On-Premises Active Directory to Microsoft Entra ID Synchronization using Microsoft Entra Connect

Objective

The objective of this project is to configure a hybrid identity environment by synchronizing on-premises Active Directory users and groups with Microsoft Entra ID using Microsoft Entra Connect. This enables centralized identity management, seamless authentication, and secure access to cloud services using on-premises credentials.

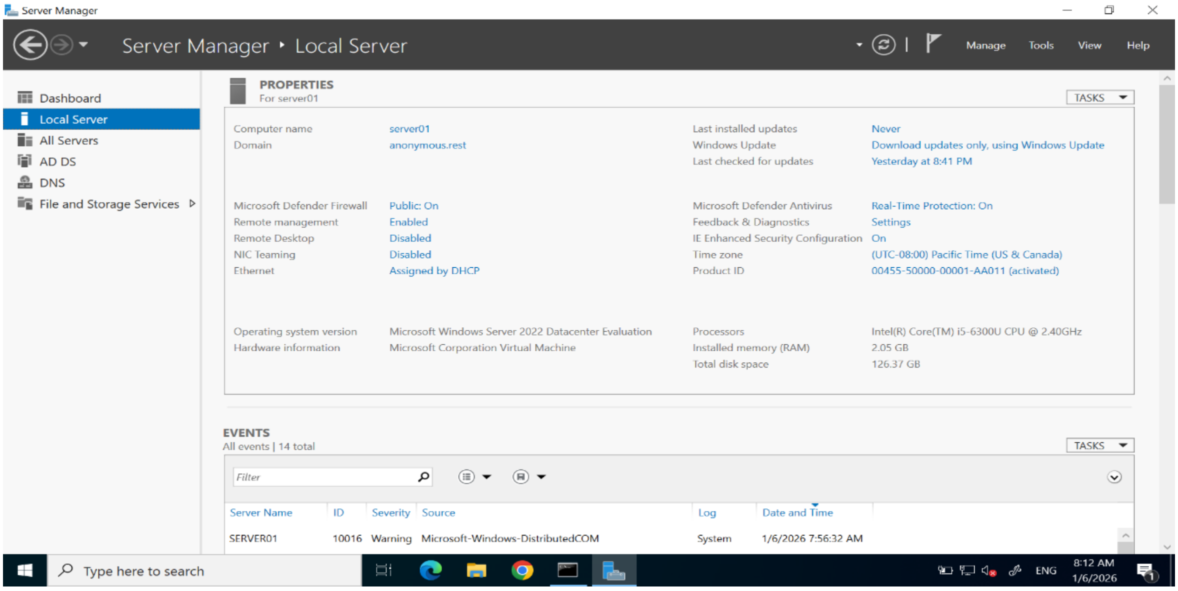
Tools & Technologies Used

- Windows Server 2022 (On-Premises Active Directory)
- Microsoft Entra ID (Azure AD)
- Microsoft Entra Connect Sync
- Azure Portal
- Active Directory Users & Computers (ADUC)

Deployment Steps

Step 1:Successfully Installed ADDS

I have successfully installed Active Directory and Domain Services on windows server named server01.



PROPERTIES
For server01

Computer name: server01
Domain: anonymous.rest

Last installed updates: Never
Windows Update: Download updates only, using Windows Update
Last checked for updates: Yesterday at 8:41 PM

Microsoft Defender Firewall: Public: On
Remote management: Enabled
Remote Desktop: Disabled
NIC Teaming: Disabled
Ethernet: Assigned by DHCP

Microsoft Defender Antivirus: Real-Time Protection: On
Feedback & Diagnostics: Settings
IE Enhanced Security Configuration: On
Time zone: (UTC-08:00) Pacific Time (US & Canada)
Product ID: 00455-50000-00001-AA011 (activated)

Operating system version: Microsoft Windows Server 2022 Datacenter Evaluation
Hardware information: Microsoft Corporation Virtual Machine

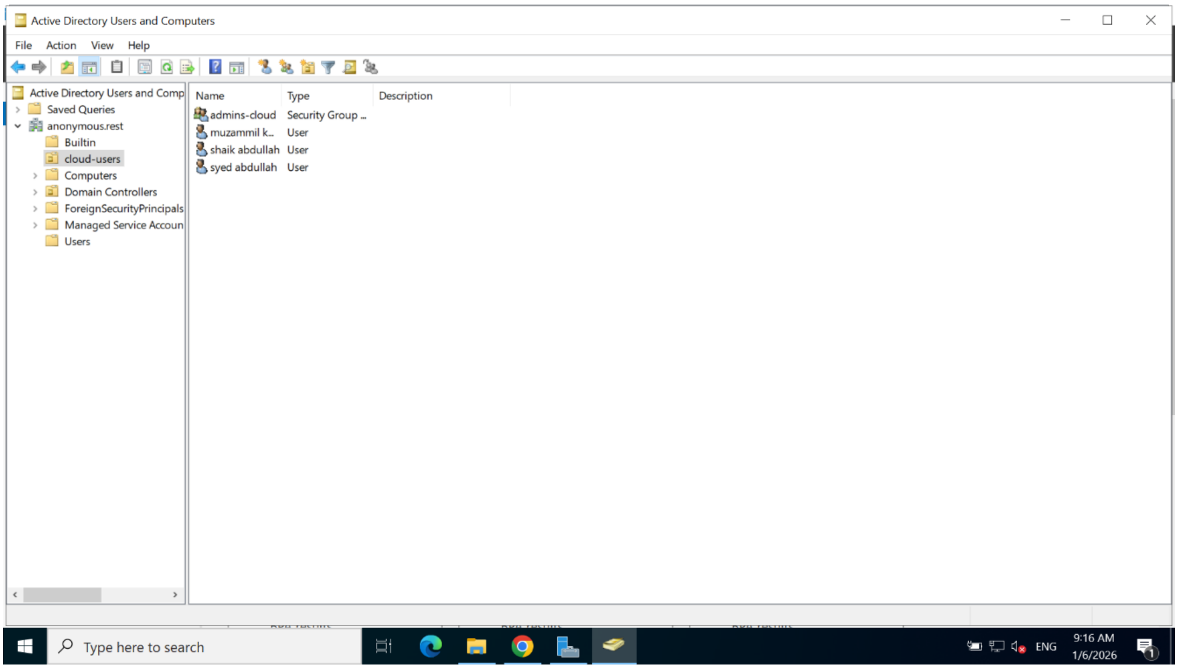
Processors: Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz
Installed memory (RAM): 2.05 GB
Total disk space: 126.37 GB

EVENTS
All events | 14 total

Server Name	ID	Severity	Source	Log	Date and Time
SERVER01	10016	Warning	Microsoft-Windows-DistributedCOM	System	1/6/2026 7:56:32 AM

Step 2:Creation of OU , Users and Group

I have created an OU named Cloud-users in Active Directory Users and Computers and in that OU I have created a Security group and users.

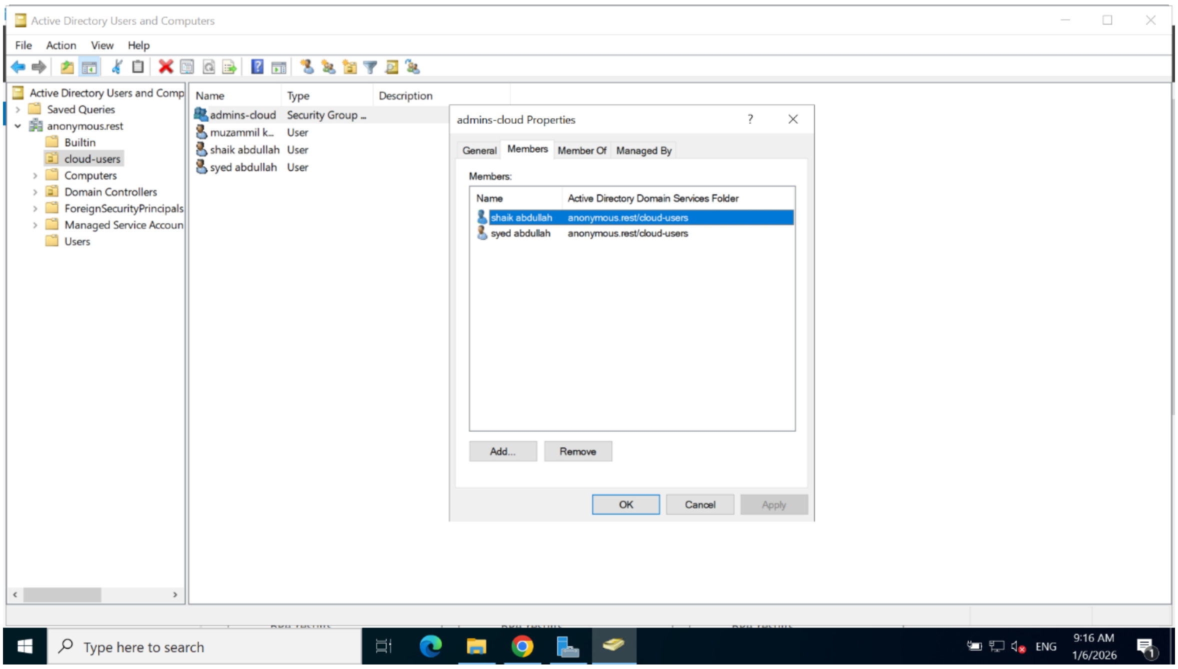


Active Directory Users and Comp
- Saved Queries
- anonymous.rest
  - Builtin
  - cloud-users
  - Computers
  - Domain Controllers
  - ForeignSecurityPrincipals
  - Managed Service Accoun
  - Users

Name	Type	Description
admins-cloud	Security Group ...	
muzammil k...	User	
shaik abdullah	User	
syed abdullah	User	

Step 3:Adding of members in group

I have added two members into a group named admins-cloud.



