



WorkshopPLUS

Power Platform for Administrators

On-Premise Data Gateways

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Objectives

After completing this Learning, you will be able to:

1

Understand....

- ✓ What on-premises data gateways are
- ✓ How on-premises data gateways work

2

Understand....

- ✓ How to install and configure the gateway

3

Understand....

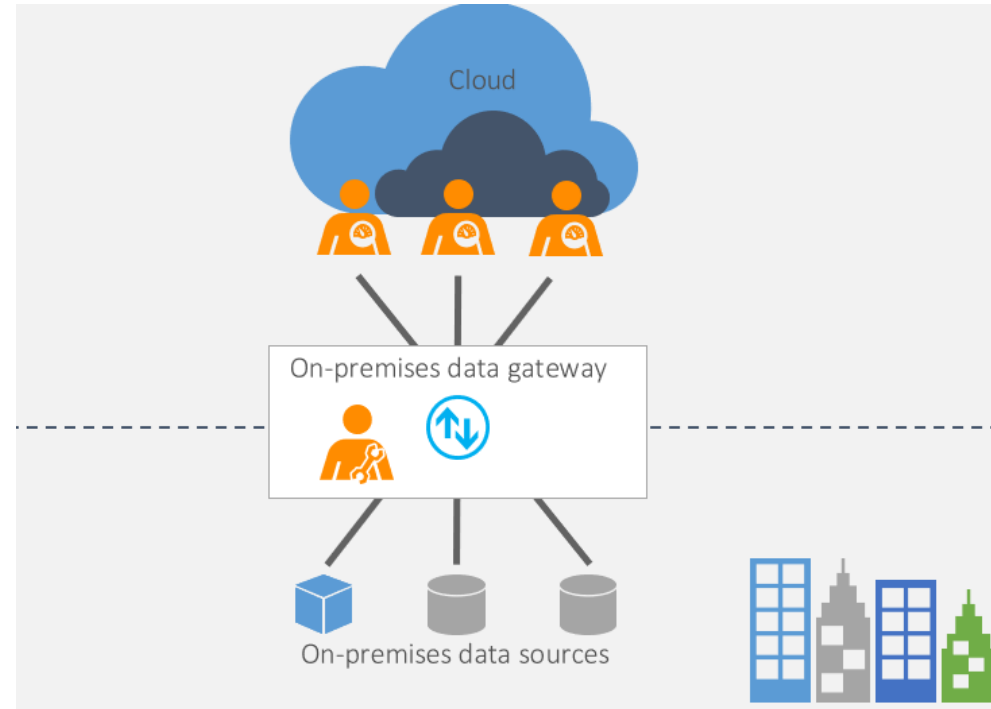
- ✓ How to manage gateways



Understand On-Premises Data Gateway

What is On-Premise Data Gateway?

- Acts as a bridge to provide quick and secure data transfer between on-premises data and several Microsoft cloud services
- Includes Power BI, Power Apps, Power Automate, Azure Analysis Services, and Azure Logic Apps
- Organizations can keep databases and other data sources on their on-premises networks, yet securely use that on-premises data in cloud services.
- Users in your organization can access on-premises data to which they already have access authorization.
- Administrators will need to install and configure Gateway before users are able to connect on-premise data sources.



Three Types of Data Gateway

On-premises data gateway (standard)

- Allows multiple users to connect to multiple on-premises data sources
- Support all available gateway services like Power Apps and Power Automate
- Well-suited to complex scenarios in which multiple people access multiple data sources

On-premises data gateway (personal mode)

