsoft Entra ID](#) [↗](#).

Next steps

- [Plan for multitenant organizations in Microsoft 365](#)
- [What is cross-tenant synchronization?](#)

What is cross-tenant synchronization?

Article • 01/03/2024

Cross-tenant synchronization automates creating, updating, and deleting [Microsoft Entra B2B collaboration](#) users across tenants in an organization. It enables users to access applications and collaborate across tenants, while still allowing the organization to evolve.

Here are the primary goals of cross-tenant synchronization:

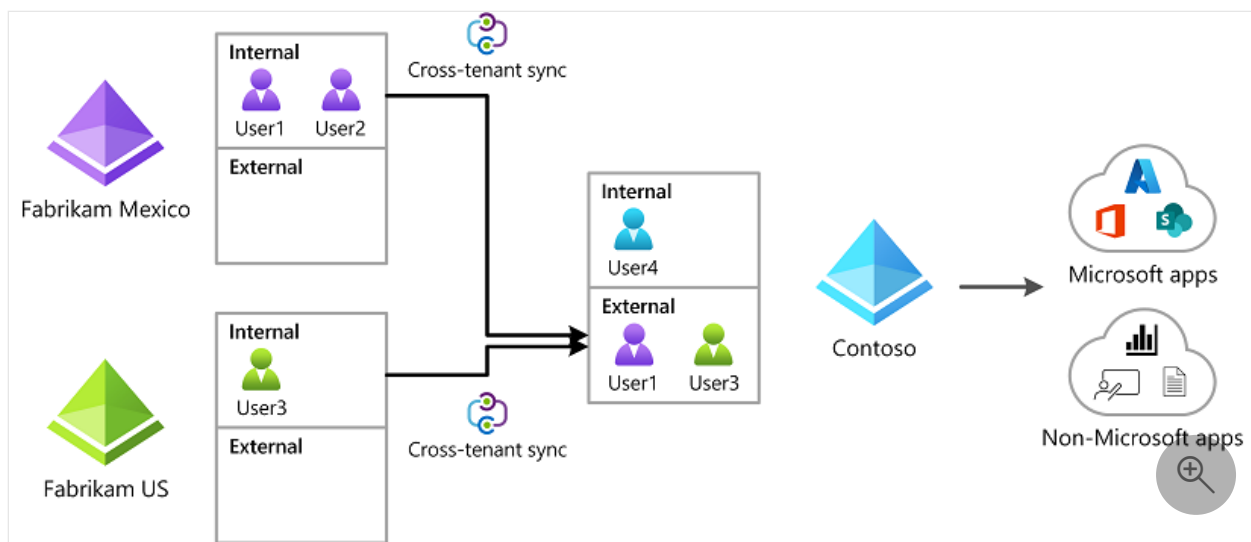
- Seamless collaboration for a multitenant organization
- Automate lifecycle management of B2B collaboration users in a multitenant organization
- Automatically remove B2B accounts when a user leaves the organization

<https://www.youtube-nocookie.com/embed/7B-PQwNfGBc> ↗

Why use cross-tenant synchronization?

Cross-tenant synchronization automates creating, updating, and deleting B2B collaboration users. Users created with cross-tenant synchronization are able to access both Microsoft applications (such as Teams and SharePoint) and non-Microsoft applications (such as [ServiceNow](#), [Adobe](#), and many more), regardless of which tenant the apps are integrated with. These users continue to benefit from the security capabilities in Microsoft Entra ID, such as [Microsoft Entra Conditional Access](#) and [cross-tenant access settings](#), and can be governed through features such as [Microsoft Entra entitlement management](#).

The following diagram shows how you can use cross-tenant synchronization to enable users to access applications across tenants in your organization.



Who should use?

- Organizations that own multiple Microsoft Entra tenants and want to streamline intra-organization cross-tenant application access.
- Cross-tenant synchronization is **not** currently suitable for use across organizational boundaries.

Benefits

With cross-tenant synchronization, you can do the following:

- Automatically create B2B collaboration users within your organization and provide them access to the applications they need, without creating and maintaining custom scripts.
- Improve the user experience and ensure that users can access resources, without receiving an invitation email and having to accept a consent prompt in each tenant.
- Automatically update users and remove them when they leave the organization.

Teams and Microsoft 365

Users created by cross-tenant synchronization will have the same experience when accessing Microsoft Teams and other Microsoft 365 services as B2B collaboration users created through a manual invitation. If your organization uses shared channels, please see the [known issues](#) document for additional details. Over time, the `member` userType will be used by the various Microsoft 365 services to provide differentiated end user experiences for users in a multitenant organization.



Properties

When you configure cross-tenant synchronization, you define a trust relationship between a source tenant and a target tenant. Cross-tenant synchronization has the following properties:

- Based on the Microsoft Entra provisioning engine.
- Is a push process from the source tenant, not a pull process from the target tenant.
- Supports pushing only internal members from the source tenant. It doesn't support syncing external users from the source tenant.
- Users in scope for synchronization are configured in the source tenant.
- Attribute mapping is configured in the source tenant.
- Extension attributes are supported.
- Target tenant administrators can stop a synchronization at any time.

The following table shows the parts of cross-tenant synchronization and which tenant they're configured.

 Expand table

Tenant	Cross-tenant access settings	Automatic redemption	Sync settings configuration	Users in scope
 Source tenant		✓	✓	✓
 Target tenant	✓	✓		

Cross-tenant synchronization setting

The cross-tenant synchronization setting is an inbound only organizational setting to allow the administrator of a source tenant to synchronize users into a target tenant. This setting is a check box with the name **Allow users sync into this tenant** that is specified in the target tenant. This setting doesn't impact B2B invitations created through other processes such as [manual invitation](#) or [Microsoft Entra entitlement management](#).

Home > Contoso | External Identities > External Identities | Cross-tenant access settings >

Inbound access settings - Contoso

B2B collaboration B2B direct connect Trust settings **Cross-tenant sync**

Enabling this will allow the admin of the specified (source) tenant to sync objects into this (target) tenant.

Disabling this will block admins of the source tenant from syncing objects into the target tenant but will not remove currently synced objects. We recommend that this setting should only be used between tenants that are part of the same organization.

Allow users sync into this tenant

Save Discard

To configure this setting using Microsoft Graph, see the [Update crossTenantIdentitySyncPolicyPartner](#) API. For more information, see [Configure cross-tenant synchronization](#).

Automatic redemption setting

The automatic redemption setting is an inbound and outbound organizational trust setting to automatically redeem invitations so users don't have to accept the consent prompt the first time they access the resource/target tenant. This setting is a check box with the following name:

- **Automatically redeem invitations with the tenant <tenant>**

Automatic redemption

i Check this setting if you want to automatically redeem invitations. If so, users from the specified tenant won't have to accept the consent prompt the first time they access this tenant using cross-tenant synchronization, B2B collaboration, or B2B direct connect. This setting will only suppress the consent prompt if the specified tenant checks this setting for outbound access as well. [Learn more](#)

Automatically redeem invitations with the tenant fc19f6b2-c752-43d3-a1aa-c75e9a85a7dc.

Save Discard

Compare setting for different scenarios

The automatic redemption setting applies to cross-tenant synchronization, B2B collaboration, and B2B direct connect in the following situations:

- When users are created in a target tenant using cross-tenant synchronization.
- When users are added to a resource tenant using B2B collaboration.
- When users access resources in a resource tenant using B2B direct connect.

The following table shows how this setting compares when enabled for these scenarios:

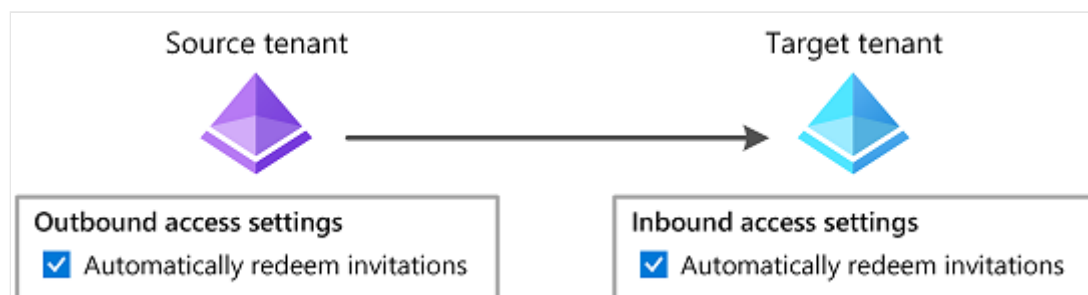
[Expand table](#)

Item	Cross-tenant synchronization	B2B collaboration	B2B direct connect
Automatic redemption setting	Required	Optional	Optional
Users receive a B2B collaboration invitation email	No	No	N/A
Users must accept a consent prompt	No	No	No
Users receive a B2B collaboration notification email	No	Yes	N/A

This setting doesn't impact application consent experiences. For more information, see [Consent experience for applications in Microsoft Entra ID](#). This setting isn't supported for organizations across different Microsoft cloud environments, such as Azure commercial and Azure Government.

When is consent prompt suppressed?

The automatic redemption setting will only suppress the consent prompt and invitation email if both the home/source tenant (outbound) and resource/target tenant (inbound) checks this setting.



The following table shows the consent prompt behavior for source tenant users when the automatic redemption setting is checked for different cross-tenant access setting combinations.

[Expand table](#)

Home/source tenant	Resource/target tenant	Consent prompt behavior for source tenant users
Outbound	Inbound	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Suppressed
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not suppressed
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not suppressed
<input type="checkbox"/>	<input type="checkbox"/>	Not suppressed
Inbound	Outbound	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Not suppressed
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not suppressed
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not suppressed
<input type="checkbox"/>	<input type="checkbox"/>	Not suppressed

To configure this setting using Microsoft Graph, see the [Update crossTenantAccessPolicyConfigurationPartner](#) API. For more information, see [Configure cross-tenant synchronization](#).

How do users know what tenants they belong to?

For cross-tenant synchronization, users don't receive an email or have to accept a consent prompt. If users want to see what tenants they belong to, they can open their [My Account](#) page and select **Organizations**. In the Microsoft Entra admin center, users can open their [Portal settings](#), view their **Directories + subscriptions**, and switch directories.

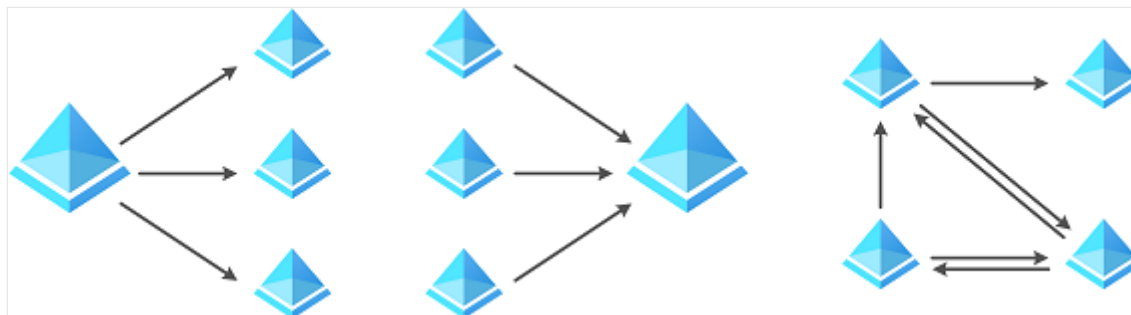
For more information, including privacy information, see [Leave an organization as an external user](#).

Get started

Here are the basic steps to get started using cross-tenant synchronization.

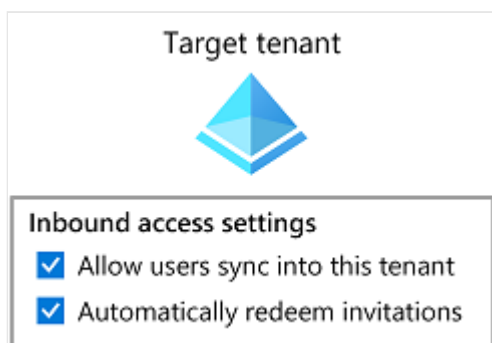
Step 1: Define how to structure the tenants in your organization

Cross-tenant synchronization provides a flexible solution to enable collaboration, but every organization is different. For example, you might have a central tenant, satellite tenants, or sort of a mesh of tenants. Cross-tenant synchronization supports any of these topologies. For more information, see [Topologies for cross-tenant synchronization](#).



Step 2: Enable cross-tenant synchronization in the target tenants

In the target tenant where users are created, navigate to the **Cross-tenant access settings** page. Here you enable cross-tenant synchronization and the B2B automatic redemption settings by selecting the respective check boxes. For more information, see [Configure cross-tenant synchronization](#).



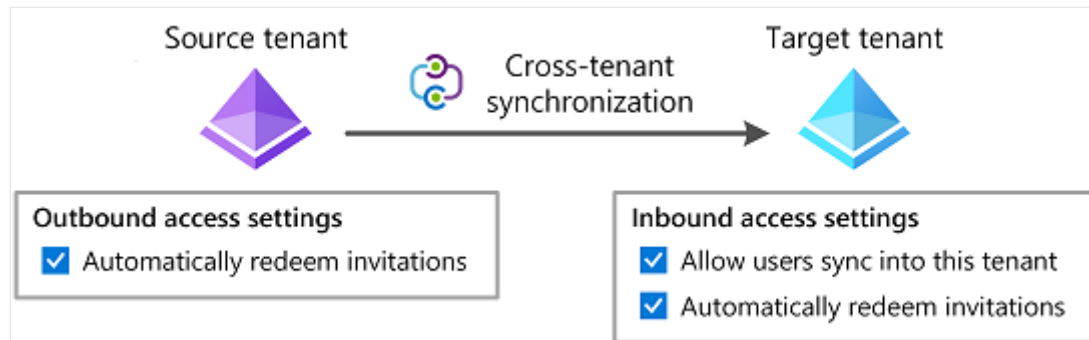
Step 3: Enable cross-tenant synchronization in the source tenants

In any source tenant, navigate to the **Cross-tenant access settings** page and enable the B2B automatic redemption feature. Next, you use the **Cross-tenant synchronization** page to set up a cross-tenant synchronization job and specify:

- Which users you want to synchronize
- What attributes you want to include
- Any transformations

For anyone that has used Microsoft Entra ID to [provision identities into a SaaS application](#), this experience will be familiar. Once you have synchronization configured,

you can start testing with a few users and make sure they're created with all the attributes that you need. When testing is complete, you can quickly add additional users to synchronize and roll out across your organization. For more information, see [Configure cross-tenant synchronization](#).



License requirements

In the source tenant: Using this feature requires Microsoft Entra ID P1 licenses. Each user who is synchronized with cross-tenant synchronization must have a P1 license in their home/source tenant. To find the right license for your requirements, see [Compare generally available features of Microsoft Entra ID](#).

In the target tenant: Cross-tenant sync relies on the Microsoft Entra External ID billing model. To understand the external identities licensing model, see [MAU billing model for Microsoft Entra External ID](#). You will also need at least one Microsoft Entra ID P1 license in the target tenant to enable auto-redemption.

Frequently asked questions

Clouds

Which clouds can cross-tenant synchronization be used in?

- Cross-tenant synchronization is supported within the commercial cloud and Azure Government.
- Cross-tenant synchronization isn't supported within the Microsoft Azure operated by 21Vianet cloud.
- Synchronization is only supported between two tenants in the same cloud.
- Cross-cloud (such as public cloud to Azure Government) isn't currently supported.

Existing B2B users

Will cross-tenant synchronization manage existing B2B users?

- Yes. Cross-tenant synchronization uses an internal attribute called the `alternativeSecurityIdentifier` to uniquely match an internal user in the source tenant with an external / B2B user in the target tenant. Cross-tenant synchronization can update existing B2B users, ensuring that each user has only one account.
- Cross-tenant synchronization cannot match an internal user in the source tenant with an internal user in the target tenant (both type member and type guest).

Synchronization frequency

How often does cross-tenant synchronization run?

- The sync interval is currently fixed to start at 40-minute intervals. Sync duration varies based on the number of in-scope users. The initial sync cycle is likely to take significantly longer than the following incremental sync cycles.

Scope

How do I control what is synchronized into the target tenant?

- In the source tenant, you can control which users are provisioned with the configuration or attribute-based filters. You can also control what attributes on the user object are synchronized. For more information, see [Scoping users or groups to be provisioned with scoping filters](#).

If a user is removed from the scope of sync in a source tenant, will cross-tenant synchronization soft delete them in the target?

- Yes. If a user is removed from the scope of sync in a source tenant, cross-tenant synchronization will soft delete them in the target tenant.

Object types

What object types can be synchronized?

- Microsoft Entra users can be synchronized between tenants. (Groups, devices, and contacts aren't currently supported.)

What user types can be synchronized?

- Internal members can be synchronized from source tenants. Internal guests can't be synchronized from source tenants.
- Users can be synchronized to target tenants as external members (default) or external guests.

- For more information about the UserType definitions, see [Properties of a Microsoft Entra B2B collaboration user](#).

I have existing B2B collaboration users. What will happen to them?

- Cross-tenant synchronization will match the user and make any necessary updates to the user, such as update the display name. By default, the UserType won't be updated from guest to member, but you can configure this in the attribute mappings.

Attributes

What user attributes can be synchronized?

- Cross-tenant synchronization will sync commonly used attributes on the user object in Microsoft Entra ID, including (but not limited to) displayName, userPrincipalName, and directory extension attributes.
- Cross-tenant synchronization supports provisioning the manager attribute. Both the user and their manager must be in scope for provisioning.
 - For cross-tenant synchronization configurations created before January 2024 with the default schema / attribute mappings:
 - The manager attribute will automatically be added to the mappings.
 - This does not trigger an initial sync cycle.
 - Manager updates will apply on the incremental cycle for users that are undergoing changes (e.g. manager change). The sync engine doesn't automatically update all existing users that were provisioned previously.
 - To update the manager for existing users that are in scope for provisioning, you can use on-demand provisioning for specific users or do a restart to provision the manager for all users.
 - For cross-tenant synchronization configurations created before January 2024 with a custom schema / attribute mappings (e.g. you added an attribute to the mappings or changed the default mappings):
 - You need to manually add the manager attribute to your attribute mappings. This will trigger a restart and update all users that are in scope for provisioning. This should be a direct mapping of the manager attribute in the source tenant to the manager in the target tenant.
 - If the manager of a user is removed in the source tenant and no new manager is assigned in the source tenant, the manager attribute will not be updated in the target tenant.

What attributes can't be synchronized?

- Attributes including (but not limited to) photos, custom security attributes, and user attributes outside of the directory can't be synchronized by cross-tenant synchronization.

Can I control where user attributes are sourced/managed?

- Cross-tenant synchronization doesn't offer direct control over source of authority. The user and its attributes are deemed authoritative at the source tenant. There are parallel sources of authority workstreams that will evolve source of authority controls for users down to the attribute level and a user object at the source may ultimately reflect multiple underlying sources. For the tenant-to-tenant process, this is still treated as the source tenant's values being authoritative for the sync process (even if pieces actually originate elsewhere) into the target tenant. Currently, there's no support for reversing the sync process's source of authority.
- Cross-tenant synchronization only supports source of authority at the object level. That means all attributes of a user must come from the same source, including credentials. It isn't possible to reverse the source of authority or federation direction of a synchronized object.

What happens if attributes for a synced user are changed in the target tenant?

- Cross-tenant synchronization doesn't query for changes in the target. If no changes are made to the synced user in the source tenant, then user attribute changes made in the target tenant will persist. However, if changes are made to the user in the source tenant, then during the next synchronization cycle, the user in the target tenant will be updated to match the user in the source tenant.

Can the target tenant manually block sign-in for a specific home/source tenant user that is synced?

- If no changes are made to the synced user in the source tenant, then the block sign-in setting in the target tenant will persist. If a change is detected for the user in the source tenant, cross-tenant synchronization will re-enable that user blocked from sign-in in the target tenant.

Structure

Can I sync a mesh between multiple tenants?

- Cross-tenant synchronization is configured as a single-direction peer-to-peer sync, meaning sync is configured between one source and one target tenant. Multiple instances of cross-tenant synchronization can be configured to sync from a single

source to multiple targets and from multiple sources into a single target. But only one sync instance can exist between a source and a target.

- Cross-tenant synchronization only synchronizes users that are internal to the home/source tenant, ensuring that you can't end up with a loop where a user is written back to the same tenant.
- Multiple topologies are supported. For more information, see [Topologies for cross-tenant synchronization](#).

Can I use cross-tenant synchronization across organizations (outside my multitenant organization)?

- For privacy reasons, cross-tenant synchronization is intended for use within an organization. We recommend using [entitlement management](#) for inviting B2B collaboration users across organizations.

Can cross-tenant synchronization be used to migrate users from one tenant to another tenant?

- No. Cross-tenant synchronization isn't a migration tool because the source tenant is required for synchronized users to authenticate. In addition, tenant migrations would require migrating user data such as SharePoint and OneDrive.

B2B collaboration

Does cross-tenant synchronization resolve any present [B2B collaboration](#) limitations?

- Since cross-tenant synchronization is built on existing B2B collaboration technology, existing limitations apply. Examples include (but aren't limited to):

 [Expand table](#)

App or service	Limitations
Power BI	- Support for UserType Member in Power BI is currently in preview. For more information, see Distribute Power BI content to external guest users with Microsoft Entra B2B .
Azure Virtual Desktop	- External member and external guest aren't supported in Azure Virtual Desktop.

B2B direct connect

How does cross-tenant synchronization relate to [B2B direct connect](#)?

- B2B direct connect is the underlying identity technology required for [Teams Connect shared channels](#).
- We recommend B2B collaboration for all other cross-tenant application access scenarios, including both Microsoft and non-Microsoft applications.
- B2B direct connect and cross-tenant synchronization are designed to co-exist, and you can enable them both for broad coverage of cross-tenant scenarios.

We're trying to determine the extent to which we'll need to utilize cross-tenant synchronization in our multitenant organization. Do you plan to extend support for B2B direct connect beyond Teams Connect?

- There's no plan to extend support for B2B direct connect beyond Teams Connect shared channels.

Microsoft 365

Does cross-tenant synchronization enhance any cross-tenant Microsoft 365 app access user experiences?

- Cross-tenant synchronization utilizes a feature that improves the user experience by suppressing the first-time B2B consent prompt and redemption process in each tenant.
- Synchronized users will have the same cross-tenant Microsoft 365 experiences available to any other B2B collaboration user.

Can cross-tenant synchronization enable people search scenarios where synchronized users appear in the global address list of the target tenant?

- Yes, but you must set the value for the **showInAddressList** attribute of synchronized users to **True**, which is not set by default. If you want to create a unified address list, you'll need to set up a [mesh peer-to-peer topology](#). For more information, see [Step 9: Review attribute mappings](#).
- Cross-tenant synchronization creates B2B collaboration users and doesn't create contacts.

Teams

Does cross-tenant synchronization enhance any current Teams experiences?

- Synchronized users will have the same cross-tenant Microsoft 365 experiences available to any other B2B collaboration user.

Integration

What federation options are supported for users in the target tenant back to the source tenant?

- For each internal user in the source tenant, cross-tenant synchronization creates a federated external user (commonly used in B2B) in the target. It supports syncing internal users. This includes internal users federated to other identity systems using domain federation (such as [Active Directory Federation Services](#)). It doesn't support syncing external users.

Does cross-tenant synchronization use System for Cross-Domain Identity Management (SCIM)?

- No. Currently, Microsoft Entra ID supports a SCIM client, but not a SCIM server. For more information, see [SCIM synchronization with Microsoft Entra ID](#).

Deprovisioning

Does cross-tenant synchronization support deprovisioning users?

- Yes, when the below actions occur in the source tenant, the user will be [soft deleted](#) in the target tenant.
 - Delete the user in the source tenant
 - Unassign the user from the cross-tenant synchronization configuration
 - Remove the user from a group that is assigned to the cross-tenant synchronization configuration
 - An attribute on the user changes such that they do not meet the scoping filter conditions defined on the cross-tenant synchronization configuration anymore
- If the user is blocked from sign-in in the source tenant (`accountEnabled = false`) they will be blocked from sign-in in the target. This is not a deletion, but an update to the `accountEnabled` property.
- Users are not soft deleted from the target tenant in this scenario:
 1. Add a user to a group and assign it to the cross-tenant synchronization configuration in the source tenant.
 2. Provision the user on-demand or through the incremental cycle.
 3. Update the account enabled status to false on the user in the source tenant.
 4. Provision the user on-demand or through the incremental cycle. The account enabled status is changed to false in the target tenant.
 5. Remove the user from the group in the source tenant.

Does cross-tenant synchronization support restoring users?

- If the user in the source tenant is restored, reassigned to the app, meets the scoping condition again within 30 days of soft deletion, it will be restored in the target tenant.
- IT admins can also manually [restore](#) the user directly in the target tenant.

How can I deprovision all the users that are currently in scope of cross-tenant synchronization?

- Unassign all users and / or groups from the cross-tenant synchronization configuration. This will trigger all the users that were unassigned, either directly or through group membership, to be deprovisioned in subsequent sync cycles. Please note that the target tenant will need to keep the inbound policy for sync enabled until deprovisioning is complete. If the scope is set to **Sync all users and groups**, you will also need to change it to **Sync only assigned users and groups**. The users will be automatically soft deleted by cross-tenant synchronization. The users will be automatically hard deleted after 30 days or you can choose to hard delete the users directly from the target tenant. You can choose to hard delete the users directly in the target tenant or wait 30 days for the users to be automatically hard deleted.

If the sync relationship is severed, are external users previously managed by cross-tenant synchronization deleted in the target tenant?

- No. No changes are made to the external users previously managed by cross-tenant synchronization if the relationship is severed (for example, if the cross-tenant synchronization policy is deleted).

Next steps

- [Topologies for cross-tenant synchronization](#)
- [Configure cross-tenant synchronization](#)

Multitenant organization identity provisioning for Microsoft 365

Article • 04/24/2024

The multitenant organization capability is designed for organizations that own multiple Microsoft Entra tenants and want to streamline intra-organization cross-tenant collaboration in Microsoft 365. It's built on the premise of reciprocal provisioning of B2B member users across multitenant organization tenants.

Microsoft 365 people search

[Teams external access](#) and [Teams shared channels](#) excluded, [Microsoft 365 people search](#) is typically scoped to within local tenant boundaries. In multitenant organizations with increased need for cross-tenant coworker collaboration, it's recommended to reciprocally provision users from their home tenants into the resource tenants of collaborating coworkers.

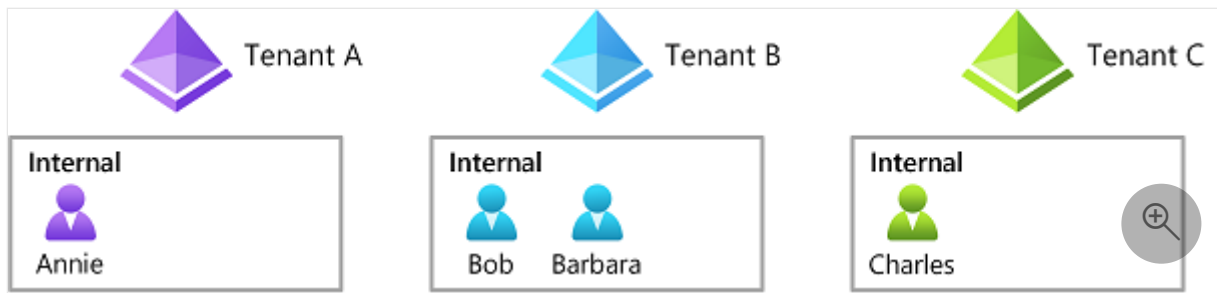
New Microsoft Teams

The [new Microsoft Teams](#) experience improves upon Microsoft 365 people search and Teams external access for a unified seamless collaboration experience. For this improved experience to light up, the multitenant organization representation in Microsoft Entra ID is required and collaborating users shall be provisioned as B2B members. For more information, see [Announcing more seamless collaboration in Microsoft Teams for multitenant organizations](#) [↗](#).

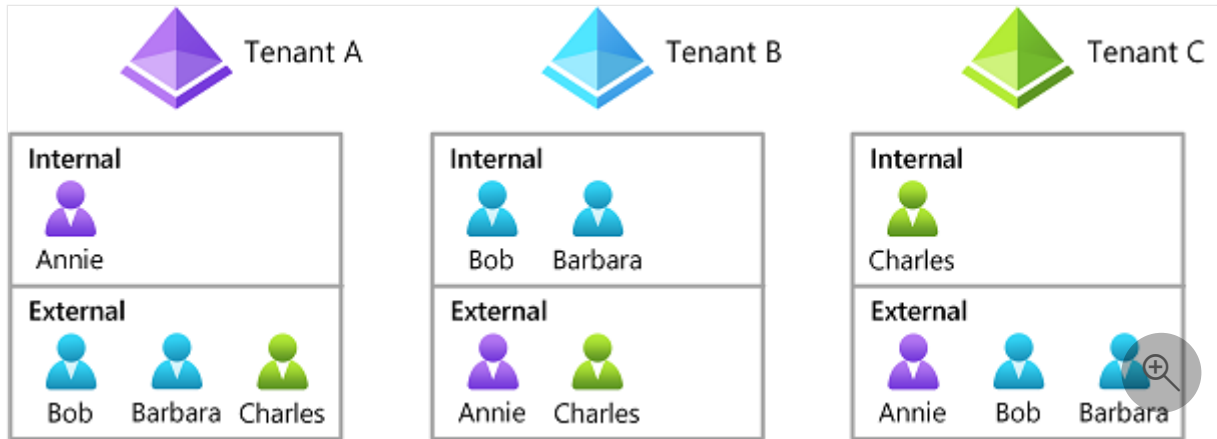
Collaborating user set

Collaboration in Microsoft 365 is built on the premise of reciprocal provisioning of B2B identities across multitenant organization tenants.

For example, say Annie in tenant A, Bob and Barbara in tenant B, and Charlie in tenant C want to collaborate. Conceptually, these four users represent a collaborating user set of four internal identities across three tenants.



For people search to succeed, while scoped to local tenant boundaries, the entire collaborating user set must be represented within the scope of each multitenant organization tenant A, B, and C, in the form of either internal or B2B identities.

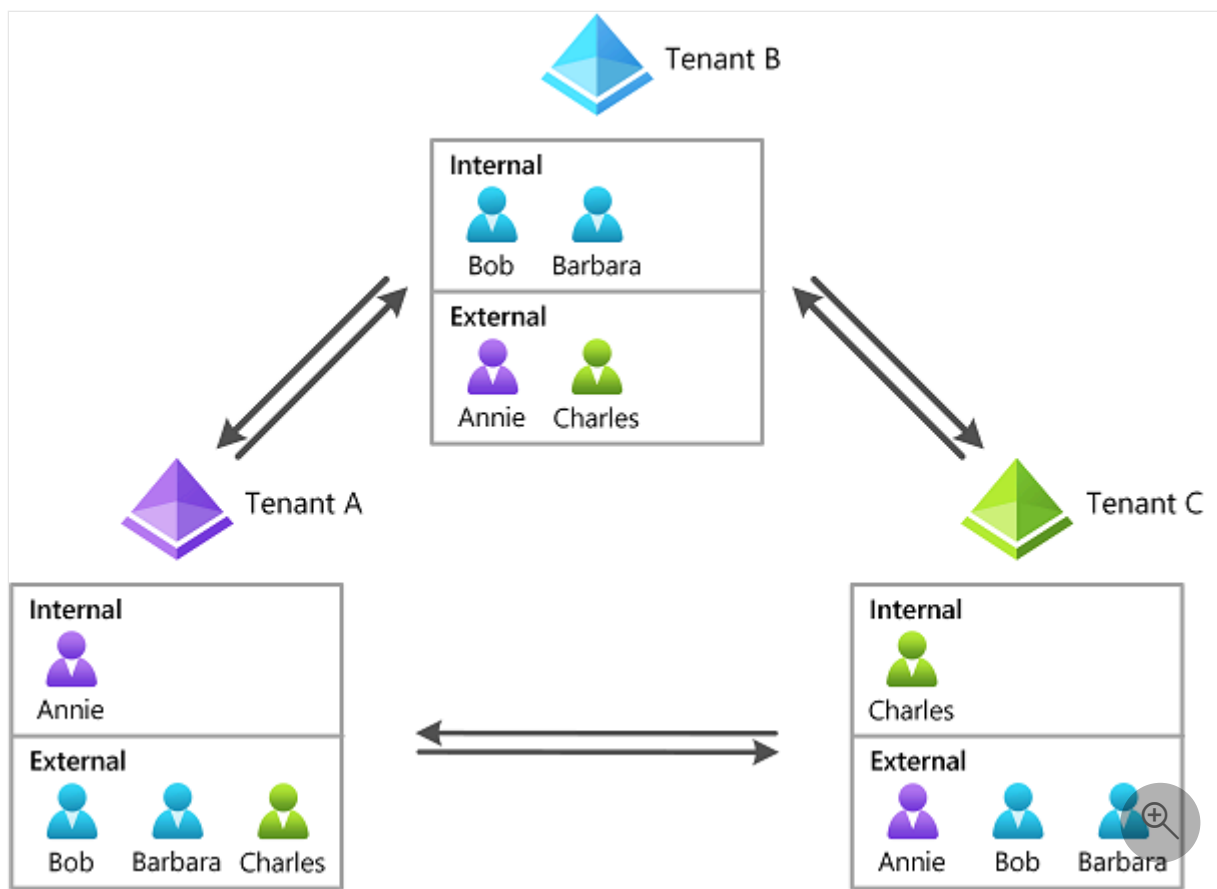


Depending on your organization's needs, the collaborating user set may contain a subset of collaborating employees, or eventually all employees.

Sharing your users

One of the simpler ways to achieve a collaborating user set in each multitenant organization tenant is for each tenant administrator to define their user contribution and synchronization them outbound. Tenant administrators on the receiving end should accept the shared users inbound.

- Administrator A contributes or shares Annie
- Administrator B contributes or shares Bob and Barbara
- Administrator C contributes or shares Charles



Microsoft 365 admin center facilitates orchestration of such a collaborating user set across multitenant organization tenants. For more information, see [Synchronize users in multitenant organizations in Microsoft 365](#).

Alternatively, pair-wise configuration of inbound and outbound cross-tenant synchronization can be used to orchestrate such collating user set across multitenant organization tenants. For more information, see [What is a cross-tenant synchronization](#).

B2B member users

To ensure a seamless collaboration experience across the multitenant organization in new Microsoft Teams, B2B identities are provisioned as B2B users of **Member** userType.

[Expand table](#)

User synchronization method	Default userType property
Synchronize users in multitenant organizations in Microsoft 365	Member Remains Guest, if the B2B identity already existed as Guest
Cross-tenant synchronization in Microsoft Entra ID	Member Remains Guest, if the B2B identity already existed as Guest

From a security perspective, you should review the default permissions granted to B2B member users. For more information, see [Compare member and guest default permissions](#).

To change the userType from **Guest** to **Member** (or vice versa), a source tenant administrator can amend the [attribute mappings](#), or a target tenant administrator can [change the userType](#) if the property is not recurringly synchronized.

Unsharing your users

To unshare users, you deprovision users by using the user deprovisioning capabilities available in Microsoft Entra cross-tenant synchronization. By default, when provisioning scope is reduced while a synchronization job is running, users fall out of scope and are soft deleted, unless Target Object Actions for Delete is disabled. For more information, see [Deprovisioning](#) and [Define who is in scope for provisioning](#).

Next steps

- [Plan for multitenant organizations in Microsoft 365](#)
- [Set up a multitenant org in Microsoft 365](#)

Multitenant organization optional policy templates

Article • 04/23/2024

Administrators staying in control of their resources is a guiding principle for multitenant organization collaboration. Cross-tenant access settings are required for each tenant-to-tenant relationship. Tenant administrators explicitly configure cross-tenant access partner configurations and identity synchronization settings for partner tenants inside the multitenant organization.

To help apply homogenous cross-tenant access settings to partner tenants in the multitenant organization, the administrator of each tenant can configure optional cross-tenant access settings templates dedicated to the multitenant organization. This article describes how to use templates to preconfigure cross-tenant access settings that are applied to any partner tenant newly joining the multitenant organization.

Autogeneration of cross-tenant access settings

Within a multitenant organization, each pair of tenants must have bi-directional [cross-tenant access settings](#), for both, partner configuration and identity synchronization. These settings provide the underlying policy framework for enabling trust and for sharing users and applications.

When your tenant joins a new multitenant organization, or when a partner tenant joins your existing multitenant organization, cross-tenant access settings to other partner tenants in the enlarged multitenant organization, if they don't already exist, are automatically generated in an unconfigured state. In an unconfigured state, these cross-tenant access settings pass through the [default settings](#).

Default cross-tenant access settings apply to all external tenants for which you haven't created organization-specific customized settings. Typically, these settings are configured to be nontrusting. For example, cross-tenant trusts for multifactor authentication and compliant device claims might be disabled and user and group sharing in B2B direct connect or B2B collaboration might be disallowed.

In multitenant organizations, on the other hand, cross-tenant access settings are typically expected to be trusting. For example, cross-tenant trusts for multifactor authentication and compliant device claims might be enabled and user and group sharing in B2B direct connect or B2B collaboration might be allowed.

While the autogeneration of cross-tenant access settings for multitenant organization partner tenants in and of itself doesn't change any authentication or authorization policy behavior, it allows your organization to easily customize the cross-tenant access settings for partner tenants in the multitenant organization on a per-tenant basis.

Policy templates at multitenant organization formation

As previously described, in multitenant organizations, cross-tenant access settings are typically expected to be trusting. For example, cross-tenant trusts for multifactor authentication and compliant device claims might be enabled and user and group sharing in B2B direct connect or B2B collaboration might be allowed.

While autogeneration of cross-tenant access settings, per previous section, guarantees the existence of cross-tenant access settings for every multitenant organization partner tenant, further maintenance of the cross-tenant access settings for multitenant organization partner tenants is conducted individually, on a per-tenant basis.

To reduce the workload for administrators at the time of multitenant organization formation, you can optionally use policy templates for preemptive configuration of cross-tenant access settings. These template settings are applied at the time of your tenant joins a multitenant organization to all external multitenant organization partner tenants as well as at the time of any partner tenant joins your existing multitenant organization to such new partner tenant.

[Enablement or configuration of the optional policy templates](#), at the time of a partner tenant joins a multitenant organization, preemptively amend the corresponding [cross-tenant access settings](#), for both partner configuration and identity synchronization.

As an example, consider the actions of the administrators for an anticipated multitenant organization with three tenants, A, B, and C.

- The administrators of all three tenants enable and configure their respective optional policy templates to enable cross-tenant trusts for multifactor authentication and compliant device claims and to allow user and group sharing in B2B direct connect and B2B collaboration.
- Administrator A creates the multitenant organization and adds tenants B and C as pending tenants to the multitenant organization.
- Administrator B joins the multitenant organization. Cross-tenant access settings in tenant A for partner tenant B are amended, according to tenant A policy template settings. Vice versa, cross-tenant access settings in tenant B for partner tenant A are amended, according to tenant B policy template settings.

- Administrator C joins the multitenant organization. Cross-tenant access settings in tenants A (and B) for partner tenant C are amended, according to tenant A (and B) policy template settings. Similarly, cross-tenant access settings in tenant C for partner tenants A and B are amended, according to tenant C policy template settings.
- Following the formation of this multitenant organization of three tenants, the cross-tenant access settings of all tenant pairs in the multitenant organization have preemptively been configured.