Active Directory Users and Comp
- Saved Queries
- anonymous.rest
  - Builtin
  - cloud-users
  - Computers
  - Domain Controllers
  - ForeignSecurityPrincipals
  - Managed Service Accoun
  - Users

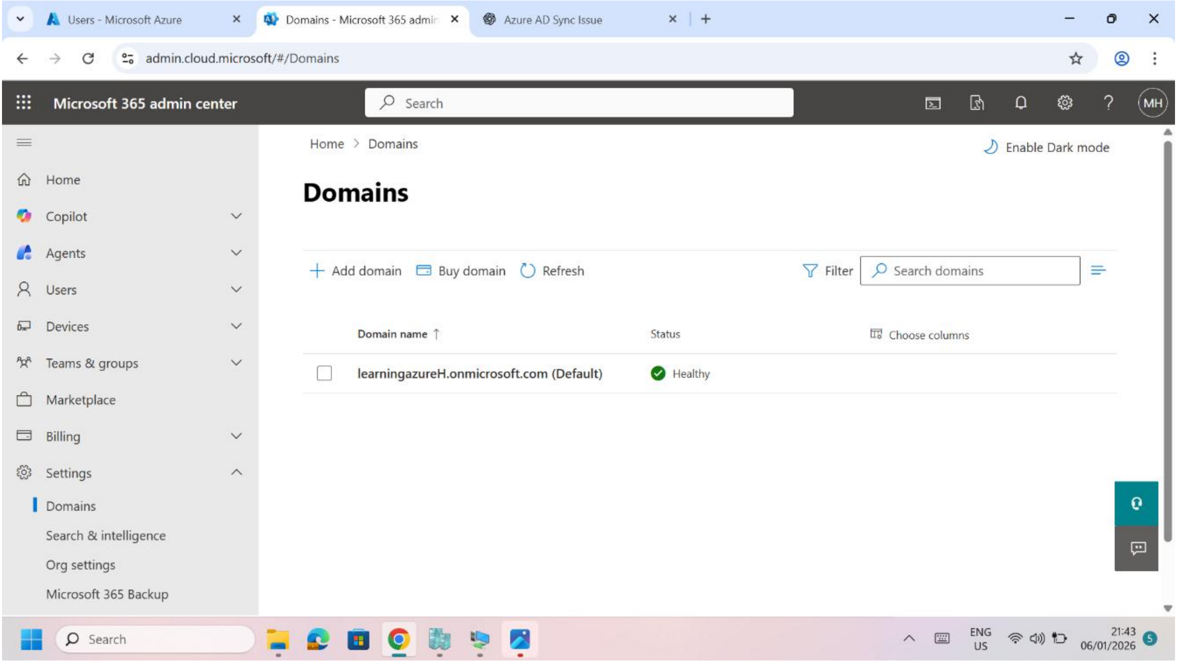
Name	Type	Description
admins-cloud	Security Group ...	
muzammil k...	User	
shaik abdullah	User	
syed abdullah	User	

Members:

Name	Active Directory Domain Services Folder
shaik abdullah	anonymous.rest/cloud-users
syed abdullah	anonymous.rest/cloud-users

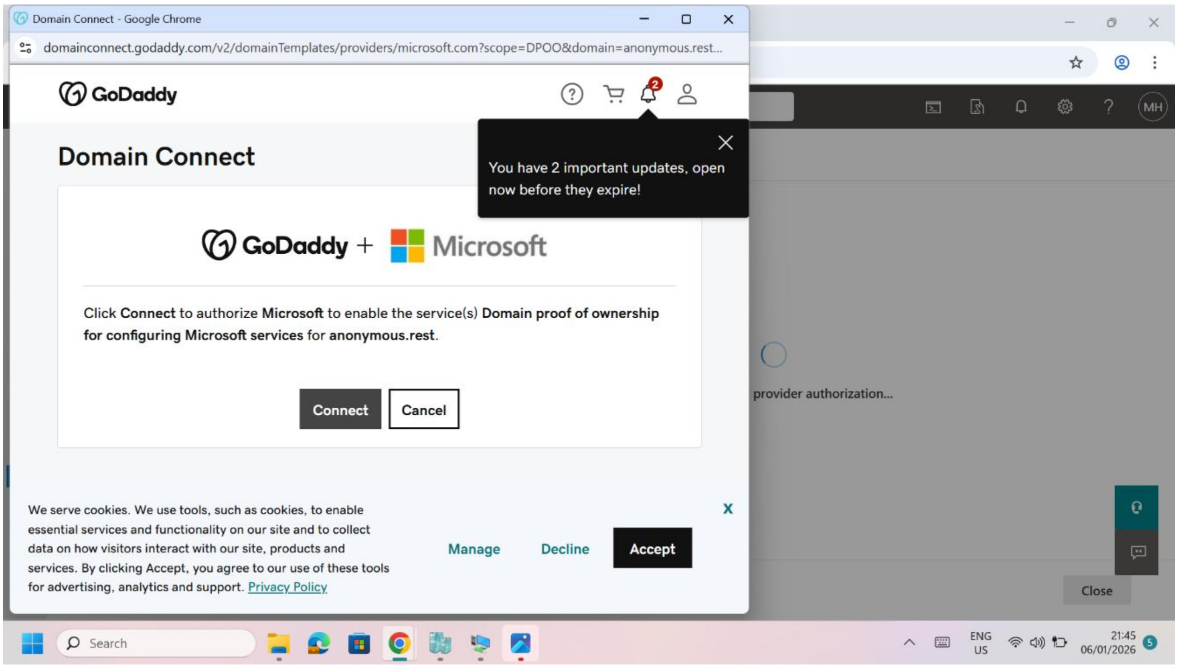
Step 4:Adding and verifying domain

I have logged into admin.cloud.microsoft and add ,verify and configure my domain successfully and make it as a primary or default domain.



Domains

Domain name ↑	Status
□ learningazureH.onmicrosoft.com (Default)	✓ Healthy


Domain Connect - Google Chrome
domainconnect.godaddy.com/v2/domainTemplates/providers/microsoft.com?scope=DPOO&domain=anonymous.rest...
GoDaddy
2
GoDaddy + Microsoft
Connect
Cancel
Manage
Decline
Accept
Close
Search
ENG
US
21:45
06/01/2026

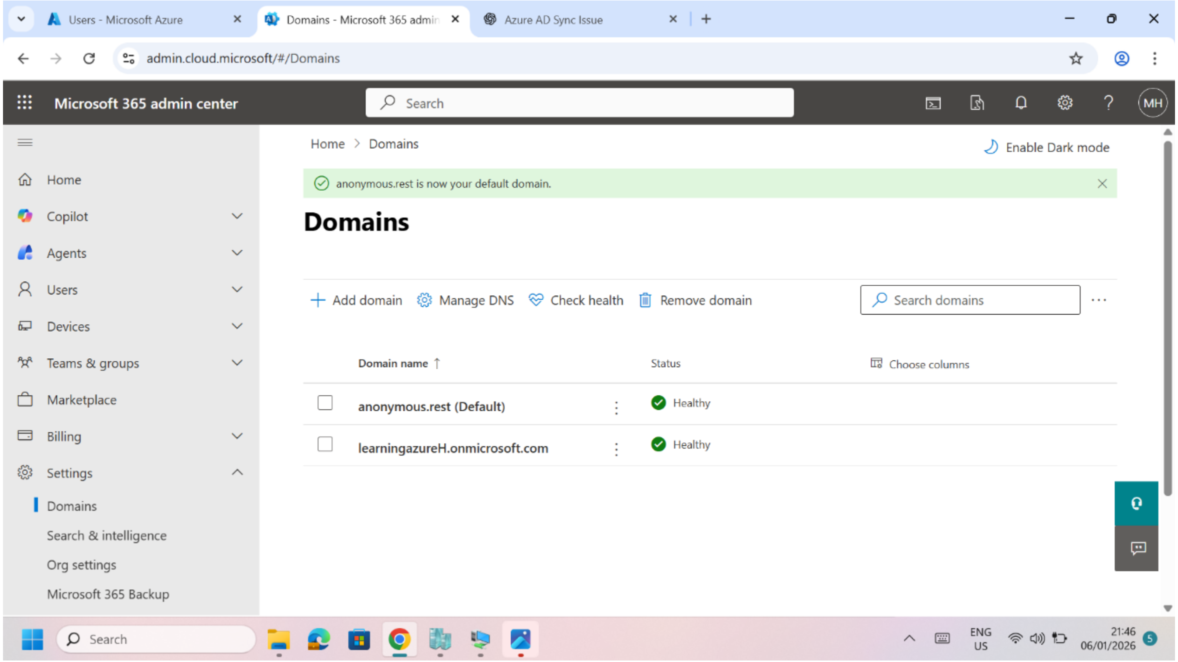
Domain Connect

You have 2 important updates, open now before they expire!

Click **Connect** to authorize **Microsoft** to enable the service(s) **Domain proof of ownership for configuring Microsoft services** for **anonymous.rest**.

provider authorization...

We serve cookies. We use tools, such as cookies, to enable essential services and functionality on our site and to collect data on how visitors interact with our site, products and services. By clicking Accept, you agree to our use of these tools for advertising, analytics and support. Privacy Policy



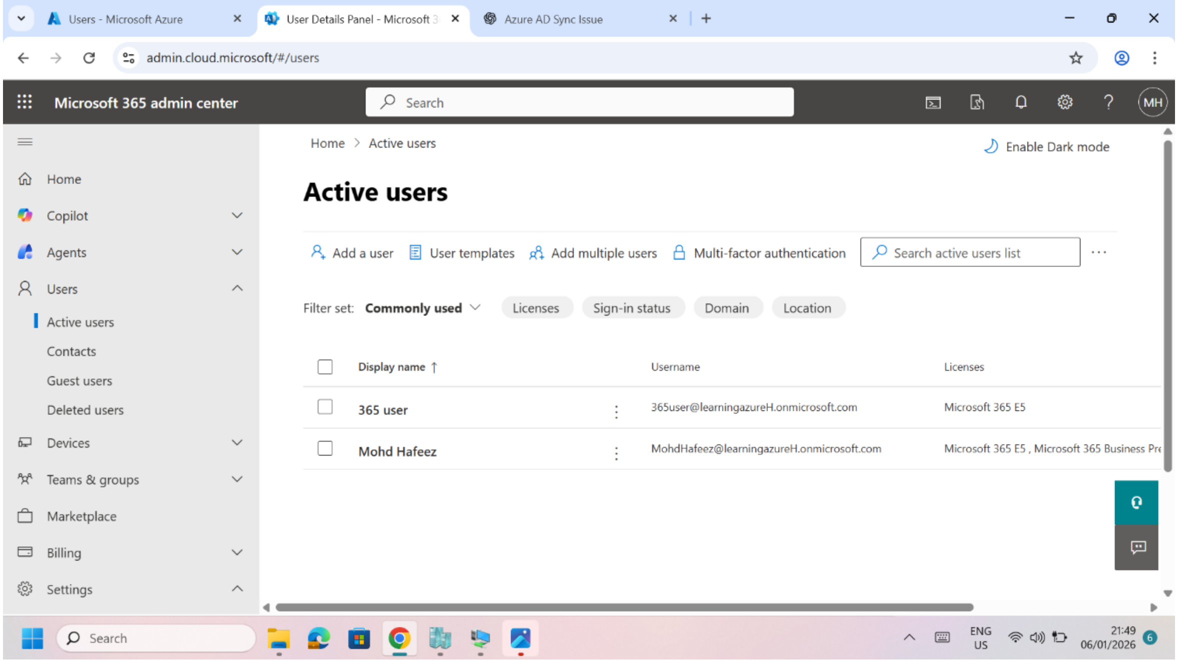
anonymous.rest is now your default domain.

Domains

Domain name ↑	Status
anonymous.rest (Default)	Healthy
learningazureH.onmicrosoft.com	Healthy

Step 5:Creation of a user and assigning a license

After successfully adding a domain I have created a user named 365user and assign is Microsoft 365 E5 license to that user.