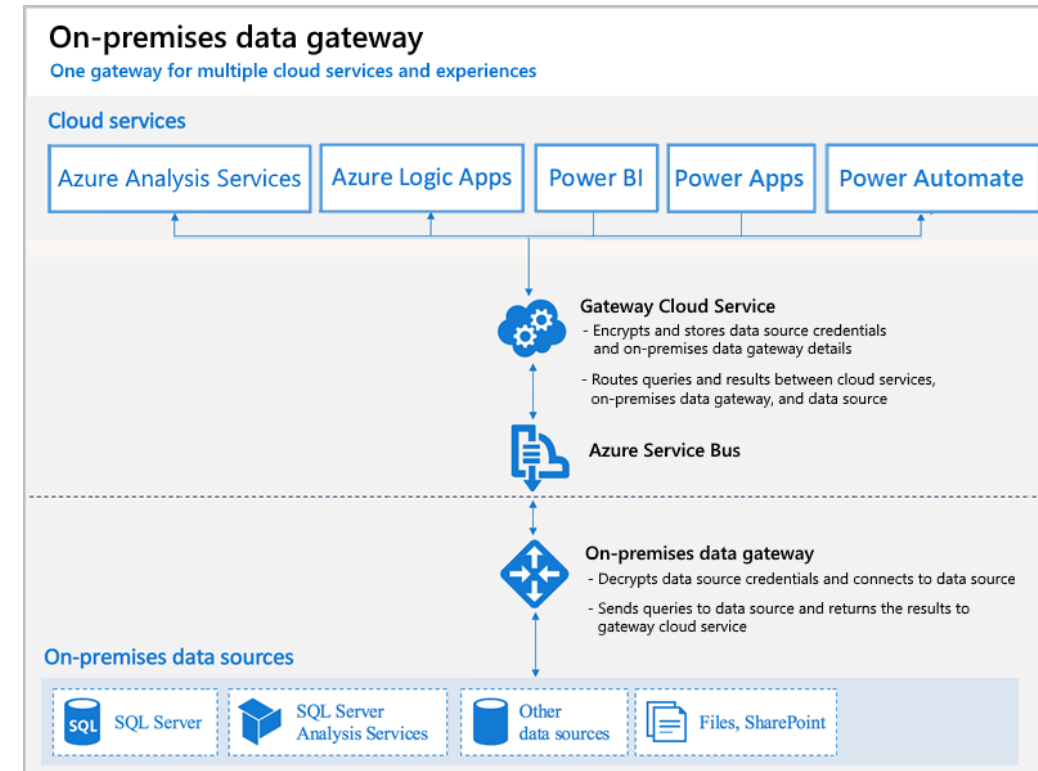
- Allows one user to connect to sources and can't be shared with others.
- Can be used **only** with Power BI
- Well-suited to scenarios in which you're the only person who creates reports, and you don't need to share any data sources with others

Virtual network data gateway

- Allows multiple users to connect to multiple data sources that are secured by virtual networks
- No installation is required because it's a Microsoft managed service.
- Well-suited to complex scenarios in which multiple people access multiple data sources

How the gateway works?

1. The cloud service creates a query and the encrypted credentials for the on-premises data source.
2. The query and credentials are sent to the gateway queue for processing.
3. The gateway cloud service analyzes the query and pushes the request to Azure Service Bus Messaging.
4. Azure Service Bus sends the pending requests to the gateway. Both the gateway and Power BI service are implemented to only accept TLS 1.2 traffic.
5. The gateway gets the query, decrypts the credentials, and connects to one or more data sources with those credentials.
6. The gateway sends the query to the data source to be run.
7. The results are sent from the data source back to the gateway and then to the cloud service.



Data Gateway Installation Facts

Install an on-premises data gateway

- Gateway is software that you install in an on-premises network.
- The gateway facilitates access to data in that network.
- As we explain in the overview, you can install a gateway either in personal mode, which applies to Power BI only, or in standard mode.
- We recommend **standard mode** as in that mode you can add a gateway to a cluster of gateways, which we recommend for high availability and performance.

Install an on-premises data gateway

Minimum requirements

- .NET Framework 4.6 (Gateway release August 2019 and earlier)
- .NET Framework 4.7.2 (Gateway release September 2019 and later)
- A 64-bit version of Windows 8 or a 64-bit version of Windows Server 2012 R2 with current TLS 1.2 and cipher suites
- 4 GB disk space for performance monitoring logs (in default configuration)

Recommended hardware

- An 8-core CPU
- 8 GB of memory
- A 64-bit version of Windows Server 2012 R2 or later
- Solid-state drive (SSD) storage for spooling