In summary, configuration of the optional policy templates enable you to homogeneously initialize cross-tenant access settings across your multitenant organization, while maintaining maximum flexibility to customize your cross-tenant access settings as needed on a per-tenant basis.

To stop using the policy templates, you can reset them to their default state. For more information, see [Configure multitenant organization templates](#).

Policy template scoping and additional properties

To provide administrators with further configurability, you can choose when cross-tenant access settings are to be amended according to the policy templates. For example, you can choose to apply the policy templates for the following tenants when a tenant joins a multitenant organization:

 Expand table

Tenant	Description
Only new partner tenants	Tenants whose cross-tenant access settings are autogenerated
Only existing partner tenants	Tenants who already have cross-tenant access settings
All partner tenants	Both new partner tenants and existing partner tenants
No partner tenants	Policy templates are effectively disabled

In this context, *new* partners refer to tenants for which you haven't yet configured cross-tenant access settings, while *existing* partners refer to tenants for which you have already configured cross-tenant access settings. This scoping is specified with the `templateApplicationLevel` property on the cross-tenant access [partner configuration template](#) and the `templateApplicationLevel` property on the cross-tenant access [identity synchronization template](#).

Finally, in terms of interpretation of template property values, any template property value of `null` has no effect on the corresponding property value in the targeted cross-tenant access settings, while a defined template property value causes the corresponding property value in the targeted cross-tenant access settings to be amended in accordance with the template. The following table illustrates how template property values are being applied to corresponding cross-tenant access setting values.

 Expand table

Template Value	Initial Partner Settings Value (Before joining multitenant org)	Final Partner Settings Value (After joining multitenant org)
<code>null</code>	<Partner Settings Value>	<Partner Settings Value>
<Template Value>	<any value>	<Template Value>

Policy templates used by Microsoft 365 admin center

When a multitenant organization is formed in Microsoft 365 admin center, an administrator agrees to the following multitenant organization template settings:

- Identity synchronization is set to allow users to synchronize into this tenant
- Cross-tenant access is set to automatically redeem user invitations for both inbound and outbound

This is achieved by setting the corresponding three template property values to `true`:

- `automaticUserConsentSettings.inboundAllowed`
- `automaticUserConsentSettings.outboundAllowed`
- `userSyncInbound`

For more information, see [Join or leave a multitenant organization in Microsoft 365](#).

Cross-tenant access settings at time of multitenant organization disassembly

Currently, there's no equivalent policy template feature supporting the disassembly of a multitenant organization. When a partner tenant leaves the multitenant organization, each tenant administrator must re-examine and amend accordingly the cross-tenant access settings for the partner tenant that left the multitenant organization.

The partner tenant that left the multitenant organization must re-examine and amend accordingly the cross-tenant access settings for all former multitenant organization partner tenants as well as consider resetting the two policy templates for cross-tenant access settings.

Next steps

- [Configure multitenant organization templates using the Microsoft Graph API](#)

Limitations in multitenant organizations

Article • 04/24/2024

This article describes limitations to be aware of when you work with multitenant organization functionality across Microsoft Entra ID and Microsoft 365. To provide feedback about the multitenant organization functionality on UserVoice, see [Microsoft Entra UserVoice](#). We watch UserVoice closely so that we can improve the service.

Scope

The limitations described in this article have the following scope.

 Expand table

Scope	Description
In scope	- Microsoft Entra administrator limitations related to multitenant organizations to support seamless collaboration experiences in new Teams, with reciprocally provisioned B2B members
Related scope	- Microsoft 365 admin center limitations related to multitenant organizations - Microsoft 365 multitenant organization people search experiences - Cross-tenant synchronization limitations related to Microsoft 365
Out of scope	- Cross-tenant synchronization unrelated to Microsoft 365 - End user experiences in new Teams - End user experiences in Power BI - Tenant migration or consolidation
Unsupported scenarios	- Seamless collaboration experience across multitenant organizations in classic Teams - Self-service for multitenant organizations larger than 100 tenants - Multitenant organizations in Azure Government or Microsoft Azure operated by 21Vianet - Cross-cloud multitenant organizations

Microsoft 365 admin center versus cross-tenant synchronization

- Whether you use the Microsoft 365 admin center share users functionality or Microsoft Entra cross-tenant synchronization, the following items apply:
 - In the identity platform, both methods are represented as Microsoft Entra cross-tenant synchronization jobs.

- Synchronization jobs created with Microsoft Entra ID will not appear in the Microsoft 365 admin center.
 - If you created your synchronization job in the Microsoft 365 admin center, do not modify the synchronization job name using Microsoft Entra ID, otherwise it will no longer appear in the admin center.
 - You might adjust the attribute mappings to match your organizations' needs.
 - By default, new B2B users are provisioned as B2B members, while existing B2B guests remain B2B guests.
 - You can opt to convert B2B guests into B2B members by setting [Apply this mapping to Always](#).
- If you're using Microsoft Entra cross-tenant synchronization to provision your users, rather than the Microsoft 365 admin center share users functionality, Microsoft 365 admin center indicates an **Outbound sync status of Not configured**. This is expected behavior. Currently, Microsoft 365 admin center only shows the status of Microsoft Entra cross-tenant synchronization jobs created and managed by Microsoft 365 admin center and doesn't display Microsoft Entra cross-tenant synchronizations created and managed in Microsoft Entra ID.
 - If you view Microsoft Entra cross-tenant synchronization in Microsoft Entra admin center, after adding tenants to or after joining a multitenant organization in Microsoft 365 admin center, you'll see a cross-tenant synchronization configuration with the name `MTO_Sync_<TenantID>`. Refrain from editing or changing the name if you want Microsoft 365 admin center to recognize the configuration as created and managed by Microsoft 365 admin center.
 - Microsoft Entra cross-tenant synchronization doesn't support establishing a cross-tenant synchronization configuration before the tenant in question allows inbound synchronization in their cross-tenant access settings for identity synchronization. Hence the usage of the cross-tenant access settings template for identity synchronization is encouraged, with `userSyncInbound` set to true, as facilitated by Microsoft 365 admin center.
 - There's no established or supported pattern for Microsoft 365 admin center to take control of pre-existing Microsoft Entra cross-tenant synchronization configurations and jobs.

Join requests

- There are multiple reasons why a join request might fail. If the Microsoft 365 admin center doesn't indicate why a join request isn't succeeding, try examining the join request response by using the Microsoft Graph APIs or Microsoft Graph Explorer.

- If you followed the correct sequence to create a multitenant organization and add a tenant to the multitenant organization, and the added tenant's join request keeps failing, submit a support request in the Microsoft Entra or Microsoft 365 admin center.

Microsoft apps

- In [SharePoint OneDrive](#), the promotion of B2B guests to B2B members might not happen automatically. If faced with a user type mismatch between Microsoft Entra ID and SharePoint OneDrive, try [Set-SPUser \[-SyncFromAD\]](#).
- In [SharePoint OneDrive](#) user interfaces, when sharing a file with *People in Fabrikam*, the current user interfaces might be counterintuitive, because B2B members in Fabrikam from Contoso count towards *People in Fabrikam*.
- In [Microsoft Forms](#), B2B member users might not be able to access forms.
- In [Microsoft Power BI](#), B2B member users are not yet supported. B2B guest users can continue to access Power BI dashboards.
- In [Microsoft Power Apps](#), [Microsoft Dynamics 365](#), and related workloads, B2B member users may have restricted functionality. For more information, see [Invite users with Microsoft Entra B2B collaboration](#).

B2B users or B2B members

- The promotion of B2B guests to B2B members represents a strategic decision by multitenant organizations to consider B2B members as trusted users of the organization. Review the [default permissions](#) for B2B members.
- To promote B2B guests to B2B members, a source tenant administrator can amend the [attribute mappings](#), or a target tenant administrator can [change the userType](#) if the property is not recurrently synchronized.
- As your organization rolls out the multitenant organization functionality including provisioning of B2B users across multitenant organization tenants, you might want to provision some users as B2B guests, while provision others users as B2B members. To achieve this, you might want to establish two Microsoft Entra cross-tenant synchronization configurations in the source tenant, one with userType attribute mappings configured to B2B guest, and another with userType attribute mappings configured to B2B member, each with [Apply this mapping set to](#)

Always. By moving a user from one configuration's scope to the other, you can easily control who will be a B2B guest or a B2B member in the target tenant.

- As part of a multitenant organization, [reset redemption for an already redeemed B2B user](#) is currently disabled.
- The at-scale provisioning of B2B users might collide with contact objects. The handling or conversion of contact objects is currently not supported.
- Using Microsoft Entra cross-tenant synchronization to target hybrid identities that have been converted to B2B users has not been tested in source of authority conflicts and is not supported.

Cross-tenant synchronization deprovisioning

- By default, when provisioning scope is reduced while a synchronization job is running, users fall out of scope and are soft deleted, unless [Target Object Actions for Delete](#) is disabled. For more information, see [Deprovisioning](#) and [Define who is in scope for provisioning](#).
- Currently, [SkipOutOfScopeDeletions](#) works for application provisioning jobs, but not for Microsoft Entra cross-tenant synchronization. To avoid soft deletion of users taken out of scope of cross-tenant synchronization, set [Target Object Actions for Delete](#) to disabled.

Next steps

- [Known issues for provisioning in Microsoft Entra ID](#)

Topologies for cross-tenant collaboration

Article • 11/03/2023

Organizations often find themselves managing multiple tenants due to mergers and acquisitions, regulatory requirements, or administrative boundaries. Regardless of your scenario, Microsoft Entra offers a flexible and ready-to-use solution for provisioning accounts across tenants and facilitating seamless collaboration. Microsoft Entra accommodates the following three models and can adapt to your evolving organizational needs.

- ✓ Hub and spoke
- ✓ Mesh
- ✓ Just-in-time

Hub and spoke

The hub and spoke topology presents two common patterns:

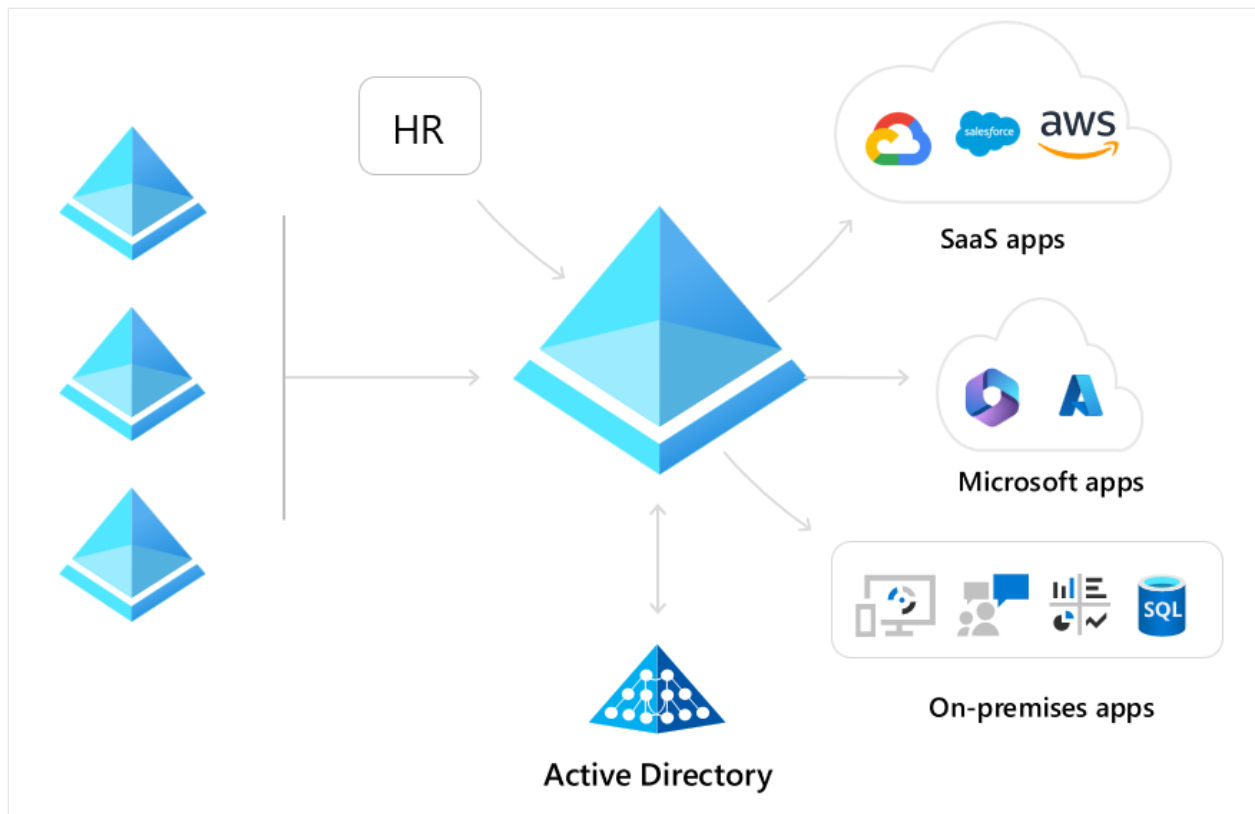
- **Option 1 (application hub):** In this option, you can integrate commonly used applications into a central hub tenant that users from across the organization can access.
- **Option 2 (user hub):** Alternatively, option 2 centralizes all your users in a single tenant and provisions them into spoke tenants where resources are managed.

Let's examine a few real-world scenarios and see how they align with each of these models.

Mergers and acquisitions (application hub)

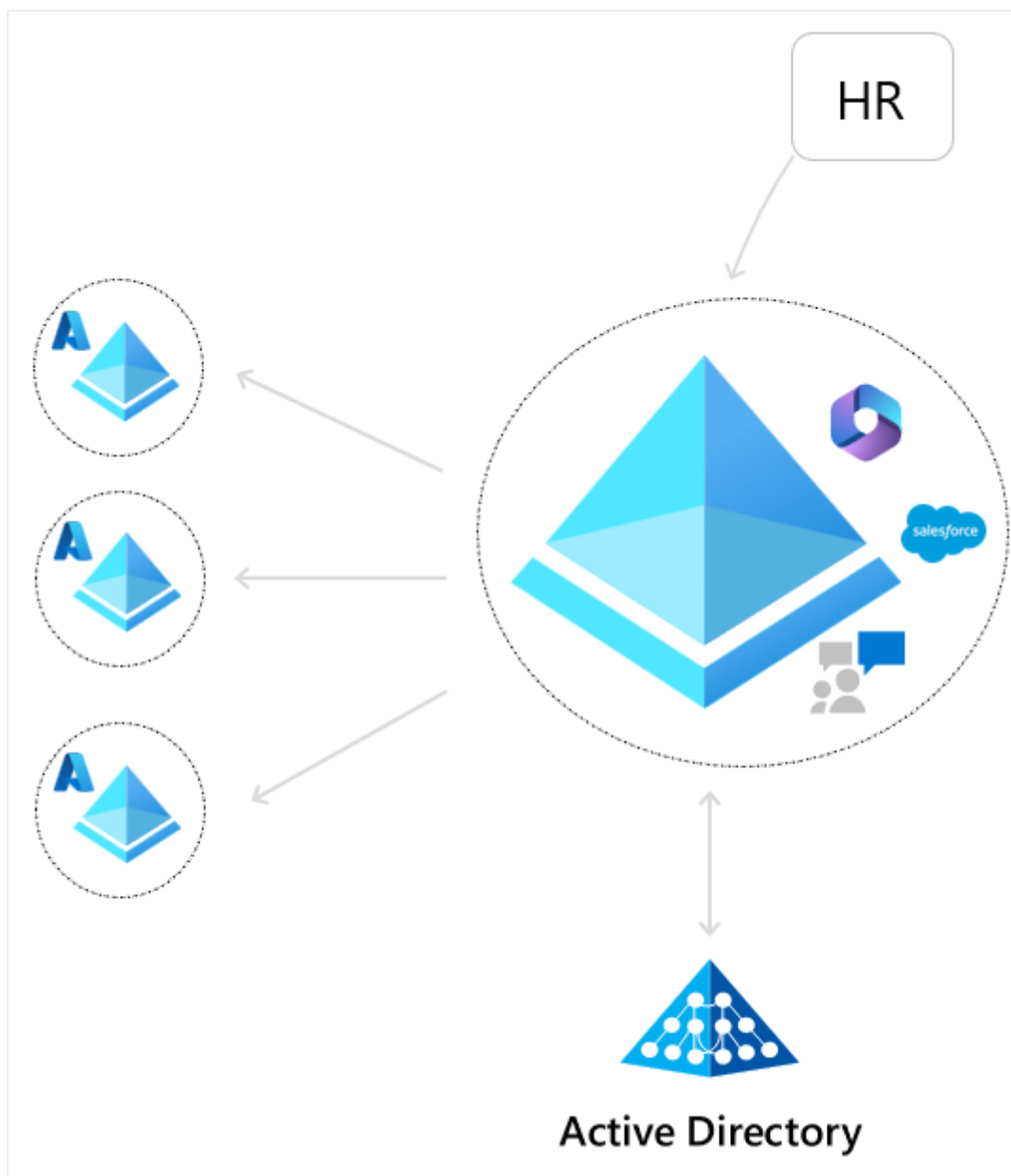
During mergers and acquisitions, the ability to quickly enable collaboration is crucial, allowing businesses to function cohesively while complex IT decisions are being made. For instance, when a newly acquired company's employees need immediate access to applications such as the internal help desk ticketing system or benefits application, cross-tenant synchronization proves invaluable. This synchronization process allows users from the acquired company to be provisioned into the application hub from day one, granting them access to SaaS apps, on-premises applications, and other cloud resources. Within the target tenant, admins can set up access packages to grant time limited access to additional applications such as Salesforce and Amazon Web Services

that contain business critical data. The following diagram shows recently acquired tenants on the left and their users being provisioned into the parent company's tenant, which grants users access to the necessary resources.



Separate collaboration and resource tenants (user hub)

As organizations scale their usage of Azure, they often create dedicated tenants for managing critical Azure resources. Meanwhile, they rely on a central hub tenant for user provisioning. This model empowers administrators in the hub tenant to establish central security and governance policies while granting development teams greater autonomy and agility to deploy required Azure resources. Cross-tenant synchronization supports this topology by enabling administrators to provision a subset of users into the spoke tenants and manage the lifecycle of those users.

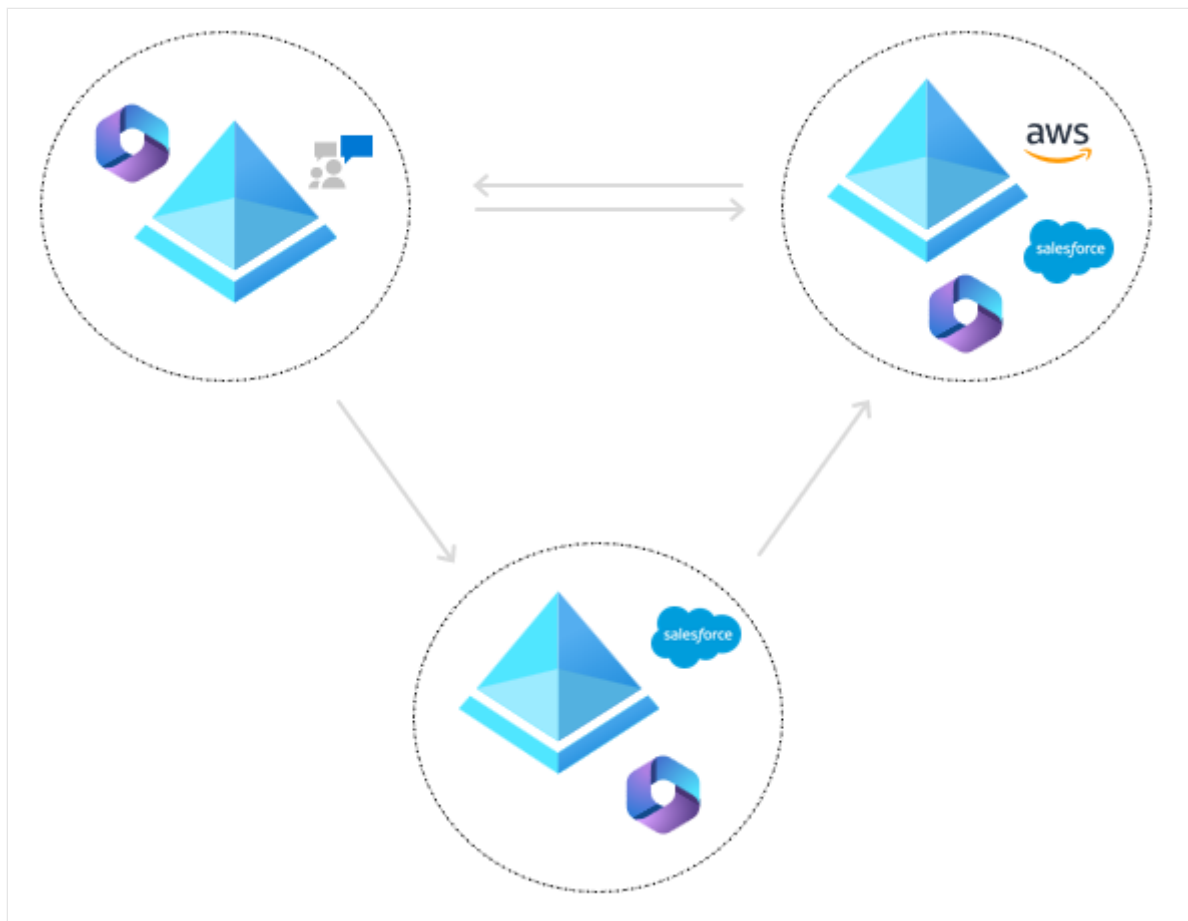


Mesh

While some companies centralize their users within a single tenant, others have a more decentralized structure with applications, HR systems, and Active Directory domains integrated into each tenant. Cross-tenant synchronization offers the flexibility to choose which users are provisioned into each tenant.

Collaborate within a portfolio company (partial-mesh)

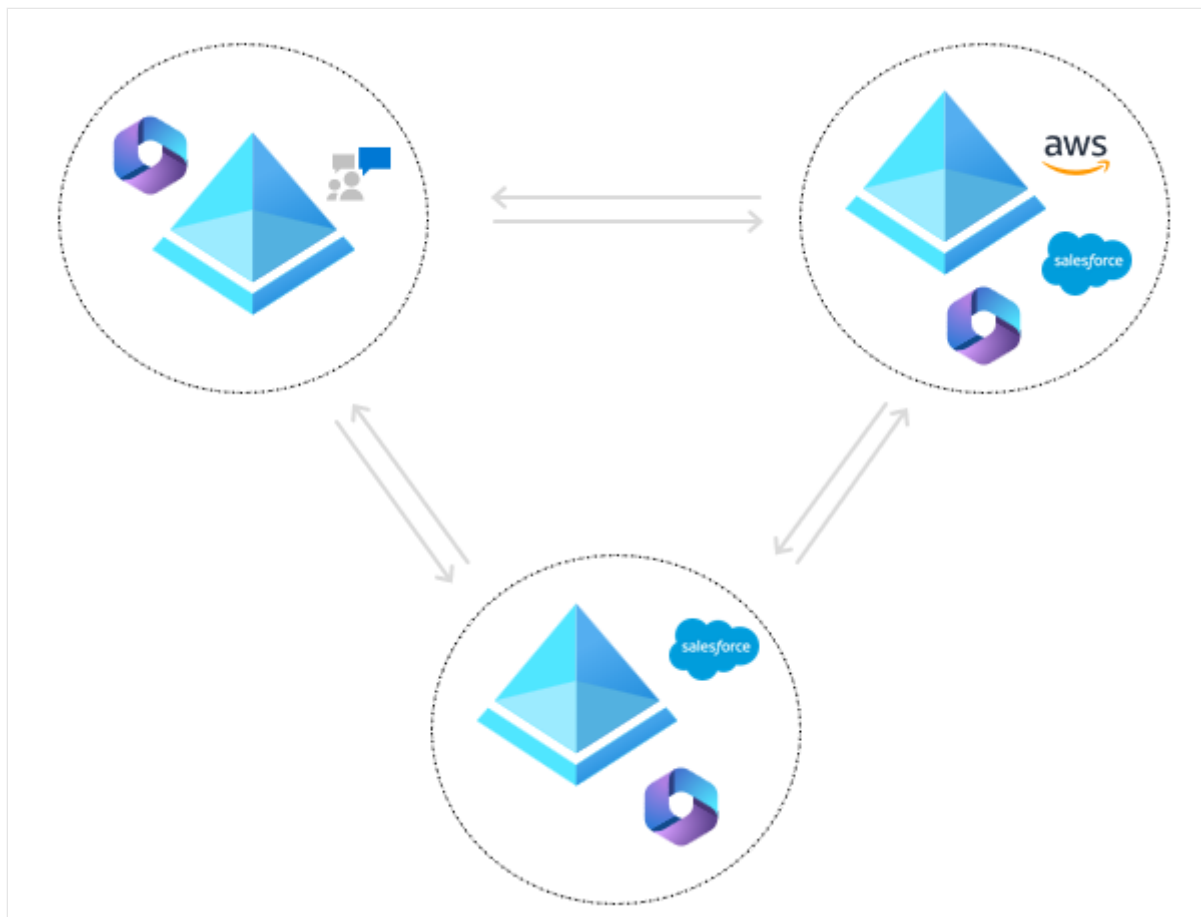
In this scenario, each tenant represents a different company within the same parent organization. Administrators in each tenant choose a subset of users to provision into the target tenant. This solution provides flexibility for each tenant to operate independently, while facilitating collaboration when users need access to critical resources.



Cross-tenant synchronization is one way. An internal member user can be synchronized into multiple tenants as an external user. When the topology shows a synchronization going in both directions, it's a distinct set of users in each direction and each arrow is a separate configuration.

Collaborate across business units (full-mesh)

In this scenario, the organization has designated different tenants for each business unit. The business units work closely together, in particular using Microsoft Teams. As a result, each tenant has chosen to provision all users across the four tenants in the organization. As new users join the company or leave, the provisioning service takes care of creating and deleting users. The organization has also configured a multitenant organization that includes all four tenants. Now when users need to collaborate in Teams, they're able to easily find users across the company and start chats and meetings with those users.



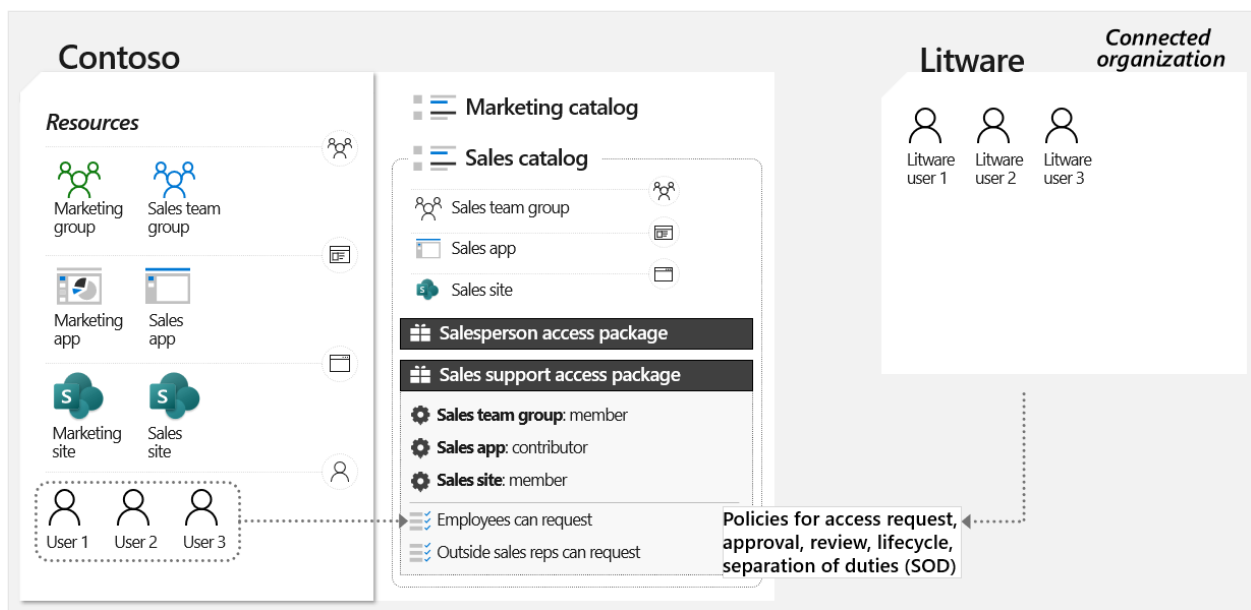
Just-in-time

While the scenarios discussed so far cover collaboration within an organization, there are cases where cross-organization collaboration is vital. This could be in the context of joint ventures or organizations of independent legal entities. By employing connected organizations and entitlement management, you can define policies for accessing resources across connected organizations and enable users to request access to the resources they need.

Joint ventures

Consider Contoso and Litware, separate organizations engaged in a multi-year joint venture. They need to collaborate closely. Administrators at Contoso have defined access packages containing the resources required by Litware users. When a new Litware employee needs access to Contoso's resources, they can request access to the access package. Upon approval, they are provisioned with the necessary resources. Access can be time-limited and subject to periodic review to ensure compliance with Contoso's governance requirements.

The following diagram shows how two organizations can just-in-time collaborate by using connected organizations and entitlement management.



Next steps

- [What is cross-tenant synchronization?](#)
- [Configure cross-tenant synchronization](#)

Feedback

Was this page helpful?

[Provide product feedback](#) | [Get help at Microsoft Q&A](#)

Governance and cross-tenant synchronization

Article • 03/21/2024

Cross-tenant synchronization is a flexible and ready-to-use solution to provision accounts and facilitate seamless collaboration across tenants in an organization. Cross-tenant synchronization automatically manages user identity lifecycle across tenants. It provisions, synchronizes, and deprovisions users in the scope of synchronization from source tenants.

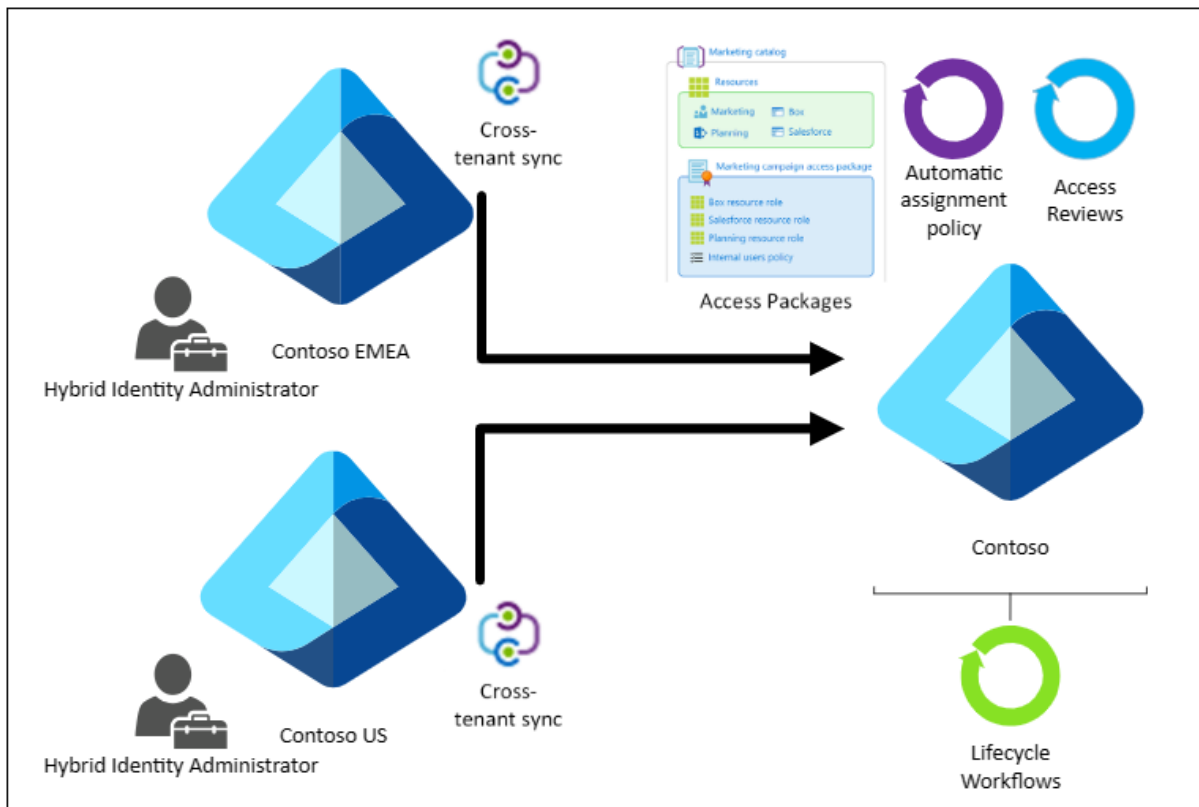
This article describes how [Microsoft Entra ID Governance](#) customers can use cross-tenant synchronization to manage identity and access lifecycles across multitenant organizations.

Deployment example

In this example, Contoso is a multitenant organization with three production Microsoft Entra tenants. Contoso is deploying cross-tenant synchronization and Microsoft Entra ID Governance features to address the following scenarios:

- Manage employee identity lifecycles across multiple tenants
- Use workflows to automate lifecycle processes for employees that originate in other tenants
- Assign resource access automatically to employees that originate in other tenants
- Allow employees to request access to resources in multiple tenants
- Review the access of synchronized users

From a cross-tenant synchronization perspective, Contoso Europe, Middle East, and Africa (Contoso EMEA) and Contoso United States (Contoso US) are source tenants and Contoso is a target tenant. The following diagram illustrates the topology.



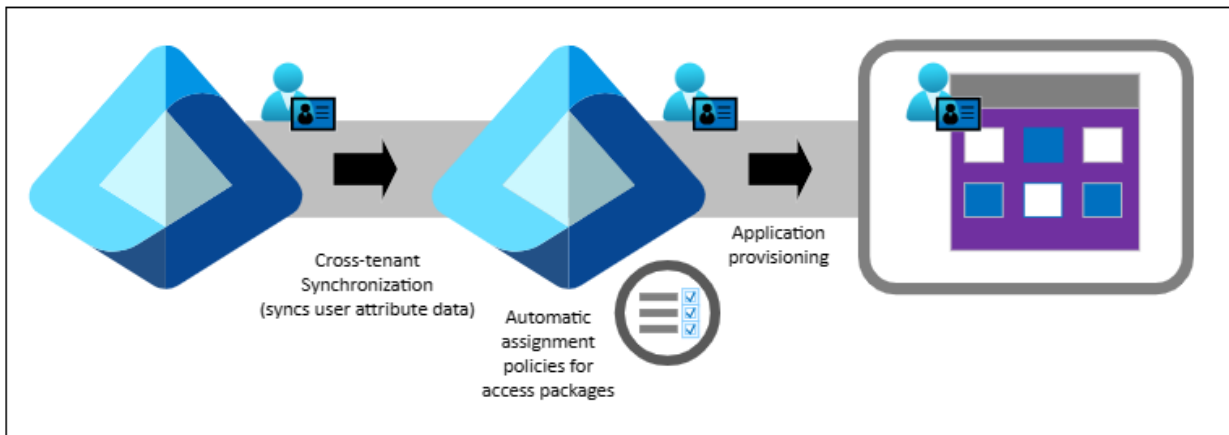
This supported [topology for cross-tenant synchronization](#) is one of many in Microsoft Entra ID. Tenants can be a source tenant, a target tenant, or both. In the following sections, learn how cross-tenant synchronization and Microsoft Entra ID Governance features address several scenarios.

Manage employee lifecycles across tenants

[Cross-tenant synchronization in Microsoft Entra ID](#) automates creating, updating, and deleting B2B collaboration users.

When organizations create, or provision, a B2B collaboration user in a tenant, user access depends partly on how the organization provisioned them: Guest or Member user type. When you select user type, consider the various [properties of a Microsoft Entra B2B collaboration user](#). The Member user type is suitable if users are part of the larger multitenant organization and need member-level access to resources in the organizational tenants. Microsoft Teams requires the Member user type in [multitenant organizations](#).

By default, cross-tenant synchronization includes commonly used attributes on the user object in Microsoft Entra ID. The following diagram illustrates this scenario.



Organizations use the attributes to help create dynamic membership of groups and access packages in the source and target tenant. Some Microsoft Entra ID features have user attributes to target, such as lifecycle workflow user scoping.

To remove, or deprovision, a B2B collaboration user from a tenant automatically stops access to resources in that tenant. This configuration is relevant when employees leave an organization.

Automate lifecycle processes with workflows

Microsoft Entra ID lifecycle workflows are an identity governance feature to manage Microsoft Entra users. Organizations can automate joiner, mover, and leaver processes.

With cross-tenant synchronization, multitenant organizations can configure lifecycle workflows to run automatically for B2B collaboration users it manages. For example, configure a user onboarding workflow, triggered by the `createdDateTime` event user attribute, to request access package assignment for new B2B collaboration users. Use attributes such as `userType` and `userPrincipalName` to scope lifecycle workflows for users homed in other tenants the organization owns.

Govern synchronized user access with access packages

Multitenant organizations can ensure B2B collaboration users have access to shared resources in a target tenant. Users can request access, where needed. In the following scenarios, see how the identity governance feature, [entitlement management](#) access packages govern resource access.

Automatically assign access in target tenants to employees from source tenants

The term birthright assignment refers to automatically granting resource access based on one or more user properties. To configure birthright assignment, create [automatic assignment policies for access packages](#) in entitlement management and configure resource roles to grant shared resource access.

Organizations manage cross-tenant synchronization configuration in the source tenant. Therefore, organizations can delegate resource access management to other source tenant administrators for synchronized B2B collaboration users:

- In the source tenant, administrators configure cross-tenant synchronization attribute mappings for the users that require cross-tenant resource access
- In the target tenant, administrators use attributes in automatic assignment policies to determine access package membership for synchronized B2B collaboration users

To drive automatic assignment policies in the target tenant, synchronize default attribute mappings, such as department or map directory extensions, in the source tenant.

Enable source-tenant employees to request access to target-tenant shared resources

With identity governance [access package](#) policies, multitenant organizations can allow B2B collaboration users, created by cross-tenant synchronization, to request access to shared resources in a target tenant. This process is useful if employees need just-in-time (JIT) access to a resource that another tenant owns.

Review synchronized-user access

[Access reviews in Microsoft Entra ID](#) enable organizations to manage group memberships, access to enterprise applications, and role assignments. Regularly review user access to ensure the right people have access.

When resource access configuration doesn't automatically assign access, such as with dynamic groups or access packages, configure access reviews to apply the results to resources upon completion. The following sections describe how multitenant organizations can configure access reviews for users across tenants in source and target tenants.

Review source-tenant user access

Multitenant organizations can include internal users in access reviews. This action enables access recertification in source tenants that synchronizes users. Use this approach for regular review of security groups assigned to cross-tenant synchronization. Therefore, ongoing B2B collaboration access to other tenants has approval in the user home tenant.

Use access reviews of users in source tenants to avoid potential conflicts between cross-tenant synchronization and access reviews that remove denied users upon completion.

Review target-tenant user access

Organizations can include B2B collaboration users in access reviews, including users provisioned by cross-tenant synchronization in target tenants. This option enables access recertification of resources in target tenants. Although organizations can target all users in access reviews, guest users can be explicitly targeted if necessary.