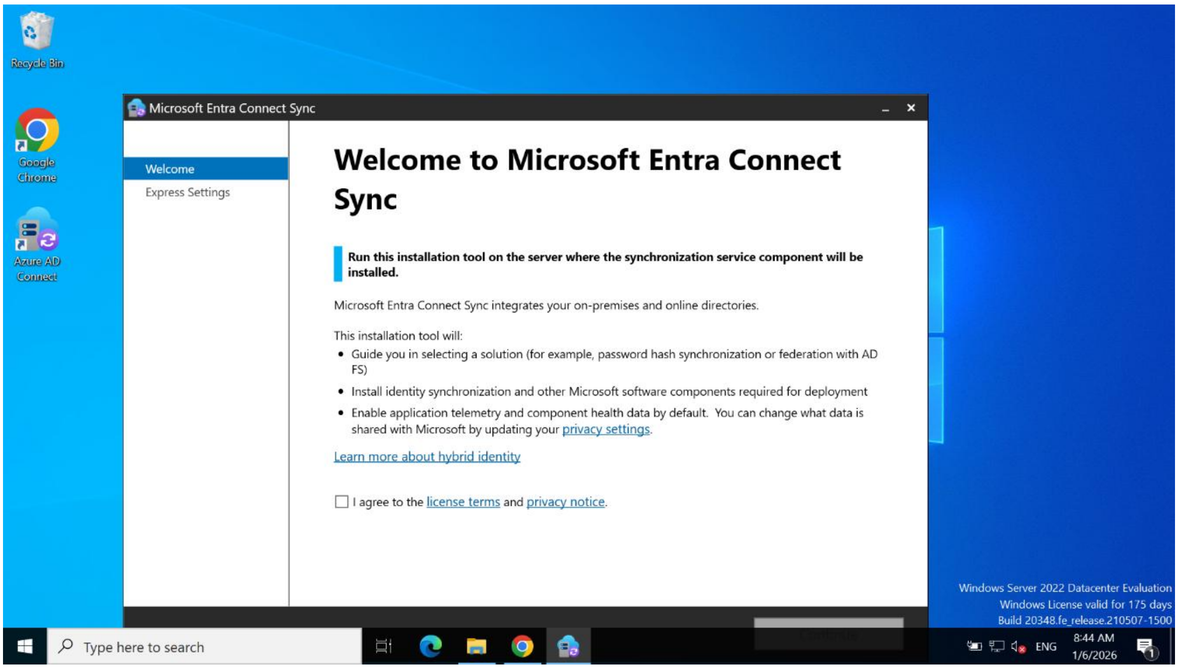


Active users

Display name ↑	Username	Licenses
365 user	365user@learningazureH.onmicrosoft.com	Microsoft 365 E5
Mohd Hafeez	MohdHafeez@learningazureH.onmicrosoft.com	Microsoft 365 E5 , Microsoft 365 Business Pr

Step 6: Launch Microsoft Entra Connect

Microsoft Entra Connect setup was launched on the on-premises Windows Server to start the hybrid identity configuration process.


Recycle Bin
Google Chrome
Azure AD Connect
Microsoft Entra Connect Sync
Welcome
Express Settings
Type here to search
Windows Server 2022 Datacenter Evaluation
Windows License valid for 175 days
Build 20348.fe_release.210507-1500
ENG
8:44 AM
1/6/2026

Welcome to Microsoft Entra Connect Sync

Run this installation tool on the server where the synchronization service component will be installed.

Microsoft Entra Connect Sync integrates your on-premises and online directories.

This installation tool will:

- Guide you in selecting a solution (for example, password hash synchronization or federation with AD FS)
- Install identity synchronization and other Microsoft software components required for deployment
- Enable application telemetry and component health data by default. You can change what data is shared with Microsoft by updating your privacy settings.

Learn more about hybrid identity

□ I agree to the license terms and privacy notice.

Step 7: Select Custom Installation

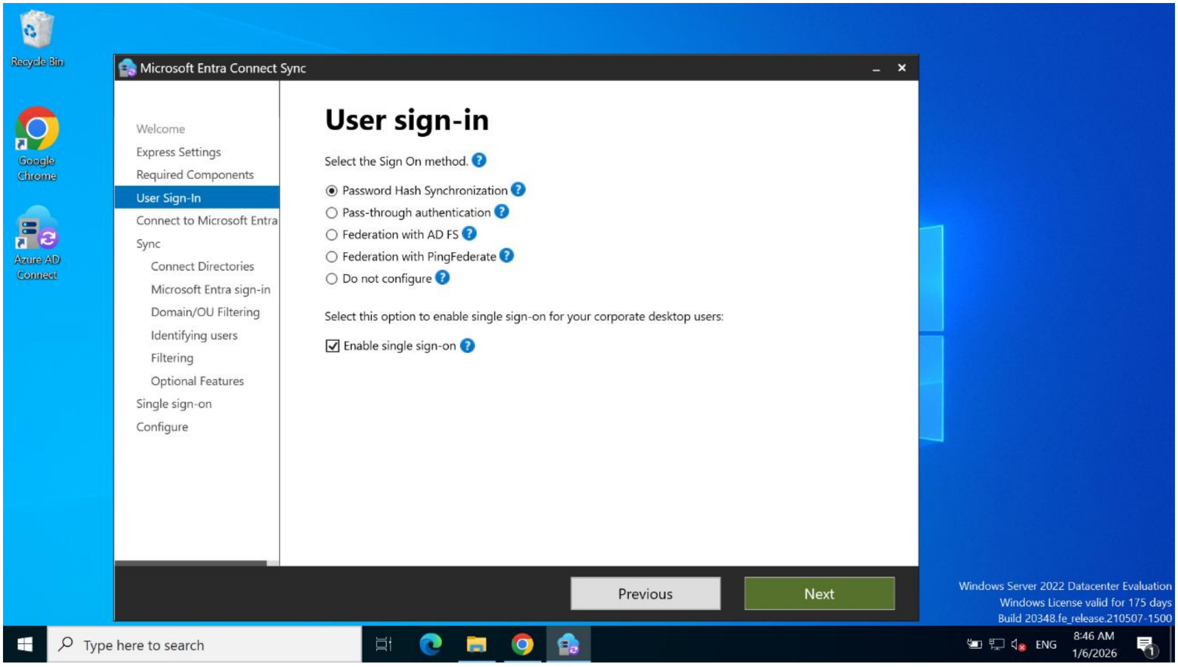
Custom installation was selected to manually control synchronization options, authentication method, filtering, and optional features.

Step 8: Review Required Components

The installer verified and prepared required components such as synchronization services and connectors needed for Entra Connect.

Step 9: Choose User Sign-In Method

Password Hash Synchronization (PHS) was selected as the sign-in method to allow users to authenticate to cloud services using synced password hashes Single Sign-On was enabled to allow seamless authentication for domain-joined devices.



Microsoft Entra Connect Sync

User sign-in

Select the Sign On method.

● Password Hash Synchronization

○ Pass-through authentication

○ Federation with AD FS

○ Federation with PingFederate

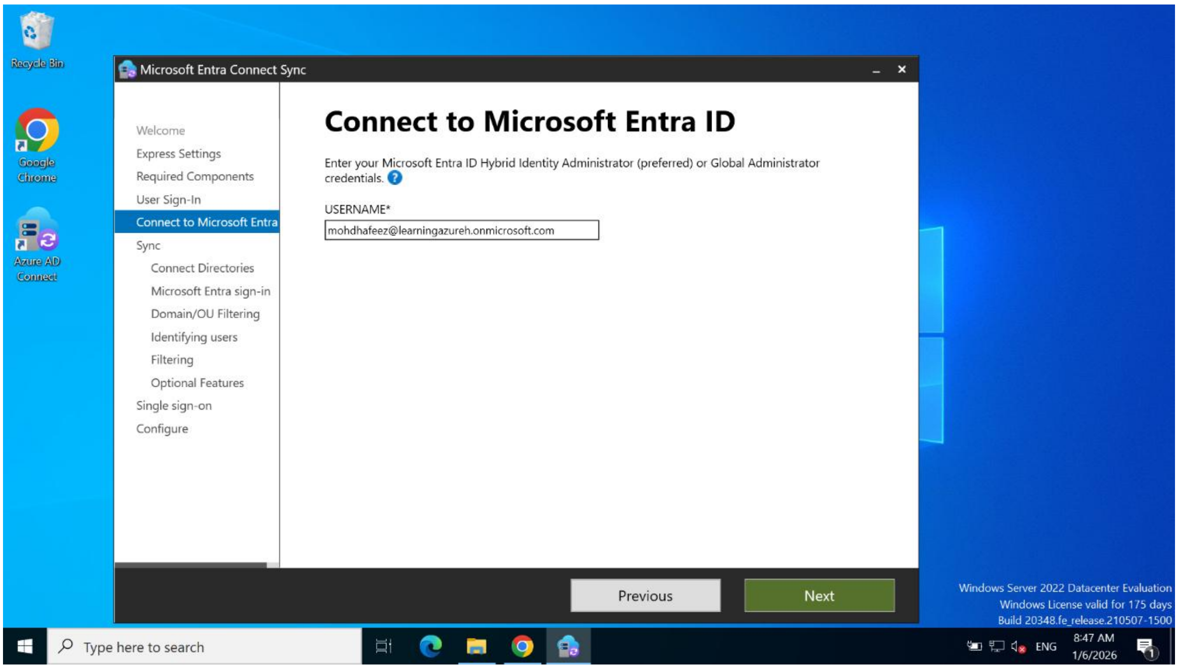
○ Do not configure

Select this option to enable single sign-on for your corporate desktop users:

☑ Enable single sign-on

Step 10: Connect to Microsoft Entra ID

Microsoft Entra ID credentials (Hybrid Identity Administrator / Global Administrator) were used to establish a secure connection with the tenant and verified entra ID tenant connection successfully.