General Considerations for installation

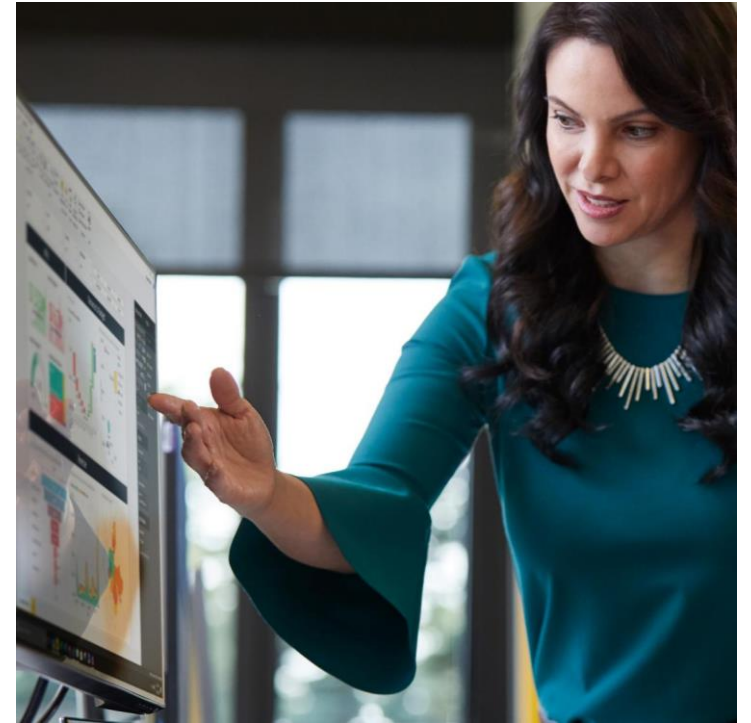
- Server Core and Domain Controller installation not supported
- The user installing the gateway will be the admin of the gateway.
- If you're planning to use Windows authentication, the gateway computer must be member of the same Active Directory environment as the data sources.
- Don't install a gateway on a client machine, like a laptop, that might be turned off, asleep, or disconnected from the internet.
- To optimize performance, it is **not** recommended to use WLAN connection, and computer should also be dedicated for Data Gateway not having other applications running on the same machine.
- You can install up to two gateways on a single computer: one running in personal mode and the other running in standard mode. You can't have more than one gateway running in the same mode on the same computer.

Demonstration

Install On-premise Data Gateway

In LAB environment install data gateway to ContosoGateway server

1. Download latest version (explain that we release new version every month)
2. Install gateway using MOD admin creds
3. OPTIONAL – skip slides of the next section by demoing gateway features