For organizations that synchronize B2B collaboration users, typically Microsoft doesn't recommend removing denied guest users automatically from access reviews. Cross-tenant synchronization reprovisions the users if they're in the synchronization scope.

Next steps

- [Multitenant organizations and Microsoft 365](#)
- [Multitenant organization templates](#)
- [Topologies for cross-tenant synchronization](#)

Govern access for security operations center (SOC) teams in a multitenant environment

Article • 05/02/2024

Managing multitenant environments can add another layer of complexity when it comes to keeping up with the ever-evolving security threats facing your enterprise. Navigating across multiple tenants can be time consuming and reduce the overall efficiency of security operation center (SOC) teams. Multitenant management in [Microsoft Defender XDR](#) provides security operation teams with a single, unified view of all the tenants they manage. This view enables teams to quickly investigate incidents and perform advanced hunting across data from multiple tenants, improving their security operations.

[Microsoft Entra ID Governance](#) enables you to govern the access and lifecycle of the users who are members of the SOC teams and threat hunter teams. This document explores:

- The controls you can put in place for SOC teams to securely access resources across tenants.
- Example topologies for how you can implement your lifecycle and access controls.
- Deployment considerations (roles, monitoring, APIs).

Manage the lifecycle and access of a SOC user

Microsoft Entra provides the controls needed to govern the lifecycle of a SOC user and to securely provide access to the resources they need. In this document, the term source tenant refers to where the SOC users originate and authenticate against. Target tenant refers to the tenant that they're investigating when there's an incident. Organizations have multiple target tenants due to mergers and acquisitions, aligning tenants with business units, and aligning tenants with geos.

Lifecycle control

Entitlement management, through access packages and connected organizations allows the target tenant administrator to define collections of resources (ex: app roles, directory roles, and groups) that users from the source tenant can request access to. If the user is approved for the resources they need, but don't yet have a B2B account, entitlement management will automatically create a B2B account for the user in the

target tenant. When they don't have any remaining entitlements in the target tenant, their B2B account will automatically be removed.

[Learn more](#)

Cross-tenant synchronization allows the source tenant to automate creating, updating, and deleting B2B users across tenants in an organization.

[Learn more](#)

Comparing entitlement management and cross-tenant synchronization

 Expand table

Capability	Entitlement management	Cross-tenant synchronization
Create users in the target tenant	•	•
Update users in the target tenant when their attributes change in the source tenant		•
Delete users	•	•
Assign users to groups, directory roles, app roles	•	
Attributes of the user in the target tenant	Minimal, supplied by user themselves at request time	Synchronized from the source tenant

Access control

You can use entitlement management and cross-tenant access policies to control access to resources across tenants. Entitlement management will assign the right users to the right resources, while cross-tenant access policies and conditional access together perform the necessary run-time checks to ensure the right users are accessing the right resources.

Entitlement management

Assigning Microsoft Entra roles through entitlement management access packages helps to efficiently manage role assignments at scale and improves the role assignment lifecycle. It provides a flexible request and approval process for gaining access to directory roles, app roles, and groups while also enabling automatic assignment to resources based on user attributes.

[Learn more](#)

Cross-tenant access policies

External identities cross-tenant access settings manage how you collaborate with other Microsoft Entra organizations through B2B collaboration. These settings determine both the level of inbound access users in external Microsoft Entra organizations have to your resources, and the level of outbound access your users have to external organizations.

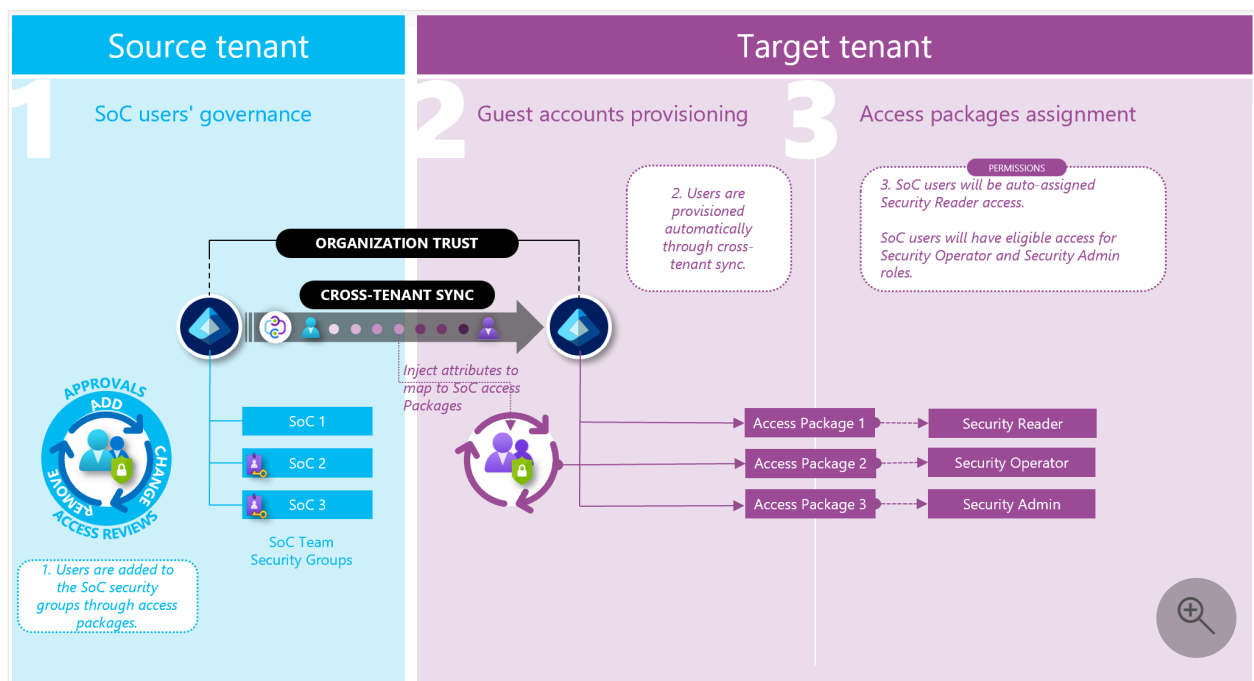
[Learn more](#)

Deployment topologies

This section describes how you can use tools such as cross-tenant synchronization, entitlement management, cross-tenant access policies, and conditional access together. In both topologies, the target tenant admin has full control over access to resources in the target tenant. They differ in who initiates provisioning and deprovisioning.

Topology 1

In topology 1, the source tenant configures entitlement management and cross-tenant synchronization to provision users into the target tenant. Then, the administrator of the target tenant configures access packages to provide access to the necessary directory roles, group, and app roles in the target tenant.



Steps to configure topology 1

1. In the source tenant, configure [cross-tenant synchronization](#) to provision internal accounts in the source tenant as external accounts in the target tenant.

As users are assigned to the cross-tenant synchronization service principal, they'll automatically be provisioned into the target tenant. As they're removed from the configuration, they'll automatically be deprovisioned. As part of your attribute mappings, you can add a new mapping of type constant to provision a [directory extension](#) attribute on the user to indicate that they're a SOC administrator. Alternatively, if you have an attribute such as department that you can rely on for this step, you can skip creating the extension. This attribute will be used in the target tenant to provide them with access to the necessary roles.

2. In the source tenant, create an access package that includes the cross-tenant synchronization service principal as a resource.

As users are granted access to the package, they'll be assigned to the cross-tenant synchronization service principal. Ensure that you set up periodic access reviews of the access package or time-limit the assignments to ensure that only the users that need access to the target tenant continue to have access.

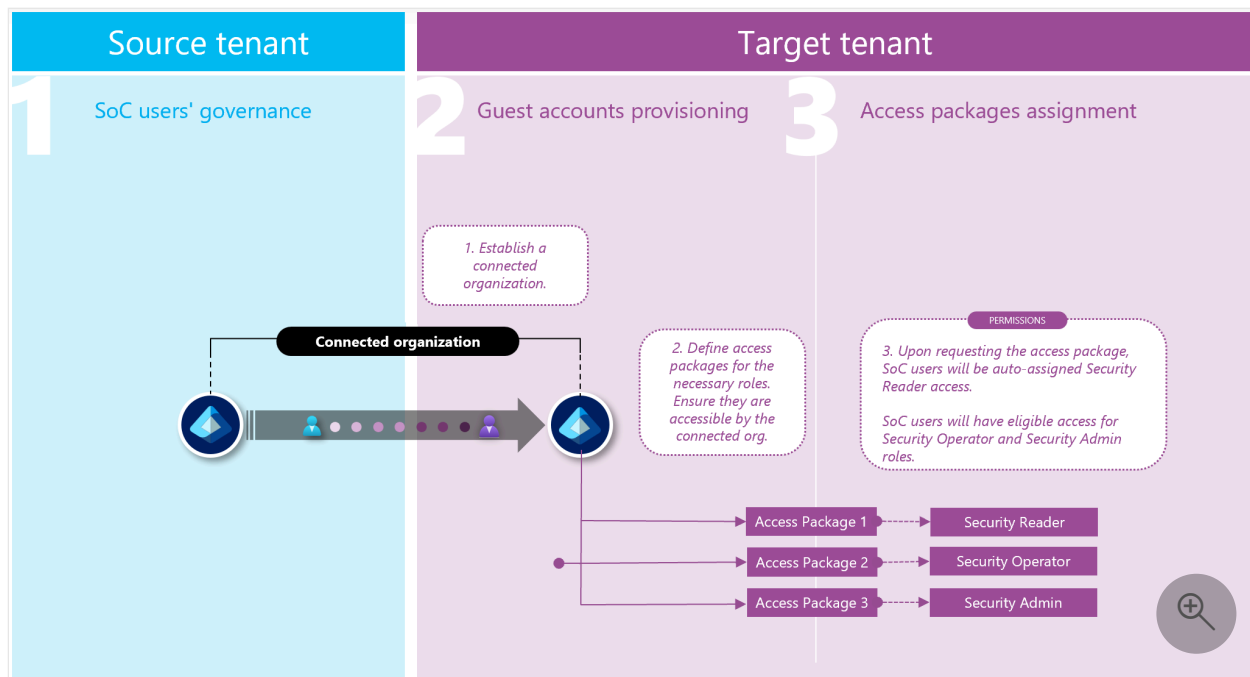
3. In the target tenant, [create access packages](#) to provide the necessary roles for investigating an incident.

We recommend one [autoassigned](#) access package to provide the Security Reader role and one request based package for the Security Operator and Security Administrator roles.

Once you have completed the setup, SOC users can navigate to myaccess.microsoft.com to request time-limited access to the necessary access packages in the source tenant. Once approved, they'll automatically be provisioned into the target tenant(s) with the security reader role. They can then request additional access in any tenants where they need the Security Operator or Security Administrator roles. Once their access period is over or they're removed as part of an access review, they'll be deprovisioned from all the target tenants they don't need access to anymore.

Topology 2

In topology 2 the target tenant administrator defines the access packages and resources that the source users can request access to. If the source tenant administrator would like to restrict which of their users can access the target tenant, you can use a cross-tenant access policy coupled with an access package to block all access to the target tenant, except for users that are part of a group that is included in an access package in the home tenant.



Steps to configure topology 2

1. In the target tenant, add the source tenant as a **connected organization**.

This setting allows the target tenant administrator to make access packages available to the source tenant.

2. In the target tenant, create an access package that provides the Security Reader, Security Administrator, and Security Operator roles.
3. Users from the source tenant can now request access packages in the target tenant.

Once you have completed the setup, SOC users can navigate to myaccess.microsoft.com to request time-limited access to the necessary roles in each tenant.

Topologies compared

In both topologies, the target tenant can control what resources users have access to. This can be accomplished using a mix of cross-tenant access policies, conditional access, and assignment of apps and roles to users. They differ in who configures and initiates provisioning. In topology 1, the source tenant configures provisioning and pushes users into the target tenants. In topology 2, the target tenant defines which users are eligible to access their tenant.

If a user needs access to several tenants at one time, topology 1 makes it easy for them to request access to an access package in one tenant and automatically get provisioned into several tenants. If the target tenant wants to ensure full control over who is

provisioned into their tenant and perform the necessary approvals in their tenant, topology 2 will best meet their needs.

Deployment considerations

Monitoring

Actions performed by a SOC analyst in Microsoft Entra are audited in the Microsoft Entra tenant that they're working in. Organizations can maintain an audit trail of actions performed, generate alerts when specific actions are performed, and analyze actions performed by pushing audit logs into Azure Monitor.

[Learn more](#)

Actions performed by a SOC analyst in Microsoft Defender are also audited.

[Learn more](#)

Scaling deployment with PowerShell / APIs

Every step that is configured through the user interface in Microsoft Entra has accompanying Microsoft Graph APIs and PowerShell commandlets, enabling you to deploy your desired policies/configuration across the tenants in your organization.

 Expand table

Capability	Microsoft Graph API	PowerShell
Cross-tenant synchronization	Link	Link
Entitlement management	Link	Link
Cross-tenant access policies	Link	Link

Role-based access control

Configuring the capabilities described in topology 1 and topology 2 require the following roles:

- Configuring cross-tenant access settings - Security Administrator
- Configuring cross-tenant synchronization - Hybrid Identity Administrator
- Configuring entitlement management - Identity Governance Administrator
- [Microsoft Defender](#) supports both built-in roles such as Security Reader, Security Administrator, and Security Operator and custom roles.

Next steps

- [What is cross-tenant synchronization?](#)
- [What is entitlement management?](#)
- [Multitenant management in Defender XDR](#)

Known issues for provisioning in Microsoft Entra ID

Article • 02/14/2024

This article discusses known issues to be aware of when you work with app provisioning or cross-tenant synchronization. To provide feedback about the application provisioning service on UserVoice, see [Microsoft Entra application provision UserVoice](#). We watch UserVoice closely so that we can improve the service.

ⓘ Note

This article isn't a comprehensive list of known issues. If you know of an issue that isn't listed, provide feedback at the bottom of the page.

Authorization

Unable to change provisioning mode back to manual

After you've configured provisioning for the first time, you'll notice that the provisioning mode has switched from manual to automatic. You can't change it back to manual. But you can turn off provisioning through the UI. Turning off provisioning in the UI effectively does the same as setting the dropdown to manual.

Attribute mappings

Attribute `SamAccountName` or `userType` not available as a source attribute

The attributes `SamAccountName` and `userType` aren't available as a source attribute by default. Extend your schema to add the attributes. You can add the attributes to the list of available source attributes by extending your schema. To learn more, see [Missing source attribute](#).

Source attribute dropdown missing for schema extension

Extensions to your schema can sometimes be missing from the source attribute dropdown in the UI. Go into the advanced settings of your attribute mappings and

manually add the attributes. To learn more, see [Customize attribute mappings](#).

Null attribute can't be provisioned

Microsoft Entra ID currently can't provision null attributes. If an attribute is null on the user object, it will be skipped.

Maximum characters for attribute-mapping expressions

Attribute-mapping expressions can have a maximum of 10,000 characters.

Unsupported scoping filters

The `appRoleAssignments`, `userType`, and `accountExpires` attributes aren't supported as scoping filters.

Multivalue directory extensions

Multivalue directory extensions can't be used in attribute mappings or scoping filters.

Service issues

Unsupported scenarios

- Provisioning passwords isn't supported.
- Provisioning nested groups isn't supported.
- Provisioning to B2C tenants isn't supported because of the size of the tenants.
- Not all provisioning apps are available in all clouds. For example, Atlassian isn't yet available in the Government cloud. We're working with app developers to onboard their apps to all clouds.

Automatic provisioning isn't available on my OIDC-based application

If you create an app registration, the corresponding service principal in enterprise apps won't be enabled for automatic user provisioning. You'll need to either request the app be added to the gallery, if intended for use by multiple organizations, or create a second non-gallery app for provisioning.

Manager isn't provisioned

If a user and their manager are both in scope for provisioning, the service provisions the user and then updates the manager. If on day one the user is in scope and the manager is out of scope, we'll provision the user without the manager reference. When the manager comes into scope, the manager reference won't be updated until you restart provisioning and cause the service to reevaluate all the users again.

The provisioning interval is fixed

The [time](#) between provisioning cycles is currently not configurable.

Changes not moving from target app to Microsoft Entra ID

The app provisioning service isn't aware of changes made in external apps. So, no action is taken to roll back. The app provisioning service relies on changes made in Microsoft Entra ID.

Switching from Sync All to Sync Assigned not working

After you change scope from **Sync All** to **Sync Assigned**, make sure to also perform a restart to ensure that the change takes effect. You can do the restart from the UI.

Provisioning cycle continues until completion

When you set provisioning to `enabled = off` or select **Stop**, the current provisioning cycle continues running until completion. The service stops executing any future cycles until you turn provisioning on again.

Member of group not provisioned

When a group is in scope and a member is out of scope, the group will be provisioned. The out-of-scope user won't be provisioned. If the member comes back into scope, the service won't immediately detect the change. Restarting provisioning addresses the issue. Periodically restart the service to ensure that all users are properly provisioned.

Global Reader

The Global Reader role is unable to read the provisioning configuration. Create a custom role with the `microsoft.directory/applications/synchronization/standard/read`

permission in order to read the provisioning configuration from the Microsoft Entra admin center.

Microsoft Azure Government Cloud

Credentials, including the secret token, notification email, and SSO certificate notification emails together have a 1KB limit in the Microsoft Azure Government Cloud.

On-premises application provisioning

The following information is a current list of known limitations with the Microsoft Entra ECMA Connector Host and on-premises application provisioning.

Application and directories

The following applications and directories aren't yet supported.

Active Directory Domain Services (user or group writeback from Microsoft Entra ID by using the on-premises provisioning preview)

- When a user is managed by Microsoft Entra Connect, the source of authority is on-premises Active Directory Domain Services. So, user attributes can't be changed in Microsoft Entra ID. This preview doesn't change the source of authority for users managed by Microsoft Entra Connect.
- Attempting to use Microsoft Entra Connect and the on-premises provisioning to provision groups or users into Active Directory Domain Services can lead to creation of a loop, where Microsoft Entra Connect can overwrite a change that was made by the provisioning service in the cloud. Microsoft is working on a dedicated capability for group or user writeback. Upvote the UserVoice feedback on [this website](#) to track the status of the preview. Alternatively, you can use [Microsoft Identity Manager](#) for user or group writeback from Microsoft Entra ID to Active Directory.

Microsoft Entra ID

By using on-premises provisioning, you can take a user already in Microsoft Entra ID and provision them into a third-party application. *You can't bring a user into the directory from a third-party application.* Customers will need to rely on our native HR integrations, Microsoft Entra Connect, Microsoft Identity Manager, or Microsoft Graph, to bring users into the directory.

Attributes and objects

The following attributes and objects aren't supported:

- Multivalued attributes.
- Reference attributes (for example, manager).
- Groups.
- Complex anchors (for example, ObjectTypeName+UserName).
- Attributes that have characters such as "." or "["
- Binary attributes.
- On-premises applications are sometimes not federated with Microsoft Entra ID and require local passwords. The on-premises provisioning preview doesn't support password synchronization. Provisioning initial one-time passwords is supported. Ensure that you're using the [Redact](#) function to redact the passwords from the logs. In the SQL and LDAP connectors, the passwords aren't exported on the initial call to the application, but rather a second call with set password.

SSL certificates

The Microsoft Entra ECMA Connector Host currently requires either an SSL certificate to be trusted by Azure or the provisioning agent to be used. The certificate subject must match the host name the Microsoft Entra ECMA Connector Host is installed on.

Anchor attributes

The Microsoft Entra ECMA Connector Host currently doesn't support anchor attribute changes (renames) or target systems, which require multiple attributes to form an anchor.

Attribute discovery and mapping

The attributes that the target application supports are discovered and surfaced in the Microsoft Entra admin center in **Attribute Mappings**. Newly added attributes will continue to be discovered. If an attribute type has changed, for example, string to Boolean, and the attribute is part of the mappings, the type won't change automatically in the Microsoft Entra admin center. Customers will need to go into advanced settings in mappings and manually update the attribute type.

Provisioning agent

- The agent doesn't currently support auto update for the on-premises application provisioning scenario. We're actively working to close this gap and ensure that auto update is enabled by default and required for all customers.
- The same provisioning agent can't be used for on-premises app provisioning and cloud sync / HR- driven provisioning.

Next steps

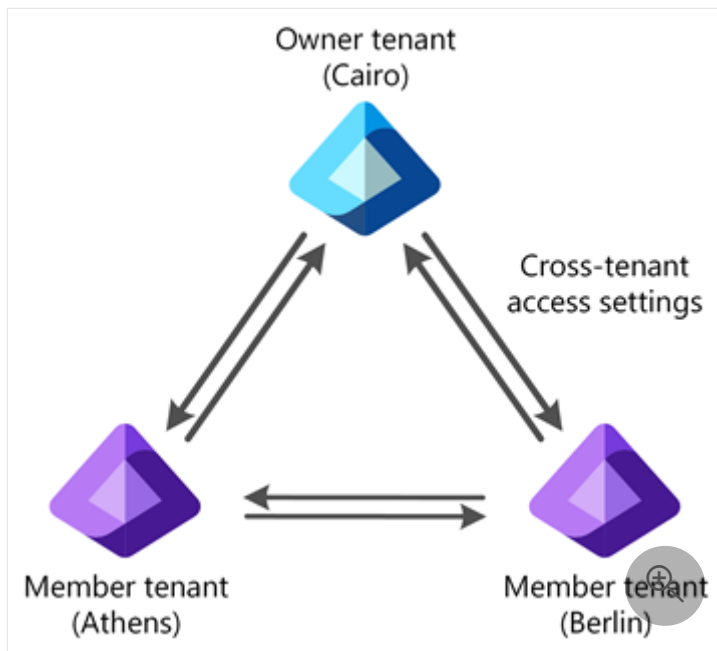
[How provisioning works](#)

Configure a multitenant organization using PowerShell or Microsoft Graph API

Article • 04/24/2024

This article describes the key steps to configure a multitenant organization using Microsoft Graph PowerShell or Microsoft Graph API. This article uses an example owner tenant named *Cairo* and two member tenants named *Berlin* and *Athens*.

If you instead want to use the Microsoft 365 admin center to configure a multitenant organization, see [Set up a multitenant org in Microsoft 365](#) and [Join or leave a multitenant organization in Microsoft 365](#). To learn how to configure Microsoft Teams for your multitenant organization, see [The new Microsoft Teams desktop client](#).



Prerequisites



Owner tenant

- For license information, see [License requirements](#).
- [Security Administrator](#) role to configure cross-tenant access settings and templates for the multitenant organization.
- [Global Administrator](#) role to consent to required permissions.



Member tenant

- For license information, see [License requirements](#).
- [Security Administrator](#) role to configure cross-tenant access settings and templates for the multitenant organization.
- [Global Administrator](#) role to consent to required permissions.

Step 1: Sign in to the owner tenant



Owner tenant

PowerShell

1. Start PowerShell.
2. If necessary, install the [Microsoft Graph PowerShell SDK](#).
3. Get the tenant ID of the owner and member tenants and initialize variables.

PowerShell

```
$OwnerTenantId = "<OwnerTenantId>"  
$MemberTenantIdB = "<MemberTenantIdB>"  
$MemberTenantIdA = "<MemberTenantIdA>"
```

4. Use the [Connect-MgGraph](#) command to sign in to the owner tenant and consent to the following required permissions.

- `MultiTenantOrganization.ReadWrite.All`
- `Policy.Read.All`
- `Policy.ReadWrite.CrossTenantAccess`
- `Application.ReadWrite.All`
- `Directory.ReadWrite.All`

PowerShell

```
Connect-MgGraph -TenantId $OwnerTenantId -Scopes  
"MultiTenantOrganization.ReadWrite.All", "Policy.Read.All", "Policy.R
```



```
eadWrite.CrossTenantAccess", "Application.ReadWrite.All", "Directory.  
ReadWrite.All"
```

Step 2: Create a multitenant organization



Owner tenant

PowerShell

1. In the owner tenant, use the [Update-MgBetaTenantRelationshipMultiTenantOrganization](#) command to create your multitenant organization. This operation can take a few minutes.

PowerShell

```
Update-MgBetaTenantRelationshipMultiTenantOrganization -DisplayName  
"Cairo"
```

2. Use the [Get-MgBetaTenantRelationshipMultiTenantOrganization](#) command to check that the operation has completed before proceeding.

PowerShell

```
Get-MgBetaTenantRelationshipMultiTenantOrganization | Format-List
```

Output

```
CreatedDateTime      : 1/8/2024 7:47:45 PM  
Description          :  
DisplayName          : Cairo  
Id                   : <MtoIdC>  
JoinRequest          :  
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg  
anizationJoinRequestRecord  
State                : active  
Tenants              :  
AdditionalProperties : {[@odata.context,  
https://graph.microsoft.com/beta/$metadata#tenantRelationships/mult  
iTenantOrganization/$entity]}
```

Step 3: Add tenants



Owner tenant

PowerShell

1. In the owner tenant, use the [New-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to add tenants to your multitenant organization.

PowerShell

```
New-MgBetaTenantRelationshipMultiTenantOrganizationTenant -TenantID $MemberTenantIdB -DisplayName "Berlin" | Format-List
```

PowerShell

```
New-MgBetaTenantRelationshipMultiTenantOrganizationTenant -TenantID $MemberTenantIdA -DisplayName "Athens" | Format-List
```

2. Use the [Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to verify that the operation has completed before proceeding.

PowerShell

```
Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant | Format-List
```

Output

```
AddedByTenantId      : <OwnerTenantId>
AddedDateTime        : 1/8/2024 7:47:45 PM
DeletedDateTime      :
DisplayName           : Cairo
Id                   : <MtoIdC>
JoinedDateTime       :
Role                  : owner
State                 : active
TenantId             : <OwnerTenantId>
TransitionDetails    :
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg
anizationMemberTransitionDetails
AdditionalProperties  : {[multiTenantOrgLabelType, none]}
```

```

AddedByTenantId      : <OwnerTenantId>
AddedDateTime        : 1/8/2024 8:05:25 PM
DeletedDateTime      :
DisplayName           : Berlin
Id                   : <MtoIdB>
JoinedDateTime       :
Role                  : member
State                 : pending
TenantId             : <MemberTenantIdB>
TransitionDetails    :
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg
anizationMemberTransitionDetails
AdditionalProperties  : {[multiTenantOrgLabelType, none]}

AddedByTenantId      : <OwnerTenantId>
AddedDateTime        : 1/8/2024 8:08:47 PM
DeletedDateTime      :
DisplayName           : Athens
Id                   : <MtoIdA>
JoinedDateTime       :
Role                  : member
State                 : pending
TenantId             : <MemberTenantIdA>
TransitionDetails    :
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg
anizationMemberTransitionDetails
AdditionalProperties  : {[multiTenantOrgLabelType, none]}

```

Step 4: (Optional) Change the role of a tenant



Owner tenant

By default, tenants added to the multitenant organization are member tenants. Optionally, you can change them to owner tenants, which allow them to add other tenants to the multitenant organization. You can also change an owner tenant to a member tenant.

PowerShell

1. In the owner tenant, use the [Update-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to change a member tenant to an owner tenant.

PowerShell

```
Update-MgBetaTenantRelationshipMultiTenantOrganizationTenant -  
MultiTenantOrganizationMemberId $MemberTenantIdB -Role "Owner" |  
Format-List
```

2. Use the `Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant` command to verify the change.

PowerShell

```
Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant -  
MultiTenantOrganizationMemberId $MemberTenantIdB | Format-List
```

Output

```
AddedByTenantId      : <OwnerTenantId>  
AddedDateTime        : 1/8/2024 8:05:25 PM  
DeletedDateTime      :  
DisplayName          : Berlin  
Id                  : <MtoIdB>  
JoinedDateTime       :  
Role                 : owner  
State                : pending  
TenantId            : <MemberTenantIdB>  
TransitionDetails    :  
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg  
anizationMemberTransitionDetails  
AdditionalProperties : {[@odata.context,  
https://graph.microsoft.com/beta/$metadata#tenantRelationships/mult  
iTenantOrganization/tenants/$entity],  
                        [multiTenantOrgLabelType, none]}
```

Step 5: (Optional) Remove a member tenant



Owner tenant

You can remove any member tenant, including your own. You can't remove owner tenants. Also, you can't remove the original creator tenant, even if it has been changed from owner to member.

PowerShell

1. In the owner tenant, use the [Remove-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to remove any member tenant. This operation takes a few minutes.

PowerShell

```
Remove-MgBetaTenantRelationshipMultiTenantOrganizationTenant -  
MultiTenantOrganizationMemberId <MemberTenantIdD>
```

2. Use the [Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to verify the change.

PowerShell

```
Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant -  
MultiTenantOrganizationMemberId <MemberTenantIdD>
```

After the remove command completes, the output is similar to the following. This is an expected error message. It indicates that the tenant has been removed from the multitenant organization.

Output

```
Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant_Get:  
Unable to read the company information from the directory.
```

```
Status: 404 (NotFound)  
ErrorCode: Directory_ObjectNotFound  
Date: 2024-01-08T20:35:11
```

...

Step 6: Sign in to a member tenant



Member tenant

The Cairo tenant created a multitenant organization and added the Berlin and Athens tenants. In these steps, you sign in to the Berlin tenant and join the multitenant organization created by Cairo.

PowerShell

1. Start PowerShell.
2. Use the [Connect-MgGraph](#) command to sign in to the member tenant and consent to the following required permissions.

- `MultiTenantOrganization.ReadWrite.All`
- `Policy.Read.All`
- `Policy.ReadWrite.CrossTenantAccess`
- `Application.ReadWrite.All`
- `Directory.ReadWrite.All`

PowerShell

```
Connect-MgGraph -TenantId $MemberTenantIdB -Scopes  
"MultiTenantOrganization.ReadWrite.All", "Policy.Read.All", "Policy.R  
eadWrite.CrossTenantAccess", "Application.ReadWrite.All", "Directory.  
ReadWrite.All"
```

Step 7: Join the multitenant organization



Member tenant

PowerShell

1. In the member tenant, use the [Update-MgBetaTenantRelationshipMultiTenantOrganizationJoinRequest](#) command to join the multitenant organization.

PowerShell

```
Update-MgBetaTenantRelationshipMultiTenantOrganizationJoinRequest -  
AddedByTenantId $OwnerTenantId | Format-List
```

2. Use the [Get-MgBetaTenantRelationshipMultiTenantOrganizationJoinRequest](#) command to verify the join.

```
PowerShell
```

```
Get-MgBetaTenantRelationshipMultiTenantOrganizationJoinRequest |  
Format-List
```

```
Output
```

```
AddedByTenantId      : <OwnerTenantId>  
Id                   : <MtoJoinRequestIdB>  
MemberState         : active  
Role                 : member  
TransitionDetails    :  
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg  
anizationJoinRequestTransitionDetails  
AdditionalProperties : {[@odata.context,  
https://graph.microsoft.com/beta/$metadata#tenantRelationships/mult  
iTenantOrganization/joinRequest/$entity]}
```

3. Use the [Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to check the multitenant organization itself. It should reflect the join operation.

```
PowerShell
```

```
Get-MgBetaTenantRelationshipMultiTenantOrganizationTenant | Format-  
List
```

```
Output
```

```
AddedByTenantId      : <OwnerTenantId>  
AddedDateTime        : 1/8/2024 8:05:25 PM  
DeletedDateTime      :  
DisplayName          : Berlin  
Id                   : <MtoJoinRequestIdB>  
JoinedDateTime       : 1/8/2024 9:53:55 PM  
Role                 : member  
State                : active  
TenantId             : <MemberTenantIdB>  
TransitionDetails    :  
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg  
anizationMemberTransitionDetails  
AdditionalProperties : {[multiTenantOrgLabelType, none]}  
  
AddedByTenantId      : <OwnerTenantId>  
AddedDateTime        : 1/8/2024 7:47:45 PM  
DeletedDateTime      :  
DisplayName          : Cairo  
Id                   : <Id>  
JoinedDateTime       :
```

```
Role           : owner
State          : active
TenantId       : <OwnerTenantId>
TransitionDetails :
Microsoft.Graph.Beta.PowerShell.Models.MicrosoftGraphMultiTenantOrg
anizationMemberTransitionDetails
AdditionalProperties : {[multiTenantOrgLabelType, none]}
```

4. To allow for asynchronous processing, wait **up to 2 hours** before joining a multitenant organization is completed.

Step 8: (Optional) Leave the multitenant organization



Member tenant

You can leave a multitenant organization that you have joined. The process for removing your own tenant from the multitenant organization is the same as the process for removing another tenant from the multitenant organization.

If your tenant is the only multitenant organization owner, you must designate a new tenant to be the multitenant organization owner. For steps, see [Step 4: \(Optional\) Change the role of a tenant](#).

PowerShell

- In the tenant, use the [Remove-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to remove the tenant. This operation takes a few minutes.

PowerShell

```
Remove-MgBetaTenantRelationshipMultiTenantOrganizationTenant -
MultiTenantOrganizationMemberId <MemberTenantId>
```

Step 9: (Optional) Delete the multitenant organization



Owner tenant

You delete a multitenant organization by removing all tenants. The process for removing the final owner tenant is the same as the process for removing all other member tenants.

PowerShell

- In the final owner tenant, use the [Remove-MgBetaTenantRelationshipMultiTenantOrganizationTenant](#) command to remove the tenant. This operation takes a few minutes.

PowerShell

```
Remove-MgBetaTenantRelationshipMultiTenantOrganizationTenant -  
MultiTenantOrganizationMemberId $OwnerTenantId
```

Next steps

- [Set up a multitenant org in Microsoft 365](#)
- [Synchronize users in multitenant organizations in Microsoft 365](#)
- [The new Microsoft Teams desktop client](#)
- [Configure multitenant organization templates using the Microsoft Graph API](#)

Configure multitenant organization policy templates using the Microsoft Graph API

Article • 04/24/2024

This article describes how to configure a policy template for your multitenant organization.

Prerequisites

- For license information, see [License requirements](#).
- [Security Administrator](#) role to configure cross-tenant access settings and templates for the multitenant organization.
- [Global Administrator](#) role to consent to required permissions.

Cross-tenant access policy partner template

The [cross-tenant access partner configuration](#) handles trust settings and automatic user consent settings between partner tenants. For example, you can use these settings to trust multifactor authentication claims for inbound users from the target partner tenant. With the template in an unconfigured state, partner configurations for partner tenants in the multitenant organization won't be amended, with all trust settings passed through from default settings. However, if you configure the template, then partner configurations will be amended corresponding to the policy template.

Configure inbound and outbound automatic redemption

To specify which trust settings and automatic user consent settings to apply to your policy template, use the [Update multiTenantOrganizationPartnerConfigurationTemplate](#) API. If you create or join a multitenant organization using the Microsoft 365 admin center, this configuration is handled automatically.

Request

HTTP

PATCH

```
https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/multiTenantOrganizationPartnerConfiguration
```

```
{
  "inboundTrust": {
    "isMfaAccepted": true,
    "isCompliantDeviceAccepted": true,
    "isHybridAzureADJoinedDeviceAccepted": true
  },
  "automaticUserConsentSettings": {
    "inboundAllowed": true,
    "outboundAllowed": true
  },
  "templateApplicationLevel": "newPartners,existingPartners"
}
```

Disable the template for existing partners

To apply this template only to new multitenant organization members and exclude existing partners, set the `templateApplicationLevel` parameter to new partners only.

Request

HTTP

PATCH

<https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/multiTenantOrganizationPartnerConfiguration>

```
{
  "inboundTrust": {
    "isMfaAccepted": true,
    "isCompliantDeviceAccepted": true,
    "isHybridAzureADJoinedDeviceAccepted": true
  },
  "automaticUserConsentSettings": {
    "inboundAllowed": true,
    "outboundAllowed": true
  },
  "templateApplicationLevel": "newPartners"
}
```

Disable the template completely

To disable the template completely, set the `templateApplicationLevel` parameter to null.

Request

HTTP

PATCH

<https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/multiTenantOrganizationPartnerConfiguration>

```
{
  "inboundTrust": {
    "isMfaAccepted": true,
    "isCompliantDeviceAccepted": true,
    "isHybridAzureADJoinedDeviceAccepted": true
  },
  "automaticUserConsentSettings": {
    "inboundAllowed": true,
    "outboundAllowed": true
  },
  "templateApplicationLevel": ""
}
```

Reset the template

To reset the template to its default state (decline all trust and automatic user consent), use the [multiTenantOrganizationPartnerConfigurationTemplate: resetToDefaultSettings](#) API.

HTTP

POST

<https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/multiTenantOrganizationPartnerConfiguration/resetToDefaultSettings>

Cross-tenant synchronization template

The identity synchronization policy governs [cross-tenant synchronization](#), which allows you to share users and groups across tenants in your organization. You can use these settings to allow inbound user synchronization. With the template in an unconfigured state, the identity synchronization policy for partner tenants in the multitenant organization won't be amended. However, if you configure the template, then the identity synchronization policy will be amended corresponding to the policy template.

Configure inbound user synchronization

To allow inbound user synchronization in the policy template, use the [Update multiTenantOrganizationIdentitySyncPolicyTemplate](#) API. If you create or join a

multitenant organization using the Microsoft 365 admin center, this configuration is handled automatically.

Request

HTTP

PATCH

<https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/multiTenantOrganizationIdentitySynchronization>

```
{
  "userSyncInbound": {
    "isSyncAllowed": true
  },
  "templateApplicationLevel": "newPartners,existingPartners"
}
```

Disable the template for existing partners

To apply this template only to new multitenant organization members and exclude existing partners, set the `templateApplicationLevel` parameter to new partners only.

Request

HTTP

PATCH

<https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/multiTenantOrganizationIdentitySynchronization>

```
{
  "userSyncInbound": {
    "isSyncAllowed": true
  },
  "templateApplicationLevel": "newPartners"
}
```

Disable the template completely

To disable the template completely, set the `templateApplicationLevel` parameter to null.

Request

HTTP

```
PATCH
https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/
multiTenantOrganizationIdentitySynchronization

{
  "userSyncInbound": {
    "isSyncAllowed": true
  },
  "templateApplicationLevel": ""
}
```

Reset the template

To reset the template to its default state (decline inbound synchronization), use the [multiTenantOrganizationIdentitySyncPolicyTemplate: resetToDefaultSettings](#) API.