Microsoft Entra Connect Sync

Connect to Microsoft Entra ID

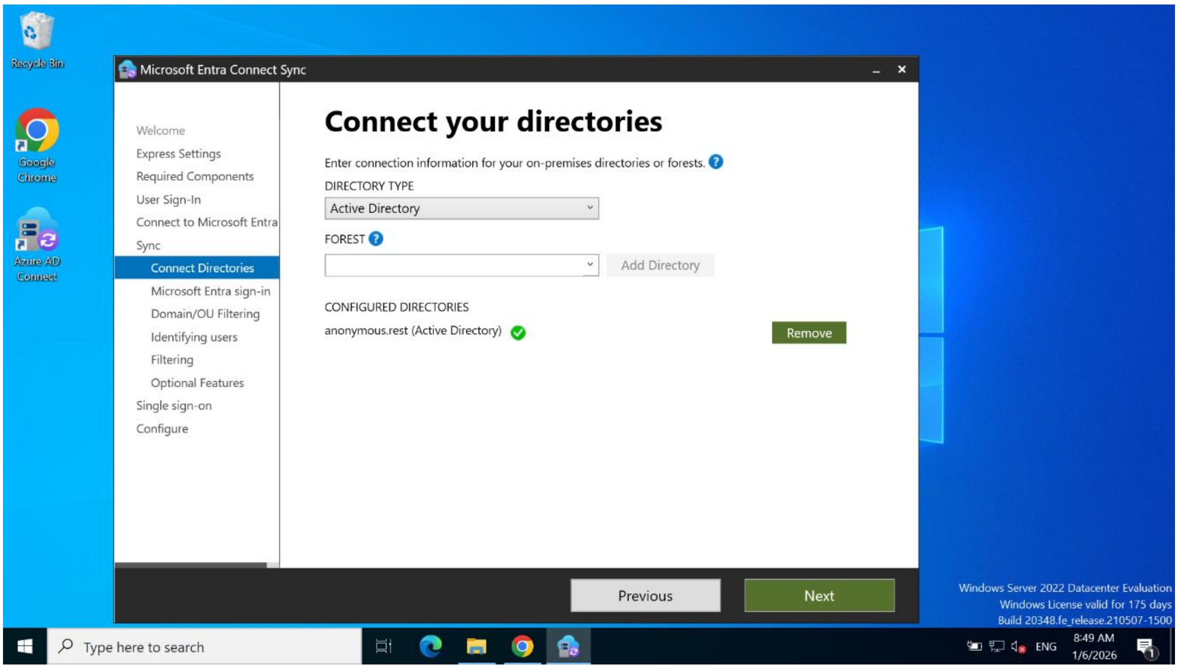
Enter your Microsoft Entra ID Hybrid Identity Administrator (preferred) or Global Administrator credentials.

USERNAME*

mohdhafeez@learningazureh.onmicrosoft.com

Step 11: Select Directory Type

Active Directory was selected as the directory type to synchronize identities from the on-premises environment and on-premises Active Directory forest (anonymous.rest) was added and authenticated successfully. The Active Directory forest was verified and showed a successful connection status.



Microsoft Entra Connect Sync

Connect your directories

Enter connection information for your on-premises directories or forests.

DIRECTORY TYPE: Active Directory

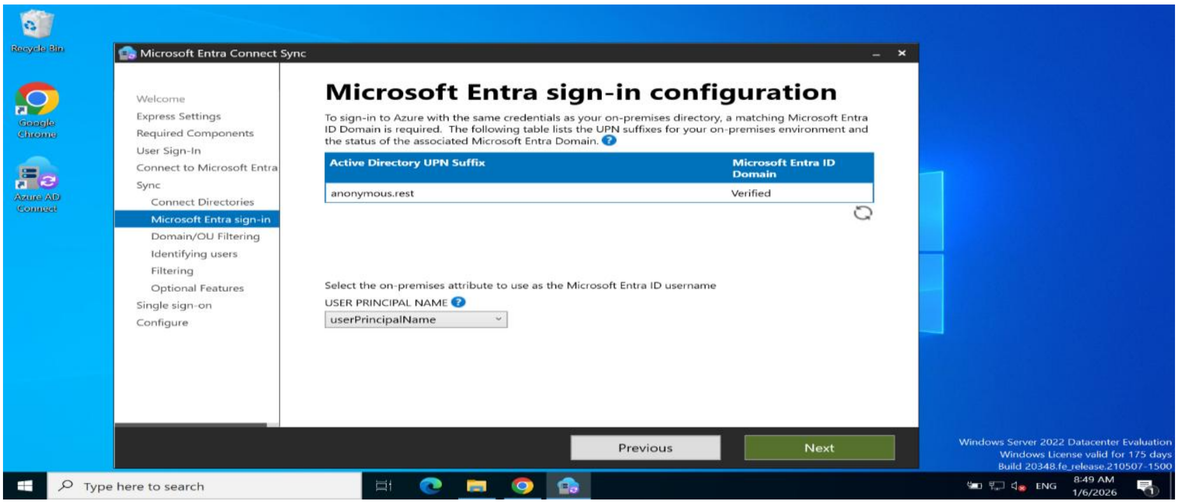
FOREST:

CONFIGURED DIRECTORIES

anonymous.rest (Active Directory) ✓

Step 12: Microsoft Entra Sign-In Configuration

UPN suffix mapping was validated to ensure on-premises user logins match Microsoft Entra ID domain names and UserPrincipalName (UPN) was selected as the attribute used for Microsoft Entra ID sign-in.



Microsoft Entra Connect Sync

Microsoft Entra sign-in configuration

To sign-in to Azure with the same credentials as your on-premises directory, a matching Microsoft Entra ID Domain is required. The following table lists the UPN suffixes for your on-premises environment and the status of the associated Microsoft Entra Domain.

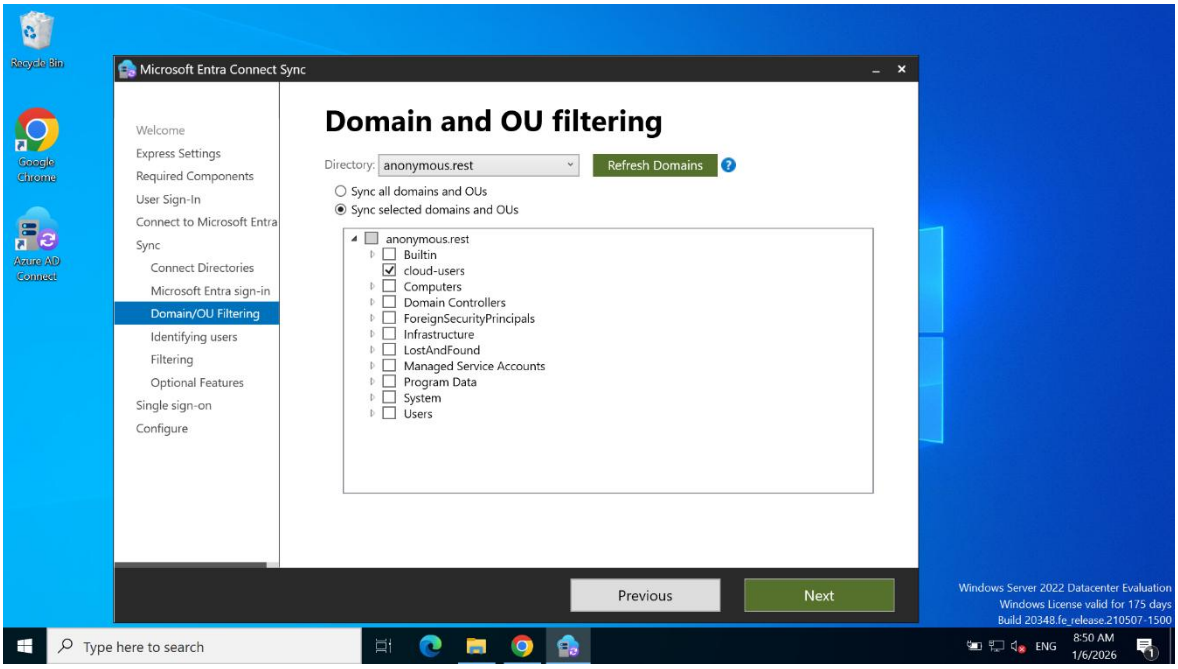
Active Directory UPN Suffix	Microsoft Entra ID Domain
anonymous.rest	Verified

Select the on-premises attribute to use as the Microsoft Entra ID username

USER PRINCIPAL NAME: userPrincipalName

Step 13: Domain and OU Filtering Selection

The option to sync selected domains and OUs was chosen instead of syncing the entire directory. Only the required OU (cloud-users) was selected to control which users are synchronized to the cloud. Default OUs such as Built-in, Computers, and System were excluded to avoid unnecessary synchronization.



Domain and OU filtering

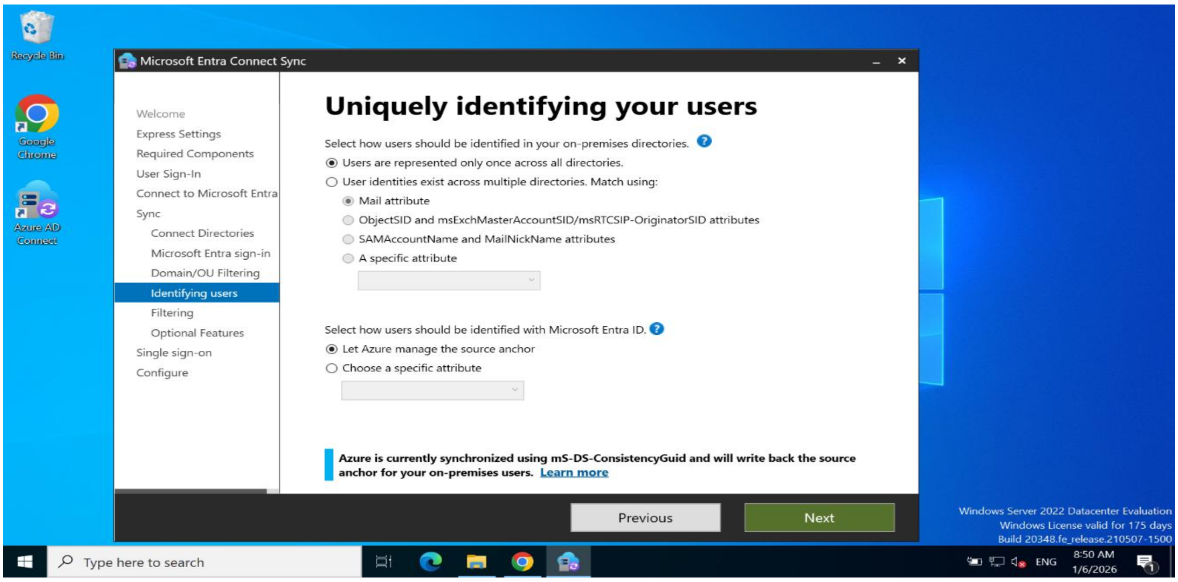
Directory: anonymous.rest
Refresh Domains

○ Sync all domains and OUs
● Sync selected domains and OUs

- □ anonymous.rest
  - □ Builtin
  - ☑ cloud-users
  - □ Computers
  - □ Domain Controllers
  - □ ForeignSecurityPrincipals
  - □ Infrastructure
  - □ LostAndFound
  - □ Managed Service Accounts
  - □ Program Data
  - □ System
  - □ Users

Step 14: Uniquely Identifying Users

The option “Users are represented only once across all directories” was selected to prevent duplicate identities and Azure was allowed to manage the source anchor automatically using the ms-DS-ConsistencyGuid attribute.



Uniquely identifying your users

Select how users should be identified in your on-premises directories.