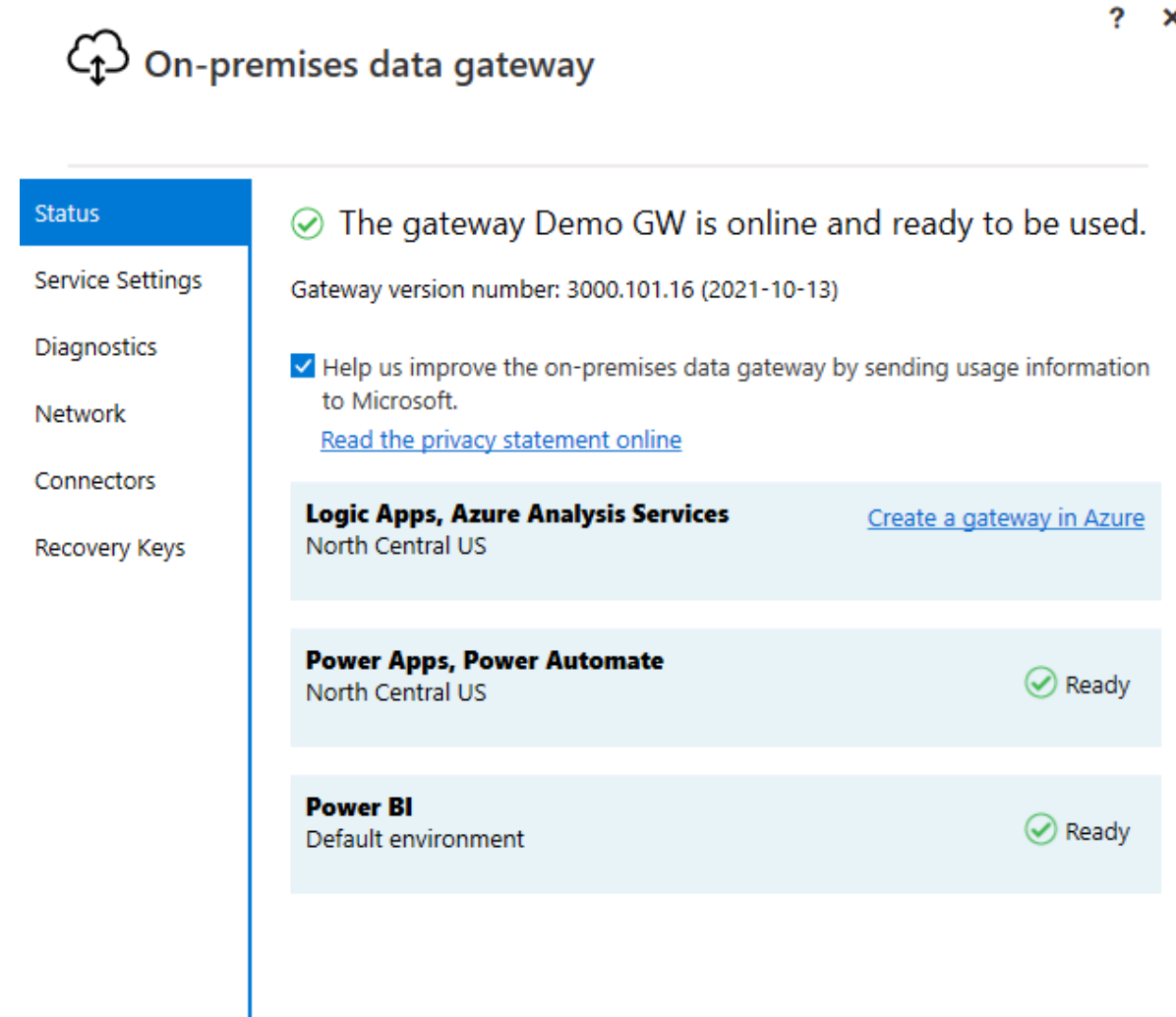


Data Gateway App Features

Data Gateway App Features

Status

- Gateway status (online/offline)
- Version number of the gateway
- List of any apps currently associated with the gateway



The screenshot shows the 'On-premises data gateway' status page. The left sidebar contains navigation links: Status (selected), Service Settings, Diagnostics, Network, Connectors, and Recovery Keys. The main content area displays the gateway status as 'online and ready to be used' with a green checkmark. It also shows the gateway version number: 3000.101.16 (2021-10-13). A checkbox is checked for 'Help us improve the on-premises data gateway by sending usage information to Microsoft.', with a link to 'Read the privacy statement online'. Below this, there are three sections for associated apps: 'Logic Apps, Azure Analysis Services' (North Central US) with a link to 'Create a gateway in Azure'; 'Power Apps, Power Automate' (North Central US) with a 'Ready' status and green checkmark; and 'Power BI' (Default environment) with a 'Ready' status and green checkmark.

On-premises data gateway

Status

Service Settings

Diagnostics

Network

Connectors

Recovery Keys

✓ The gateway Demo GW is online and ready to be used.

Gateway version number: 3000.101.16 (2021-10-13)

✓ Help us improve the on-premises data gateway by sending usage information to Microsoft.

[Read the privacy statement online](#)

Logic Apps, Azure Analysis Services [Create a gateway in Azure](#)