Request

```
HTTP
```

```
POST
https://graph.microsoft.com/beta/policies/crossTenantAccessPolicy/templates/
multiTenantOrganizationIdentitySynchronization/resetToDefaultSettings
```

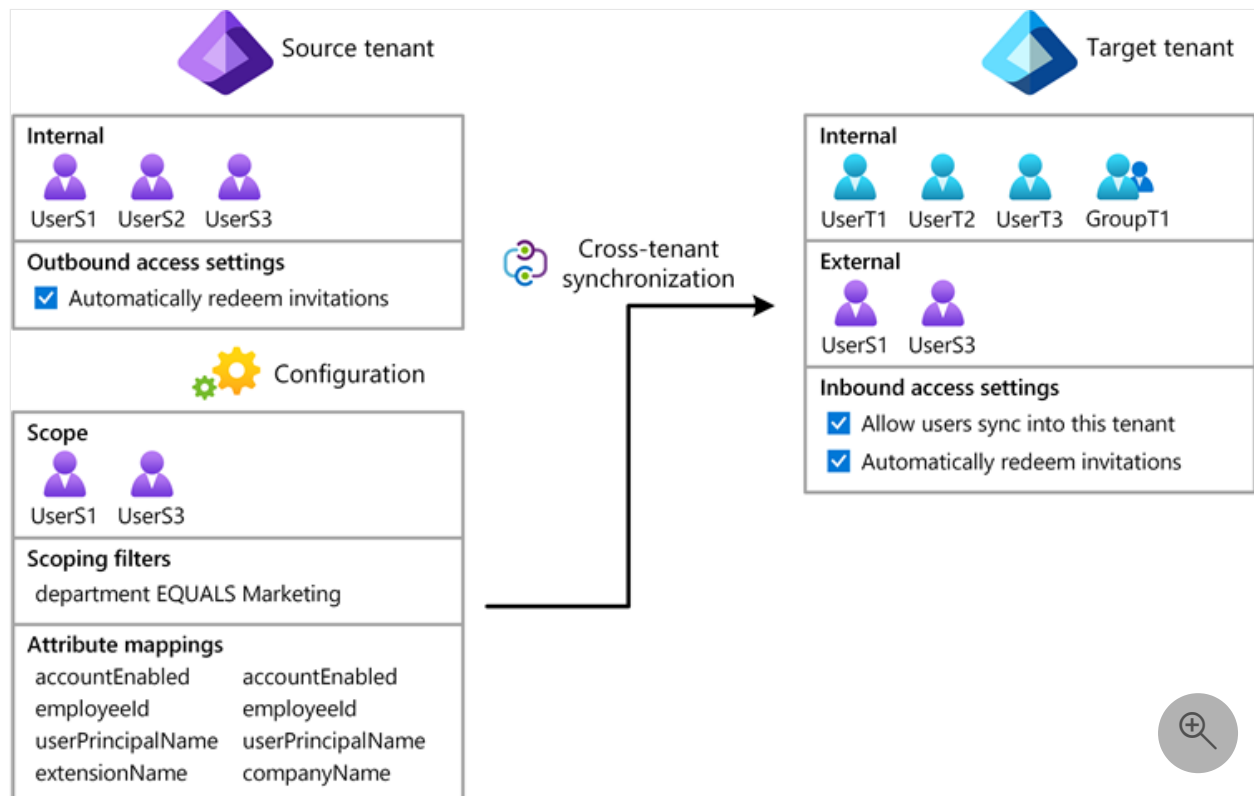
Next steps

- [Configure cross-tenant synchronization](#)

Configure cross-tenant synchronization

Article • 03/11/2024

This article describes the steps to configure cross-tenant synchronization using the Microsoft Entra admin center. When configured, Microsoft Entra ID automatically provisions and de-provisions B2B users in your target tenant. For important details on what this service does, how it works, and frequently asked questions, see [Automate user provisioning and deprovisioning to SaaS applications with Microsoft Entra ID](#).



Learning objectives

By the end of this article, you'll be able to:

- Create B2B users in your target tenant
- Remove B2B users in your target tenant
- Keep user attributes synchronized between your source and target tenants

Prerequisites



Source tenant

- Microsoft Entra ID P1 or P2 license. For more information, see [License requirements](#).
- [Security Administrator](#) role to configure cross-tenant access settings.
- [Hybrid Identity Administrator](#) role to configure cross-tenant synchronization.
- [Cloud Application Administrator](#) or [Application Administrator](#) role to assign users to a configuration and to delete a configuration.



Target tenant

- Microsoft Entra ID P1 or P2 license. For more information, see [License requirements](#).
- [Security Administrator](#) role to configure cross-tenant access settings.

Step 1: Plan your provisioning deployment

1. Define how you would like to [structure the tenants in your organization](#).
2. Learn about [how the provisioning service works](#).
3. Determine who will be in [scope for provisioning](#).
4. Determine what data to [map between tenants](#).


Step 2: Enable user synchronization in the target tenant

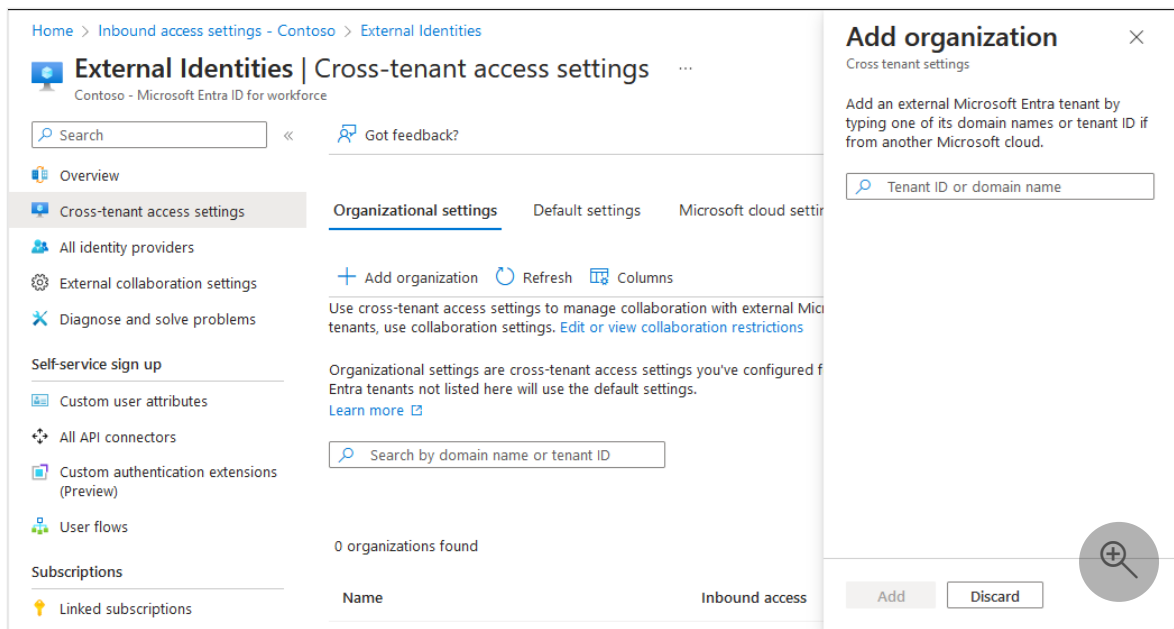
Tip

Steps in this article might vary slightly based on the portal you start from.



Target tenant

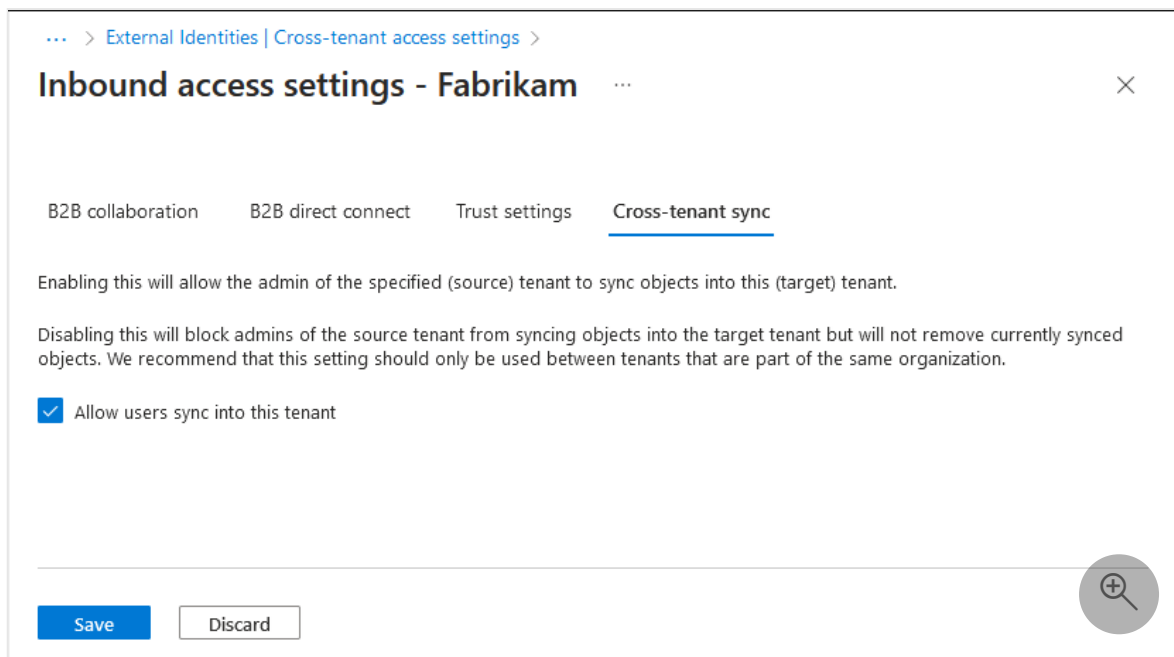
1. Sign in to the [Microsoft Entra admin center](#)  of the target tenant.
2. Browse to **Identity > External Identities > Cross-tenant access settings**.
3. On the **Organization settings** tab, select **Add organization**.
4. Add the source tenant by typing the tenant ID or domain name and selecting **Add**.



5. Under **Inbound access** of the added organization, select **Inherited from default**.

6. Select the **Cross-tenant sync** tab.

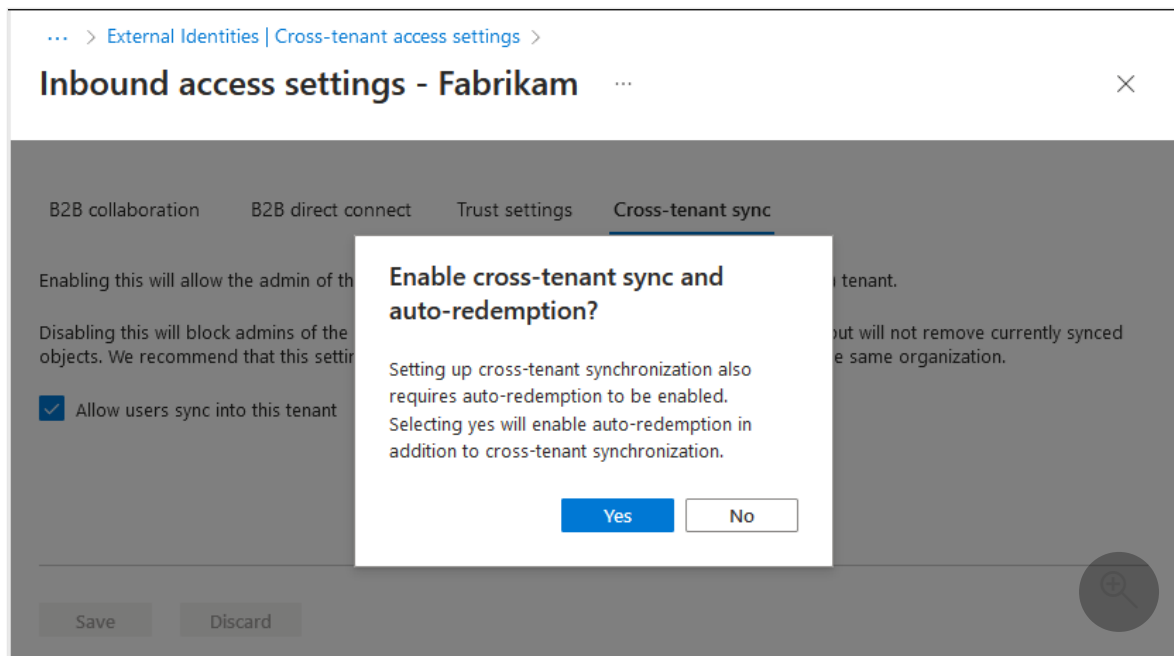
7. Check the **Allow users sync into this tenant** check box.



8. Select **Save**.

9. If you see an **Enable cross-tenant sync and auto-redemption** dialog box asking if you want to enable auto-redemption, select **Yes**.

Selecting **Yes** will automatically redeem invitations in the target tenant.



Step 3: Automatically redeem invitations in the target tenant

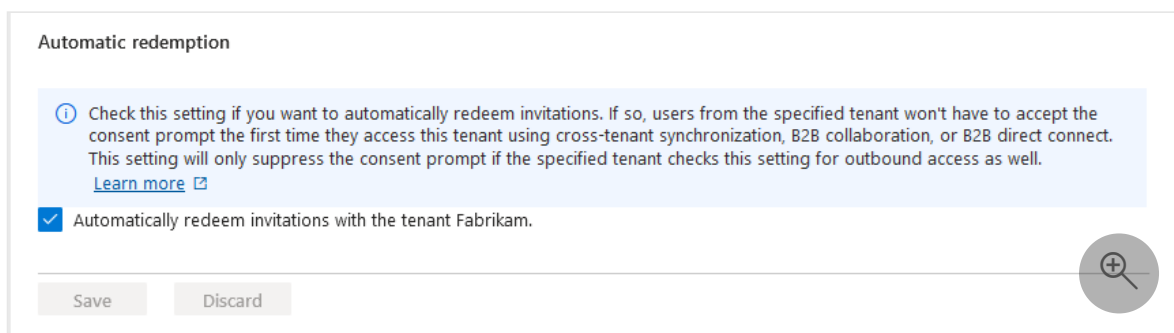


Target tenant

In this step, you automatically redeem invitations so users from the source tenant don't have to accept the consent prompt. This setting must be checked in both the source tenant (outbound) and target tenant (inbound). For more information, see [Automatic redemption setting](#).

1. In the target tenant, on the same **Inbound access settings** page, select the **Trust settings** tab.
2. Check the **Automatically redeem invitations with the tenant <tenant>** check box.

This box might already be checked if you previously selected **Yes** in the **Enable cross-tenant sync and auto-redemption** dialog box.



3. Select **Save**.

Step 4: Automatically redeem invitations in the source tenant



Source tenant

In this step, you automatically redeem invitations in the source tenant.

1. Sign in to the [Microsoft Entra admin center](#) of the source tenant.
2. Browse to **Identity > External Identities > Cross-tenant access settings**.
3. On the **Organization settings** tab, select **Add organization**.
4. Add the target tenant by typing the tenant ID or domain name and selecting **Add**.

The screenshot shows the Microsoft Entra admin center interface. The main page is titled 'External Identities | Cross-tenant access settings' for the 'Fabrikam - Microsoft Entra ID for workforce' tenant. The 'Organizational settings' tab is active, showing a list of organizations with columns for 'Name' and 'Inbound access'. A search box is present with the text 'Search by domain name or tenant ID'. The 'Add organization' button is highlighted. A modal dialog box is open on the right, titled 'Add organization', with the subtitle 'Cross-tenant settings'. The dialog contains a search box for 'Tenant ID or domain name' and an 'Add' button.


5. Under **Outbound access** for the target organization, select **Inherited from default**.
6. Select the **Trust settings** tab.
7. Check the **Automatically redeem invitations with the tenant <tenant>** check box.

Home > Fabrikam > External Identities | Cross-tenant access settings >

Outbound access settings - Contoso

B2B collaboration B2B direct connect Trust settings

Automatic redemption

 Check this setting if you want to automatically redeem invitations. If so, users from this tenant don't have to accept the consent prompt the first time they access the specified tenant using cross-tenant synchronization, B2B collaboration, or B2B direct connect. This setting will only suppress the consent prompt if the specified tenant checks this setting for inbound access as well. [Learn more](#)

Automatically redeem invitations with the tenant Contoso.

8. Select **Save**.

Step 5: Create a configuration in the source tenant



Source tenant

1. In the source tenant, browse to **Identity > External Identities > Cross-tenant synchronization**.
2. Select **Configurations**.
3. At the top of the page, select **New configuration**.
4. Provide a name for the configuration and select **Create**.

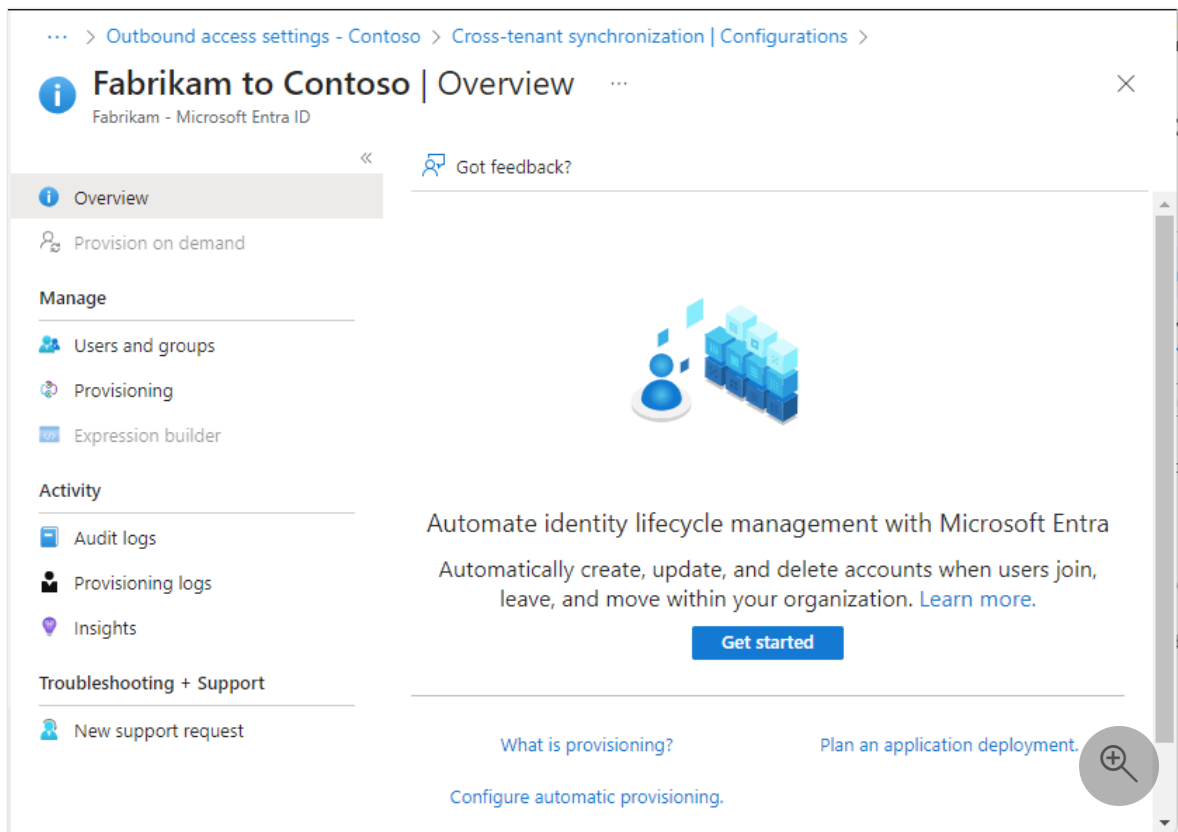
It can take up to 15 seconds for the configuration that you just created to appear in the list.

Step 6: Test the connection to the target tenant



Source tenant

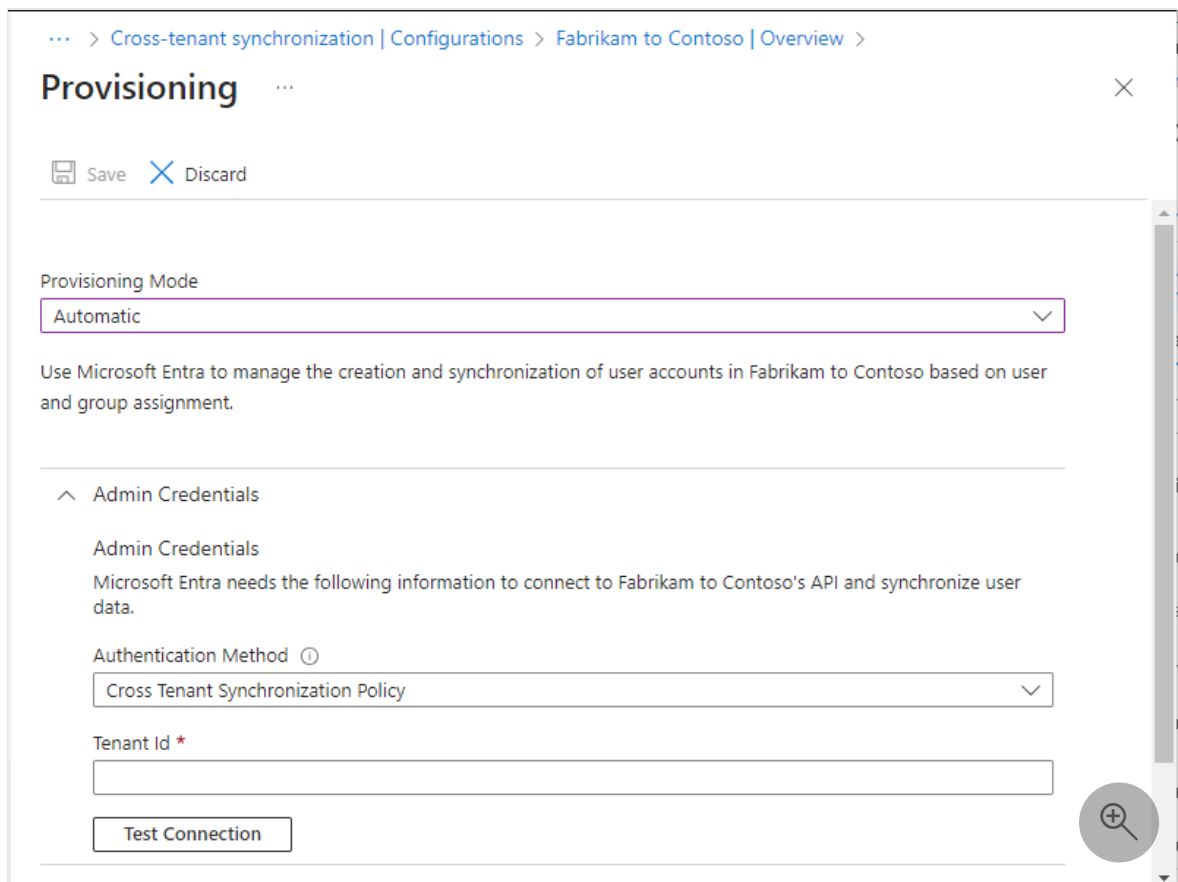
1. In the source tenant, you should see your new configuration. If not, in the configuration list, select your configuration.



2. Select **Get started**.

3. Set the **Provisioning Mode** to **Automatic**.

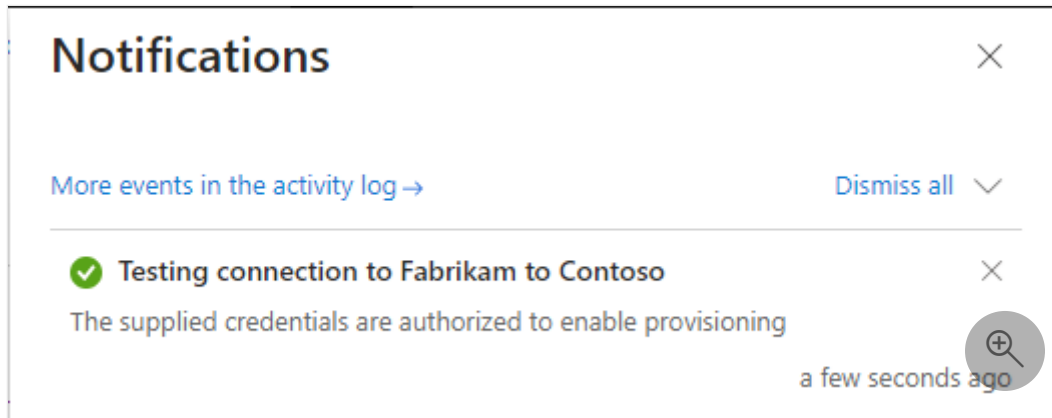
4. Under the **Admin Credentials** section, change the **Authentication Method** to **Cross Tenant Synchronization Policy**.



5. In the **Tenant Id** box, enter the tenant ID of the target tenant.

6. Select **Test Connection** to test the connection.

You should see a message that the supplied credentials are authorized to enable provisioning. If the test connection fails, see [Troubleshooting tips](#) later in this article.



7. Select **Save**.

Mappings and Settings sections appear.

8. Close the **Provisioning** page.

Step 7: Define who is in scope for provisioning



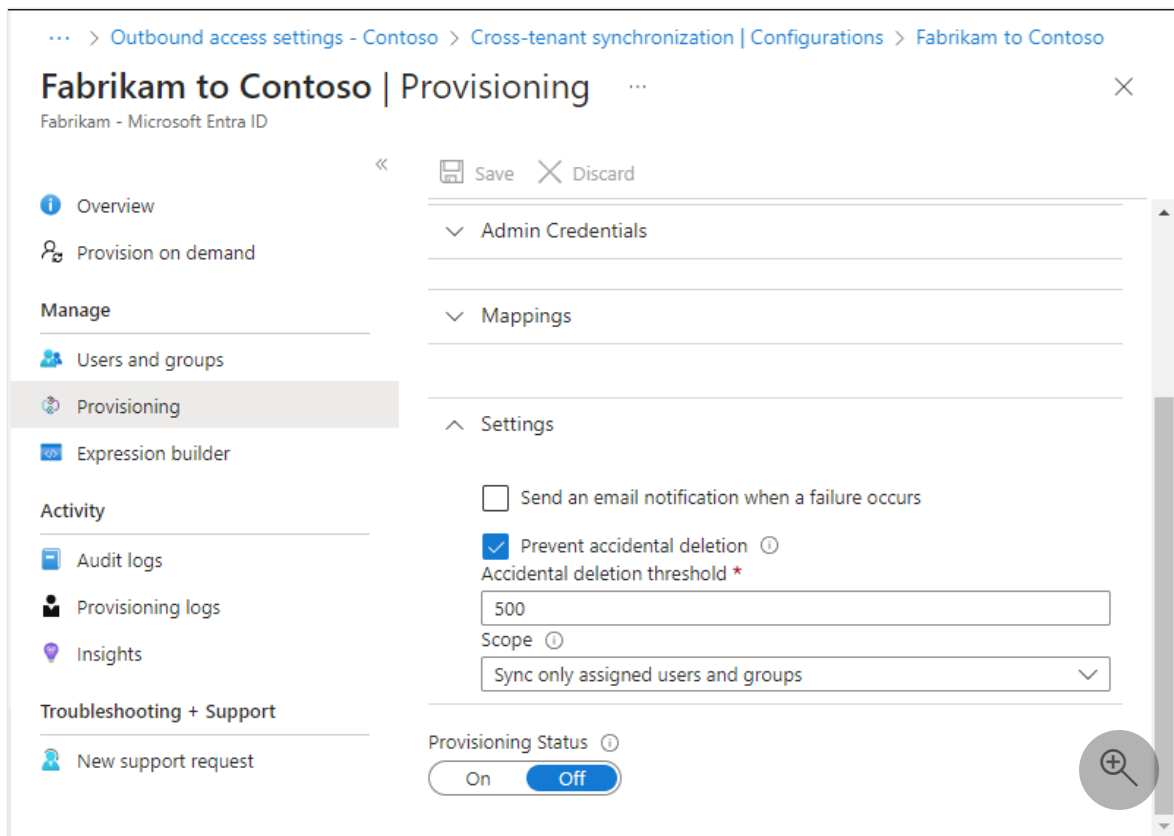
Source tenant

The Microsoft Entra provisioning service allows you to define who will be provisioned in one or both of the following ways:

- Based on assignment to the configuration
- Based on attributes of the user

Start small. Test with a small set of users before rolling out to everyone. When the scope for provisioning is set to assigned users and groups, you can control it by assigning one or two users to the configuration. You can further refine who is in scope for provisioning by creating attribute-based scoping filters, described in the [next step](#).

1. In the source tenant, select **Provisioning** and expand the **Settings** section.



2. In the **Scope** list, select whether to synchronize all users in the source tenant or only users assigned to the configuration.

It's recommended that you select **Sync only assigned users and groups** instead of **Sync all users and groups**. Reducing the number of users in scope improves performance.

3. If you made any changes, select **Save**.
4. On the configuration page, select **Users and groups**.

For cross-tenant synchronization to work, at least one internal user must be assigned to the configuration.

5. Select **Add user/group**.
6. On the **Add Assignment** page, under **Users and groups**, select **None Selected**.
7. On the **Users and groups** pane, search for and select one or more internal users or groups you want to assign to the configuration.

If you select a group to assign to the configuration, only users that are direct members in the group will be in scope for provisioning. You can select a static group or a dynamic group. The assignment doesn't cascade to nested groups.

8. Select **Select**.

9. Select Assign.

Display Name	Object Type	Role assigned
<input type="checkbox"/> US User3	User	Default Access
<input type="checkbox"/> US User1	User	Default Access
<input type="checkbox"/> GR Group1	Group	Default Access

For more information, see [Assign users and groups to an application](#).

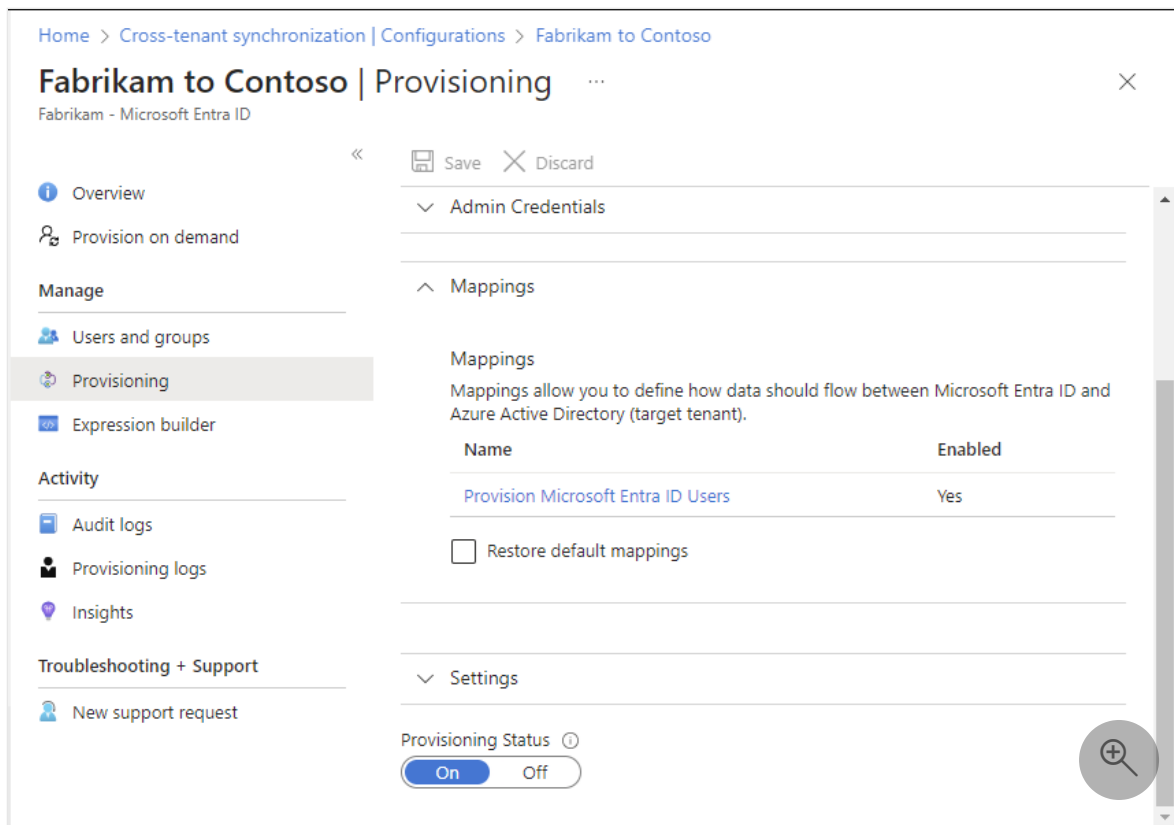
Step 8: (Optional) Define who is in scope for provisioning with scoping filters



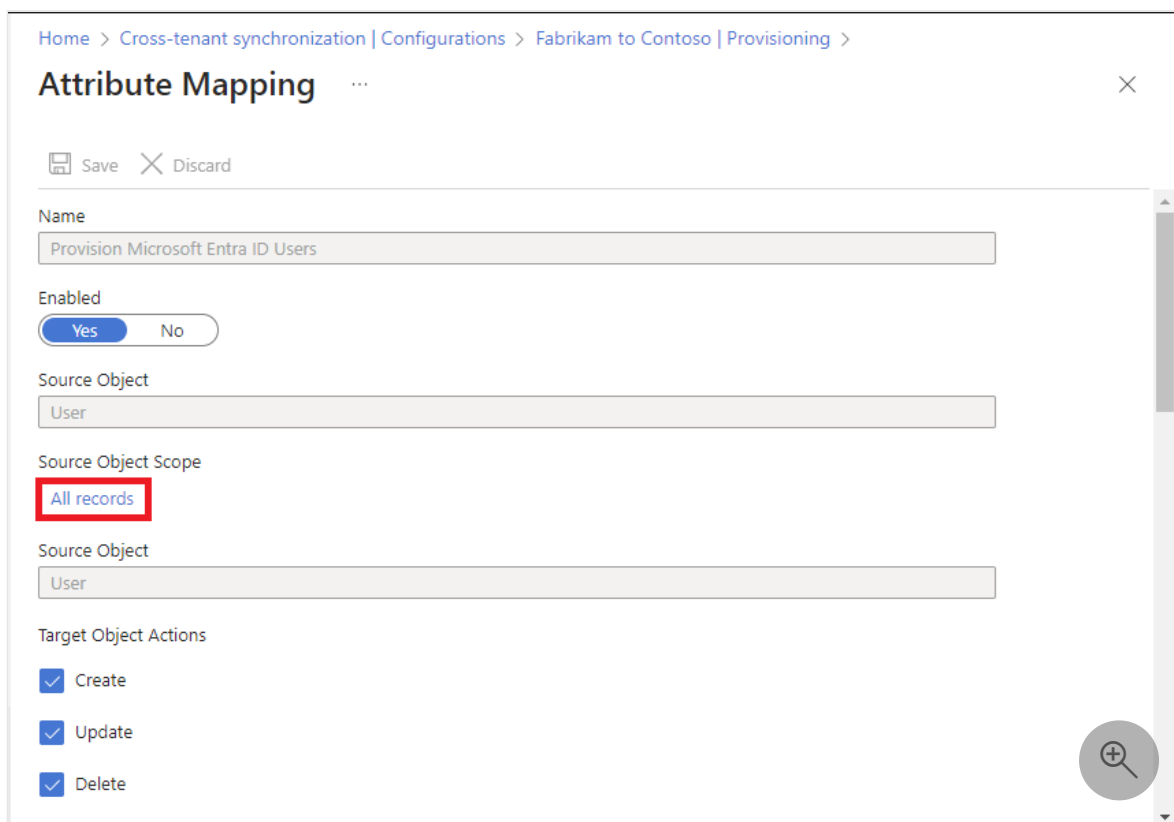
Source tenant

Regardless of the value you selected for **Scope** in the previous step, you can further limit which users are synchronized by creating attribute-based scoping filters.

1. In the source tenant, select **Provisioning** and expand the **Mappings** section.



2. Select **Provision Microsoft Entra ID Users** to open the **Attribute Mapping** page.
3. Under **Source Object Scope**, select **All records**.



4. On the **Source Object Scope** page, select **Add scoping filter**.
5. Add any scoping filters to define which users are in scope for provisioning.

To configure scoping filters, refer to the instructions provided in [Scoping users or groups to be provisioned with scoping filters](#).

... > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning >

Add Scoping Filter

Define which users are in scope for provisioning. Only objects that meet the criteria below will be synchronized.

Target Attribute	Operator	Value	Add/Remove
No scoping filters found			
department	EQUALS	Marketing	Add New Scoping Clause

Scoping Filter Title *

Marketing department filter

i If multiple scoping clauses are present, they are evaluated using "AND" logic.

Ok

6. Select **Ok** and **Save** to save any changes.

If you added a filter, you'll see a message that saving your changes will result in all assigned users and groups being resynchronized. This may take a long time depending on the size of your directory.

7. Select **Yes** and close the **Attribute Mapping** page.

Step 9: Review attribute mappings



Source tenant

Attribute mappings allow you to define how data should flow between the source tenant and target tenant. For information on how to customize the default attribute mappings, see [Tutorial - Customize user provisioning attribute-mappings for SaaS applications in Microsoft Entra ID](#).

1. In the source tenant, select **Provisioning** and expand the **Mappings** section.
2. Select **Provision Microsoft Entra ID Users**.
3. On the **Attribute Mapping** page, scroll down to review the user attributes that are synchronized between tenants in the **Attribute Mappings** section.

The first attribute, `alternativeSecurityIdentifier`, is an internal attribute used to uniquely identify the user across tenants, match users in the source tenant with existing users in the target tenant, and ensure that each user only has one account. The matching attribute cannot be changed. Attempting to change the matching attribute or adding additional matching attributes will result in a `schemaInvalid` error.

... > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning >

Attribute Mapping

Save Discard

Attribute Mappings

Attribute mappings define how attributes are synchronized between Azure Active Directory and Azure Active Directory (target tenant)

Azure Active Directory Attribute	Azure Active Directory (target tenant) Attribute	Matching precedence	Remove
AltSecIdFromNetId([netid])	alternativeSecurityIds	1	Delete
IsSoftDeleted	IsSoftDeleted		Delete
accountEnabled	accountEnabled		Delete
streetAddress	streetAddress		Delete
city	city		Delete
state	state		Delete
postalCode	postalCode		Delete
country	country		Delete
department	department		Delete
employeeId	employeeId		Delete
displayName	displayName		Delete
givenName	givenName		Delete

4. Select the **Member** (`userType`) attribute to open the **Edit Attribute** page.
5. Review the **Constant Value** setting for the `userType` attribute.

This setting defines the type of user that will be created in the target tenant and can be one of the values in the following table. By default, users will be created as external member (B2B collaboration users). For more information, see [Properties of a Microsoft Entra B2B collaboration user](#).

 Expand table

Constant Value	Description
Member	Default. Users will be created as external member (B2B collaboration users) in the target tenant. Users will be able to function as any internal member of the target tenant.
Guest	Users will be created as external guests (B2B collaboration users) in the target tenant.