● Users are represented only once across all directories.
○ User identities exist across multiple directories. Match using:
- ● Mail attribute
- ○ ObjectSID and msExchMasterAccountSID/msRTCSIP-OriginatorSID attributes
- ○ SAMAccountName and MailNickName attributes
- ○ A specific attribute

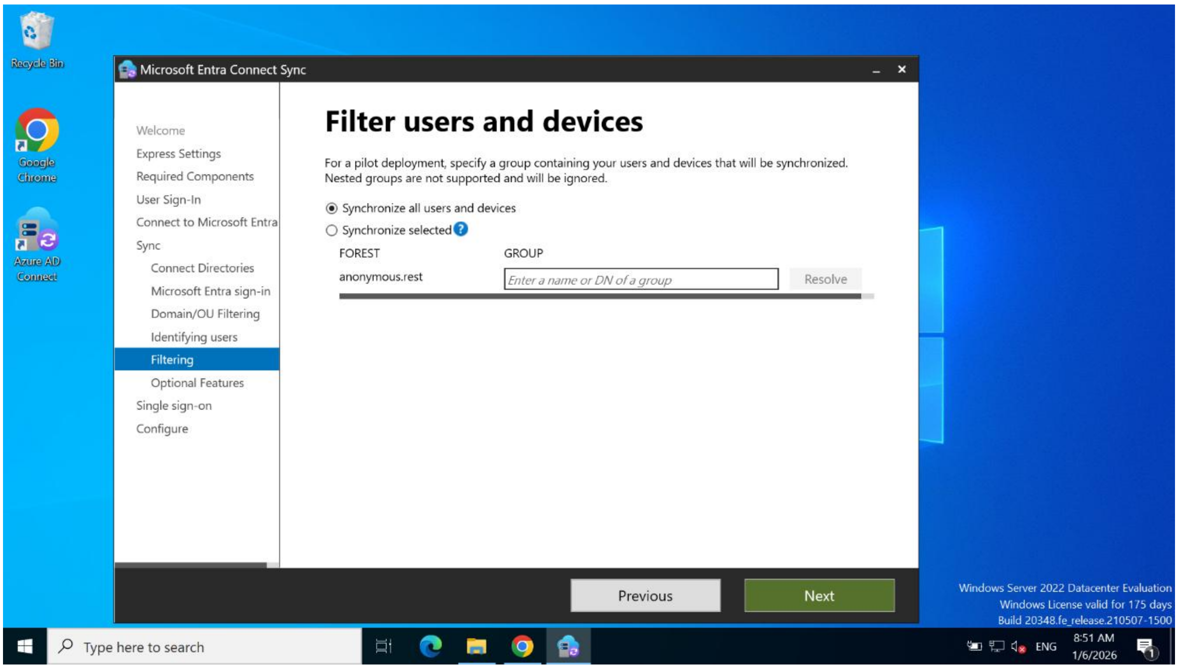
Select how users should be identified with Microsoft Entra ID.

● Let Azure manage the source anchor
○ Choose a specific attribute

Azure is currently synchronized using mS-DS-ConsistencyGuid and will write back the source anchor for your on-premises users. Learn more

Step 15: User and Device Filtering

The option to synchronize all users and devices was selected for this deployment.



Filter users and devices

For a pilot deployment, specify a group containing your users and devices that will be synchronized. Nested groups are not supported and will be ignored.

● Synchronize all users and devices

○ Synchronize selected

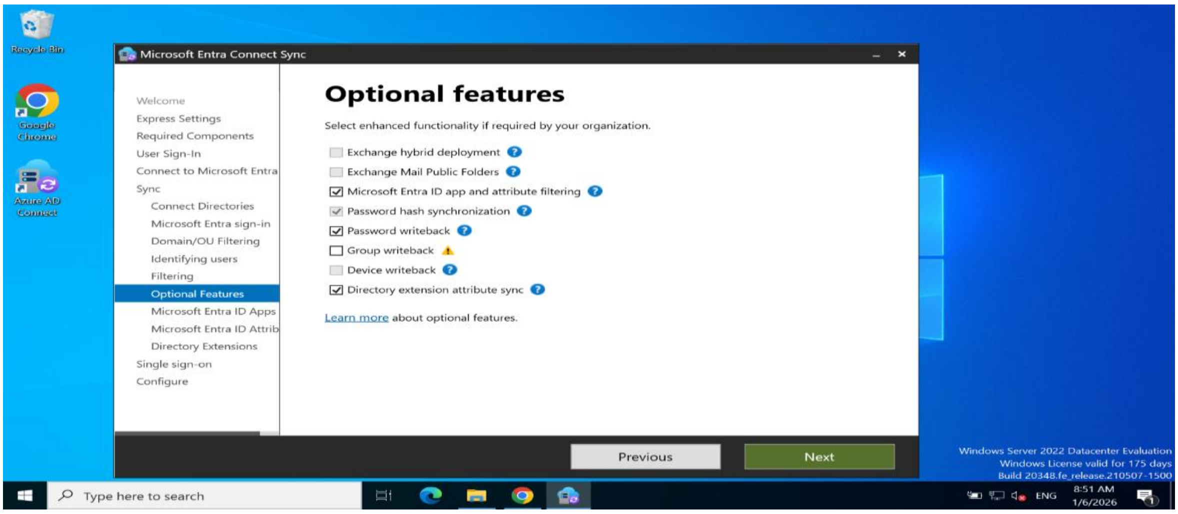
FOREST	GROUP	
anonymous.rest	Enter a name or DN of a group	Resolve

Step 16: Enable Password Hash Synchronization

Password Hash Synchronization was enabled to maintain password consistency between on-premises AD and Entra ID.

Password writeback was enabled to allow password changes in Entra ID to be written back to on-premises AD.

Directory extension attributes were enabled to synchronize additional AD attributes to Entra ID if required.



Optional features

Select enhanced functionality if required by your organization.

□ Exchange hybrid deployment

□ Exchange Mail Public Folders

☑ Microsoft Entra ID app and attribute filtering

☑ Password hash synchronization

☑ Password writeback

□ Group writeback

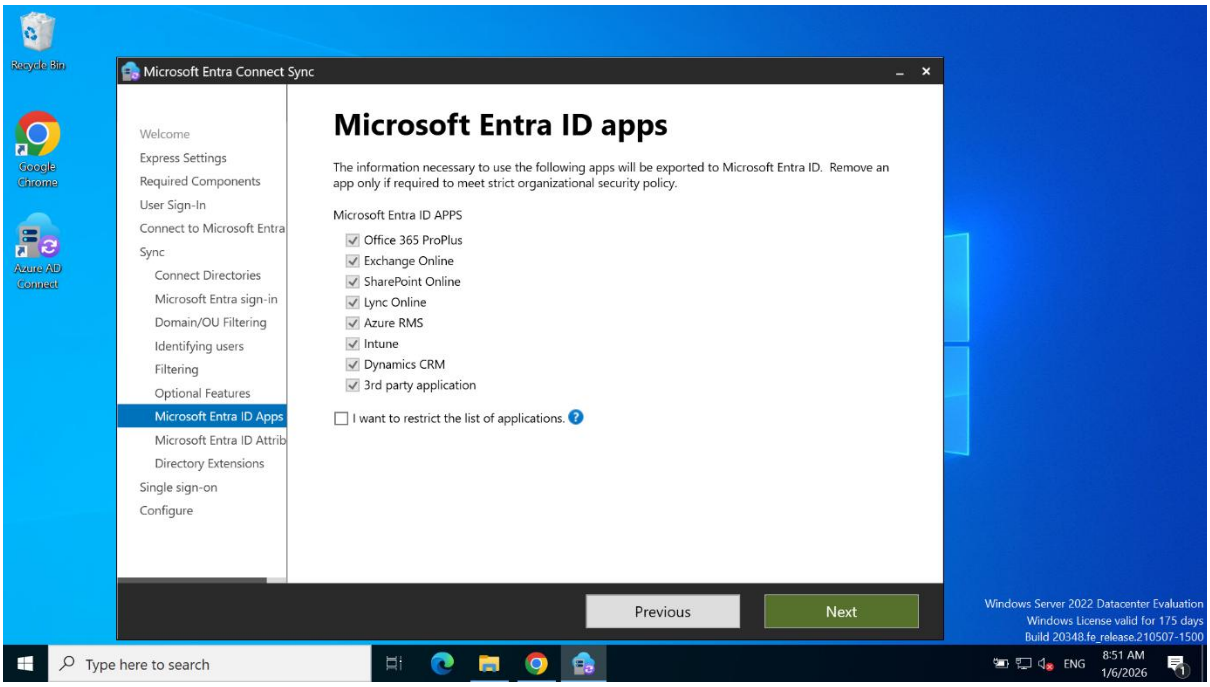
□ Device writeback

☑ Directory extension attribute sync

Learn more about optional features.

Step 17: Review Microsoft Entra ID Applications

Default Microsoft Entra ID applications such as Office 365, Exchange Online, SharePoint Online, and Intune were reviewed.



Microsoft Entra ID apps

The information necessary to use the following apps will be exported to Microsoft Entra ID. Remove an app only if required to meet strict organizational security policy.

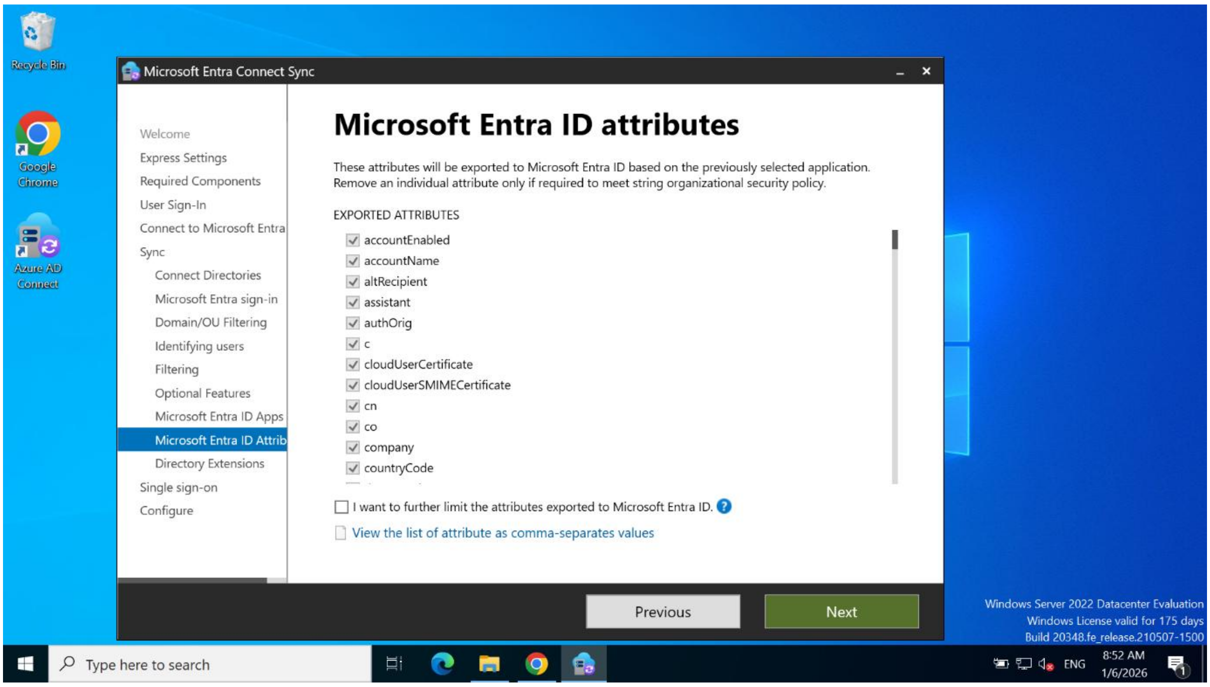
Microsoft Entra ID APPS

- ☑ Office 365 ProPlus
- ☑ Exchange Online
- ☑ SharePoint Online
- ☑ Lync Online
- ☑ Azure RMS
- ☑ Intune
- ☑ Dynamics CRM
- ☑ 3rd party application

☐ I want to restrict the list of applications.