North Central US

Power Apps, Power Automate ✓ Ready

North Central US

Power BI ✓ Ready

Default environment

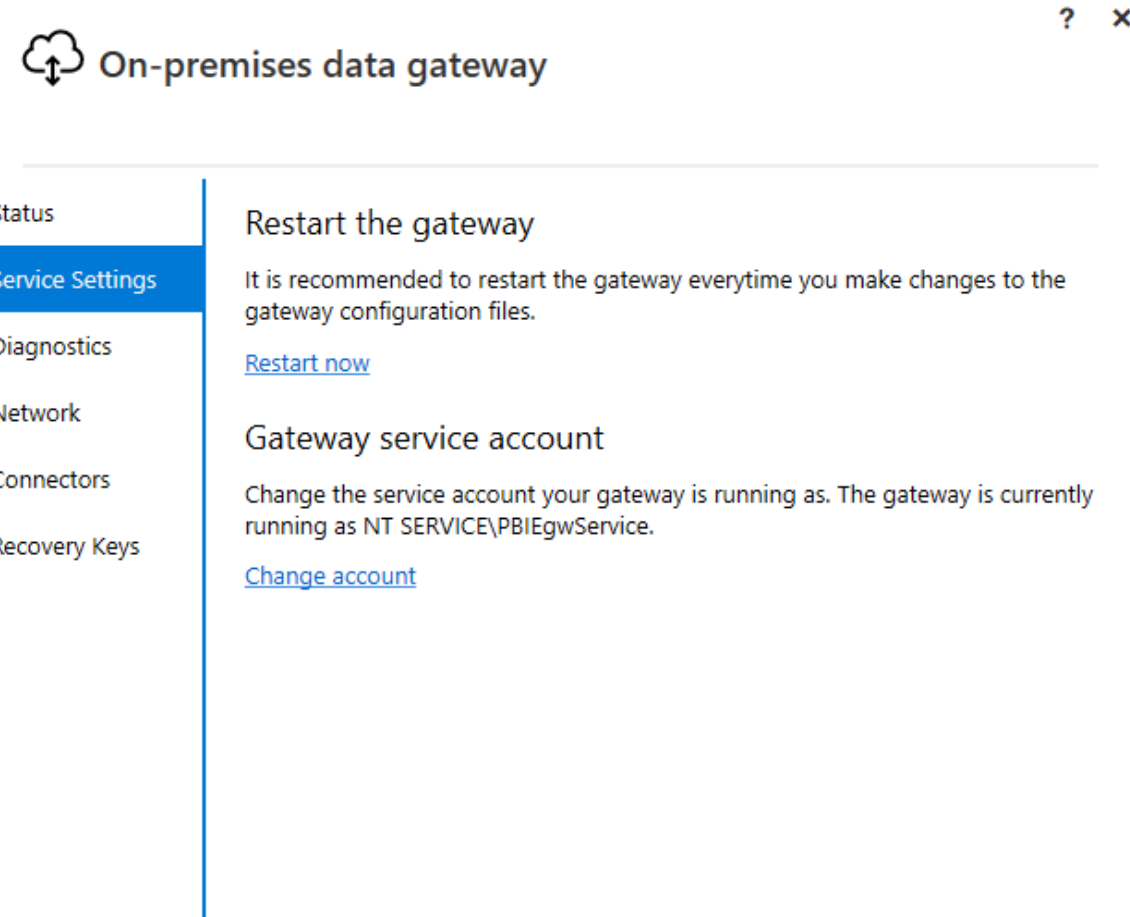
Data Gateway App Features

Service Settings

Provides a way of restarting the gateway whenever a restart is needed

Gateway service account

- By default, configured to use **NT SERVICE\PBIEgwService** for the Windows service sign-in credential
- Possibility to change gateway service account to use Active Directory user account or managed service account



Data Gateway App Features

Diagnostics

Additional logging

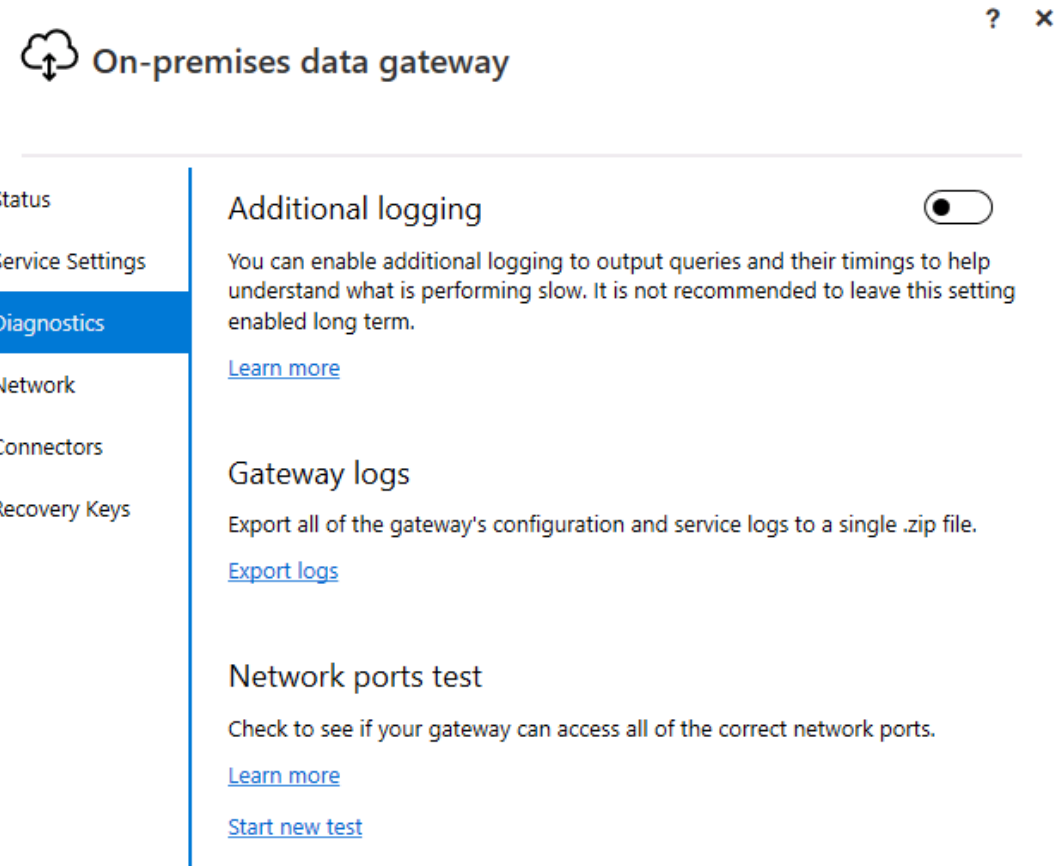
- Provides additional verbose information in the log file, which includes duration information. This information can be useful in figuring out why some responses through the gateway are slow
- Enabling this feature could **increase** the log size significantly depending on gateway usage. So, we recommend that you don't leave this setting enabled long term.