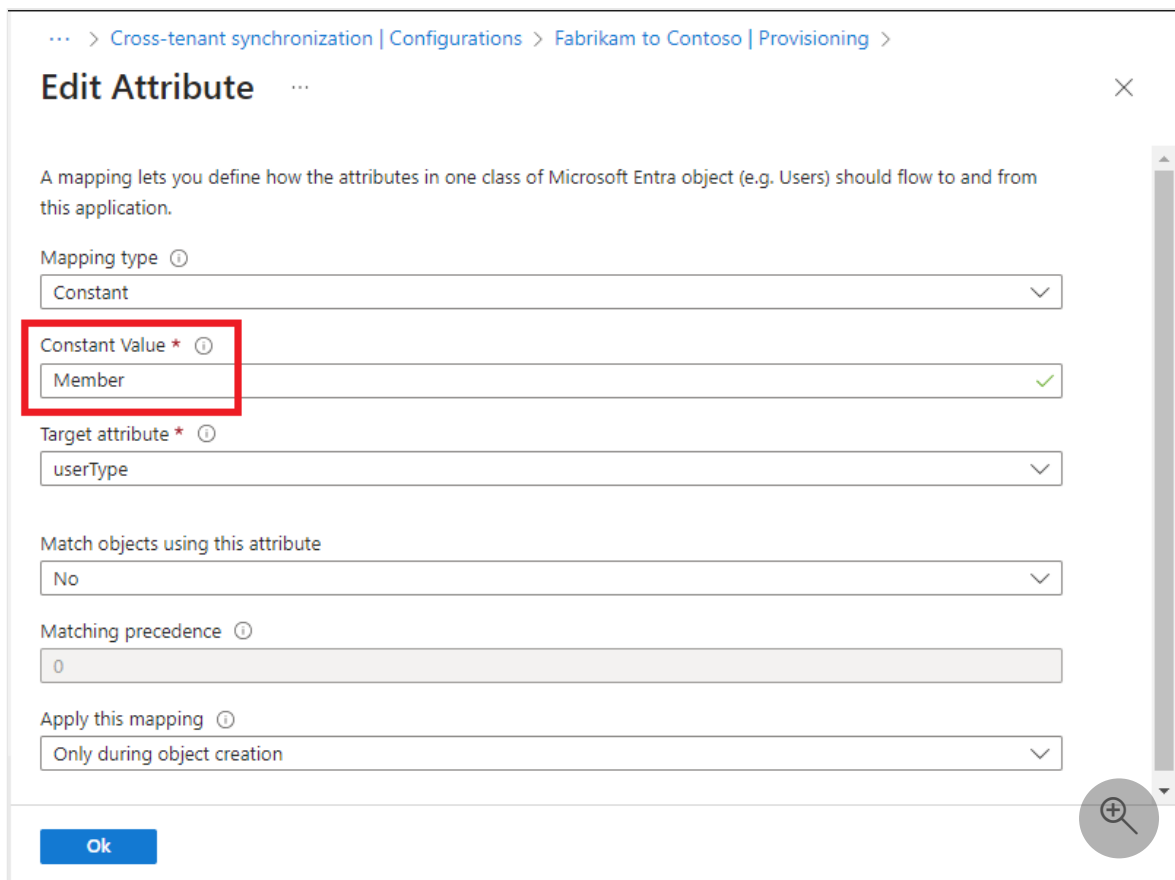
ⓘ Note

If the B2B user already exists in the target tenant then **Member (userType)** will not be changed to **Member**, unless the **Apply this mapping** setting is set to **Always**.

The user type you choose has the following limitations for apps or services (but aren't limited to):

 Expand table

App or service	Limitations
Power BI	- Support for UserType Member in Power BI is currently in preview. For more information, see Distribute Power BI content to external guest users with Microsoft Entra B2B .
Azure Virtual Desktop	- External member and external guest aren't supported in Azure Virtual Desktop.



... > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning >

Edit Attribute

A mapping lets you define how the attributes in one class of Microsoft Entra object (e.g. Users) should flow to and from this application.

Mapping type ⓘ
Constant

Constant Value * ⓘ
Member

Target attribute * ⓘ
userType

Match objects using this attribute
No

Matching precedence ⓘ
0

Apply this mapping ⓘ
Only during object creation

Ok

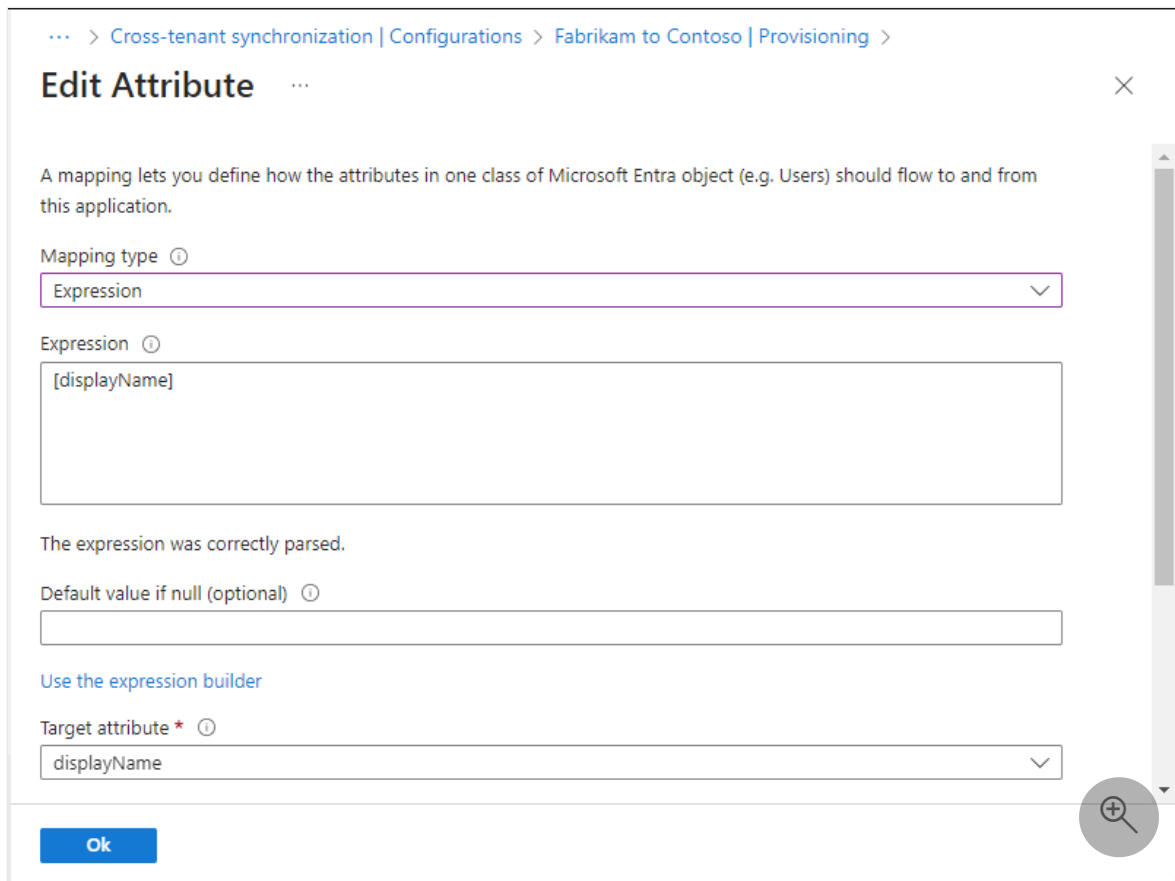
6. If you want to define any transformations, on the **Attribute Mapping** page, select the attribute you want to transform, such as **displayName**.

7. Set the **Mapping type** to **Expression**.

8. In the **Expression** box, enter the transformation expression. For example with the display name, you can do the following:

- Flip the first name and last name and add a comma in between.
- Add the domain name in parentheses at the end of the display name.

For examples, see [Reference for writing expressions for attribute mappings in Microsoft Entra ID](#).



... > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning >

Edit Attribute

A mapping lets you define how the attributes in one class of Microsoft Entra object (e.g. Users) should flow to and from this application.

Mapping type ⓘ
Expression

Expression ⓘ
[displayName]

The expression was correctly parsed.

Default value if null (optional) ⓘ

[Use the expression builder](#)

Target attribute * ⓘ
displayName

Ok

💡 Tip

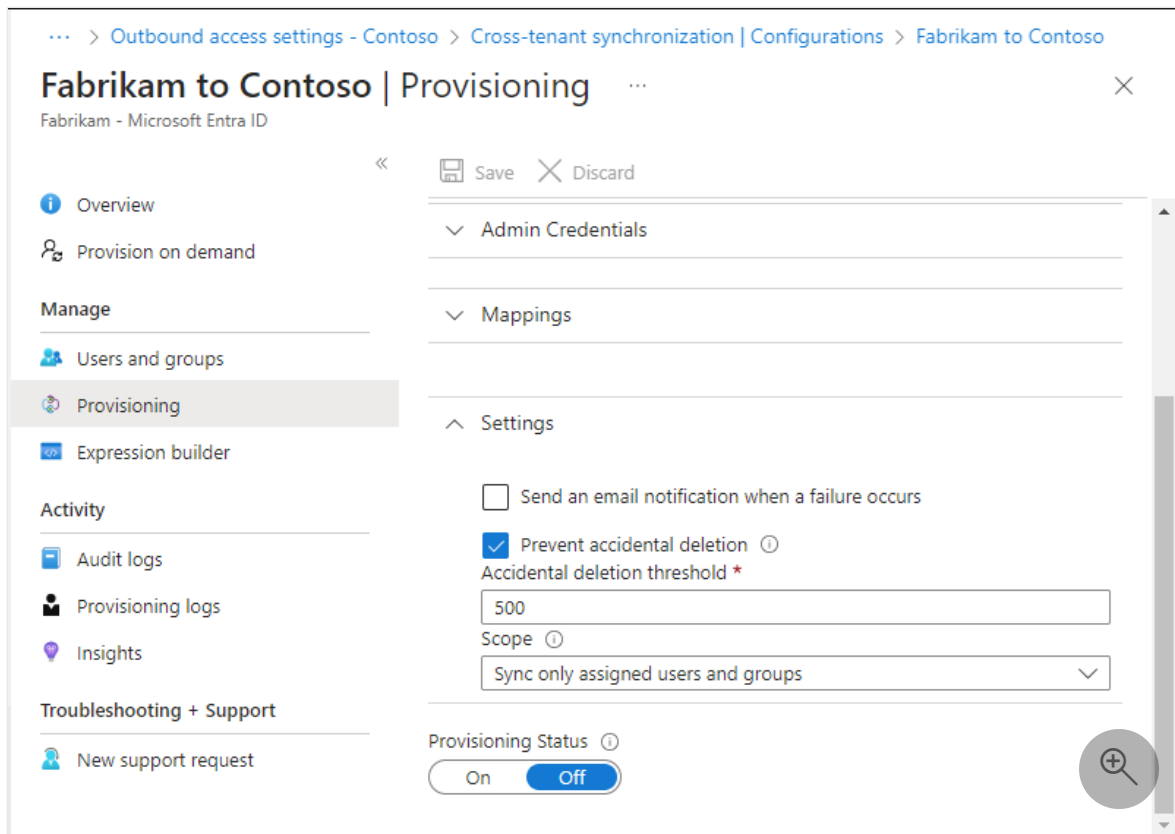
You can map directory extensions by updating the schema of the cross-tenant synchronization. For more information, see [Map directory extensions in cross-tenant synchronization](#).

Step 10: Specify additional provisioning settings



Source tenant

1. In the source tenant, select **Provisioning** and expand the **Settings** section.



2. Check the **Send an email notification when a failure occurs** check box.
3. In the **Notification Email** box, enter the email address of a person or group who should receive provisioning error notifications.

Email notifications are sent within 24 hours of the job entering quarantine state. For custom alerts, see [Understand how provisioning integrates with Azure Monitor logs](#).

4. To prevent accidental deletion, select **Prevent accidental deletion** and specify a threshold value. By default, the threshold is set to 500.

For more information, see [Enable accidental deletions prevention in the Microsoft Entra provisioning service](#).

5. Select **Save** to save any changes.

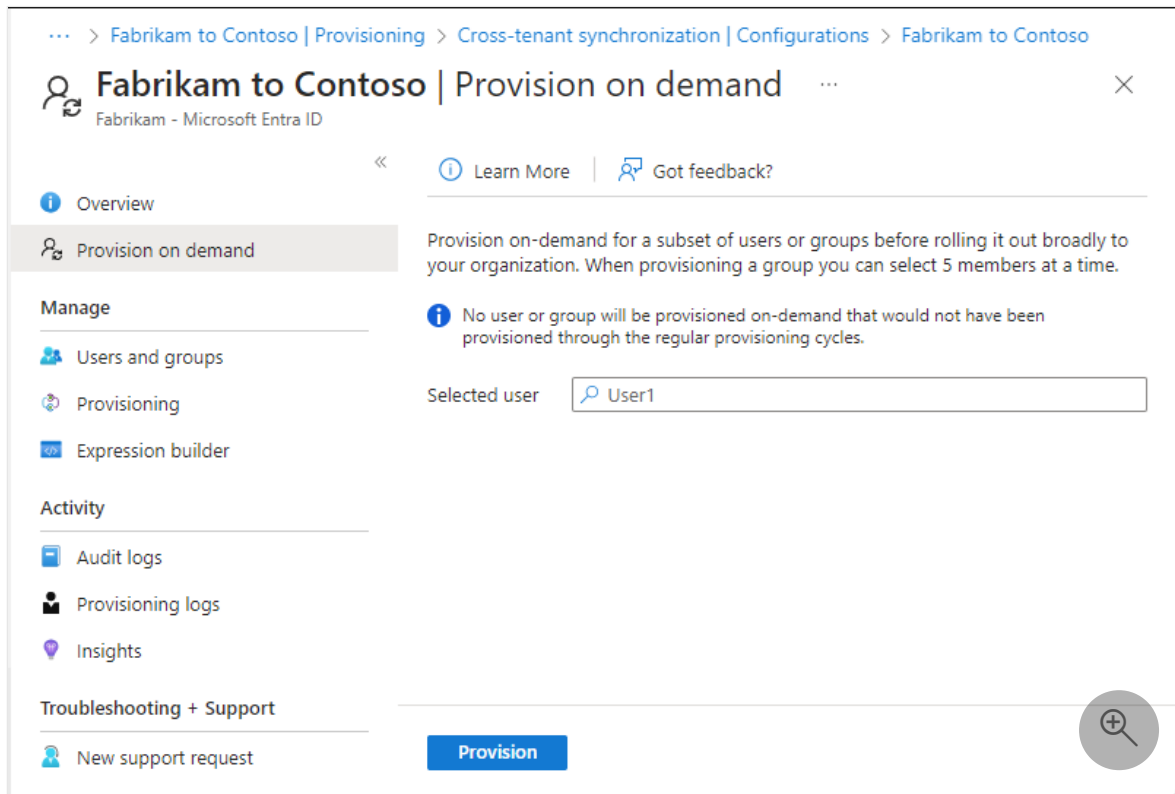
Step 11: Test provision on demand



Source tenant

Now that you have a configuration, you can test on-demand provisioning with one of your users.

1. In the source tenant, browse to **Identity** > **External Identities** > **Cross-tenant synchronization**.
2. Select **Configurations** and then select your configuration.
3. Select **Provision on demand**.
4. In the **Select a user or group** box, search for and select one of your test users.



5. Select **Provision**.

After a few moments, the **Perform action** page appears with information about the provisioning of the test user in the target tenant.

Perform action ×

Modified attributes (successful) Data flow

User 'user1@fabrikam.com' was created in Azure Active Directory (target tenant)

Target attribute name	Source attribute value	Expression	Original target attribute v...	Modified target attribute value
IsSoftDeleted	False	[IsSoftDeleted]		False
accountEnabled	True	[accountEnabled]		True
displayName	User1	[displayName]		User1
mailNickname	user1	[mailNickname]		user1
alternativeSecurityIds	AltSecIdFromNetid("1003...	AltSecIdFromNetid([netid])		(1 values)
showInAddressList	"true"	"true"		true
userType	"Member"	"Member"		Member
preferredLanguage	undefined	[preferredLanguage]		en-US

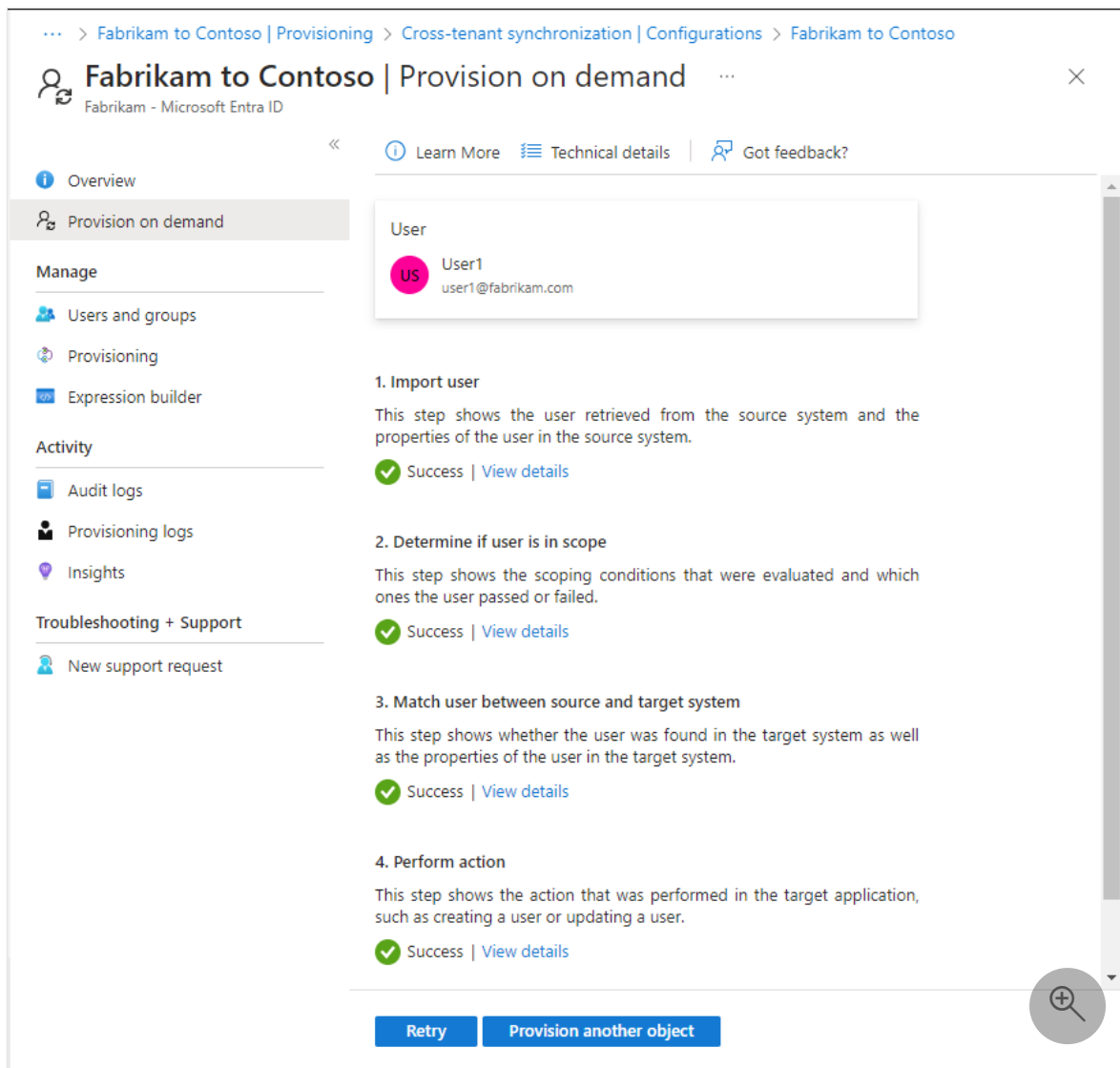
If the user isn't in scope, you'll see a page with information about why test user was skipped.

Determine if user is in scope ×

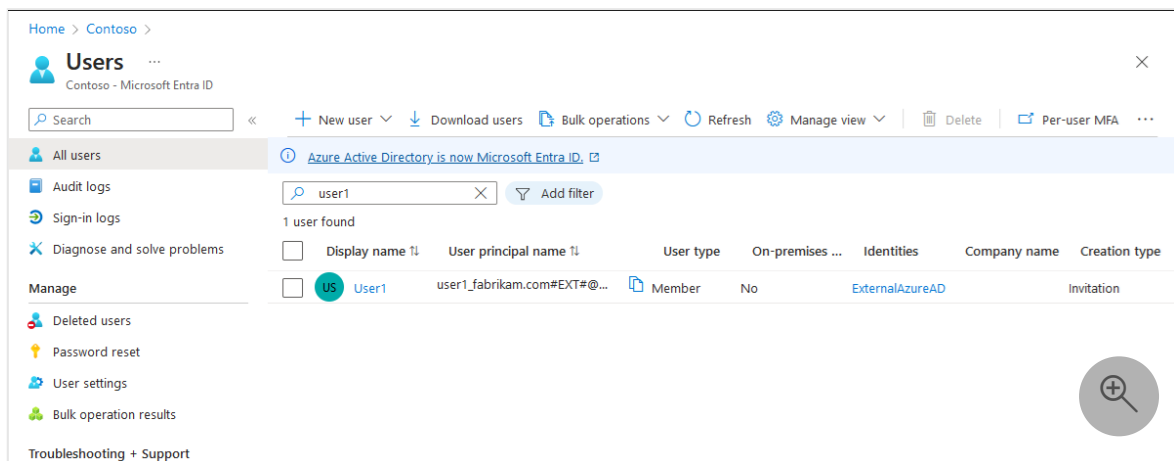
The User 'alice@fabrikam.com' will be skipped due to the following reasons: 1) This object is not assigned to the application. If you did not expect the object to be skipped, assign the object to the application or change your scoping filter to allow all users and groups to be in scope for provisioning. 2) This object does not have required entitlement for provisioning. If you did not expect the object to be skipped, update provisioning scope to 'Sync all users and groups' or assign the object to the application with entitlement of provisioning category

Attribute name	Attribute value
SkipReason	NotEffectivelyEntitled
IsActive	True
Assigned to the application	False
IsInProvisioningScope	True

On the **Provision on demand** page, you can view details about the provision and have the option to retry.



6. In the target tenant, verify that the test user was provisioned.



7. If all is working as expected, assign additional users to the configuration.

For more information, see [On-demand provisioning in Microsoft Entra ID](#).

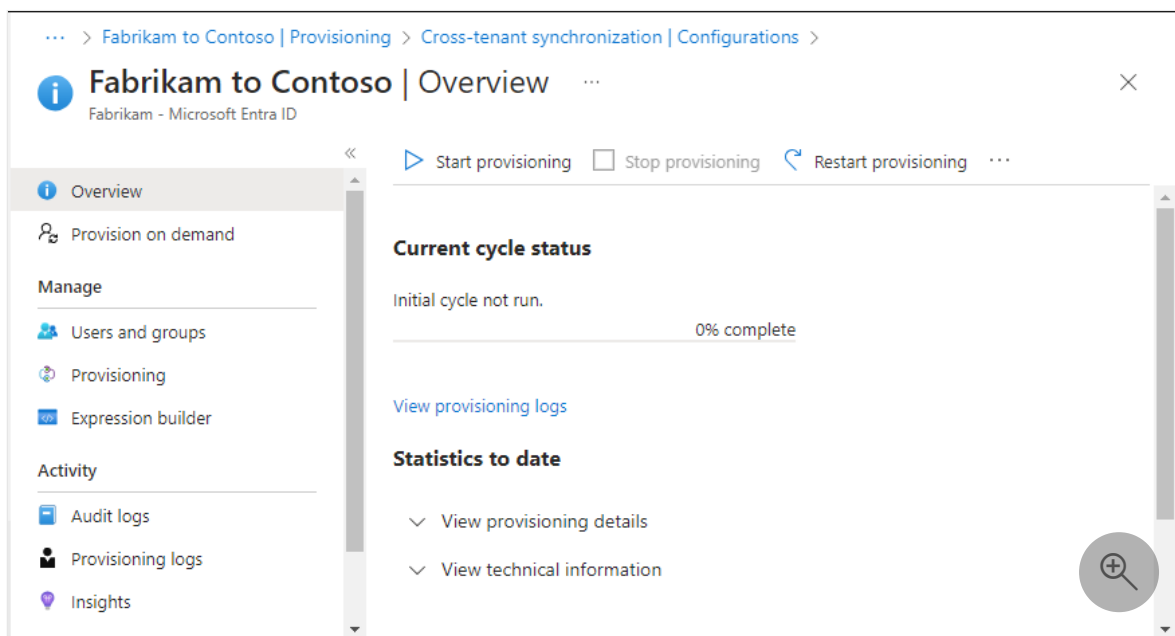
Step 12: Start the provisioning job



Source tenant

The provisioning job starts the initial synchronization cycle of all users defined in **Scope** of the **Settings** section. The initial cycle takes longer to perform than subsequent cycles, which occur approximately every 40 minutes as long as the Microsoft Entra provisioning service is running.

1. In the source tenant, browse to **Identity** > **External Identities** > **Cross-tenant synchronization**.
2. Select **Configurations** and then select your configuration.
3. On the **Overview** page, review the provisioning details.



4. Select **Start provisioning** to start the provisioning job.

Step 13: Monitor provisioning

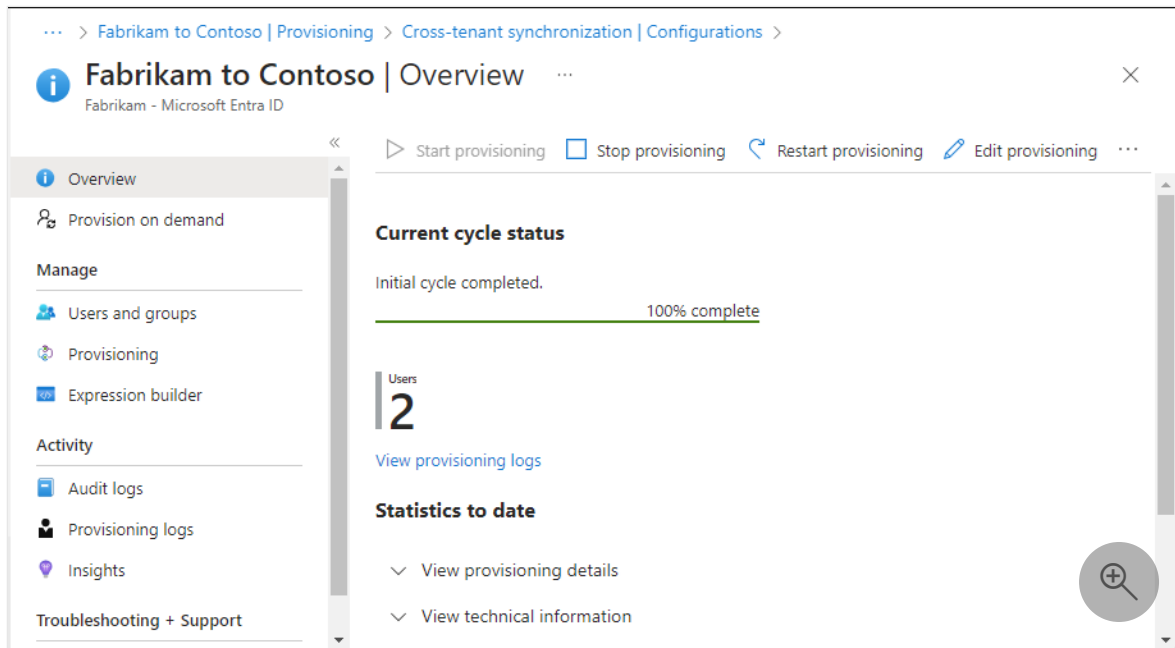


Source and target tenants

Once you've started a provisioning job, you can monitor the status.

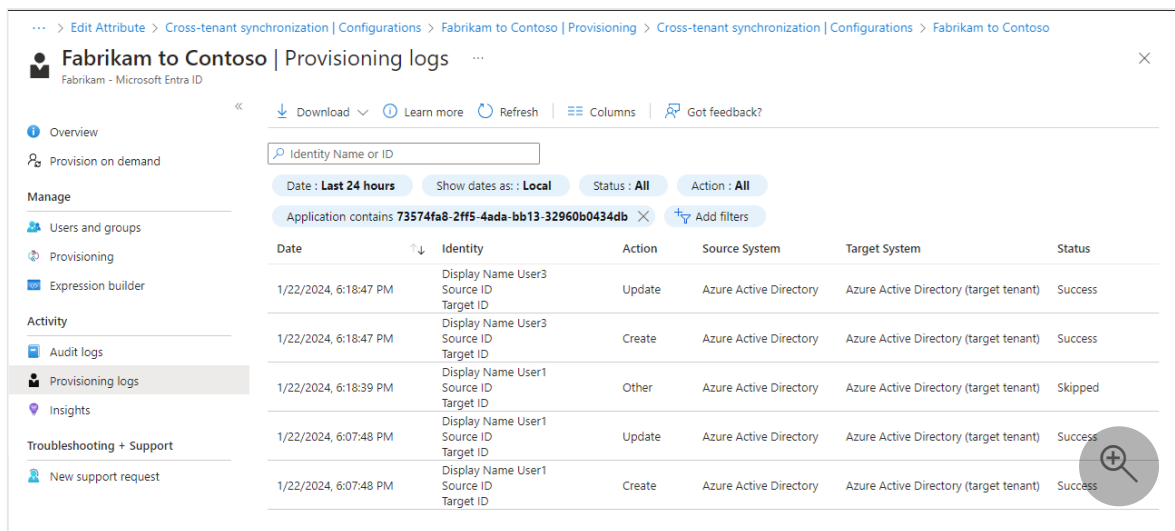
1. In the source tenant, on the **Overview** page, check the progress bar to see the status of the provisioning cycle and how close it's to completion. For more information, see [Check the status of user provisioning](#).

If provisioning seems to be in an unhealthy state, the configuration will go into quarantine. For more information, see [Application provisioning in quarantine status](#).



The screenshot shows the 'Fabrikam to Contoso | Overview' page in Microsoft Entra ID. The breadcrumb trail is: > Fabrikam to Contoso | Provisioning > Cross-tenant synchronization | Configurations >. The page title is 'Fabrikam to Contoso | Overview' with a sub-header 'Fabrikam - Microsoft Entra ID'. The left navigation pane includes: Overview (selected), Provision on demand, Manage (Users and groups, Provisioning, Expression builder), Activity (Audit logs, Provisioning logs, Insights), and Troubleshooting + Support. The main content area has controls for 'Start provisioning', 'Stop provisioning', 'Restart provisioning', and 'Edit provisioning'. The 'Current cycle status' section shows 'Initial cycle completed.' with a green progress bar at '100% complete'. Below this, a 'Users' count of '2' is displayed. A 'View provisioning logs' link is present. The 'Statistics to date' section has expandable options for 'View provisioning details' and 'View technical information'.

2. Select **Provisioning logs** to determine which users have been provisioned successfully or unsuccessfully. By default, the logs are filtered by the service principal ID of the configuration. For more information, see [Provisioning logs in Microsoft Entra ID](#).



The screenshot shows the 'Fabrikam to Contoso | Provisioning logs' page. The breadcrumb trail is: > Edit Attribute > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning > Cross-tenant synchronization | Configurations > Fabrikam to Contoso. The page title is 'Fabrikam to Contoso | Provisioning logs' with a sub-header 'Fabrikam - Microsoft Entra ID'. The left navigation pane includes: Overview, Provision on demand, Manage (Users and groups, Provisioning, Expression builder), Activity (Audit logs, Provisioning logs (selected), Insights), and Troubleshooting + Support (New support request). The main content area has controls for 'Download', 'Learn more', 'Refresh', 'Columns', and 'Got feedback?'. There is a search box for 'Identity Name or ID'. Filter buttons include 'Date: Last 24 hours', 'Show dates as: Local', 'Status: All', and 'Action: All'. A filter for 'Application contains 73574fa8-2ff5-4ada-bb13-32960b0434db' is also visible. The table below shows the following data:

Date	Identity	Action	Source System	Target System	Status
1/22/2024, 6:18:47 PM	Display Name User3 Source ID Target ID	Update	Azure Active Directory	Azure Active Directory (target tenant)	Success
1/22/2024, 6:18:47 PM	Display Name User3 Source ID Target ID	Create	Azure Active Directory	Azure Active Directory (target tenant)	Success
1/22/2024, 6:18:39 PM	Display Name User1 Source ID Target ID	Other	Azure Active Directory	Azure Active Directory (target tenant)	Skipped
1/22/2024, 6:07:48 PM	Display Name User1 Source ID Target ID	Update	Azure Active Directory	Azure Active Directory (target tenant)	Success
1/22/2024, 6:07:48 PM	Display Name User1 Source ID Target ID	Create	Azure Active Directory	Azure Active Directory (target tenant)	Success

3. Select **Audit logs** to view all logged events in Microsoft Entra ID. For more information, see [Audit logs in Microsoft Entra ID](#).

The screenshot shows the 'Audit logs' page for 'Fabrikam to Contoso' in the Microsoft Entra ID console. The page includes a navigation pane on the left with options like Overview, Provisioning on demand, Manage, Users and groups, Provisioning, Expression builder, Activity, Audit logs (selected), Provisioning logs, Insights, Troubleshooting + Support, and New support request. The main content area displays a table of audit events with columns for Date, Service, Category, Activity, Status, Status reason, Target(s), and Initiated by (actor). A search bar and filter options are visible at the top of the table.

Date	Service	Category	Activity	Status	Status reason	Target(s)	Initiated by (actor)
1/22/2024, 6:18:47 PM	Account Provisioning	ProvisioningManagement	Export	Success	User 'user3@fabrika...	Fabrikam to Contoso, user3...	Azure AD Cloud Sync
1/22/2024, 6:18:39 PM	Account Provisioning	ProvisioningManagement	Synchronization rule action	Success	The state of the entr...	Fabrikam to Contoso, user1...	Azure AD Cloud Sync
1/22/2024, 6:18:39 PM	Account Provisioning	ProvisioningManagement	Synchronization rule action	Success	The state of the entr...	Fabrikam to Contoso, user1...	Azure AD Cloud Sync
1/22/2024, 6:18:39 PM	Account Provisioning	ProvisioningManagement	Import	Success	No User with 'alterna...	Fabrikam to Contoso, [Type...	Azure AD Cloud Sync
1/22/2024, 6:18:39 PM	Account Provisioning	ProvisioningManagement	Import	Success	Retrieved 'user1@fab...	Fabrikam to Contoso, user1...	Azure AD Cloud Sync
1/22/2024, 6:18:39 PM	Account Provisioning	ProvisioningManagement	Other	Success	A target entry in Azu...	Fabrikam to Contoso, user1...	Azure AD Cloud Sync
1/22/2024, 6:18:38 PM	Account Provisioning	ProvisioningManagement	Import	Success	Received User 'user1...	Fabrikam to Contoso, user1...	Azure AD Cloud Sync
1/22/2024, 6:18:38 PM	Account Provisioning	ProvisioningManagement	Import	Success	Received User 'user3...	Fabrikam to Contoso, user3...	Azure AD Cloud Sync
1/22/2024, 6:18:38 PM	Account Provisioning	ProvisioningManagement	Other	Success	This app role assign...	Fabrikam to Contoso	Azure AD Cloud Sync

You can also view audit logs in the target tenant.

4. In the target tenant, select **Users > Audit logs** to view logged events for user management.

The screenshot shows the 'Users | Audit logs' page in the target tenant. The navigation pane on the left includes options like All users, Audit logs (selected), Sign-in logs, Diagnose and solve problems, Manage, Deleted users, Password reset, User settings, Bulk operation results, and Troubleshooting + Support. The main content area displays a table of audit events with columns for Date, Service, Category, Activity, Status, Status reason, Target(s), and Initiated by (actor). A search bar and filter options are visible at the top of the table.

Date	Service	Category	Activity	Status	Status reason	Target(s)	Initiated by (actor)
1/22/2024, 6:24:19 PM	Core Directory	UserManagement	Update user	Success		user3_fabrikam.com...	Microsoft Substrate Management
1/22/2024, 6:18:47 PM	Core Directory	UserManagement	Update user	Success		user3_fabrikam.com...	Microsoft.Azure.SyncFabric
1/22/2024, 6:18:47 PM	Invited Users	UserManagement	Redeem external user invite	Success		UPN: user3_fabrika...	unknown
1/22/2024, 6:18:47 PM	Invited Users	UserManagement	Redeem external user invite	Success			
1/22/2024, 6:18:47 PM	Core Directory	UserManagement	Update user	Success		user3_fabrikam.com...	Microsoft B2B Admin Worke...
1/22/2024, 6:18:44 PM	Invited Users	UserManagement	Invite external user	Success		user3	Microsoft.Azure.SyncFabric
1/22/2024, 6:18:44 PM	Core Directory	UserManagement	Add user	Success		user3_fabrikam.com...	Microsoft B2B Admin Worke...

Step 14: Configure leave settings



Target tenant

Even though users are being provisioned in the target tenant, they still might be able to remove themselves. If users remove themselves and they are in scope, they'll be provisioned again during the next provisioning cycle. If you want to disallow the ability for users to remove themselves from your organization, you must configure the **External user leave settings**.

1. In the target tenant, browse to **Identity > External Identities > External collaboration settings**.
2. Under **External user leave settings**, choose whether to allow external users to leave your organization themselves.

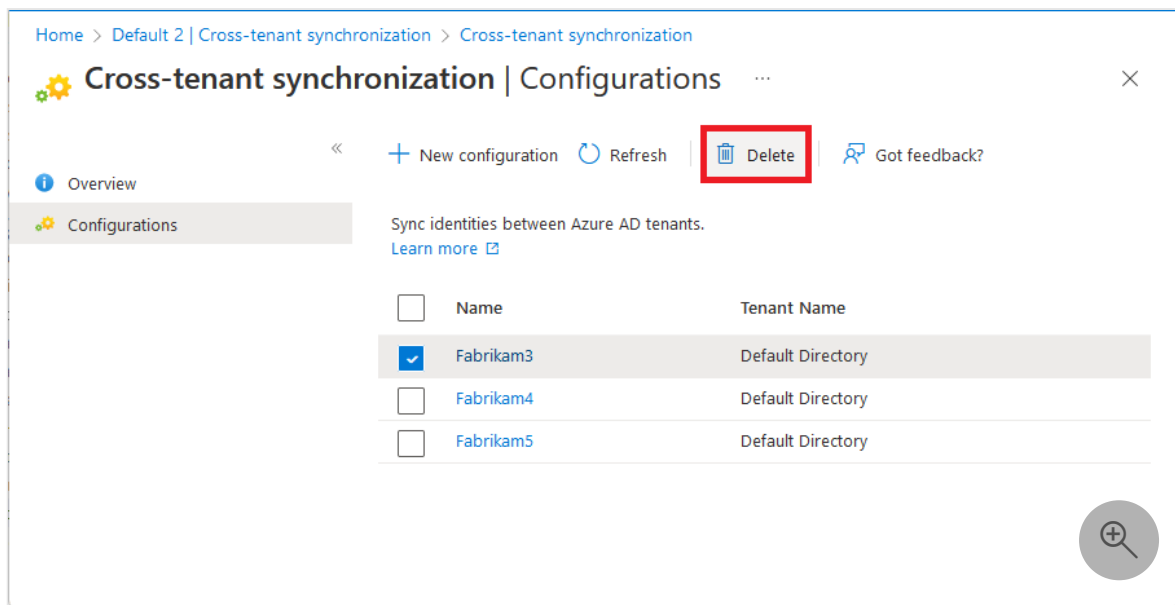
This setting also applies to B2B collaboration and B2B direct connect, so if you set **External user leave settings** to **No**, B2B collaboration users and B2B direct connect users can't leave your organization themselves. For more information, see [Leave an organization as an external user](#).

Troubleshooting tips

Delete a configuration

Follows these steps to delete a configuration on the **Configurations** page.

1. In the source tenant, browse to **Identity** > **External Identities** > **Cross-tenant synchronization**.
2. On the **Configurations** page, add a check mark next to the configuration you want to delete.
3. Select **Delete** and then **OK** to delete the configuration.



Symptom - Test connection fails with AzureDirectoryB2BManagementPolicyCheckFailure

When configuring cross-tenant synchronization in the source tenant and you test the connection, it fails with the following error message:

```
You appear to have entered invalid credentials. Please confirm you are using the correct information for an administrative account.
```

Error code: AzureDirectoryB2BManagementPolicyCheckFailure
Details: Policy permitting auto-redemption of invitations not configured.

Notifications ✕

[More events in the activity log →](#) [Dismiss all](#) ∨

! **Testing connection to Fabrikam** ✕

You appear to have entered invalid credentials. Please confirm you are using the correct information for an administrative account.