Step 18: Review Attribute Synchronization

The list of attributes to be exported to Microsoft Entra ID was reviewed and left at default settings.



Microsoft Entra ID attributes

These attributes will be exported to Microsoft Entra ID based on the previously selected application. Remove an individual attribute only if required to meet string organizational security policy.

EXPORTED ATTRIBUTES

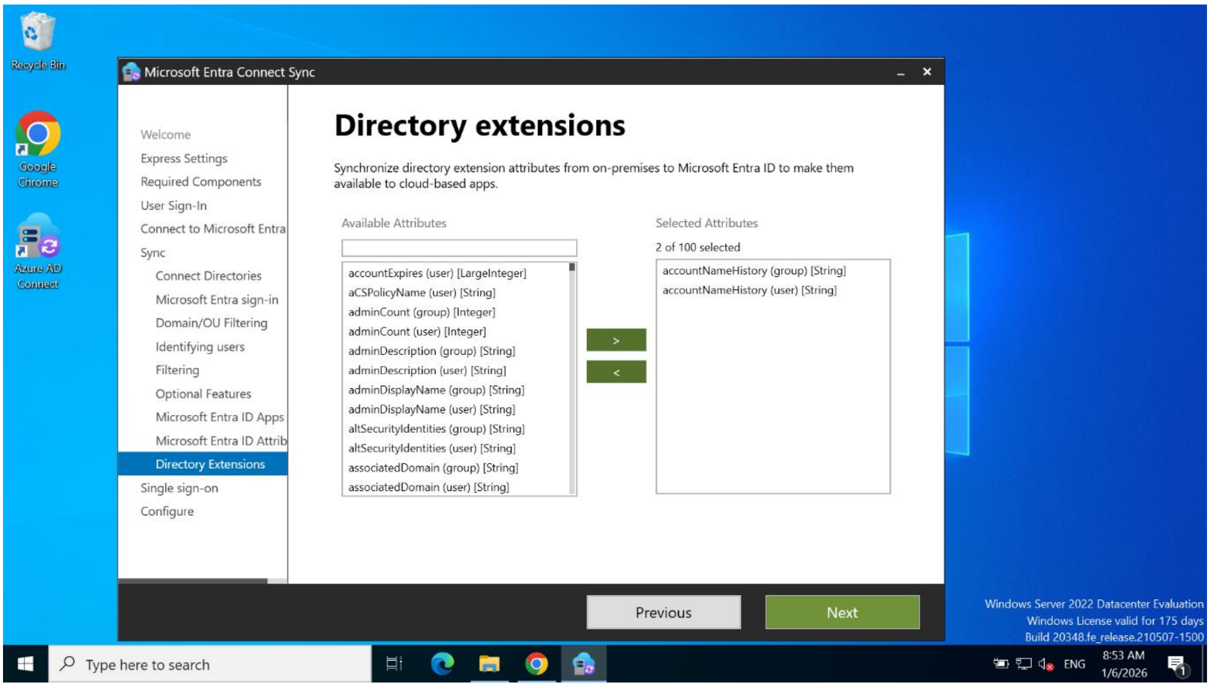
- ☑ accountEnabled
- ☑ accountName
- ☑ altRecipient
- ☑ assistant
- ☑ authOrig
- ☑ c
- ☑ cloudUserCertificate
- ☑ cloudUserSMIMECertificate
- ☑ cn
- ☑ co
- ☑ company
- ☑ countryCode

☐ I want to further limit the attributes exported to Microsoft Entra ID.

View the list of attribute as comma-separates values

Step 19: Directory Extensions Review

Selected directory extension attributes were reviewed to ensure correct data synchronization.



Directory extensions

Synchronize directory extension attributes from on-premises to Microsoft Entra ID to make them available to cloud-based apps.

Available Attributes

accountExpires (user) [LargeInteger]
aCSPolicyName (user) [String]
adminCount (group) [Integer]
adminCount (user) [Integer]
adminDescription (group) [String]
adminDescription (user) [String]
adminDisplayName (group) [String]
adminDisplayName (user) [String]
altSecurityIdentities (group) [String]
altSecurityIdentities (user) [String]
associatedDomain (group) [String]
associatedDomain (user) [String]

Selected Attributes

2 of 100 selected

accountNameHistory (group) [String]
accountNameHistory (user) [String]

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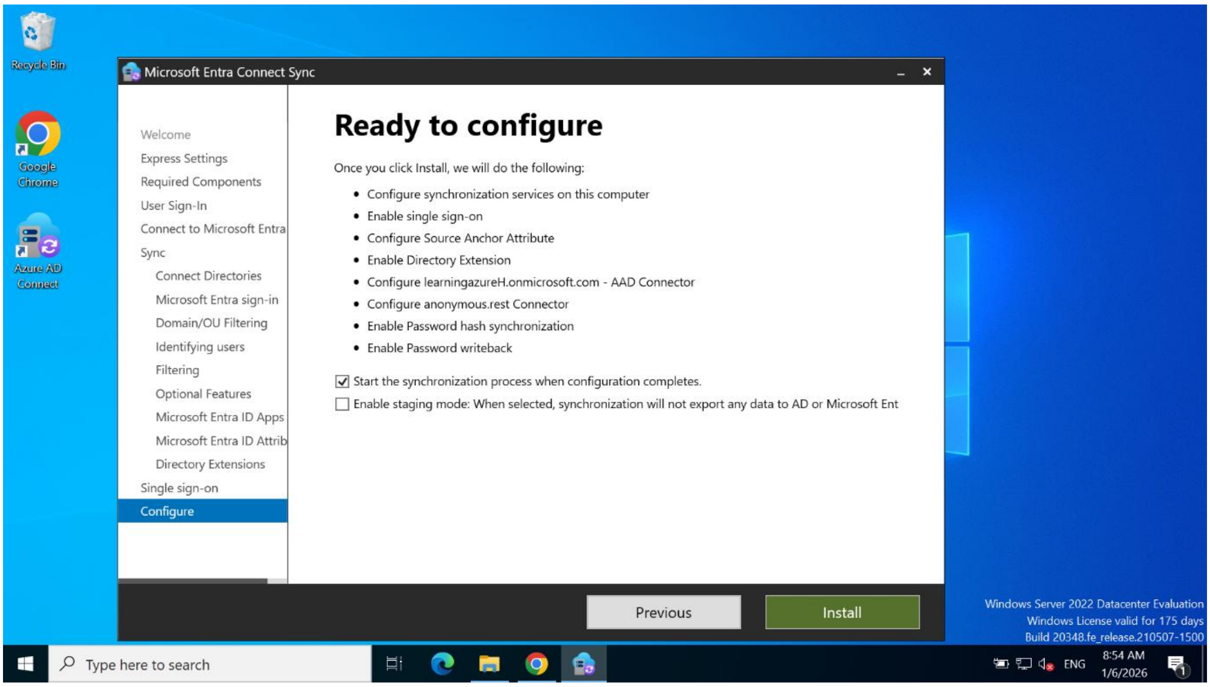
Build 20348.fe_release.210507-1500

Step 20: Ready to Configure Summary

The configuration summary was reviewed, including connectors, authentication method, and enabled features.



Ready to configure

Once you click Install, we will do the following:

- Configure synchronization services on this computer
- Enable single sign-on
- Configure Source Anchor Attribute
- Enable Directory Extension
- Configure learningazureH.onmicrosoft.com - AAD Connector
- Configure anonymous.rest Connector
- Enable Password hash synchronization
- Enable Password writeback

☑ Start the synchronization process when configuration completes.

□ Enable staging mode: When selected, synchronization will not export any data to AD or Microsoft Ent

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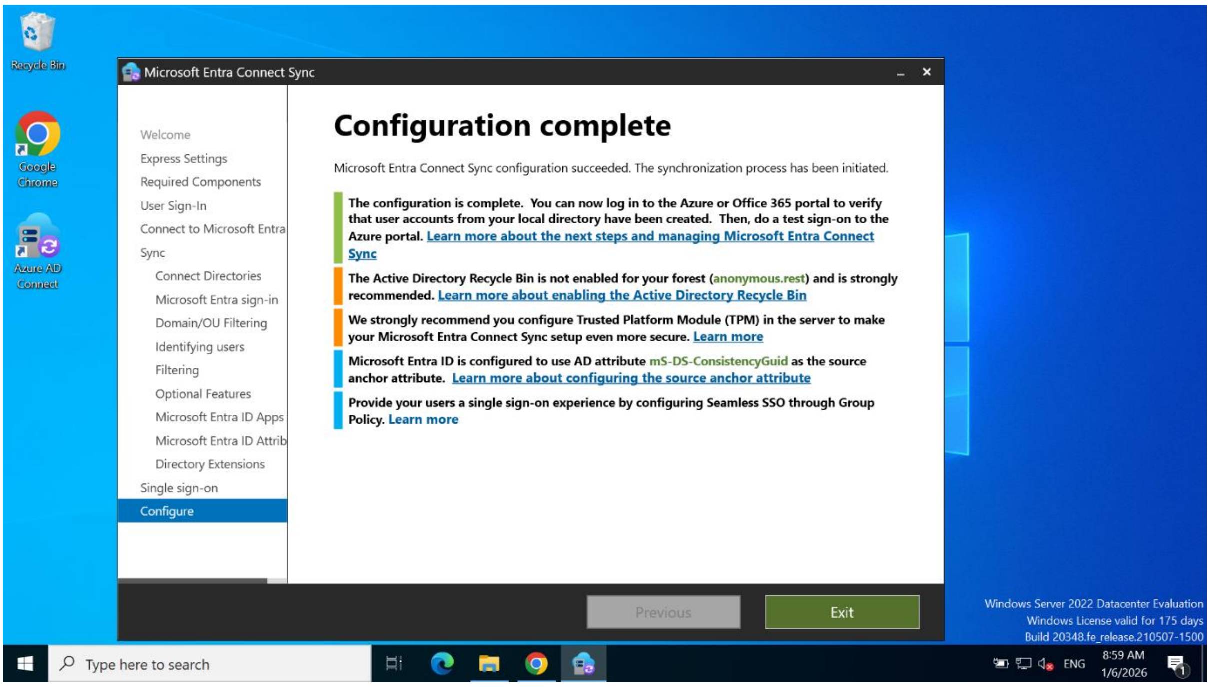
Windows License valid for 175 days
Build 20348.fe_release.210507-1500

Step 21: Configuration Completion

Microsoft Entra Connect completed configuration successfully and initiated the synchronization process.