Gateway logs

- Provides a copy of all of the gateway logs in a single file in .zip format

Network ports test

- Checks if the gateway has [access to all required ports](#).

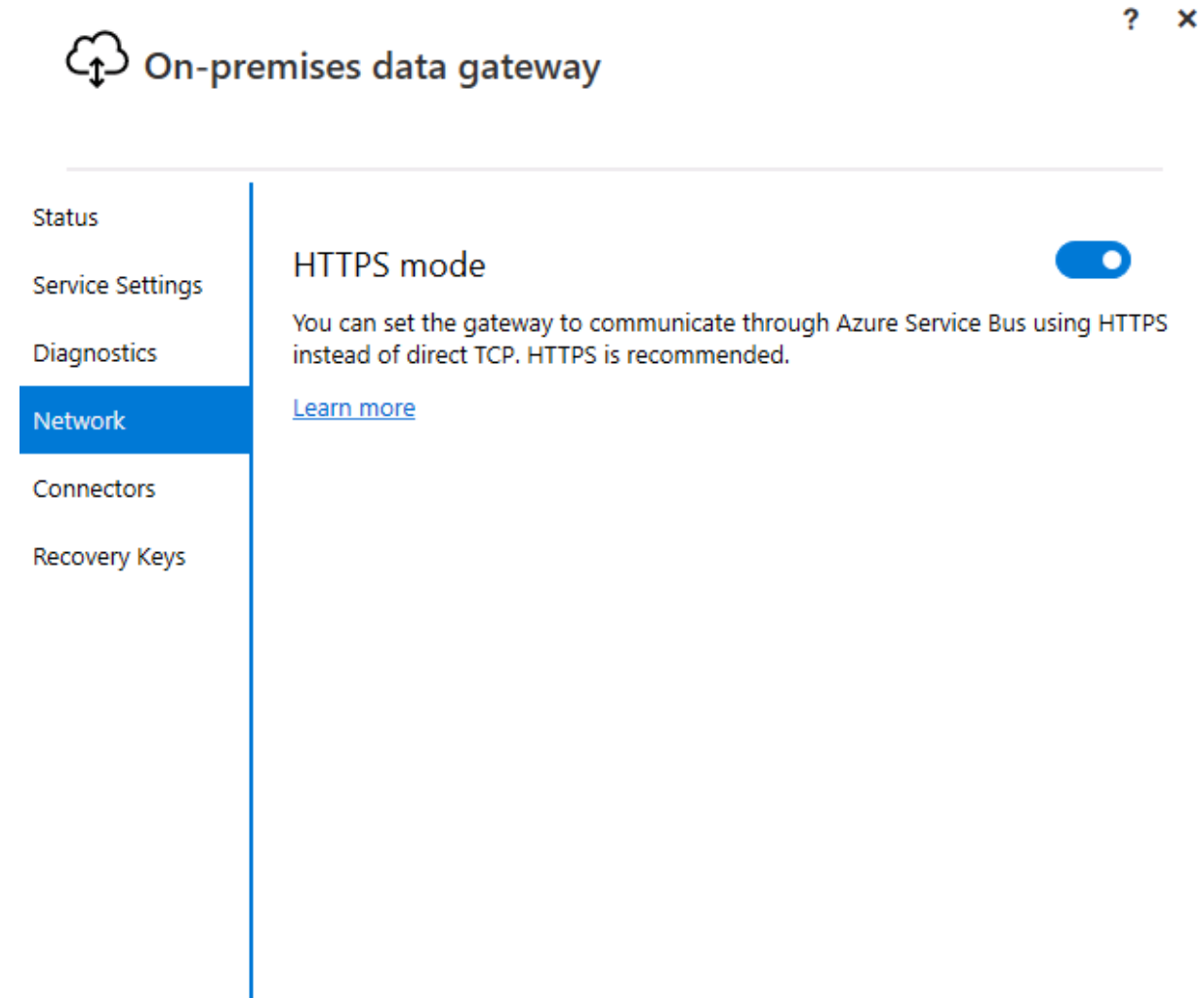


Data Gateway App Features

Network

HTTPS mode

- Forces the gateway to communicate with Azure Service Bus by using [HTTPS instead of TCP](#) when turned on.