Error code: AzureDirectoryB2BManagementPolicyCheckFailure
Details: Policy permitting auto-redemption of invitations not configured.
Request-id:

16 minutes ago +

Cause

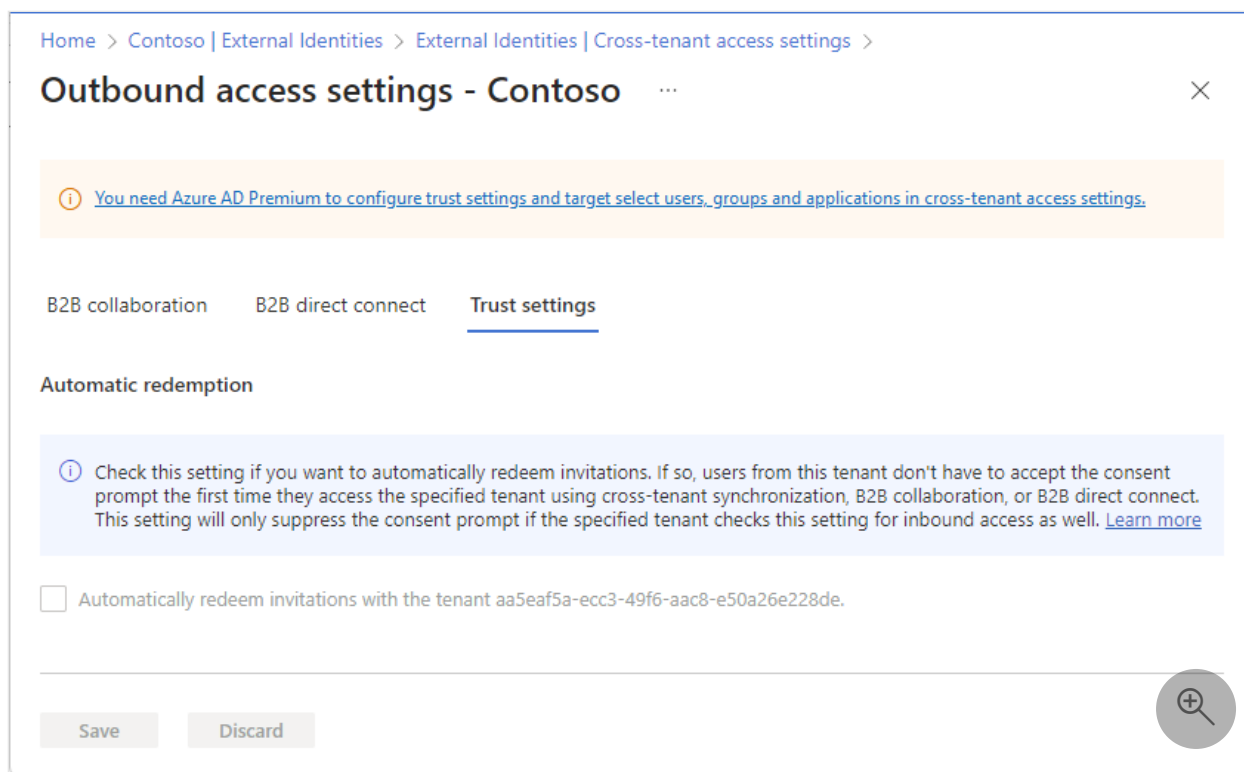
This error indicates the policy to automatically redeem invitations in both the source and target tenants wasn't set up.

Solution

Follow the steps in [Step 3: Automatically redeem invitations in the target tenant](#) and [Step 4: Automatically redeem invitations in the source tenant](#).

Symptom - Automatic redemption check box is disabled

When configuring cross-tenant synchronization, the **Automatic redemption** check box is disabled.



Cause

Your tenant doesn't have a Microsoft Entra ID P1 or P2 license.

Solution

You must have Microsoft Entra ID P1 or P2 to configure trust settings.

Symptom - Recently deleted user in the target tenant is not restored

After soft deleting a synchronized user in the target tenant, the user isn't restored during the next synchronization cycle. If you try to soft delete a user with on-demand provisioning and then restore the user, it can result in duplicate users.

Cause

Restoring a previously soft-deleted user in the target tenant isn't supported.

Solution

Manually restore the soft-deleted user in the target tenant. For more information, see [Restore or remove a recently deleted user using Microsoft Entra ID](#).

Symptom - Users are skipped because SMS sign-in is enabled on the user

Users are skipped from synchronization. The scoping step includes the following filter with status false: "Filter external users.alternativeSecurityIds EQUALS 'None'"

Cause

If SMS sign-in is enabled for a user, they will be skipped by the provisioning service.

Solution

Disable SMS Sign-in for the users. The script below shows how you can disable SMS Sign-in using PowerShell.

PowerShell

```
##### Disable SMS Sign-in options for the users

#### Import module
Install-Module Microsoft.Graph.Users.Actions
Install-Module Microsoft.Graph.Identity.SignIns
Import-Module Microsoft.Graph.Users.Actions

Connect-MgGraph -Scopes "User.Read.All", "Group.ReadWrite.All",
"UserAuthenticationMethod.Read.All", "UserAuthenticationMethod.ReadWrite", "UserAuthenticationMethod.ReadWrite.All"

##### The value for phoneAuthenticationMethodId is 3179e48a-750b-4051-897c-87b9720928f7

$phoneAuthenticationMethodId = "3179e48a-750b-4051-897c-87b9720928f7"

#### Get the User Details

$userId = "objectid_of_the_user_in_Azure_AD"

#### validate the value for SmsSignInState

$smssignin = Get-MgUserAuthenticationPhoneMethod -UserId $userId

{
    if($smssignin.SmsSignInState -eq "ready"){
        #### Disable Sms Sign-In for the user is set to ready

        Disable-MgUserAuthenticationPhoneMethodSmsSignIn -UserId $userId -
        PhoneAuthenticationMethodId $phoneAuthenticationMethodId
        Write-Host "SMS sign-in disabled for the user" -ForegroundColor Green
    }
    else{
        Write-Host "SMS sign-in status not set or found for the user " -
        ForegroundColor Yellow
    }
}
}
```



```
##### End the script
```

Symptom - Users fail to provision with error "AzureActiveDirectoryForbidden"

Users in scope fail to provision. The provisioning logs details include the following error message:

```
Guest invitations not allowed for your company. Contact your company administrator for more details.
```

Cause

This error indicates the Guest invite settings in the target tenant are configured with the most restrictive setting: "No one in the organization can invite guest users including admins (most restrictive)".

Solution

Change the Guest invite settings in the target tenant to a less restrictive setting. For more information, see [Configure external collaboration settings](#).

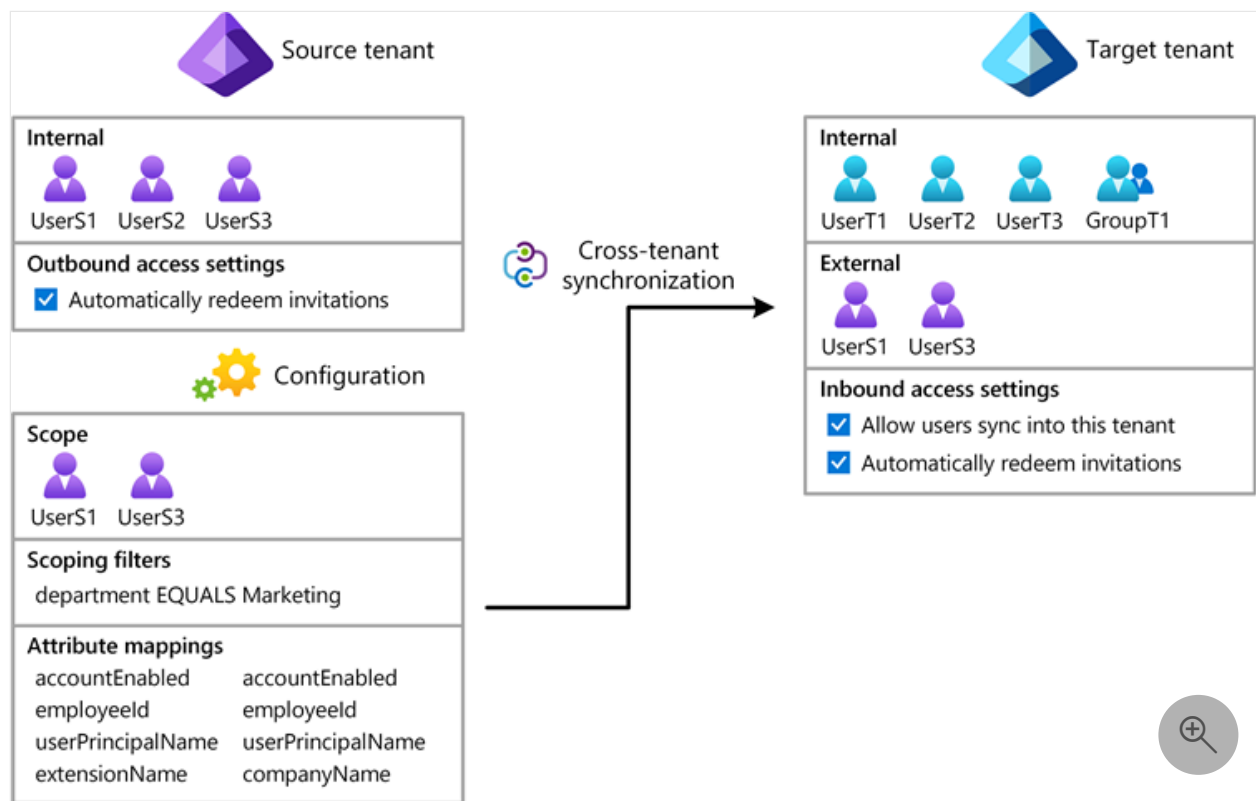
Next steps

- [Tutorial: Reporting on automatic user account provisioning](#)
- [Managing user account provisioning for enterprise apps in the Azure portal](#)
- [What is single sign-on in Microsoft Entra ID?](#)

Configure cross-tenant synchronization using PowerShell or Microsoft Graph API

Article • 04/23/2024

This article describes the key steps to configure cross-tenant synchronization using Microsoft Graph PowerShell or Microsoft Graph API. When configured, Microsoft Entra ID automatically provisions and de-provisions B2B users in your target tenant. For detailed steps using the Microsoft Entra admin center, see [Configure cross-tenant synchronization](#).



Prerequisites



Source tenant

- Microsoft Entra ID P1 or P2 license. For more information, see [License requirements](#).
- [Security Administrator](#) role to configure cross-tenant access settings.
- [Hybrid Identity Administrator](#) role to configure cross-tenant synchronization.

- [Cloud Application Administrator](#) or [Application Administrator](#) role to assign users to a configuration and to delete a configuration.
- [Global Administrator](#) role to consent to required permissions.



Target tenant

- Microsoft Entra ID P1 or P2 license. For more information, see [License requirements](#).
- [Security Administrator](#) role to configure cross-tenant access settings.
- [Global Administrator](#) role to consent to required permissions.

Step 1: Sign in to the target tenant



Target tenant

PowerShell

1. Start PowerShell.
2. If necessary, install the [Microsoft Graph PowerShell SDK](#).
3. Get the tenant ID of the source and target tenants and initialize variables.

PowerShell

```
$SourceTenantId = "<SourceTenantId>"  
$TargetTenantId = "<TargetTenantId>"
```

4. Use the [Connect-MgGraph](#) command to sign in to the target tenant and consent to the following required permissions.

- `Policy.Read.All`
- `Policy.ReadWrite.CrossTenantAccess`

PowerShell

```
Connect-MgGraph -TenantId $TargetTenantId -Scopes  
"Policy.Read.All", "Policy.ReadWrite.CrossTenantAccess"
```

Step 2: Enable user synchronization in the target tenant



Target tenant

PowerShell

1. In the target tenant, use the [New-MgPolicyCrossTenantAccessPolicyPartner](#) command to create a new partner configuration in a cross-tenant access policy between the target tenant and the source tenant. Use the source tenant ID in the request.

If you get the error `New-MgPolicyCrossTenantAccessPolicyPartner_Create: Another object with the same value for property tenantId already exists`, you might already have an existing configuration. For more information, see [Symptom - New-MgPolicyCrossTenantAccessPolicyPartner_Create error](#).

PowerShell

```
$Params = @{  
    TenantId = $SourceTenantId  
}  
New-MgPolicyCrossTenantAccessPolicyPartner -BodyParameter $Params |  
Format-List
```

Output

```
AutomaticUserConsentSettings :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphInboundOutboundPolicyConfiguration  
B2BCollaborationInbound      :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting  
B2BCollaborationOutbound     :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting  
B2BDirectConnectInbound      :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting  
B2BDirectConnectOutbound     :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting  
IdentitySynchronization      :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantIdentity
```

```

SyncPolicyPartner
InboundTrust          :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPo
lICYInboundTrust
IsServiceProvider     :
TenantId              : <SourceTenantId>
TenantRestrictions    :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPo
lICYTenantRestrictions
AdditionalProperties    : {[@odata.context,
https://graph.microsoft.com/v1.0/$metadata#policies/crossTenantAcce
ssPolicy/partners/$entity],
                        [crossCloudMeetingConfiguration,

System.Collections.Generic.Dictionary`2[System.String,System.Object
]], [protectedContentSharing,

System.Collections.Generic.Dictionary`2[System.String,System.Object
]]}

```

2. Use the [Invoke-MgGraphRequest](#) command to enable user synchronization in the target tenant.

If you get an `Request_MultipleObjectsWithSameKeyValue` error, you might already have an existing policy. For more information, see [Symptom - Request_MultipleObjectsWithSameKeyValue error](#).

PowerShell

```

$params = @{
    userSyncInbound = @{
        isSyncAllowed = $true
    }
}
Invoke-MgGraphRequest -Method PUT -Uri
"https://graph.microsoft.com/v1.0/policies/crossTenantAccessPolicy/
partners/$SourceTenantId/identitySynchronization" -Body $params

```

3. Use the [Get-MgPolicyCrossTenantAccessPolicyPartnerIdentitySynchronization](#) command to verify `IsSyncAllowed` is set to True.

PowerShell

```

(Get-MgPolicyCrossTenantAccessPolicyPartnerIdentitySynchronization
-CrossTenantAccessPolicyConfigurationPartnerTenantId
$SourceTenantId).UserSyncInbound

```

Output

```
IsSyncAllowed
```

```
-----
```

```
True
```

Step 3: Automatically redeem invitations in the target tenant



Target tenant

PowerShell

1. In the target tenant, use the [Update-MgPolicyCrossTenantAccessPolicyPartner](#) command to automatically redeem invitations and suppress consent prompts for inbound access.

PowerShell

```
$AutomaticUserConsentSettings = @{  
    "InboundAllowed"="True"  
}  
  
Update-MgPolicyCrossTenantAccessPolicyPartner -  
CrossTenantAccessPolicyConfigurationPartnerTenantId $SourceTenantId  
-AutomaticUserConsentSettings $AutomaticUserConsentSettings
```

Step 4: Sign in to the source tenant



Source tenant

PowerShell

1. Start an instance of PowerShell.
2. Get the tenant ID of the source and target tenants and initialize variables.

PowerShell

```
$SourceTenantId = "<SourceTenantId>"  
$TargetTenantId = "<TargetTenantId>"
```

3. Use the [Connect-MgGraph](#) command to sign in to the source tenant and consent to the following required permissions.

- `Policy.Read.All`
- `Policy.ReadWrite.CrossTenantAccess`
- `Application.ReadWrite.All`
- `Directory.ReadWrite.All`
- `AuditLog.Read.All`

PowerShell

```
Connect-MgGraph -TenantId $SourceTenantId -Scopes  
"Policy.Read.All", "Policy.ReadWrite.CrossTenantAccess", "Application  
.ReadWrite.All", "Directory.ReadWrite.All", "AuditLog.Read.All"
```

Step 5: Automatically redeem invitations in the source tenant



Source tenant

PowerShell

1. In the source tenant, use the [New-MgPolicyCrossTenantAccessPolicyPartner](#) command to create a new partner configuration in a cross-tenant access policy between the source tenant and the target tenant. Use the target tenant ID in the request.

If you get the error `New-MgPolicyCrossTenantAccessPolicyPartner_Create: Another object with the same value for property tenantId already exists`, you might already have an existing configuration. For more information, see [Symptom - New-MgPolicyCrossTenantAccessPolicyPartner_Create error](#).

PowerShell

```
$Params = @{
    TenantId = $TargetTenantId
}
New-MgPolicyCrossTenantAccessPolicyPartner -BodyParameter $Params |
Format-List
```

Output

```
AutomaticUserConsentSettings :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphInboundOutboundPolicyConfiguration
B2BCollaborationInbound      :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting
B2BCollaborationOutbound     :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting
B2BDirectConnectInbound      :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting
B2BDirectConnectOutbound     :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyB2BSetting
IdentitySynchronization      :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantIdentitySyncPolicyPartner
InboundTrust                  :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyInboundTrust
IsServiceProvider             :
TenantId                      : <TargetTenantId>
TenantRestrictions            :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCrossTenantAccessPolicyTenantRestrictions
AdditionalProperties           : {["@odata.context",
https://graph.microsoft.com/v1.0/$metadata#policies/crossTenantAccessPolicy/partners/$entity],
                                [crossCloudMeetingConfiguration,
                                System.Collections.Generic.Dictionary`2[System.String,System.Object]], [protectedContentSharing,
                                System.Collections.Generic.Dictionary`2[System.String,System.Object]]}]
```

2. Use the [Update-MgPolicyCrossTenantAccessPolicyPartner](#) command to automatically redeem invitations and suppress consent prompts for outbound access.

PowerShell

```
$AutomaticUserConsentSettings = @{"OutboundAllowed"="True"}
Update-MgPolicyCrossTenantAccessPolicyPartner -CrossTenantAccessPolicyConfigurationPartnerTenantId $TargetTenantId -AutomaticUserConsentSettings $AutomaticUserConsentSettings
```

Step 6: Create a configuration application in the source tenant



Source tenant

PowerShell

1. In the source tenant, use the [Invoke-MgInstantiateApplicationTemplate](#) command to add an instance of a configuration application from the Microsoft Entra application gallery into your tenant.

PowerShell

```
Invoke-MgInstantiateApplicationTemplate -ApplicationTemplateId "518e5f48-1fc8-4c48-9387-9fdf28b0dfe7" -DisplayName "Fabrikam"
```

2. Use the [Get-MgServicePrincipal](#) command to get the service principal ID and app role ID.

PowerShell

```
Get-MgServicePrincipal -Filter "DisplayName eq 'Fabrikam'" | Format-List
```

Output

```
AccountEnabled           : True
AddIns                   : {}
AlternativeNames         : {}
AppDescription           :
AppDisplayName           : Fabrikam
```

```
AppId : <AppId>
AppManagementPolicies :
AppOwnerOrganizationId : <AppOwnerOrganizationId>
AppRoleAssignedTo :
AppRoleAssignmentRequired : True
AppRoleAssignments :
AppRoles : {<AppRoleId>}
ApplicationTemplateId : 518e5f48-1fc8-4c48-9387-
9fdf28b0dfe7
ClaimsMappingPolicies :
CreatedObjects :
CustomSecurityAttributes :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphCustomSecurityAttri
buteValue
DelegatedPermissionClassifications :
DeletedDateTime :
Description :
DisabledByMicrosoftStatus :
DisplayName : Fabrikam
Endpoints :
ErrorUrl :
FederatedIdentityCredentials :
HomeRealmDiscoveryPolicies :
Homepage :
https://account.activedirectory.windowsazure.com:444/applications/d
efault.aspx?metadata=aad2aadsync|ISV9.1|primary|z
Id : <ServicePrincipalId>
Info :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphInformationalUrl
KeyCredentials : {}
LicenseDetails :

...
```

3. Initialize a variable for the service principal ID.

Be sure to use the service principal ID instead of the application ID.

```
PowerShell
```

```
$ServicePrincipalId = "<ServicePrincipalId>"
```

4. Initialize a variable for the app role ID.

```
PowerShell
```

```
$AppRoleId = "<AppRoleId>"
```

Step 7: Test the connection to the target tenant



Source tenant

PowerShell

1. In the source tenant, use the `Invoke-MgGraphRequest` command to test the connection to the target tenant and validate the credentials.

PowerShell

```
$Params = @{
    "useSavedCredentials" = $false
    "templateId" = "Azure2Azure"
    "credentials" = @(
        @{
            "key" = "CompanyId"
            "value" = $TargetTenantId
        }
        @{
            "key" = "AuthenticationType"
            "value" = "SyncPolicy"
        }
    )
}
Invoke-MgGraphRequest -Method POST -Uri
"https://graph.microsoft.com/v1.0/servicePrincipals/$ServicePrincip
alId/synchronization/jobs/validateCredentials" -Body $Params
```

Step 8: Create a provisioning job in the source tenant



Source tenant

In the source tenant, to enable provisioning, create a provisioning job.

PowerShell

1. Determine the synchronization template to use, such as `Azure2Azure`.

A template has pre-configured synchronization settings.

2. In the source tenant, use the [New-MgServicePrincipalSynchronizationJob](#) command to create a provisioning job based on a template.

PowerShell

```
New-MgServicePrincipalSynchronizationJob -ServicePrincipalId  
$ServicePrincipalId -TemplateId "Azure2Azure" | Format-List
```

Output

```
Id : <JobId>  
Schedule :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphSynchronizationSchedule  
Schema :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphSynchronizationSchema  
Status :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphSynchronizationStatus  
SynchronizationJobSettings : {AzureIngestionAttributeOptimization,  
LookaheadQueryEnabled}  
TemplateId : Azure2Azure  
AdditionalProperties : {[@odata.context,  
https://graph.microsoft.com/v1.0/$metadata#servicePrincipals('<ServicePrincipalId>')/synchronization/jobs/$entity]}
```

3. Initialize a variable for the job ID.

PowerShell

```
$JobId = "<JobId>"
```

Step 9: Save your credentials



Source tenant

PowerShell

1. In the source tenant, use the [Invoke-MgGraphRequest](#) command to save your credentials.

```
PowerShell

$params = @{
    "value" = @(
        @{
            "key" = "AuthenticationType"
            "value" = "SyncPolicy"
        }
        @{
            "key" = "CompanyId"
            "value" = $TargetTenantId
        }
    )
}

Invoke-MgGraphRequest -Method PUT -Uri
"https://graph.microsoft.com/v1.0/servicePrincipals/$ServicePrincipalId/synchronization/secrets" -Body $params
```

Step 10: Assign a user to the configuration



Source tenant

For cross-tenant synchronization to work, at least one internal user must be assigned to the configuration.

PowerShell

1. In the source tenant, use the [New-MgServicePrincipalAppRoleAssignedTo](#) command to assign an internal user to the configuration.

```
PowerShell

$params = @{
    PrincipalId = "<PrincipalId>"
    ResourceId = $ServicePrincipalId
    AppRoleId = $AppRoleId
}

New-MgServicePrincipalAppRoleAssignedTo -PrincipalId $params.PrincipalId -ResourceId $params.ResourceId -AppRoleId $params.AppRoleId
```

```
New-MgServicePrincipalAppRoleAssignedTo -ServicePrincipalId
$ServicePrincipalId -BodyParameter $Params | Format-List
```

Output

```
AppRoleId          : <AppRoleId>
CreatedDateTime    : 7/31/2023 10:27:12 PM
DeletedDateTime    :
Id                 : <Id>
PrincipalDisplayName : User1
PrincipalId        : <PrincipalId>
PrincipalType      : User
ResourceDisplayName : Fabrikam
ResourceId         : <ServicePrincipalId>
AdditionalProperties : {[@odata.context,
https://graph.microsoft.com/v1.0/$metadata#appRoleAssignments/$entity]}
```

Step 11: Test provision on demand



Source tenant

Now that you have a configuration, you can test on-demand provisioning with one of your users.

PowerShell

1. In the source tenant, use the [Get-MgServicePrincipalSynchronizationJobSchema](#) command to get the schema rule ID.

PowerShell

```
$SynchronizationSchema = Get-
MgServicePrincipalSynchronizationJobSchema -ServicePrincipalId
$ServicePrincipalId -SynchronizationJobId $JobId
$SynchronizationSchema.SynchronizationRules | Format-List
```

Output

```
ContainerFilter      :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphContainerFilter
```

```

Editable           : True
GroupFilter        :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphGroupFilter
Id                 : <RuleId>
Metadata           : {defaultSourceObjectMappings,
supportsProvisionOnDemand}
Name               : USER_INBOUND_USER
ObjectMappings     : {Provision Azure Active Directory Users, , ,
...}
Priority           : 1
SourceDirectoryName : Azure Active Directory
TargetDirectoryName : Azure Active Directory (target tenant)
AdditionalProperties : {}

```

2. Initialize a variable for the rule ID.

```

PowerShell

$RuleId = "<RuleId>"

```

3. Use the [New-MgServicePrincipalSynchronizationJobOnDemand](#) command to provision a test user on demand.

```

PowerShell

$params = @{
    Parameters = @(
        @{
            Subjects = @(
                @{
                    ObjectId = "<UserObjectId>"
                    ObjectTypeName = "User"
                }
            )
            RuleId = $RuleId
        }
    )
}

New-MgServicePrincipalSynchronizationJobOnDemand -
ServicePrincipalId $ServicePrincipalId -SynchronizationJobId $JobId
-BodyParameter $params | Format-List

```

Output

```

Key           :
Microsoft.Identity.Health.CPP.Common.DataContracts.SyncFabric.Statu
sInfo
Value         : [{"provisioningSteps":
[{"name":"EntryImport","type":"Import","status":"Success","descript
ion":"Retrieved User

```

```
'user1@fabrikam.com' from Azure Active
Directory", "timestamp": "2023-07-31T22:31:15.9116590Z", "details":
{"objectId":
    "
    <UserObjectId>", "accountEnabled": "True", "displayName": "User1", "mail
    Nickname": "user1", "userPrincipalName": "use
    ...
    AdditionalProperties : {[@odata.context,
    https://graph.microsoft.com/v1.0/$metadata#microsoft.graph.stringKe
    yStringValuePair]}
```

Step 12: Start the provisioning job



Source tenant

PowerShell

1. Now that the provisioning job is configured, in the source tenant, use the [Start-MgServicePrincipalSynchronizationJob](#) command to start the provisioning job.

PowerShell

```
Start-MgServicePrincipalSynchronizationJob -ServicePrincipalId
$ServicePrincipalId -SynchronizationJobId $JobId
```

Step 13: Monitor provisioning



Source tenant

PowerShell

1. Now that the provisioning job is running, in the source tenant, use the [Get-MgServicePrincipalSynchronizationJob](#) command to monitor the progress of the current provisioning cycle as well as statistics to date such as the number of users and groups that have been created in the target system.

PowerShell

```
Get-MgServicePrincipalSynchronizationJob -ServicePrincipalId  
$ServicePrincipalId -SynchronizationJobId $JobId | Format-List
```

Output

```
Id                : <JobId>  
Schedule          :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphSynchroniza  
tionSchedule  
Schema           :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphSynchroniza  
tionSchema  
Status           :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphSynchroniza  
tionStatus  
SynchronizationJobSettings : {AzureIngestionAttributeOptimiz  
ation, LookaheadQueryEnabled}  
TemplateId       : Azure2Azure  
AdditionalProperties : {[@odata.context,  
https://graph.microsoft.com/v1.0/$metadata#servicePrincipals('<Serv  
icePrincipalId>')/synchro  
nization/jobs/$entity]}
```

2. In addition to monitoring the status of the provisioning job, use the [Get-MgAuditLogProvisioning](#) command to retrieve the provisioning logs and get all the provisioning events that occur. For example, query for a particular user and determine if they were successfully provisioned.

PowerShell

```
Get-MgAuditLogDirectoryAudit | Select -First 10 | Format-List
```

Output

```
ActivityDateTime   : 7/31/2023 12:08:17 AM  
ActivityDisplayName : Export  
AdditionalDetails  : {Details, ErrorCode, EventName, ipaddr...}  
Category          : ProvisioningManagement  
CorrelationId     : cc519f3b-fb72-4ea2-9b7b-8f9dc271c5ec  
Id                : Sync_cc519f3b-fb72-4ea2-9b7b-  
8f9dc271c5ec_L5BFV_161778479  
InitiatedBy       :  
Microsoft.Graph.PowerShell.Models.MicrosoftGraphAuditActivityInitia  
tor1  
LoggedByService   : Account Provisioning  
OperationType     :  
Result            : success
```

```
ResultReason      : User 'user2@fabrikam.com' was created in
Azure Active Directory (target tenant)
TargetResources   : {<ServicePrincipalId>, }
AdditionalProperties : {}

ActivityDateTime   : 7/31/2023 12:08:17 AM
ActivityDisplayName : Export
AdditionalDetails  : {Details, ErrorCode, EventName, ipaddr...}
Category          : ProvisioningManagement
CorrelationId     : cc519f3b-fb72-4ea2-9b7b-8f9dc271c5ec
Id                : Sync_cc519f3b-fb72-4ea2-9b7b-
8f9dc271c5ec_L5BFV_161778264
InitiatedBy       :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphAuditActivityInitia
tor1
LoggedByService   : Account Provisioning
OperationType     :
Result            : success
ResultReason      : User 'user2@fabrikam.com' was updated in
Azure Active Directory (target tenant)
TargetResources   : {<ServicePrincipalId>, }
AdditionalProperties : {}

ActivityDateTime   : 7/31/2023 12:08:14 AM
ActivityDisplayName : Synchronization rule action
AdditionalDetails  : {Details, ErrorCode, EventName, ipaddr...}
Category          : ProvisioningManagement
CorrelationId     : cc519f3b-fb72-4ea2-9b7b-8f9dc271c5ec
Id                : Sync_cc519f3b-fb72-4ea2-9b7b-
8f9dc271c5ec_L5BFV_161778395
InitiatedBy       :
Microsoft.Graph.PowerShell.Models.MicrosoftGraphAuditActivityInitia
tor1
LoggedByService   : Account Provisioning
OperationType     :
Result            : success
ResultReason      : User 'user2@fabrikam.com' will be created in
Azure Active Directory (target tenant) (User is active and assigned
in Azure Active Directory, but no matching
User was found in Azure Active Directory (target tenant))
TargetResources   : {<ServicePrincipalId>, }
AdditionalProperties : {}
```

Troubleshooting tips

PowerShell

Symptom - Insufficient privileges error

When you try to perform an action, you receive an error message similar to the following:

```
code: Authorization_RequestDenied
message: Insufficient privileges to complete the operation.
```

Cause

Either the signed-in user doesn't have sufficient privileges, or you need to consent to one of the required permissions.

Solution

1. Make sure you're assigned the required roles. See [Prerequisites](#) earlier in this article.
2. When you sign in with [Connect-MgGraph](#), make sure you specify the required scopes. See [Step 1: Sign in to the target tenant](#) and [Step 4: Sign in to the source tenant](#) earlier in this article.

Symptom - New-MgPolicyCrossTenantAccessPolicyPartner_Create error

When you try to create a new partner configuration, you receive an error message similar to the following:

```
New-MgPolicyCrossTenantAccessPolicyPartner_Create: Another object with
the same value for property tenantId already exists.
```

Cause

You are likely trying to create a configuration or object that already exists, possibly from a previous configuration.

Solution

1. Verify your syntax and that you are using the correct tenant ID.

2. Use the [Get-MgPolicyCrossTenantAccessPolicyPartner](#) command to list the existing object.
3. If you have an existing object, you might need to make an update using [Update-MgPolicyCrossTenantAccessPolicyPartner](#)

Symptom - Request_MultipleObjectsWithSameKeyValue error

When you try to enable user synchronization, you receive an error message similar to the following:

```
Invoke-MgGraphRequest: PUT
https://graph.microsoft.com/v1.0/policies/crossTenantAccessPolicy/partners/<SourceTenantId>/identitySynchronization
HTTP/1.1 409 Conflict
...
{"error":{"code":"Request_MultipleObjectsWithSameKeyValue","message":"A conflicting object with one or more of the specified property values is present in the directory.","details":
[{"code":"ConflictingObjects","message":"A conflicting object with one or more of the specified property values is present in the directory."},
... ]}}
```

Cause

You are likely trying to create a policy that already exists, possibly from a previous configuration.

Solution

1. Verify your syntax and that you are using the correct tenant ID.
2. Use the [Get-MgPolicyCrossTenantAccessPolicyPartnerIdentitySynchronization](#) command to list the `IsSyncAllowed` setting.

PowerShell

```
(Get-MgPolicyCrossTenantAccessPolicyPartnerIdentitySynchronization
-CrossTenantAccessPolicyConfigurationPartnerTenantId
$SourceTenantId).UserSyncInbound
```

3. If you have an existing policy, you might need to make an update using [Set-MgPolicyCrossTenantAccessPolicyPartnerIdentitySynchronization](#) command to enable user synchronization.

PowerShell

```
$Params = @{  
    userSyncInbound = @{  
        isSyncAllowed = $true  
    }  
}  
  
Set-MgPolicyCrossTenantAccessPolicyPartnerIdentitySynchronization -  
CrossTenantAccessPolicyConfigurationPartnerTenantId $SourceTenantId  
-BodyParameter $Params
```

Next steps

- [Microsoft Entra synchronization API overview](#)
- [Tutorial: Develop and plan provisioning for a SCIM endpoint in Microsoft Entra ID](#)

Scoping users or groups to be provisioned with scoping filters

Article • 01/18/2024

Learn how to use scoping filters in the Microsoft Entra provisioning service to define attribute based rules. The rules are used to determine which users or groups are provisioned.

Scoping filter use cases

You use scoping filters to prevent objects in applications that support automated user provisioning from being provisioned if an object doesn't satisfy your business requirements. A scoping filter allows you to include or exclude any users who have an attribute that matches a specific value. For example, when provisioning users from Microsoft Entra ID to a SaaS application used by a sales team, you can specify that only users with a "Department" attribute of "Sales" should be in scope for provisioning.

Scoping filters can be used differently depending on the type of provisioning connector:

- **Outbound provisioning from Microsoft Entra ID to SaaS applications.** When Microsoft Entra ID is the source system, [user and group assignments](#) are the most common method for determining which users are in scope for provisioning. These assignments also are used for enabling single sign-on and provide a single method to manage access and provisioning. Scoping filters can be used optionally, in addition to assignments or instead of them, to filter users based on attribute values.

Tip

The more users and groups in scope for provisioning, the longer the synchronization process can take. Setting the scope to sync assigned users and groups, limiting the number of groups assigned to the app, and limiting the size of the groups will reduce the time it takes to synchronize everyone that is in scope.

- **Inbound provisioning from HCM applications to Microsoft Entra ID and Active Directory.** When an [HCM application such as Workday](#) is the source system, scoping filters are the primary method for determining which users should be provisioned from the HCM application to Active Directory or Microsoft Entra ID.

By default, Microsoft Entra provisioning connectors don't have any attribute-based scoping filters configured.

Scoping filter construction

A scoping filter consists of one or more *clauses*. Clauses determine which users are allowed to pass through the scoping filter by evaluating each user's attributes. For example, you might have one clause that requires that a user's "State" attribute equals "New York", so only New York users are provisioned into the application.

A single clause defines a single condition for a single attribute value. If multiple clauses are created in a single scoping filter, they're evaluated together using "AND" logic. The "AND" logic means all clauses must evaluate to "true" in order for a user to be provisioned.

Finally, multiple scoping filters can be created for a single application. If multiple scoping filters are present, they're evaluated together by using "OR" logic. The "OR" logic means that if all the clauses in any of the configured scoping filters evaluate to "true", the user is provisioned.

Each user or group processed by the Microsoft Entra provisioning service is always evaluated individually against each scoping filter.

As an example, consider the following scoping filter:

The screenshot displays two side-by-side windows from the Microsoft Entra provisioning console. The left window, titled "Source Object Query", shows a scoping filter group named "New York Engineering" with a "Delete" button. Below it, an information icon indicates that multiple scoping filters are evaluated using "OR" logic. The right window, titled "Add Scoping Filter", shows a table of clauses with columns for "TARGET ATTRIBUTE", "OPERATOR", and "VALUE". Each row has a "Delete" button. The clauses are: city (EQUALS, New York), department (EQUALS, Engineering), employeeID (extension...) (REGEX MATCH, {1[0-9][0-9][0-9][0-9][0-9][0-9]}), and jobTitle (IS NOT NULL). Below the table is an "Add New Scoping Clause" button and a "Scoping Filter Title" dropdown menu set to "New York Engineering". An information icon at the bottom indicates that multiple scoping clauses are evaluated using "AND" logic.

TARGET ATTRIBUTE	OPERATOR	VALUE	
city	EQUALS	New York	Delete
department	EQUALS	Engineering	Delete
employeeID (extension...)	REGEX MATCH	{1[0-9][0-9][0-9][0-9][0-9][0-9]}	Delete
jobTitle	IS NOT NULL		Delete

According to this scoping filter, users must satisfy the following criteria to be provisioned:

- They must be in New York.

- They must work in the Engineering department.
- Their company employee ID must be between 1,000,000 and 2,000,000.
- Their job title must not be null or empty.


Create scoping filters

Scoping filters are configured as part of the attribute mappings for each Microsoft Entra user provisioning connector. The following procedure assumes that you already set up automatic provisioning for [one of the supported applications](#) and are adding a scoping filter to it.

Create a scoping filter

Tip

Steps in this article might vary slightly based on the portal you start from.

1. Sign in to the [Microsoft Entra admin center](#)  as at least a [Application Administrator](#).
2. Browse to **Identity > Applications > Enterprise applications > All applications**.
3. Select the application for which you have configured automatic provisioning: for example, "ServiceNow".
4. Select the **Provisioning** tab.
5. In the **Mappings** section, select the mapping that you want to configure a scoping filter for: for example, "Synchronize Microsoft Entra users to ServiceNow".
6. Select the **Source object scope** menu.
7. Select **Add scoping filter**.
8. Define a clause by selecting a source **Attribute Name**, an **Operator**, and an **Attribute Value** to match against. The following operators are supported:
 - a. **&**. Clause returns "true" if the evaluated attribute exists in the input string value.
 - b. **!&**. Clause returns "true" if the evaluated attribute does not exist in the input string value.

- c. **ENDS_WITH**. Clause returns "true" if the evaluated attribute ends with the input string value.
- d. **EQUALS**. Clause returns "true" if the evaluated attribute matches the input string value exactly (case sensitive).
- e. **Greater_Than**. Clause returns "true" if the evaluated attribute is greater than the value. The value specified on the scoping filter must be an integer and the attribute on the user must be an integer [0,1,2,...].
- f. **Greater_Than_OR_EQUALS**. Clause returns "true" if the evaluated attribute is greater than or equal to the value. The value specified on the scoping filter must be an integer and the attribute on the user must be an integer [0,1,2,...].
- g. **Includes**. Clause returns "true" if the evaluated attribute contains the string value (case sensitive) as described [here](#).
- h. **IS FALSE**. Clause returns "true" if the evaluated attribute contains a Boolean value of false.
- i. **IS NOT NULL**. Clause returns "true" if the evaluated attribute isn't empty.
- j. **IS NULL**. Clause returns "true" if the evaluated attribute is empty.
- k. **IS TRUE**. Clause returns "true" if the evaluated attribute contains a Boolean value of true.
- l. **NOT EQUALS**. Clause returns "true" if the evaluated attribute doesn't match the input string value (case sensitive).
- m. **NOT REGEX MATCH**. Clause returns "true" if the evaluated attribute doesn't match a regular expression pattern. It returns "false" if the attribute is null / empty.
- n. **REGEX MATCH**. Clause returns "true" if the evaluated attribute matches a regular expression pattern. For example: `([1-9][0-9])` matches any number between 10 and 99 (case sensitive).