Configuration complete

Microsoft Entra Connect Sync configuration succeeded. The synchronization process has been initiated.

The configuration is complete. You can now log in to the Azure or Office 365 portal to verify that user accounts from your local directory have been created. Then, do a test sign-on to the Azure portal. Learn more about the next steps and managing Microsoft Entra Connect Sync

The Active Directory Recycle Bin is not enabled for your forest (anonymous.rest) and is strongly recommended. Learn more about enabling the Active Directory Recycle Bin

We strongly recommend you configure Trusted Platform Module (TPM) in the server to make your Microsoft Entra Connect Sync setup even more secure. Learn more

Microsoft Entra ID is configured to use AD attribute mS-DS-ConsistencyGuid as the source anchor attribute. Learn more about configuring the source anchor attribute

Provide your users a single sign-on experience by configuring Seamless SSO through Group Policy. Learn more

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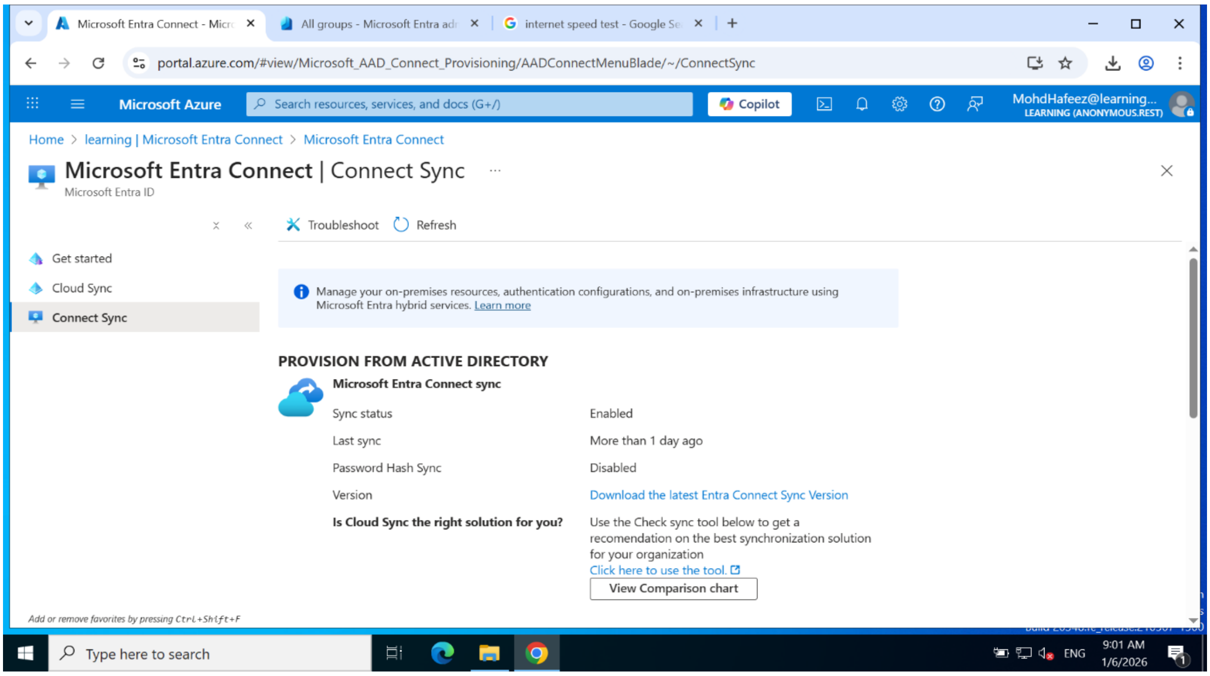
Windows License valid for 175 days
Build 20348.fe_release.210507-1500
Type here to search
8:59 AM
1/6/2026

Step 22: Validation in Azure Portal

Synchronization was validated by confirming synced users and groups in Microsoft Entra ID, including on-premises users and security groups.



Microsoft Entra Connect - Micr
All groups - Microsoft Entra ad
internet speed test - Google Se
portal.azure.com/#view/Microsoft_AAD_Connect_Provisioning/AADConnectMenuBlade/~/ConnectSync
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
MohdHafeez@learning...
LEARNING (ANONYMOUS.REST)
Home > learning | Microsoft Entra Connect > Microsoft Entra Connect

Microsoft Entra Connect | Connect Sync

Microsoft Entra ID

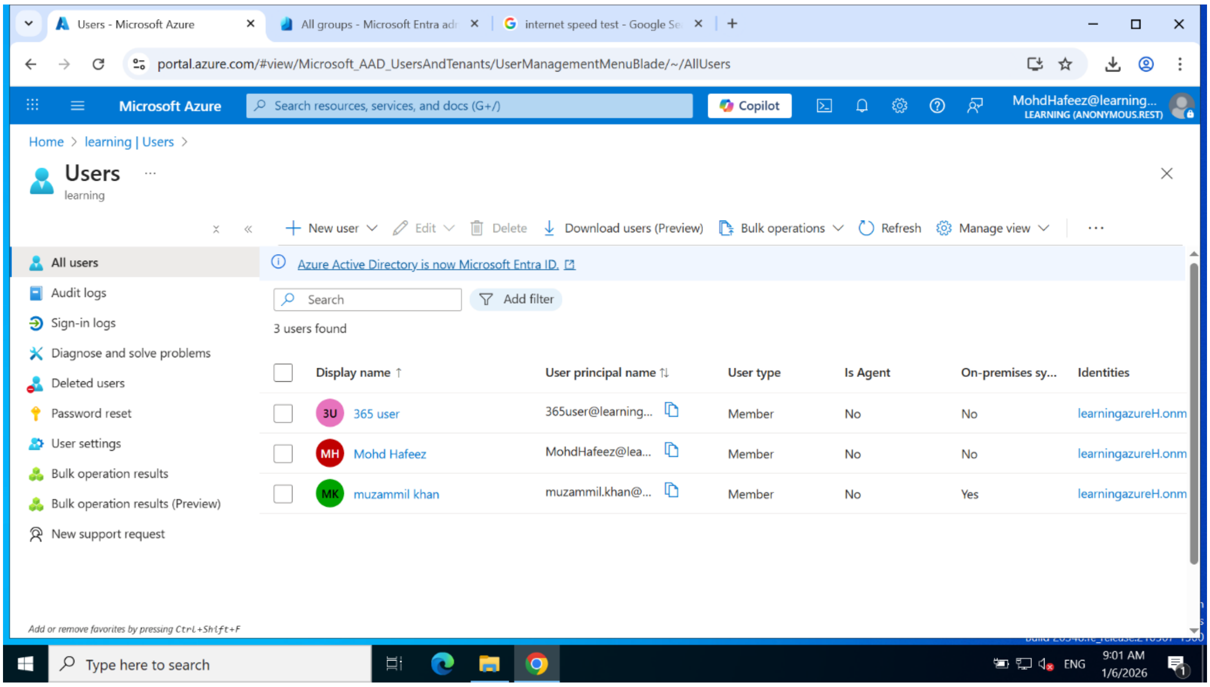
Troubleshoot
Refresh
Get started
Cloud Sync
Connect Sync

Manage your on-premises resources, authentication configurations, and on-premises infrastructure using Microsoft Entra hybrid services. Learn more

PROVISION FROM ACTIVE DIRECTORY

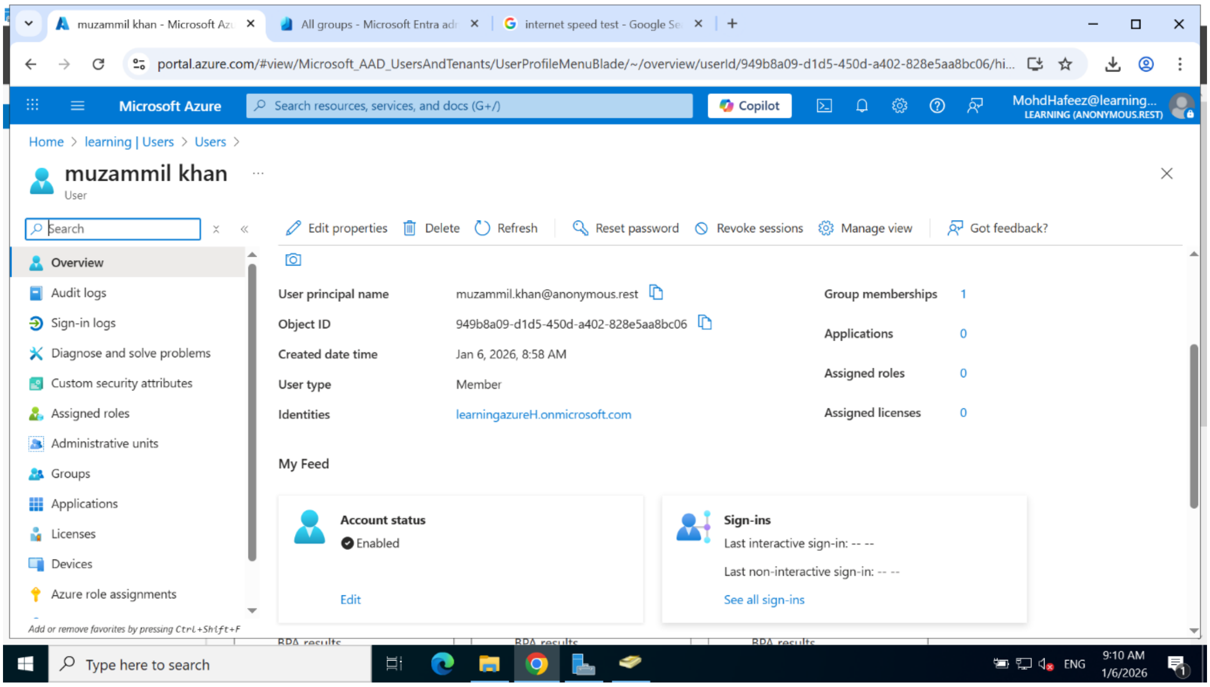
Microsoft Entra Connect sync

Sync status	Enabled
Last sync	More than 1 day ago
Password Hash Sync	Disabled
Version	Download the latest Entra Connect Sync Version
Is Cloud Sync the right solution for you?	Use the Check sync tool below to get a recomendation on the best synchronization solution for your organization Click here to use the tool. View Comparison chart