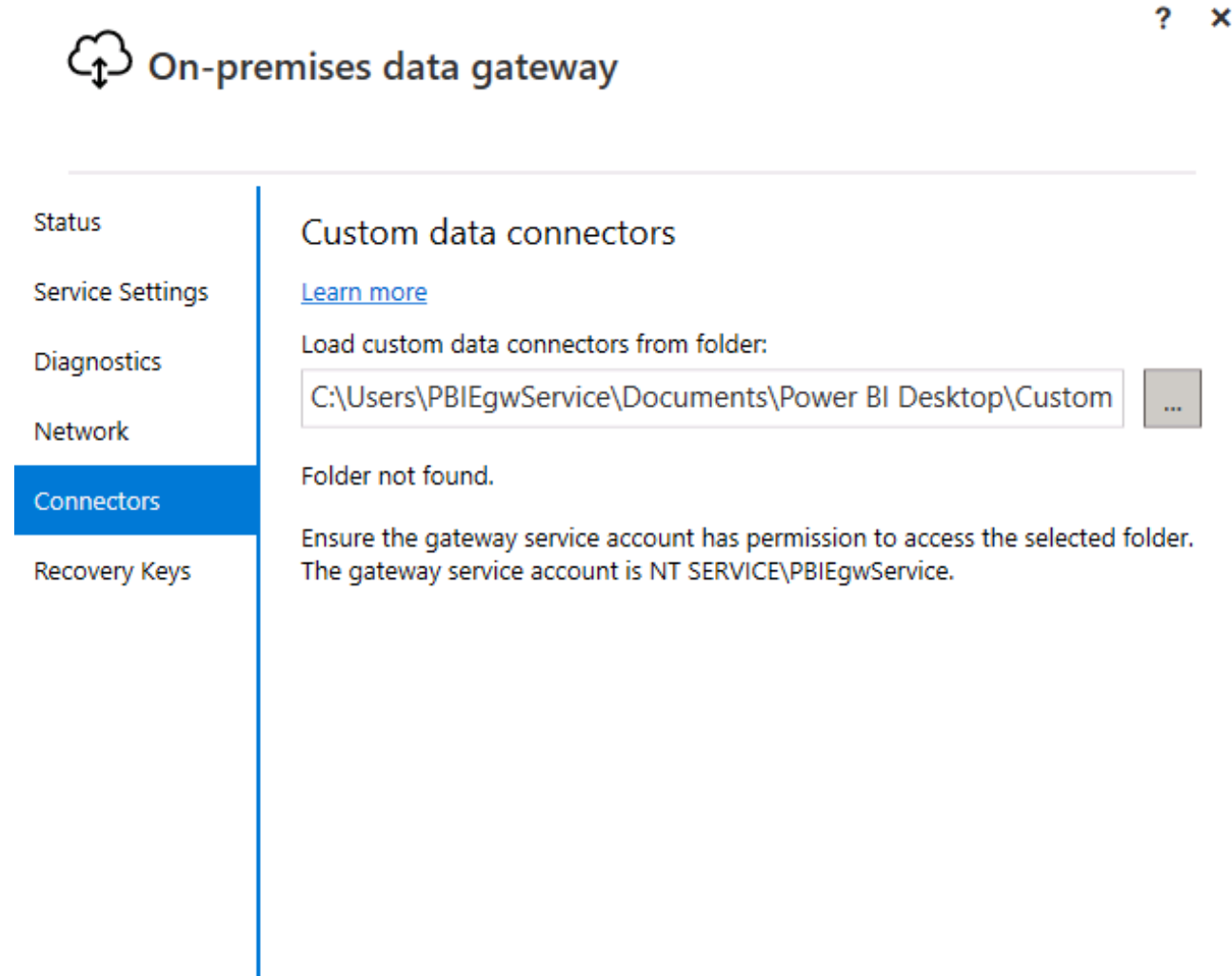


Data Gateway App Features

Custom Data Connectors

Custom data connectors


- You can connect to and access data from Power BI by using custom data connectors that you develop.