Important

- The IsMemberOf filter is not supported currently.
- The members attribute on a group is not supported currently.
- Filtering is not supported for multi-valued attributes.
- Scoping filters will return "false" if the value is null / empty.

9. Optionally, repeat steps 7-8 to add more scoping clauses.
10. In **Scoping Filter Title**, add a name for your scoping filter.
11. Select **OK**.
12. Select **OK** again on the **Scoping Filters** screen. Optionally, repeat steps 6-11 to add another scoping filter.
13. Select **Save** on the **Attribute Mapping** screen.

Important

Saving a new scoping filter triggers a new full sync for the application, where all users in the source system are evaluated again against the new scoping filter. If a user in the application was previously in scope for provisioning, but falls out of scope, their account is disabled or deprovisioned in the application. To override this default behavior, refer to [Skip deletion for user accounts that go out of scope](#).

Common scoping filters

 Expand table

Target Attribute	Operator	Value	Description
userPrincipalName	REGEX MATCH	.*\@domain.com	All users with <code>userPrincipal</code> that have the domain <code>@domain.com</code> are in scope for provisioning.
userPrincipalName	NOT REGEX MATCH	.*\@domain.com	All users with <code>userPrincipal</code> that has the domain <code>@domain.com</code> are out of scope for provisioning.
department	EQUALS	sales	All users from the sales department are in scope for provisioning
workerID	REGEX MATCH	(1[0-9][0-9][0-9][0-9][0-9][0-9])	All employees with <code>workerID</code> between 1000000 and 2000000 are in scope for provisioning.

Related articles

- [Automate user provisioning and deprovisioning to SaaS applications](#)

- [Customize attribute mappings for user provisioning](#)
- [Write expressions for attribute mappings](#)
- [Account provisioning notifications](#)
- [Use SCIM to enable automatic provisioning of users and groups from Microsoft Entra ID to applications](#)
- [List of tutorials on how to integrate SaaS apps](#)

Enable accidental deletions prevention in the Microsoft Entra provisioning service

Article • 10/23/2023

The Microsoft Entra provisioning service includes a feature to help avoid accidental deletions. This feature ensures that users aren't disabled or deleted in an application unexpectedly.

You use accidental deletions to specify a deletion threshold. Anything above the threshold that you set requires an admin to explicitly allow the processing of the deletions.

Configure accidental deletion prevention

To enable accidental deletion prevention:

1. Sign in to the [Microsoft Entra admin center](#) as at least a [Application Administrator](#).
2. Browse to **Identity > Applications > Enterprise applications**.
3. Select your application.
4. Select **Provisioning** and then on the provisioning page select **Edit provisioning**.
 1. Under **Settings**, select the **Prevent accidental deletions** check box and specify a deletion threshold.
 2. Ensure the **Notification Email** address is completed. If the deletion threshold is met, an email is sent.
 3. Select **Save** to save the changes.

When the deletion threshold is met, the job goes into quarantine, and a notification email is sent. The quarantined job can then be allowed or rejected. To learn more about quarantine behavior, see [Application provisioning in quarantine status](#).

Recovering from an accidental deletion

When you encounter an accidental deletion, you see it on the provisioning status page. It says `Provisioning has been quarantined. See quarantine details for more information.`

You can click either **Allow deletes** or **View provisioning logs**.

Allowing deletions

The **Allow deletes** action deletes the objects that triggered the accidental delete threshold. Use the procedure to accept the deletions.

1. Select **Allow deletes**.
2. Click **Yes** on the confirmation to allow the deletions.
3. View the confirmation that the deletions were accepted. The status returns to healthy with the next cycle.

Rejecting deletions

Investigate and reject deletions as necessary:

- Investigate the source of the deletions. You can use the provisioning logs for details.
- Prevent the deletion by assigning the user / group to the application (or configuration) again, restoring the user / group, or updating your provisioning configuration.
- Once you've made the necessary changes to prevent the user / group from being deleted, restart provisioning. Don't restart provisioning until you've made the necessary changes to prevent the users / groups from being deleted.

Test deletion prevention

You can test the feature by triggering disable / deletion events by setting the threshold to a low number, for example 3, and then changing scoping filters, unassigning users, and deleting users from the directory (see common scenarios in next section).

Let the provisioning job run (20 – 40 mins) and navigate back to the provisioning page. Check the provisioning job in quarantine and choose to allow the deletions or review the provisioning logs to understand why the deletions occurred.

Common deprovisioning scenarios to test

- Delete a user / put them into the recycle bin.
- Block sign in for a user.
- Unassign a user or group from the application (or configuration).

- Remove a user from a group that's provides them access to the application (or configuration).

To learn more about deprovisioning scenarios, see [How Application Provisioning Works](#).

Frequently Asked Questions

What scenarios count toward the deletion threshold?

When a user is set for removal from the target application (or target tenant), it's counted against the deletion threshold. Scenarios that could lead to a user being removed from the target application (or target tenant) could include: unassigning the user from the application (or configuration) and soft / hard deleting a user in the directory. Groups evaluated for deletion count towards the deletion threshold. In addition to deletions, the same functionality also works for disables.

What is the interval that the deletion threshold is evaluated on?

It's evaluated each cycle. If the number of deletions doesn't exceed the threshold during a single cycle, the "circuit breaker" isn't triggered. If multiple cycles are needed to reach a steady state, the deletion threshold is evaluated per cycle.

How are these deletion events logged?

You can find users that should be disabled / deleted but haven't due to the deletion threshold. Navigation to **Provisioning logs** and then filter **Action** with *StagedAction* or *StagedDelete*.

Next steps

- [How application provisioning works](#)
- [Plan an application provisioning deployment](#)

Feedback

Was this page helpful?

On-demand provisioning in Microsoft Entra ID

Article • 10/23/2023


Use on-demand provisioning to provision a user or group in seconds. Among other things, you can use this capability to:

- Troubleshoot configuration issues quickly.
- Validate expressions that you've defined.
- Test scoping filters.

How to use on-demand provisioning

Tip

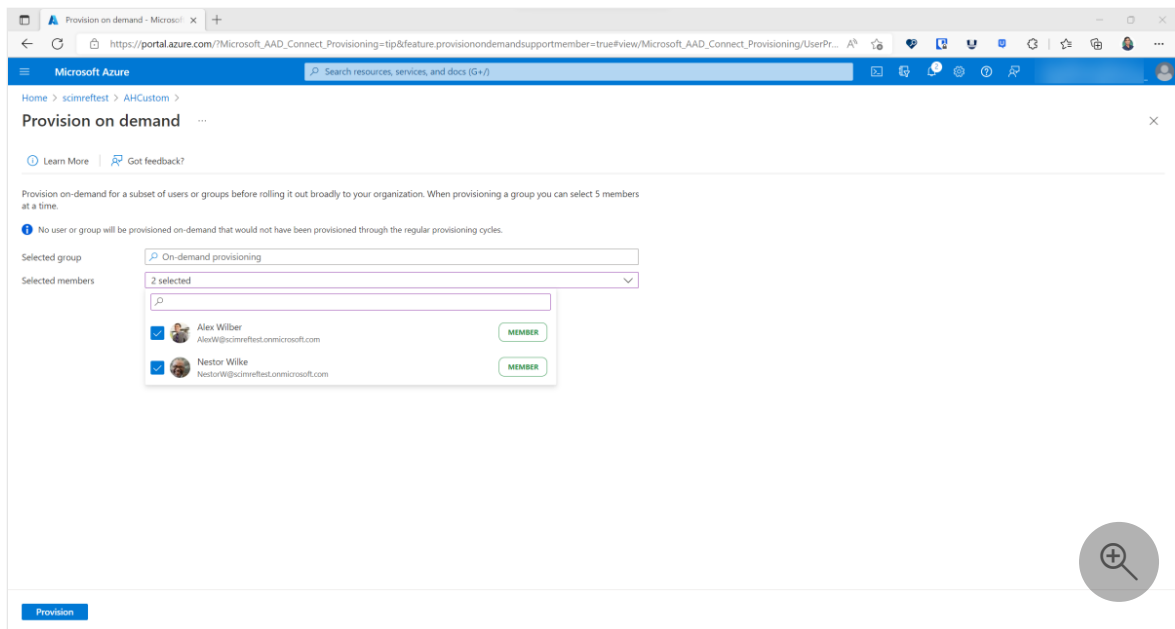
Steps in this article may vary slightly based on the portal you start from.

1. Sign in to the [Microsoft Entra admin center](#)  as at least a [Application Administrator](#).
2. Browse to **Identity** > **Applications** > **Enterprise applications** > select your application.
3. Select **Provisioning**.
4. Configure provisioning by providing your admin credentials.
5. Select **Provision on demand**.
6. Search for a user by first name, last name, display name, user principal name, or email address. Alternatively, you can search for a group and pick up to five users.

Note

For Cloud HR provisioning app (Workday / SuccessFactors to Active Directory / Microsoft Entra ID), the input value is different. For Workday scenario, please provide "WorkerID" or "WID" of the user in Workday. For SuccessFactors scenario, please provide "personIdExternal" of the user in SuccessFactors.

7. Select **Provision** at the bottom of the page.



Understand the provisioning steps

The on-demand provisioning process attempts to show the steps that the provisioning service takes when provisioning a user. There are typically five steps to provision a user. One or more of those steps, explained in the following sections, are shown during the on-demand provisioning experience.

Step 1: Test connection

The provisioning service attempts to authorize access to the target system by making a request for a "test user". The provisioning service expects a response that indicates that the service authorized to continue with the provisioning steps. This step is shown only when it fails. It's not shown during the on-demand provisioning experience when the step is successful.

Troubleshooting tips

- Ensure that you've provided valid credentials, such as the secret token and tenant URL, to the target system. The required credentials vary by application. For detailed configuration tutorials, see the [tutorial list](#).
- Make sure that the target system supports filtering on the matching attributes defined in the **Attribute mappings** pane. You might need to check the API documentation provided by the application developer to understand the supported filters.
- For System for Cross-domain Identity Management (SCIM) applications, you can use a tool like Postman. Such tools help you ensure that the application responds

to authorization requests in the way that the Microsoft Entra provisioning service expects. Have a look at an [example request](#).

Step 2: Import user

Next, the provisioning service retrieves the user from the source system. The user attributes that the service retrieves are used later to:

- Evaluate whether the user is in scope for provisioning.
- Check the target system for an existing user.
- Determine what user attributes to export to the target system.

View details

The **View details** section shows the properties of the user that were imported from the source system (for example, Microsoft Entra ID).

Troubleshooting tips

- Importing the user can fail when the matching attribute is missing on the user object in the source system. To resolve this failure, try one of these approaches:
 - Update the user object with a value for the matching attribute.
 - Change the matching attribute in your provisioning configuration.
- If an attribute that you expected is missing from the imported list, ensure that the attribute has a value on the user object in the source system. The provisioning service currently doesn't support provisioning null attributes.
- Make sure that the **Attribute mapping** page of your provisioning configuration contains the attribute that you expect.

Step 3: Determine if user is in scope

Next, the provisioning service determines whether the user is in [scope](#) for provisioning. The service considers aspects such as:

- Whether the user is assigned to the application.
- Whether scope is set to **Sync assigned** or **Sync all**.
- The scoping filters defined in your provisioning configuration.

View details

The **View details** section shows the scoping conditions that were evaluated. You might see one or more of the following properties:

- **Active in source system** indicates that the user has the property `IsActive` set to **true** in Microsoft Entra ID.
- **Assigned to application** indicates that the user is assigned to the application in Microsoft Entra ID.
- **Scope sync all** indicates that the scope setting allows all users and groups in the tenant.
- **User has required role** indicates that the user has the necessary roles to be provisioned into the application.
- **Scoping filters** are also shown if you have defined scoping filters for your application. The filter is displayed with the following format: {scoping filter title} {scoping filter attribute} {scoping filter operator} {scoping filter value}.

Troubleshooting tips

- Make sure that you've defined a valid scoping role. For example, avoid using the [Greater_Than operator](#) with a noninteger value.
- If the user doesn't have the necessary role, review the [tips for provisioning users assigned to the default access role](#).

Step 4: Match user between source and target

In this step, the service attempts to match the user that was retrieved in the import step with a user in the target system.

View details

The **View details** page shows the properties of the users that were matched in the target system. The context pane changes as follows:

- If no users are matched in the target system, no properties are shown.
- If one user matches in the target system, the properties of that user are shown.
- If multiple users match, the properties of both users are shown.
- If multiple matching attributes are part of your attribute mappings, each matching attribute is evaluated sequentially and the matched users for that attribute are shown.

Troubleshooting tips

- The provisioning service might not be able to match a user in the source system uniquely with a user in the target. Resolve this problem by ensuring that the matching attribute is unique.
- Make sure that the target system supports filtering on the attribute that's defined as the matching attribute.

Step 5: Perform action

Finally, the provisioning service takes an action, such as creating, updating, deleting, or skipping the user.

Here's an example of what you might see after the successful on-demand provisioning of a user:

The screenshot displays the 'Perform action' step in the Microsoft Azure portal. The left pane shows the provisioning process with four steps, all marked as successful:

- 1. Import group:** This step shows the group retrieved from the source system and the properties of the group in the source system. Status: Success | [View details](#)
- 2. Determine if group is in scope:** This step shows the scoping conditions that were evaluated and which ones the group passed or failed. Status: Success | [View details](#)
- 3. Match group between source and target system:** This step shows whether the group was found in the target system as well as the properties of the group in the target system. Status: Success | [View details](#)
- 4. Perform action:** This step shows the action that was performed in the target application, such as creating a group or updating a group. Status: Success | [View details](#)

The right pane, titled 'Perform action', shows that 2 members are evaluated for addition. A table lists the members and their membership update status:

Members	User principal name	Group membership operations	Membership update status
	AlexW@scimrefest.onmicrosoft.com	Add member	Success View details
	NestorW@scimrefest.onmicrosoft.com	Add member	Success View details

View details

The **View details** section displays the attributes that were modified in the target system. This display represents the final output of the provisioning service activity and the attributes that were exported. If this step fails, the attributes displayed represent the attributes that the provisioning service attempted to modify.

Troubleshooting tips

- Failures for exporting changes can vary greatly. Check the [documentation for provisioning logs](#) for common failures.
- On-demand provisioning says the group or user can't be provisioned because they're not assigned to the application. There's a replication delay of up to a few

minutes between when an object is assigned to an application and when that assignment is honored in on-demand provisioning. You may need to wait a few minutes and try again.

Frequently asked questions

- **Do you need to turn provisioning off to use on-demand provisioning?** For applications that use a long-lived bearer token or a user name and password for authorization, no more steps are required. Applications that use OAuth for authorization currently require the provisioning job to be stopped before using on-demand provisioning. Applications such as G Suite, Box, Workplace by Facebook, and Slack fall into this category. Work is in progress to support on-demand provisioning for all applications without having to stop provisioning jobs.
- **How long does on-demand provisioning take?** On-demand provisioning typically takes less than 30 seconds.

Known limitations

There are currently a few known limitations to on-demand provisioning. Post your [suggestions and feedback](#) so we can better determine what improvements to make next.

ⓘ Note

The following limitations are specific to the on-demand provisioning capability. For information about whether an application supports provisioning groups, deletions, or other capabilities, check the tutorial for that application.

- On-demand provisioning of groups supports updating up to five members at a time. Connectors for cross-tenant synchronization, Workday, etc. do not support group provisioning and as a result do not support on-demand provisioning of groups.
- On-demand provisioning supports provisioning one user at a time through the Microsoft Entra admin center.
- Restoring a previously soft-deleted user in the target tenant with on-demand provisioning isn't supported. If you try to soft-delete a user with on-demand provisioning and then restore the user, it can result in duplicate users.
- On-demand provisioning of roles isn't supported.

- On-demand provisioning supports disabling users that have been unassigned from the application. However, it doesn't support disabling or deleting users that have been disabled or deleted from Microsoft Entra ID. Those users don't appear when you search for a user.
- On-demand provisioning doesn't support nested groups that aren't directly assigned to the application.
- The on-demand provisioning request API can only accept a single group with up to 5 members at a time.

Next steps

- [Troubleshooting provisioning](#)
-

Feedback

Was this page helpful?

[Provide product feedback](#)  | [Get help at Microsoft Q&A](#)

What are the Microsoft Entra user provisioning logs?

Article • 01/25/2024

Microsoft Entra ID integrates with several third party services to provision users into your tenant. If you need to troubleshoot an issue with a provisioned user, you can use the information captured in the Microsoft Entra provisioning logs to help find a solution.

Two other activity logs are also available to help monitor the health of your tenant:

- **Sign-ins** – Information about sign-ins and how your resources are used by your users.
- **Audit** – Information about changes applied to your tenant such as users and group management or updates applied to your tenant’s resources.

This article gives you an overview of the user provisioning logs.

License and role requirements

The required roles and licenses might vary based on the report. Global Administrator can access all reports, but we recommend using a role with least privilege access to align with the [Zero Trust guidance](#).

 Expand table

Log / Report	Roles	Licenses
Audit	Report Reader Security Reader Security Administrator Global Reader A custom role with <code>AuditLogsRead</code> or <code>CustomSecAuditLogsRead</code> permission	All editions of Microsoft Entra ID
Sign-ins	Report Reader Security Reader Security Administrator Global Reader A custom role with <code>SignInLogsRead</code> permission	All editions of Microsoft Entra ID
Provisioning	Same as audit and sign-ins, plus Security Operator Application Administrator Cloud App Administrator	Microsoft Entra ID P1/P2

Log / Report	Roles	Licenses
	A custom role with <code>ProvisioningLogsRead</code> permission	
Usage and insights	Security Reader Reports Reader Security Administrator	Microsoft Entra ID P1/P2
Identity Protection*	Security Administrator Security Operator Security Reader Global Reader A custom role with <code>IdentityRiskEventReadWrite</code> permission	Microsoft Entra ID Free Microsoft 365 Apps Microsoft Entra ID P1/P2
Microsoft Graph activity logs	Security Administrator A custom role with <code>ListKeys</code> permission	Microsoft Entra ID P1/P2

*The level of access and capabilities for Identity Protection varies with the role and license. For more information, see the [license requirements for Identity Protection](#).

What can you do with the provisioning logs?

You can use the provisioning logs to find answers to questions like:

- What groups were successfully created in ServiceNow?
- What users were successfully removed from Adobe?
- What users from Workday were successfully created in Active Directory?

ⓘ Note

Entries in the provisioning logs are system generated and can't be changed or deleted.

What do the logs show?

When you select an item in the provisioning list view, you get more details about this item, such as the steps taken to provision the user and tips for troubleshooting issues. The details are grouped into four tabs.

- **Steps:** This tab outlines the steps taken to provision an object. Provisioning an object can include the following steps, but not all steps are applicable to all provisioning events.

- Import the object.
- Match the object between source and target.
- Determine if the object is in scope.
- Evaluate the object before synchronization.
- Provision the object (create, update, delete, or disable).

Steps Troubleshooting & Recommendations Modified Properties Summary

- 1. Import User from Azure Active Directory ✓
- 2. Determine if User is in scope ✓
- 3. Match User between Azure Active Directory and Box ✓
- 4. Provision User in Box ✓

EntryExportAdd	
Result	Success
Description	User 'cheryl@f128.info' was created in Box
ReportableIdentifier	cheryl@f128.info

- **Troubleshooting & Recommendations:** If there was an error, this tab provides the error code and reason.
- **Modified Properties:** If there were changes, this tab shows the old value and the new value.
- **Summary:** Provides an overview of what happened and identifiers for the object in the source and target systems.

Map directory extensions in cross-tenant synchronization

Article • 01/30/2024

Directory extensions enable you to extend the schema in Microsoft Entra ID with your own attributes. You can map these directory extensions when provisioning users in cross-tenant synchronization. [Custom security attributes](#) are different and aren't supported in cross-tenant synchronization.

This article describes how to map directory extensions in cross-tenant synchronization.

Prerequisites

- [Hybrid Identity Administrator](#) role to configure cross-tenant synchronization.
- [Cloud Application Administrator](#) or [Application Administrator](#) role to assign users to a configuration and to delete a configuration.

Create directory extensions

If you don't already have directory extensions, you must create one or more directory extensions in the source or target tenant. You can create extensions using Microsoft Entra Connect or Microsoft Graph API. For information on how to create directory extensions, see [Syncing extension attributes for Microsoft Entra Application Provisioning](#).

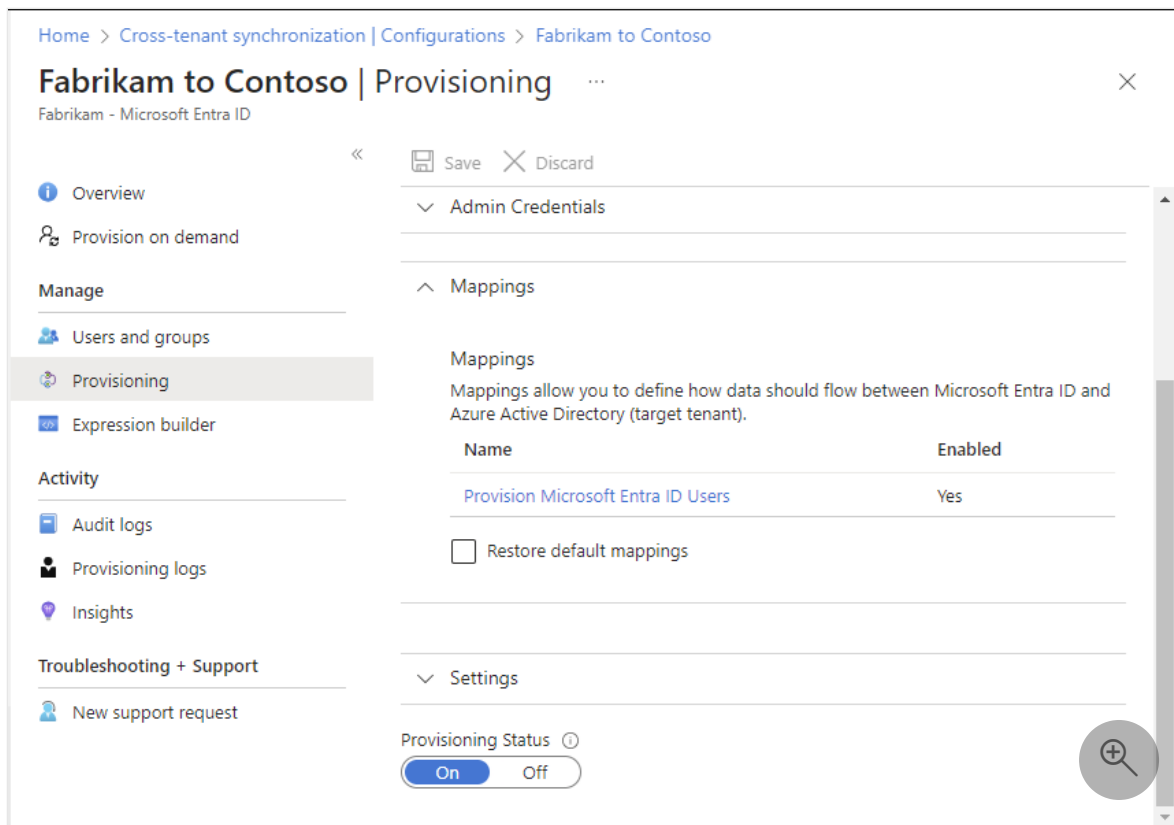
Map directory extensions



Source tenant

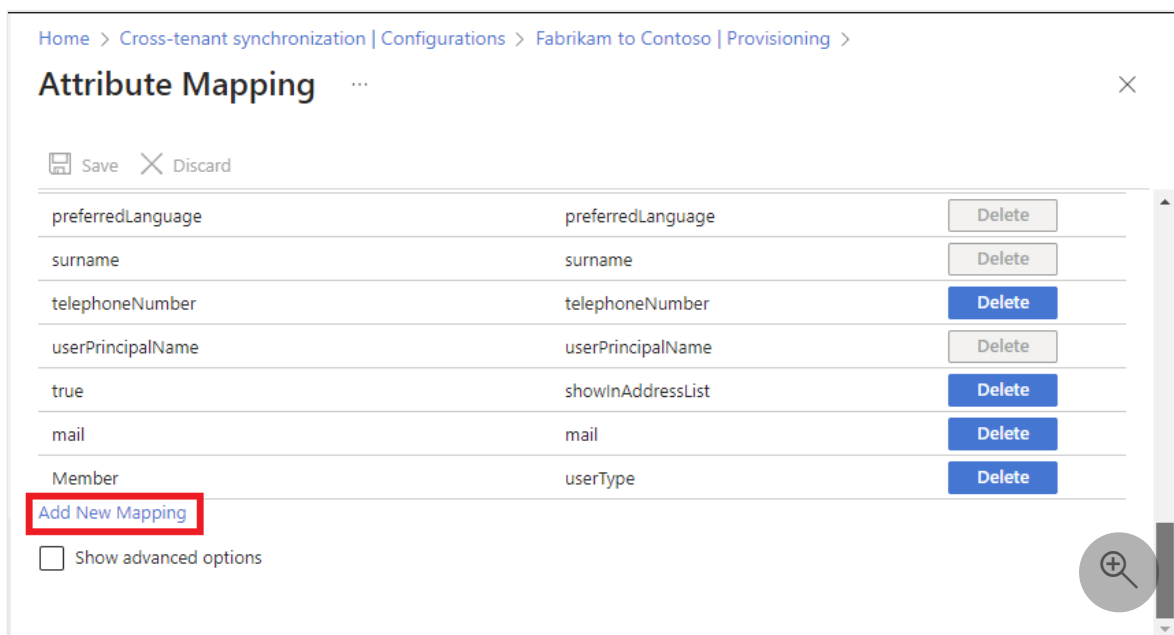
Once you have one or more directory extensions, you can use them when mapping attributes in cross-tenant synchronization.

1. Sign in to the [Microsoft Entra admin center](#) of the source tenant.
2. Browse to **Identity** > **External Identities** > **Cross-tenant synchronization**.
3. Select **Configurations** and then select your configuration.
4. Select **Provisioning** and expand the **Mappings** section.



5. Select **Provision Microsoft Entra ID Users** to open the **Attribute Mapping** page.

6. Scroll to the bottom of the page and select **Add new mapping**.



7. In the **Source attribute** drop-down list, select a source attribute.

If you created a directory extension in the source tenant, select the directory extension.

Home > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning >

Edit Attribute

A mapping lets you define how the attributes in one class of Microsoft Entra object (e.g. Users) should flow to and from this application.

Mapping type ⓘ
Direct

Source attribute * ⓘ
[Empty dropdown]

- employeeHireDate
- employeeId
- employeeLeaveDateTime
- employeeOrgData.costCenter
- employeeOrgData.division
- employeeType
- testExtension (extension_c44d2adc1ddd43f29f29248e8de53937_testExtension)
- extensionAttribute1
- extensionAttribute10

Ok

If the directory extension isn't listed, make sure that the directory extension was created successfully. You can also try to manually add the directory extension to the attribute list as described in the next section.

8. In the **Target attribute** drop-down list, select a target attribute.

If you created a directory extension in the target tenant, select the directory extension.

9. Select **Ok** to save the mapping.

Manually add directory extensions to the attribute list



Source tenant

If your directory extension wasn't automatically discovered, you can try the following steps to manually add the directory extension to the attribute list.

1. Sign in to the Microsoft Entra admin center of the source tenant using the following link:

<https://entra.microsoft.com/>

[Microsoft_AAD_Connect_Provisioning_forceSchemaEditorEnabled=true](#)

2. Browse to **Identity > External Identities > Cross-tenant synchronization**.
3. Select **Configurations** and then select your configuration.
4. Select **Provisioning** and expand the **Mappings** section.
5. Select **Provision Microsoft Entra ID Users** to open the **Attribute Mapping** page.
6. Scroll to the bottom and select the **Show advanced settings** check box.

Home > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning >

Attribute Mapping

Save Discard

userPrincipalName	userPrincipalName	Delete
true	showInAddressList	Delete
mail	mail	Delete
Member	userType	Delete

Add New Mapping

Show advanced options

Supported Attributes

View and edit the list of attributes that appear in the source and target attribute lists for this application.

[Edit attribute list for Microsoft Entra ID](#)

[Edit attribute list for Azure Active Directory \(target tenant\)](#)

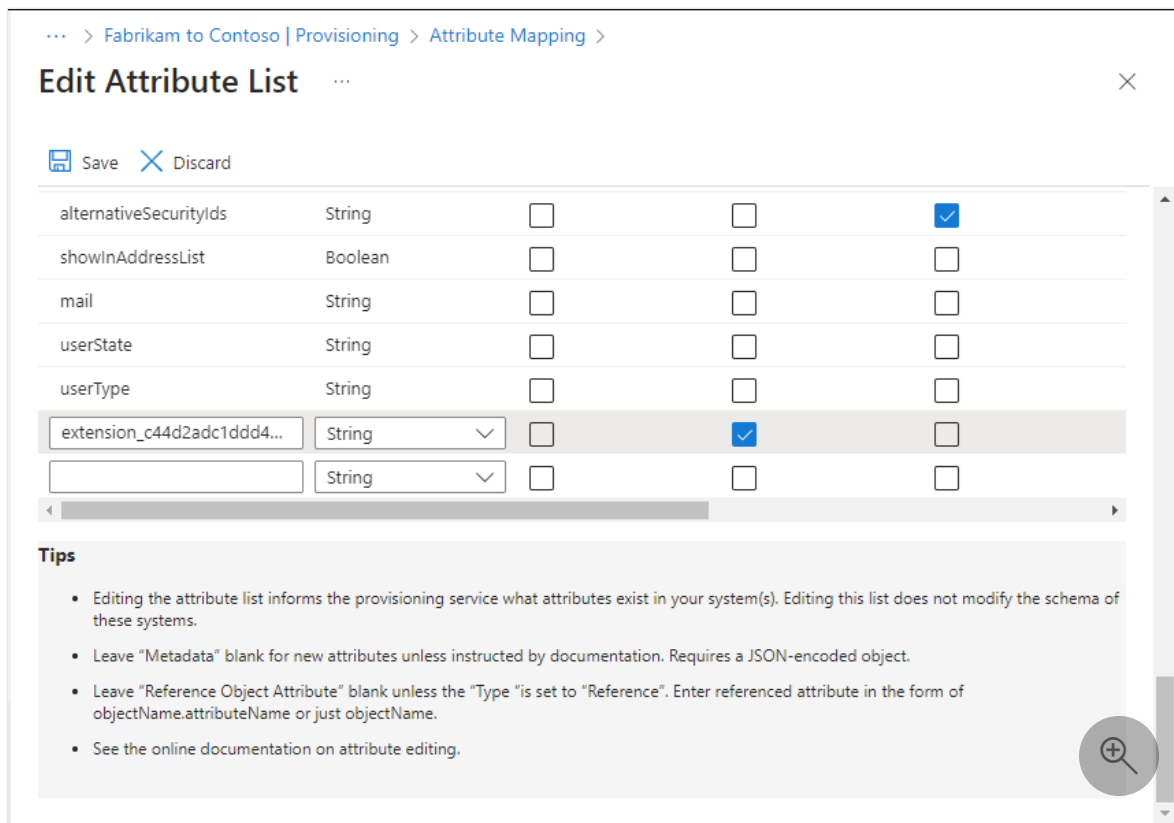
[Use the expression builder](#)

In addition to configuring your attribute mappings through the user interface, you can review, download, and edit the JSON representation of your schema. [Review your schema here.](#)

💡 Tip

If you don't see the **Edit attribute list** links, be sure that you are signed in to the Microsoft Entra admin center using the link in Step 1.

7. If you created a directory extension in the source tenant, select the **Edit attribute list for Microsoft Entra ID** link.
8. If you created an extension in the target tenant, select the **Edit attribute list for Azure Active Directory (target tenant)** link.
9. Add the directory extension and select the appropriate options.



10. Select **Save**.

11. Refresh the browser.

12. Browse to the **Attribute mappings** page and try to map the directory extension as described earlier in this article.

Manually add directory extensions by editing the schema



Source tenant

Follow these steps to manually add directory extensions to the schema by using the schema editor.

1. Sign in to the [Microsoft Entra admin center](#) of the source tenant.
2. Browse to **Identity > External Identities > Cross-tenant synchronization**.
3. Select **Configurations** and then select your configuration.
4. Select **Provisioning** and expand the **Mappings** section.
5. Select **Provision Microsoft Entra ID Users** to open the **Attribute Mapping** page.

6. Scroll to the bottom and select the **Show advanced settings** check box.

Home > Cross-tenant synchronization | Configurations > Fabrikam to Contoso | Provisioning >

Attribute Mapping

Save Discard

userPrincipalName	userPrincipalName	Delete
true	showInAddressList	Delete
mail	mail	Delete
Member	userType	Delete

Add New Mapping

Show advanced options

Supported Attributes
View and edit the list of attributes that appear in the source and target attribute lists for this application.

[Edit attribute list for Microsoft Entra ID](#)

[Edit attribute list for Azure Active Directory \(target tenant\)](#)

[Use the expression builder](#)

In addition to configuring your attribute mappings through the user interface, you can review, download, and edit the JSON representation of your schema. [Review your schema here.](#)

7. Select the **Review your schema here** link to open the **Schema editor** page.

... > Fabrikam to Contoso | Provisioning > Attribute Mapping >

Schema editor

Save Discard Download Got feedback?

The schema below is a JSON representation of your provisioning configuration. You can use it to define what objects you want to provision, map objects between your source and target system, and specify who should be provisioned. We recommend making these changes directly through our configuration experience. The schema below is only used for saving your configuration and making changes in it.

i We recommend downloading and saving the current configuration prior to making changes. A backup copy can be used to roll back to a known good state.

```
1 {
2   "@odata.context": "https://graph.microsoft.com/beta/$metadata#servicePri
3   "id": "Azure2Azure.1f58d1c91f90427abd849f967e96fb42.6a0b230b-3a8d-455d-9
4   "version": "v1.2",
5   "synchronizationRules": [
6     {
7       "containerFilter": null,
8       "editable": true,
9       "groupFilter": null,
10      "id": "df8df8d1-9e6e-40d3-b8df-09bbb402db7e",
11      "name": "USER_INBOUND_USER",
12      "priority": 1,
13      "sourceDirectoryName": "Microsoft Entra ID",
```

8. Download an original copy of the schema as a backup.

9. Modify the schema following your required configuration.

10. Select **Save**.

11. Refresh the browser.

12. Browse to the **Attribute mappings** page and try to map the directory extension as described earlier in this article.

Next steps

- [Syncing extension attributes for Microsoft Entra Application Provisioning](#)
- [Configure cross-tenant synchronization](#)

Reference for writing expressions for attribute mappings in Microsoft Entra ID

Article • 01/26/2024

When you configure provisioning to a SaaS application, one of the types of attribute mappings that you can specify is an expression mapping. For these mappings, you must write a script-like expression that allows you to transform your users' data into formats that are more acceptable for the SaaS application.

Syntax overview

The syntax for Expressions for Attribute Mappings is reminiscent of Visual Basic for Applications (VBA) functions.

- The entire expression must be defined in terms of functions, which consist of a name followed by arguments in parentheses: *FunctionName*(`<<argument 1>>`, `<<argument N>>`)
- You can nest functions within each other. For example:
FunctionOne(*FunctionTwo*(`<<argument1>>`))
- You can pass three different types of arguments into functions:
 1. Attributes, which must be enclosed in square brackets. For example:
[attributeName]
 2. String constants, which must be enclosed in double quotes. For example:
"United States"
 3. Other Functions. For example: *FunctionOne*(`<<argument1>>`, *FunctionTwo*(`<<argument2>>`))
- For string constants, if you need a backslash (\) or quotation mark (") in the string, it must be escaped with the backslash (\) symbol. For example: "Company name: \"Contoso\""
- The syntax is case-sensitive, which must be considered while typing them as strings in a function vs copy pasting them directly from here.

List of Functions

Append AppRoleAssignmentsComplex BitAnd CBool CDate Coalesce
ConvertToBase64 ConvertToUTF8Hex Count CStr DateAdd DateDiff
DateFromNum FormatDateTime Guid IgnoreFlowIfNullOrEmpty IIF InStr
IsNull IsNullOrEmpty IsPresent IsString Item Join Left Mid
NormalizeDiacritics Not Now NumFromDate PCase RandomString
Redact RemoveDuplicates Replace SelectUniqueValue
SingleAppRoleAssignment Split StripSpaces Switch ToLower ToUpper
Word

Append

Function: Append(source, suffix)

Description: Takes a source string value and appends the suffix to the end of it.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
source	Required	String	Usually name of the attribute from the source object.
suffix	Required	String	The string that you want to append to the end of the source value.

Append constant suffix to user name

Example: If you're using a Salesforce Sandbox, you might need to append another suffix to all your user names before synchronizing them.

Expression: `Append([userPrincipalName], ".test")`

Sample input/output:

- **INPUT:** (userPrincipalName): "John.Doe@contoso.com"
- **OUTPUT:** "John.Doe@contoso.com.test"

AppRoleAssignmentsComplex

Function: AppRoleAssignmentsComplex([appRoleAssignments])

Description: Used to configure multiple roles for a user. For detailed usage, see [Tutorial - Customize user provisioning attribute-mappings for SaaS applications in Microsoft Entra ID](#).

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
[appRoleAssignments]	Required	String	[appRoleAssignments] object.

BitAnd

Function: BitAnd(value1, value2)

Description: This function converts both parameters to the binary representation and sets a bit to:

- 0 - if one or both of the corresponding bits in value1 and value2 are 0
- 1 - if both of the corresponding bits are 1.

In other words, it returns 0 in all cases except when the corresponding bits of both parameters are 1.

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
value1	Required	Num	Numeric value that should be AND'ed with value2
value2	Required	Num	Numeric value that should be AND'ed with value1

Example: `BitAnd(&HF, &HF7)`

11110111 AND 00000111 = 00000111 so `BitAnd` returns 7, the binary value of 00000111.

CBool

Function: `CBool(Expression)`

Description: `CBool` returns a boolean based on the evaluated expression. If the expression evaluates to a non-zero value, then `CBool` returns *True*, else it returns *False*.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
Expression	Required	expression	Any valid expression

Example: `CBool([attribute1] = [attribute2])`

Returns True if both attributes have the same value.

CDate

Function:

`CDate(expression)`

Description:

The CDate function returns a UTC DateTime from a string. DateTime isn't a native attribute type but it can be used within date functions such as [FormatDateTime](#) and [DateAdd](#).

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
Expression	Required	Expression	Any valid string that represents a date/time. For supported formats, refer to .NET custom date and time format strings .

Remarks:

The returned string is always in UTC and follows the format **M/d/yyyy h:mm:ss tt**.