Users - Microsoft Azure
All groups - Microsoft Entra adı
internet speed test - Google Se
portal.azure.com/#view/Microsoft_AAD_UsersAndTenants/UserManagementMenuBlade/~/AllUsers
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
MohdHafeez@learning...
LEARNING (ANONYMOUS.REST)
Home > learning | Users >
Users
learning
New user
Edit
Delete
Download users (Preview)
Bulk operations
Refresh
Manage view
All users
Audit logs
Sign-in logs
Diagnose and solve problems
Deleted users
Password reset
User settings
Bulk operation results
Bulk operation results (Preview)
New support request
Azure Active Directory is now Microsoft Entra ID.
Search
Add filter
Add or remove favorites by pressing Ctrl+Shift+F
Type here to search
ENG
9:01 AM
1/6/2026

3 users found

Display name	User principal name	User type	Is Agent	On-premises sy...	Identities
3U 365 user	365user@learning...	Member	No	No	learningazureH.onm
MH Mohd Hafeez	MohdHafeez@lea...	Member	No	No	learningazureH.onm
MK muzammil khan	muzammil.khan@...	Member	No	Yes	learningazureH.onm

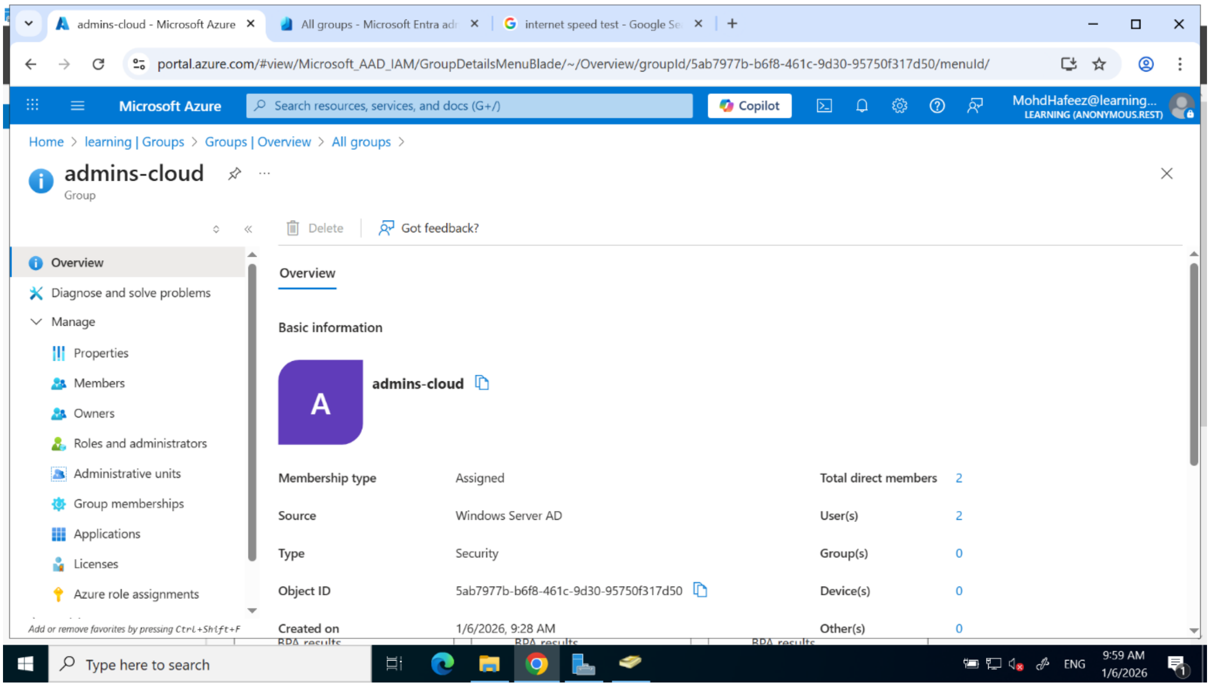

muzammil khan - Microsoft Az
All groups - Microsoft Entra adı
internet speed test - Google Se
portal.azure.com/#view/Microsoft_AAD_UsersAndTenants/UserProfileMenuBlade/~/overview/userId/949b8a09-d1d5-450d-a402-828e5aa8bc06/hi...
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
MohdHafeez@learning...
LEARNING (ANONYMOUS.REST)
Home > learning | Users > Users >
muzammil khan
User
Search
Edit properties
Delete
Refresh
Reset password
Revoke sessions
Manage view
Got feedback?
Overview
Audit logs
Sign-in logs
Diagnose and solve problems
Custom security attributes
Assigned roles
Administrative units
Groups
Applications
Licenses
Devices
Azure role assignments
Add or remove favorites by pressing Ctrl+Shift+F
Type here to search
ENG
9:10 AM
1/6/2026

User principal name	muzammil.khan@anonymous.rest	Group memberships	1
Object ID	949b8a09-d1d5-450d-a402-828e5aa8bc06	Applications	0
Created date time	Jan 6, 2026, 8:58 AM	Assigned roles	0
User type	Member	Assigned licenses	0
Identities	learningazureH.onmicrosoft.com		

My Feed

Account status
Enabled
Edit

Sign-ins
Last interactive sign-in: -- --
Last non-interactive sign-in: -- --
See all sign-ins



admins-cloud - Microsoft Azure
All groups - Microsoft Entra adı
internet speed test - Google Se
portal.azure.com/#view/Microsoft_AAD_IAM/GroupDetailsMenuBlade/~/Overview/groupId/5ab7977b-b6f8-461c-9d30-95750f317d50/menuId/
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
MohdHafeez@learning...
LEARNING (ANONYMOUS.REST)
Home > learning | Groups > Groups | Overview > All groups >
Delete
Got feedback?
Overview
Diagnose and solve problems
Manage
Properties
Members
Owners
Roles and administrators
Administrative units
Group memberships
Applications
Licenses
Azure role assignments
Add or remove favorites by pressing Ctrl+Shift+F
Type here to search
ENG
9:59 AM
1/6/2026

admins-cloud

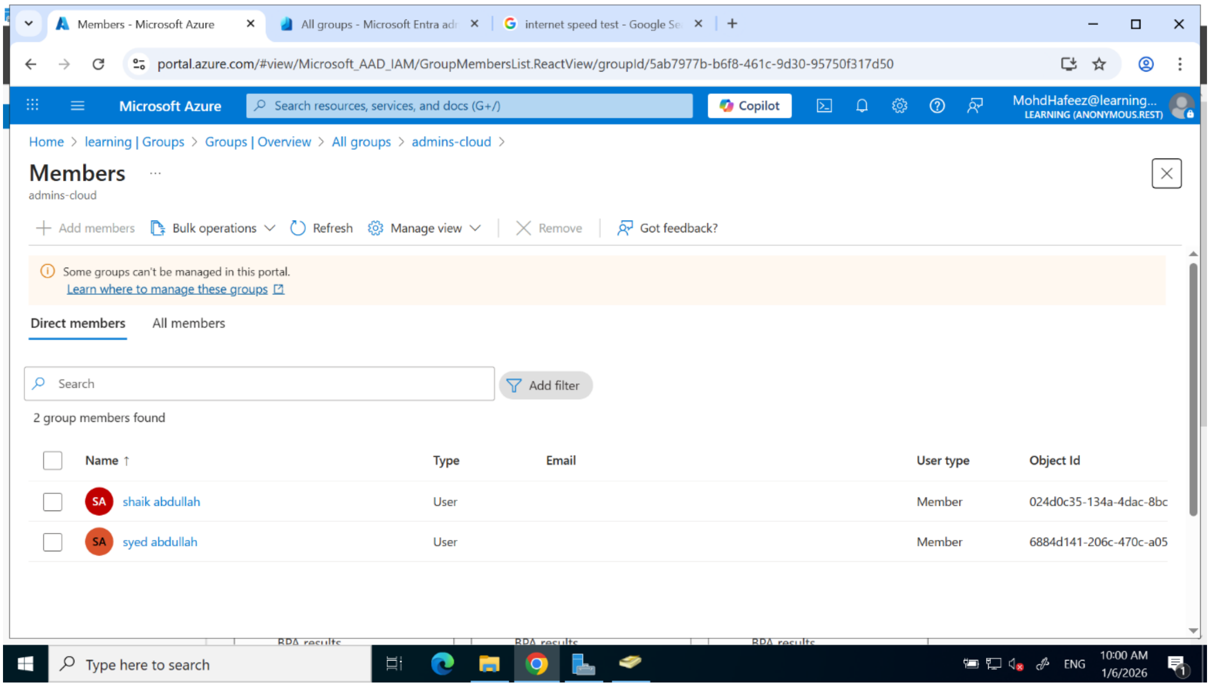
Group

Overview

Basic information

admins-cloud

Membership type	Assigned	Total direct members	2
Source	Windows Server AD	User(s)	2
Type	Security	Group(s)	0
Object ID	5ab7977b-b6f8-461c-9d30-95750f317d50	Device(s)	0
Created on	1/6/2026, 9:28 AM	Other(s)	0



Members - Microsoft Azure
All groups - Microsoft Entra adı
internet speed test - Google Se
portal.azure.com/#view/Microsoft_AAD_IAM/GroupMembersList.ReactView/groupId/5ab7977b-b6f8-461c-9d30-95750f317d50
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
MohdHafeez@learning...
LEARNING (ANONYMOUS.REST)
Home > learning | Groups > Groups | Overview > All groups > admins-cloud >
Add members
Bulk operations
Refresh
Manage view
Remove
Got feedback?
Direct members
All members
Search
Add filter
Type here to search
ENG
10:00 AM
1/6/2026

Members

admins-cloud

Some groups can't be managed in this portal.

Learn where to manage these groups

2 group members found

Name ↑	Type	Email	User type	Object Id
SA shaik abdullah	User		Member	024d0c35-134a-4dac-8bc
SA syed abdullah	User		Member	6884d141-206c-470c-a05

Validation and Verification

- Sync status confirmed as **Enabled** in Azure Portal
- On-premises users visible in Microsoft Entra ID
- Group memberships synchronized correctly
- User identities show on-premises source

Outcome

A hybrid identity environment was successfully implemented. On-premises Active Directory users and groups are now synchronized with Microsoft Entra ID, enabling centralized identity management and seamless access to cloud services.

Skills Demonstrated

- Hybrid Identity Implementation
- Microsoft Entra Connect Configuration
- Active Directory to Entra ID Synchronization
- OU-based Filtering
- User and Group Validation

Subscription Used

Microsoft Azure Subscription (Learning / Pay-As-You-Go)