Example 1:

`CDate([StatusHireDate])`

Sample input/output:

- **INPUT** (StatusHireDate): "2020-03-16-07:00"

- **OUTPUT:** "3/16/2020 7:00:00 AM" <-- Note the UTC equivalent of the above *DateTime* is returned

Example 2:

```
CDate("2021-06-30+08:00")
```

Sample input/output:

- **INPUT:** "2021-06-30+08:00"
- **OUTPUT:** "6/29/2021 4:00:00 PM" <-- Note the UTC equivalent of the above *DateTime* is returned

Example 3:

```
CDate("2009-06-15T01:45:30-07:00")
```

Sample input/output:

- **INPUT:** "2009-06-15T01:45:30-07:00"
- **OUTPUT:** "6/15/2009 8:45:30 AM" <-- Note the UTC equivalent of the above *DateTime* is returned

Coalesce

Function: Coalesce(source1, source2, ..., defaultValue)

Description: Returns the first source value that isn't NULL. If all arguments are NULL and defaultValue is present, the defaultValue is returned. If all arguments are NULL and defaultValue isn't present, Coalesce returns NULL.

Parameters:

[Expand table](#)

Name	Required/Repeating	Type	Notes
source1 ... sourceN	Required	String	Required, variable-number of times. Usually name of the attribute from the source object.
defaultValue	Optional	String	Default value to be used when all source values are NULL. Can be empty string ("").

Flow mail value if not NULL, otherwise flow userPrincipalName

Example: You wish to flow the mail attribute if it is present. If it isn't, you wish to flow the value of userPrincipalName instead.

Expression: `Coalesce([mail],[userPrincipalName])`

Sample input/output:

- **INPUT** (mail): NULL
- **INPUT** (userPrincipalName): "John.Doe@contoso.com"
- **OUTPUT:** "John.Doe@contoso.com"

ConvertToBase64

Function: ConvertToBase64(source)

Description: The ConvertToBase64 function converts a string to a Unicode base64 string.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
source	Required	String	String to be converted to base 64

Example: `ConvertToBase64("Hello world!")`

Returns "SABIAGwAbABvACAAdwBvAHIAbABkACEA"

ConvertToUTF8Hex

Function: ConvertToUTF8Hex(source)

Description: The ConvertToUTF8Hex function converts a string to a UTF8 Hex encoded value.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
source	Required	String	String to be converted to UTF8 Hex

Example: `ConvertToUTF8Hex("Hello world!")`

Returns 48656C6C6F20776F7226C6421

Count

Function: Count(attribute)

Description: The Count function returns the number of elements in a multi-valued attribute

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
attribute	Required	attribute	Multi-valued attribute that will have elements counted

CStr

Function: CStr(value)

Description: The CStr function converts a value to a string data type.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
value	Required	numeric, reference, or boolean	Can be a numeric value, reference attribute, or Boolean.

Example: `CStr([dn])`

Returns "cn=Joe,dc=contoso,dc=com"

DateAdd

Function:

```
DateAdd(interval, value, dateTime)
```

Description:

Returns a date/time string representing a date to which a specified time interval has been added. The returned date is in the format: **M/d/yyyy h:mm:ss tt**.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
interval	Required	String	Interval of time you want to add. See accepted values below this table.
value	Required	Number	The number of units you want to add. It can be positive (to get dates in the future) or negative (to get dates in the past).
dateTime	Required	DateTime	DateTime representing date to which the interval is added.

When passing a date string as input, use [CDate](#) function to wrap the datetime string. To get system time in UTC, use the [Now](#) function.

The **interval** string must have one of the following values:

- yyyy Year
- m Month
- d Day
- ww Week
- h Hour
- n Minute
- s Second

Example 1: Generate a date value based on incoming StatusHireDate from Workday

```
DateAdd("d", 7, CDate([StatusHireDate]))
```

[Expand table](#)

Example	interval	value	dateTime (value of variable StatusHireDate)	output
Add 7 days to hire date	"d"	7	2012-03-16-07:00	3/23/2012 7:00:00 AM
Get a date ten days prior to hire date	"d"	-10	2012-03-16-07:00	3/6/2012 7:00:00 AM
Add two weeks to hire date	"ww"	2	2012-03-16-07:00	3/30/2012 7:00:00 AM
Add ten months to hire date	"m"	10	2012-03-16-07:00	1/16/2013 7:00:00 AM
Add two years to hire date	"yyyy"	2	2012-03-16-07:00	3/16/2014 7:00:00 AM

DateDiff

Function:

```
DateDiff(interval, date1, date2)
```

Description:

This function uses the *interval* parameter to return a number that indicates the difference between the two input dates. It returns

- a positive number if $date2 > date1$,
- a negative number if $date2 < date1$,
- 0 if $date2 == date1$

Parameters:

[Expand table](#)

Name	Required/Optional	Type	Notes
interval	Required	String	Interval of time to use for calculating the difference.
date1	Required	DateTime	DateTime representing a valid date.
date2	Required	DateTime	DateTime representing a valid date.

When passing a date string as input, use [CDate](#) function to wrap the datetime string. To get system time in UTC, use the [Now](#) function.

The **interval** string must have one of the following values:

- yyyy Year
- m Month
- d Day
- ww Week
- h Hour
- n Minute
- s Second

Example 1: Compare current date with hire date from Workday with different intervals

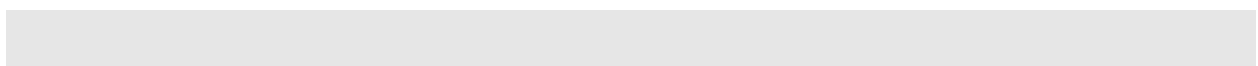
```
DateDiff("d", Now(), CDate([StatusHireDate]))
```

[Expand table](#)

Example	interval	date1	date2	output
Positive difference in days between two dates	d	2021-08-18+08:00	2021-08-31+08:00	13
Negative difference in days between two dates	d	8/25/2021 5:41:18 PM	2012-03-16-07:00	-3449
Difference in weeks between two dates	ww	8/25/2021 5:41:18 PM	2012-03-16-07:00	-493
Difference in months between two dates	m	8/25/2021 5:41:18 PM	2012-03-16-07:00	-113
Difference in years between two dates	yyyy	8/25/2021 5:41:18 PM	2012-03-16-07:00	-9
Difference when both dates are same	d	2021-08-31+08:00	2021-08-31+08:00	0
Difference in hours between two dates	h	2021-08-24	2021-08-25	24
Difference in minutes between two dates	n	2021-08-24	2021-08-25	1440
Difference in seconds between two dates	s	2021-08-24	2021-08-25	86400

Example 2: Combine DateDiff with IIF function to set attribute value

If an account is Active in Workday, set the *accountEnabled* attribute of the user to True only if hire date is within the next five days.



```
Switch([Active], ,
      "1", IIF(DateDiff("d", Now(), CDate([StatusHireDate])) > 5, "False",
      "True"),
      "0", "False")
```

DateFromNum

Function: DateFromNum(value)

Description: The DateFromNum function converts a value in AD's date format to a DateTime type.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
value	Required	Date	AD Date to be converted to DateTime type

Example: `DateFromNum([lastLogonTimestamp])`

`DateFromNum(129699324000000000)`

Returns a DateTime representing January 1, 2012 at 11:00PM.

FormatDateTime

Function: FormatDateTime(source, dateTimeStyles, inputFormat, outputFormat)

Description: Takes a date string from one format and converts it into a different format.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
source	Required	String	Usually name of the attribute from the source object.
dateTimeStyles	Optional	String	Use this parameter to specify the formatting options that customize string parsing for some date and time parsing methods. For supported values, see DateTimeStyles doc . If left empty, the default value used is

Name	Required/ Repeating	Type	Notes
			DateTimeStyles.RoundtripKind, DateTimeStyles.AllowLeadingWhite, DateTimeStyles.AllowTrailingWhite
inputFormat	Required	String	Expected format of the source value. For supported formats, see .NET custom date and time format strings .
outputFormat	Required	String	Format of the output date.

Output date as a string in a certain format

Example: You want to send dates to a SaaS application like ServiceNow in a certain format. You can consider using the following expression.

Expression:

```
FormatDateTime([extensionAttribute1], , "yyyyMMddHHmmss.fZ", "yyyy-MM-dd")
```

Sample input/output:

- **INPUT** (extensionAttribute1): "20150123105347.1Z"
- **OUTPUT**: "2015-01-23"

Guid

Function: Guid()

Description: The function Guid generates a new random GUID

Example:

```
Guid()
```

Sample output: "1088051a-cd4b-4288-84f8-e02042ca72bc"

IgnoreFlowIfNullOrEmpty

Function: IgnoreFlowIfNullOrEmpty(expression)

Description: The IgnoreFlowIfNullOrEmpty function instructs the provisioning service to ignore the attribute and drop it from the flow if the enclosed function or attribute is NULL or empty.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
Expression	Required	Expression	Expression to be evaluated

Example 1: Don't flow an attribute if it is null

```
IgnoreFlowIfNullOrEmpty([department])
```

The above expression will drop the department attribute from the provisioning flow if it is null or empty.

Example 2: Don't flow an attribute if the expression mapping evaluates to empty string or null

Let's say the SuccessFactors attribute *prefix* is mapped to the on-premises Active Directory attribute *personalTitle* using the following expression mapping:

```
IgnoreFlowIfNullOrEmpty(Switch([prefix], "", "3443", "Dr.", "3444", "Prof.", "3445", "Prof. Dr.))
```

The above expression first evaluates the [Switch](#) function. If the *prefix* attribute doesn't have any of the values listed within the *Switch* function, then *Switch* will return an empty string and the attribute *personalTitle* will not be included in the provisioning flow to on-premises Active Directory.

IIF

Function: IIF(condition,valuelfTrue,valuelfFalse)

Description: The IIF function returns one of a set of possible values based on a specified condition.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
condition	Required	Variable or Expression	Any value or expression that can be evaluated to true or false.
valuelfTrue	Required	Variable or String	If the condition evaluates to true, the returned value.

Name	Required/ Repeating	Type	Notes
valueIfFalse	Required	Variable or String	If the condition evaluates to false, the returned value.

The following comparison operators can be used in the *condition*:

- Equal to (=) and not equal to (<>)
- Greater than (>) and greater than equal to (>=)
- Less than (<) and less than equal to (<=)

Example: Set the target attribute value to source country attribute if country="USA", else set target attribute value to source department attribute. `IIF([country]="USA", [country],[department])`

Known limitations

This section includes limitations and workarounds for the IIF function. For information about troubleshooting user creation issues, see [Creation fails due to null / empty values](#).

- The IIF function currently doesn't support AND and OR logical operators.
- To implement AND logic, use nested IIF statement chained along the *trueValue* path. Example: If country="USA" and state="CA", return value "True", else return "False". `IIF([country]="USA",IIF([state]="CA","True","False"),"False")`
- To implement OR logic, use nested IIF statement chained along the *falseValue* path. Example: If country="USA" or state="CA", return value "True", else return "False". `IIF([country]="USA","True",IIF([state]="CA","True","False"))`
- If the source attribute used within the IIF function is empty or null, the condition check fails.
 - Unsupported IIF expression examples:
 - `IIF([country]="","Other",[country])`
 - `IIF(IsNullOrEmpty([country]),"Other",[country])`
 - `IIF(IsPresent([country]),[country],"Other")`
 - Recommended workaround: Use the [Switch](#) function to check for empty/null values. Example: If country attribute is empty, set value "Other". If it is present, pass the country attribute value to target attribute.
 - `Switch([country],[country],"","Other")`

Function: InStr(value1, value2, start, compareType)

Description: The InStr function finds the first occurrence of a substring in a string

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
value1	Required	String	String to be searched
value2	Required	String	String to be found
start	Optional	Integer	Starting position to find the substring
compareType	Optional	Enum	Can be vbTextCompare or vbBinaryCompare

Example: `InStr("The quick brown fox","quick")`

Evaluates to 5

`InStr("repEated","e",3,vbBinaryCompare)`

Evaluates to 7

IsNull

Function: IsNull(Expression)

Description: If the expression evaluates to Null, then the IsNull function returns true. For an attribute, a Null is expressed by the absence of the attribute.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
Expression	Required	Expression	Expression to be evaluated

Example: `IsNull([displayName])`

Returns True if the attribute isn't present.

IsNullorEmpty

Function: IsNullOrEmpty(Expression)

Description: If the expression is null or an empty string, then the IsNullOrEmpty function returns true. For an attribute, this would evaluate to True if the attribute is absent or is present but is an empty string. The inverse of this function is named IsPresent.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
Expression	Required	Expression	Expression to be evaluated

Example: `IsNullOrEmpty([displayName])`

Returns True if the attribute isn't present or is an empty string.

IsPresent

Function: IsPresent(Expression)

Description: If the expression evaluates to a string that isn't Null and isn't empty, then the IsPresent function returns true. The inverse of this function is named IsNullOrEmpty.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
Expression	Required	Expression	Expression to be evaluated

Example: `Switch(IsPresent([directManager]),[directManager],
IsPresent([skiplevelManager]),[skiplevelManager], IsPresent([director]),[director])`

IsString

Function: IsString(Expression)

Description: If the expression can be evaluated to a string type, then the IsString function evaluates to True.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
Expression	Required	Expression	Expression to be evaluated

Item

Function: Item(attribute, index)

Description: The Item function returns one item from a multi-valued string/attribute.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
attribute	Required	Attribute	Multi-valued attribute to be searched
index	Required	Integer	Index to an item in the multi-valued string

Example: `Item([proxyAddresses], 1)` returns the first item in the multi-valued attribute. Index 0 shouldn't be used.

Join

Function: Join(separator, source1, source2, ...)

Description: Join() is similar to Append(), except that it can combine multiple **source** string values into a single string, and each value will be separated by a **separator** string.

If one of the source values is a multi-value attribute, then every value in that attribute will be joined together, separated by the separator value.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
separator	Required	String	String used to separate source values when they are concatenated into one string. Can be "" if no separator is required.

Name	Required/ Repeating	Type	Notes
source1 ... sourceN	Required, variable- number of times	String	String values to be joined together.

Left

Function: Left(String, NumChars)

Description: The Left function returns a specified number of characters from the left of a string. If numChars = 0, return empty string. If numChars < 0, return input string. If string is null, return empty string. If string contains fewer characters than the number specified in numChars, a string identical to string (that is, containing all characters in parameter 1) is returned.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
String	Required	Attribute	The string to return characters from
NumChars	Required	Integer	A number identifying the number of characters to return from the beginning (left) of string

Example: `Left("John Doe", 3)`

Returns "Joh".

Mid

Function: Mid(source, start, length)

Description: Returns a substring of the source value. A substring is a string that contains only some of the characters from the source string.

Parameters:

[Expand table](#)

Character with Diacritic	Normalized character	Character with Diacritic	Normalized character
ğ, ğ, ğ	g	Ğ, Ğ, Ğ	G
ï, î, ì, í, î, î, î, î, î, î, î	i	Ï, Î, Ì, Í, Î, Î, Î, Î, Î, Î, Î	I
ł, ł, Ł, Ł, Ł	l	Ł, Ł, Ł, Ł, Ł	L
ñ, ñ, ñ, ñ, ñ	n	Ñ, Ñ, Ñ, Ñ, Ñ	N
ö, ò, ó, ô, ô, ó, ô, ó, ò, ô, ò, ò, ò, ò, ò, ò	o	Ö, Ò, Ó, Ô, Ô, Ó, Ô, Ó, Ò, Ô, Ö, Ö, Ö, Ö, Ö, Ö	O
ø, ø, œ	oe	Ø, Ø, Œ	OE
ř, ř, ř, ř	r	Ř, Ř, Ř, Ř	R
ß	ss		
š, ś, ș, ș, š, ś	s	Š, Ś, Ș, Ș, Š, Ś	S
ť, ť, ť, ť	t	Ť, Ť, Ť, Ť	T
ü, ù, û, ú, û, ú, û, ú, ù, û, ù, ù, ù, ù	u	Ü, Ù, Û, Ú, Û, Ú, Û, Ú, Ù, Û, Ü, Ü, Ü, Ü, Ü, Ü	U
ÿ, ý, ý, ý, ý, ý, ý	y	ÿ, Ý, Ý, Ý, Ý, Ý, Ý	Y
ž, ž, ž, ž, ž	z	Ž, Ž, Ž, Ž, Ž	Z

Remove diacritics from a string

Example: Replace characters containing accent marks with equivalent characters that don't contain accent marks.

Expression: NormalizeDiacritics([givenName])

Sample input/output:

- **INPUT** (givenName): "Zoë"
- **OUTPUT:** "Zoe"

Not

Function: Not(source)

Description: Flips the boolean value of the **source**. If **source** value is True, returns False. Otherwise, returns True.

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
source	Required	Boolean String	Expected source values are "True" or "False".

Now

Function: Now()

Description:

The Now function returns a string representing the current UTC DateTime in the format **M/d/yyyy h:mm:ss tt**.

Example: `Now()`

Example value returned *7/2/2021 3:33:38 PM*


NumFromDate

Function: NumFromDate(value)

Description: The NumFromDate function converts a DateTime value to Active Directory format that is required to set attributes like [accountExpires](#). Use this function to convert DateTime values received from cloud HR apps like Workday and SuccessFactors to their equivalent AD representation.

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
value	Required	String	Date time string in ISO 8601  format. If the date variable is in a different format, use FormatDateTime function to convert the date to ISO 8601 format.

Example:

- Workday example Assuming you want to map the attribute *ContractEndDate* from Workday, which is in the format *2020-12-31-08:00* to *accountExpires* field in AD, here's how you can use this function and change the timezone offset to match your locale. `NumFromDate(Join("", FormatDateTime([ContractEndDate], "yyyy-MM-ddzzz", "yyyy-MM-dd"), " 23:59:59-08:00"))`
- SuccessFactors example Assuming you want to map the attribute *endDate* from SuccessFactors, which is in the format *M/d/yyyy hh:mm:ss tt* to *accountExpires* field in AD, here's how you can use this function and change the time zone offset to match your locale. `NumFromDate(Join("", FormatDateTime([endDate], "M/d/yyyy hh:mm:ss tt", "yyyy-MM-dd"), " 23:59:59-08:00"))`

PCase

Function: PCase(source, wordSeparators)


Description: The PCase function converts the first character of each word in a string to upper case, and all other characters are converted to lower case.

Parameters:

 Expand table

Name	Required/Optional	Type	Notes
source	Required	String	source value to convert to proper case.
wordSeparators	Optional	String	Specify a set of characters that is used as word separators (example: " , -")

Remarks:

- If the *wordSeparators* parameter isn't specified, then PCase internally invokes the .NET function [ToTitleCase](#) to convert the *source* string to proper case. The .NET function *ToTitleCase* supports a comprehensive set of the [Unicode character categories](#)  as word separators.
 - Space character
 - New line character
 - *Control* characters like CRLF
 - *Format* control characters
 - *ConnectorPunctuation* characters like underscore
 - *DashPunctuation* characters like dash and hyphen (including characters such as En Dash, Em Dash, double hyphen, etc.)

- *OpenPunctuation* and *ClosePunctuation* characters that occur in pairs like parenthesis, curly bracket, angle bracket, etc.
- *InitialQuotePunctuation* and *FinalQuotePunctuation* characters like single quotes, double quotes and angular quotes.
- *OtherPunctuation* characters like exclamation mark, number sign, percent sign, ampersand, asterisk, comma, full stop, colon, semi-colon, etc.
- *MathSymbol* characters like plus sign, less-than and greater-than sign, vertical line, tilde, equals sign, etc.
- *CurrencySymbol* characters like dollar sign, cent sign, pound sign, euro sign, etc.
- *ModifierSymbol* characters like macron, accents, arrow heads, etc.
- *OtherSymbol* characters like copyright sign, degree sign, registered sign, etc.
- If the *wordSeparators* parameter is specified, then PCase only uses the characters specified as word separators.

Example:

Let's say you're sourcing the attributes *firstName* and *lastName* from SAP SuccessFactors and in HR both these attributes are in upper-case. Using the PCase function, you can convert the name to proper case as shown below.

[Expand table](#)

Expression	Input	Output	Notes
<code>PCase([firstName])</code>	<i>firstName</i> = "PABLO GONSALVES (SECOND)"	"Pablo Gonsalves (Second)"	As the <i>wordSeparators</i> parameter isn't specified, the <i>PCase</i> function uses the default word separators character set.
<code>PCase([lastName], " '-")</code>	<i>lastName</i> = "PINTO- DE'SILVA"	"Pinto- De'Silva"	The <i>PCase</i> function uses characters in the <i>wordSeparators</i> parameter to identify words and transform them to proper case.
<code>PCase(Join(" ", [firstName], [lastName]))</code>	<i>firstName</i> = GREGORY, <i>lastName</i> = "JAMES"	"Gregory James"	You can nest the Join function within PCase. As the <i>wordSeparators</i> parameter isn't specified, the <i>PCase</i> function uses the default word separators character set.

RandomString

Function: RandomString(Length, MinimumNumbers, MinimumSpecialCharacters, MinimumCapital, MinimumLowerCase, CharactersToAvoid)

Description: The RandomString function generates a random string based on the conditions specified. Characters allowed can be identified [here](#).

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
Length	Required	Number	Total length of the random string. This should be greater than or equal to the sum of MinimumNumbers, MinimumSpecialCharacters, and MinimumCapital. 256 characters max.
MinimumNumbers	Required	Number	Minimum numbers in the random string.
MinimumSpecialCharacters	Required	Number	Minimum number of special characters.
MinimumCapital	Required	Number	Minimum number of capital letters in the random string.
MinimumLowerCase	Required	Number	Minimum number of lower case letters in the random string.
CharactersToAvoid	Optional	String	Characters to be excluded when generating the random string.

Example 1: - Generate a random string without special character restrictions:

`RandomString(6,3,0,0,3)` Generates a random string with 6 characters. The string contains 3 numbers and 3 lower case characters (1a73qt).

Example 2: - Generate a random string with special character restrictions:

`RandomString(10,2,2,2,1,"?,")` Generates a random string with 10 characters. The string contains at least 2 numbers, 2 special characters, 2 capital letters, 1 lower case letter and excludes the characters "?" and "," (1@!2BaRg53).

Redact

Function: Redact()

Description: The Redact function replaces the attribute value with the string literal "[Redact]" in the provisioning logs.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
attribute/value	Required	String	Specify the attribute or constant / string to redact from the logs.

Example 1: Redact an attribute: `Redact([userPrincipalName])` Removes the userPrincipalName from the provisioning logs.

Example 2: Redact a string: `Redact("StringToBeRedacted")` Removes a constant string from the provisioning logs.

Example 3: Redact a random string: `Redact(RandomString(6,3,0,0,3))` Removes the random string from the provisioning logs.

RemoveDuplicates

Function: RemoveDuplicates(attribute)

Description: The RemoveDuplicates function takes a multi-valued string and make sure each value is unique.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
attribute	Required	Multi-valued Attribute	Multi-valued attribute that has duplicates removed

Example: `RemoveDuplicates([proxyAddresses])` Returns a sanitized proxyAddress attribute where all duplicate values are removed.

Replace

Function: Replace(source, oldValue, regexPattern, regexGroupName, replacementValue, replacementAttributeName, template)

Description: Replaces values within a string in a case-sensitive manner. The function behaves differently depending on the parameters provided:

- When **oldValue** and **replacementValue** are provided:
 - Replaces all occurrences of **oldValue** in the **source** with **replacementValue**
- When **oldValue** and **template** are provided:
 - Replaces all occurrences of the **oldValue** in the **template** with the **source** value
- When **regexPattern** and **replacementValue** are provided:
 - The function applies the **regexPattern** to the **source** string and you can use the regex group names to construct the string for **replacementValue**

ⓘ Note

To learn more about regex grouping constructs and named sub-expressions, see [Grouping Constructs in Regular Expressions](#).

- When **regexPattern**, **regexGroupName**, **replacementValue** are provided:
 - The function applies the **regexPattern** to the **source** string and replaces all values matching **regexGroupName** with **replacementValue**
- When **regexPattern**, **regexGroupName**, **replacementAttributeName** are provided:
 - If **source** has a value, **source** is returned
 - If **source** has no value, the function applies the **regexPattern** to the **replacementAttributeName** and returns the value matching **regexGroupName**

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
source	Required	String	Usually name of the attribute from the source object.
oldValue	Optional	String	Value to be replaced in source or template .
regexPattern	Optional	String	Regex pattern for the value to be replaced in source . When replacementAttributeName is used, the regexPattern is applied to extract a value from replacementAttributeName .
regexGroupName	Optional	String	Name of the group inside regexPattern . When named replacementAttributeName is used, we'll extract the value of the named regex group from the

Name	Required/ Repeating	Type	Notes
			replacementAttributeName and return it as the replacement value.
replacementValue	Optional	String	New value to replace old one with.
replacementAttributeName	Optional	String	Name of the attribute to be used for replacement value
template	Optional	String	When template value is provided, we'll look for oldValue inside the template and replace it with source value.

Replace characters using a regular expression

Example 1: Using **oldValue** and **replacementValue** to replace the entire source string with another string.

Let's say your HR system has an attribute `BusinessTitle`. As part of recent job title changes, your company wants to update anyone with the business title "Product Developer" to "Software Engineer". Then in this case, you can use the following expression in your attribute mapping.

```
Replace([BusinessTitle],"Product Developer", , , "Software Engineer", , )
```

- **source:** `[BusinessTitle]`
- **oldValue:** "Product Developer"
- **replacementValue:** "Software Engineer"
- **Expression output:** Software Engineer

Example 2: Using **oldValue** and **template** to insert the source string into another *templated* string.

The parameter **oldValue** is a misnomer in this scenario. It's actually the value that gets replaced.

Let's say you want to always generate login ID in the format `<username>@contoso.com`. There is a source attribute called **UserID** and you want that value to be used for the `<username>` portion of the login ID. Then in this case, you can use the following expression in your attribute mapping.

```
Replace([UserID],"<username>", , , , "<username>@contoso.com")
```

- **source:** `[UserID] = "jsmith"`

- **oldValue:** "<username>"
- **template:** "<username>@contoso.com"
- **Expression output:** "jsmith@contoso.com"

Example 3: Using **regexPattern** and **replacementValue** to extract a portion of the source string and replace it with an empty string or a custom value built using regex patterns or regex group names.

Let's say you have a source attribute **telephoneNumber** that has components **country code** and **phone number** separated by a space character. For example, **+91 9998887777**. Then in this case, you can use the following expression in your attribute mapping to extract the 10 digit phone number.

```
Replace([telephoneNumber], , "\\+(?<isdCode>\\d* )(?<phoneNumber>\\d{10})", , ,
"${phoneNumber}", , )
```

- **source:** [telephoneNumber] = "+91 9998887777"
- **regexPattern:** "\\+(?<isdCode>\\d*)(?<phoneNumber>\\d{10})"
- **replacementValue:** "\${phoneNumber}"
- **Expression output:** 9998887777

You can also use this pattern to remove characters and collapse a string. For example, the expression below removes parenthesis, dashes and space characters in the mobile number string and returns only digits.

```
Replace([mobile], , "[()\\s-]+", , "", , )
```

- **source:** [mobile] = "+1 (999) 888-7777"
- **regexPattern:** "[()\\s-]+"
- **replacementValue:** "" (empty string)
- **Expression output:** 19998887777

Example 4: Using **regexPattern**, **regexGroupName** and **replacementValue** to extract a portion of the source string and replace it with another literal value or empty string.

Let's say your source system has an attribute **AddressLineData** with two components **street number** and **street name**. As part of a recent move, let's say the street number of the address changed, and you want to update only the street number portion of the address line. Then in this case, you can use the following expression in your attribute mapping to extract the street number.

```
Replace([AddressLineData], , "(?<streetNumber>^\\d*)", "streetNumber", "888", , )
```

- **source:** [AddressLineData] = "545 Tremont Street"

- **regexPattern:** "(?<streetNumber>^\d*)"
- **regexGroupName:** "streetNumber"
- **replacementValue:** "888"
- **Expression output:** 888 Tremont Street

Here is another example where the domain suffix from a UPN is replaced with an empty string to generate login ID without domain suffix.

```
Replace([userPrincipalName], , "(?<Suffix>@(.)*", "Suffix", "", , , )
```

- **source:** [userPrincipalName] = "jsmith@contoso.com"
- **regexPattern:** "(?<Suffix>@(.)*"
- **regexGroupName:** "Suffix"
- **replacementValue:** "" (empty string)
- **Expression output:** jsmith

Example 5: Using **regexPattern**, **regexGroupName** and **replacementAttributeName** to handle scenarios when the source attribute is empty or doesn't have a value.

Let's say your source system has an attribute telephoneNumber. If telephoneNumber is empty, you want to extract the 10 digits of the mobile number attribute. Then in this case, you can use the following expression in your attribute mapping.

```
Replace([telephoneNumber], , "\\+(?<isdCode>\d* )(?<phoneNumber>\d{10})", "phoneNumber" , , [mobile], )
```

- **source:** [telephoneNumber] = "" (empty string)
- **regexPattern:** "\\+(?<isdCode>\d*)(?<phoneNumber>\d{10})"
- **regexGroupName:** "phoneNumber"
- **replacementAttributeName:** [mobile] = "+91 8887779999"
- **Expression output:** 8887779999

Example 6: You need to find characters that match a regular expression value and remove them.

```
Replace([mailNickname], , "[a-zA-Z_]*", , "", , , )
```

- **source** [mailNickname]
 - **oldValue:** "john_doe72"
 - **replaceValue:** ""
 - **Expression output:** 72
-

SelectUniqueValue

Function: SelectUniqueValue(uniqueValueRule1, uniqueValueRule2, uniqueValueRule3, ...)

Description: Requires a minimum of two arguments, which are unique value generation rules defined using expressions. The function evaluates each rule and then checks the value generated for uniqueness in the target app/directory. The first unique value found will be the one returned. If all of the values already exist in the target, the entry will get escrowed, and the reason gets logged in the audit logs. There is no upper bound to the number of arguments that can be provided.

- This function must be at the top-level and cannot be nested.
- This function cannot be applied to attributes that have a matching precedence.
- This function is only meant to be used for entry creations. When using it with an attribute, set the **Apply Mapping** property to **Only during object creation**.
- This function is currently only supported for "Workday to Active Directory User Provisioning" and "SuccessFactors to Active Directory User Provisioning". It cannot be used with other provisioning applications.
- The LDAP search that *SelectUniqueValue* function performs in on-premises Active Directory doesn't escape special characters like diacritics. If you pass a string like "Jéssica Smith" that contains a special character, you will encounter processing errors. Nest the [NormalizeDiacritics](#) function as shown in the example below to normalize special characters.

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
uniqueValueRule1 ... uniqueValueRuleN	At least 2 are required, no upper bound	String	List of unique value generation rules to evaluate.

Generate unique value for userPrincipalName (UPN) attribute

Example: Based on the user's first name, middle name and last name, you need to generate a value for the UPN attribute and check for its uniqueness in the target AD directory before assigning the value to the UPN attribute.

Expression:

```
ad-attr-mapping-expr
```

```

SelectUniqueValue(
    Join("@", NormalizeDiacritics(StripSpaces(Join(".",
[PreferredFirstName], [PreferredLastName]))), "contoso.com"),
    Join("@", NormalizeDiacritics(StripSpaces(Join(".",
Mid([PreferredFirstName], 1, 1), [PreferredLastName]))), "contoso.com"),
    Join("@", NormalizeDiacritics(StripSpaces(Join(".",
Mid([PreferredFirstName], 1, 2), [PreferredLastName]))), "contoso.com")
)

```

Sample input/output:

- **INPUT** (PreferredFirstName): "John"
- **INPUT** (PreferredLastName): "Smith"
- **OUTPUT**: "John.Smith@contoso.com" if UPN value of John.Smith@contoso.com doesn't already exist in the directory
- **OUTPUT**: "J.Smith@contoso.com" if UPN value of John.Smith@contoso.com already exists in the directory
- **OUTPUT**: "Jo.Smith@contoso.com" if the above two UPN values already exist in the directory

SingleAppRoleAssignment

Function: SingleAppRoleAssignment([appRoleAssignments])

Description: Returns a single appRoleAssignment from the list of all appRoleAssignments assigned to a user for a given application. This function is required to convert the appRoleAssignments object into a single role name string. The best practice is to ensure only one appRoleAssignment is assigned to one user at a time. This function isn't supported in scenarios where users have multiple app role assignments.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
[appRoleAssignments]	Required	String	[appRoleAssignments] object.

Split

Function: Split(source, delimiter)

Description: Splits a string into a multi-valued array, using the specified delimiter character.

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
source	Required	String	source value to update.
delimiter	Required	String	Specifies the character that will be used to split the string (example: ",")

Split a string into a multi-valued array

Example: You need to take a comma-delimited list of strings, and split them into an array that can be plugged into a multi-value attribute like Salesforce's PermissionSets attribute. In this example, a list of permission sets has been populated in extensionAttribute5 in Microsoft Entra ID.

Expression: Split([extensionAttribute5], ",")

Sample input/output:

- **INPUT** (extensionAttribute5): "PermissionSetOne, PermissionSetTwo"
- **OUTPUT:** ["PermissionSetOne", "PermissionSetTwo"]

StripSpaces

Function: StripSpaces(source)

Description: Removes all space (" ") characters from the source string.

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
source	Required	String	source value to update.

Switch

Function: Switch(source, defaultValue, key1, value1, key2, value2, ...)

Description: When **source** value matches a **key**, returns **value** for that **key**. If **source** value doesn't match any keys, returns **defaultValue**. **Key** and **value** parameters must always come in pairs. The function always expects an even number of parameters. The function shouldn't be used for referential attributes such as manager.

ⓘ Note

Switch function performs a case-sensitive string comparison of the **source** and **key** values. If you'd like to perform a case-insensitive comparison, normalize the **source** string before comparison using a nested ToLower function and ensure that all **key** strings use lowercase. Example: `Switch(ToLower([statusFlag]), "0", "true", "1", "false", "0")`. In this example, the **source** attribute `statusFlag` may have values ("True" / "true" / "TRUE"). However, the Switch function will always convert it to lowercase string "true" before comparison with **key** parameters.

⊗ Caution

For the **source** parameter, do not use the nested functions IsPresent, IsNull or IsNullOrEmpty. Instead use a literal empty string as one of the key values. Example: `Switch([statusFlag], "Default Value", "true", "1", "", "0")`. In this example, if the **source** attribute `statusFlag` is empty, the Switch function will return the value 0.

Parameters:

[Expand table](#)

Name	Required/ Repeating	Type	Notes
source	Required	String	Source value to update.
defaultValue	Optional	String	Default value to be used when source doesn't match any keys. Can be empty string ("").
key	Required	String	Key to compare source value with.
value	Required	String	Replacement value for the source matching the key.

Replace a value based on predefined set of options

Example: Define the time zone of the user based on the state code stored in Microsoft Entra ID. If the state code doesn't match any of the predefined options, use default value of "Australia/Sydney".

Expression: `Switch([state], "Australia/Sydney", "NSW", "Australia/Sydney", "QLD", "Australia/Brisbane", "SA", "Australia/Adelaide")`

Sample input/output:

- **INPUT** (state): "QLD"
- **OUTPUT:** "Australia/Brisbane"

ToLower

Function: ToLower(source, culture)

Description: Takes a *source* string value and converts it to lower case using the culture rules that are specified. If there is no *culture* info specified, then it will use Invariant culture.

If you would like to set existing values in the target system to lower case, [update the schema for your target application](#) and set the property caseExact to 'true' for the attribute that you're interested in.

Parameters:

 Expand table

Name	Required/Repeating	Type	Notes
source	Required	String	Usually name of the attribute from the source object
culture	Optional	String	The format for the culture name based on RFC 4646 is <i>languagecode2-country/regioncode2</i> , where <i>languagecode2</i> is the two-letter language code and <i>country/regioncode2</i> is the two-letter subculture code. Examples include ja-JP for Japanese (Japan) and en-US for English (United States). In cases where a two-letter language code isn't available, a three-letter code derived from ISO 639-2 is used.

Convert generated userPrincipalName (UPN) value to lower case

Example: You would like to generate the UPN value by concatenating the PreferredFirstName and PreferredLastName source fields and converting all characters to lower case.

```
ToLower(Join("@", NormalizeDiacritics(StripSpaces(Join(".", [PreferredFirstName], [PreferredLastName]))), "contoso.com"))
```

Sample input/output:

- **INPUT** (PreferredFirstName): "John"
- **INPUT** (PreferredLastName): "Smith"
- **OUTPUT**: "john.smith@contoso.com"

ToUpper

Function: ToUpper(source, culture)

Description: Takes a *source* string value and converts it to upper case using the culture rules that are specified. If there is no *culture* info specified, then it will use Invariant culture.

If you would like to set existing values in the target system to upper case, [update the schema for your target application](#) and set the property caseExact to 'true' for the attribute that you're interested in.

Parameters:

 Expand table

Name	Required/ Repeating	Type	Notes
source	Required	String	Usually name of the attribute from the source object.
culture	Optional	String	The format for the culture name based on RFC 4646 is <i>languagecode2-country/regioncode2</i> , where <i>languagecode2</i> is the two-letter language code and <i>country/regioncode2</i> is the two-letter subculture code. Examples include ja-JP for Japanese (Japan) and en-US for English (United States). In cases where a two-letter language code isn't available, a three-letter code derived from ISO 639-2 is used.

Word

Function: Word(String,WordNumber,Delimiters)

Description: The Word function returns a word contained within a string, based on parameters describing the delimiters to use and the word number to return. Each string of characters in string separated by the one of the characters in delimiters are identified as words:

If number < 1, returns empty string. If string is null, returns empty string. If string contains less than number words, or string doesn't contain any words identified by delimiters, an empty string is returned.

Parameters:

[Expand table](#)

Name	Required/Repeating	Type	Notes
String	Required	Multi-valued Attribute	String to return a word from.
WordNumber	Required	Integer	Number identifying which word number should return
delimiters	Required	String	A string representing the delimiter(s) that should be used to identify words

Example: `Word("The quick brown fox",3," ")`

Returns "brown".

`Word("This,string!has&many separators",3," !&#")`

Returns "has".

Examples

This section provides more expression function usage examples.

Strip known domain name

Strip a known domain name from a user's email to obtain a user name. For example, if the domain is "contoso.com", then you could use the following expression:

Expression: `Replace([mail], "@contoso.com", , , "", ,)`

Sample input / output:

- INPUT (mail): "john.doe@contoso.com"
- OUTPUT: "john.doe"

Generate user alias by concatenating parts of first and last name

Generate a user alias by taking first three letters of user's first name and first five letters of user's last name.

Expression: `Append(Mid([givenName], 1, 3), Mid([surname], 1, 5))`

Sample input/output:

- INPUT (givenName): "John"
- INPUT (surname): "Doe"
- OUTPUT: "JohDoe"

Add a comma between last name and first name.

Add a comma between last name and first name.

Expression: `Join(", ", "", [surname], [givenName])`

Sample input/output:

- INPUT (givenName): "John"
- INPUT (surname): "Doe"
- OUTPUT: "Doe, John"

Generate an ID for a user based on their Microsoft Entra ID object ID. Remove any letters from the ID and add 1000 at the beginning.

This expression allows you to generate an identifier for a user that starts with 1000 and is likely to be unique.

Expression: `Join("", 1000, Replace(ConvertToUTF8Hex([objectId]), "[a-zA-Z]*", "", , ,))`

Sample input/output:

- INPUT: "d05e47b1-3909-445a-ba5e-ca60cbc0e4b4"

- **OUTPUT:**

"100064303565343762312333930392343435612626135652636136306362633065346234"

Related Articles

- [Automate User Provisioning/Deprovisioning to SaaS Apps](#)
- [Customizing Attribute Mappings for User Provisioning](#)
- [Scoping Filters for User Provisioning](#)
- [Using SCIM to enable automatic provisioning of users and groups from Microsoft Entra ID to applications](#)
- [Account Provisioning Notifications](#)
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