Data Gateway App Features

Recovery Keys

- Changes the recovery key you specified when installing the on-premises data gateway
- This feature does not appear until you have signed in.
- Not available in the on-premises data gateway (personal mode)

 On-premises data gateway

Status

Service Settings

Diagnostics


Network

Connectors

Recovery Keys

Recovery Keys

[Set new recovery key](#)

 Replacing your recovery key may invalidate existing credentials for the on-premises data sources configured through this gateway. Proceeding may require re-entering credentials used by these data sources and connections. The gateway may be offline and unreachable for several minutes during this process.

Available gateway clusters*
Demo GW

Available gateways*
Demo GW (Primary instance)

Recovery key*

New recovery key*

Confirm new recovery key*

[Provide relay details \(optional\)](#) By default, Azure Relays are automatically provisioned

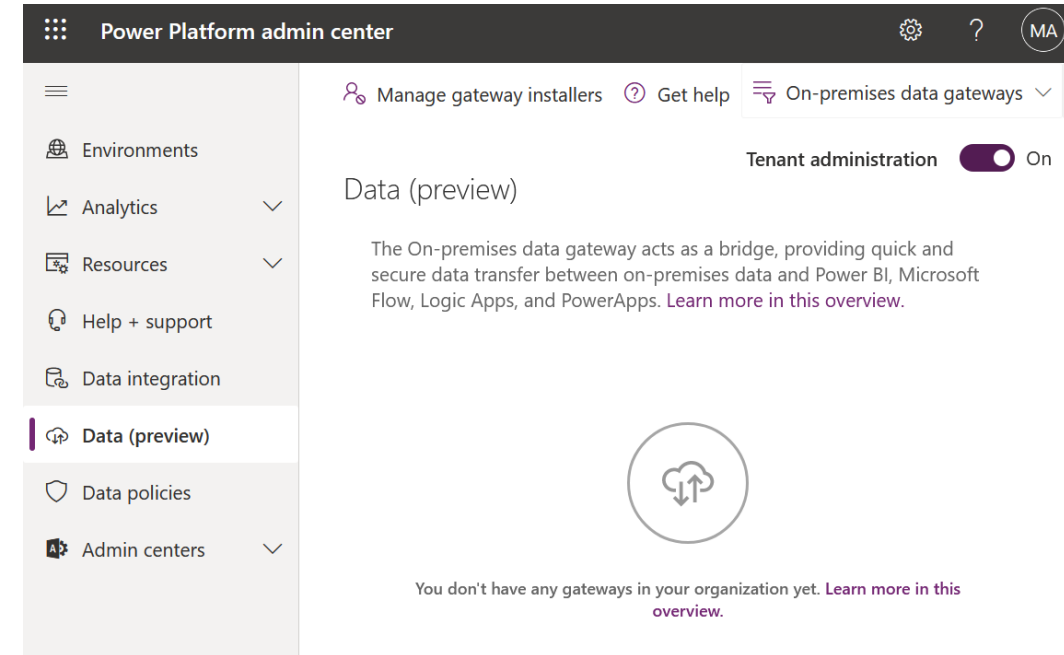
<< Back

Configure

Managing Data Gateways

Manage Data Gateways in Power Platform Admin Center

- Users having Global, Power Platform or Power BI Administrator role, or are Gateway administrators have access to data gateway management on the Power Platform admin center. However, there might be differences in the features available and the operations that can be performed by each of these roles.
- Global, Power Platform, and Power BI Administrators can use the Tenant administration setting to control the list of gateways exposed.



Manage Data Gateways in Power Platform Admin Center

All data page lists with on-premises data gateway clusters installed contains following information about gateway clusters:

- Name of the gateway cluster
- Admin contact information for the gateway cluster
- The list of gateway users
- See whether the gateway connection is online or offline
- Number of gateway members in the gateway cluster

Manage gateway installers Get help On-premises data gateways West Europe (Default) Search

Tenant administration ☒ On

Data (preview)

The On-premises data gateway acts as a bridge, providing quick and secure data transfer between on-premises data and Power BI, Microsoft Flow, Logic Apps, and PowerApps. [Learn more in this overview.](#)

Gateway cluster name ↑	Contact info	Users	Status	Gateways
ContosoOnPremiseG...	admin@M365x1...	MOD		1

Manage Data Gateway Users

Every installed Data Gateway has a default admin user account which is the account that created it and who can grant certain permissions to other users to use this data gateway.

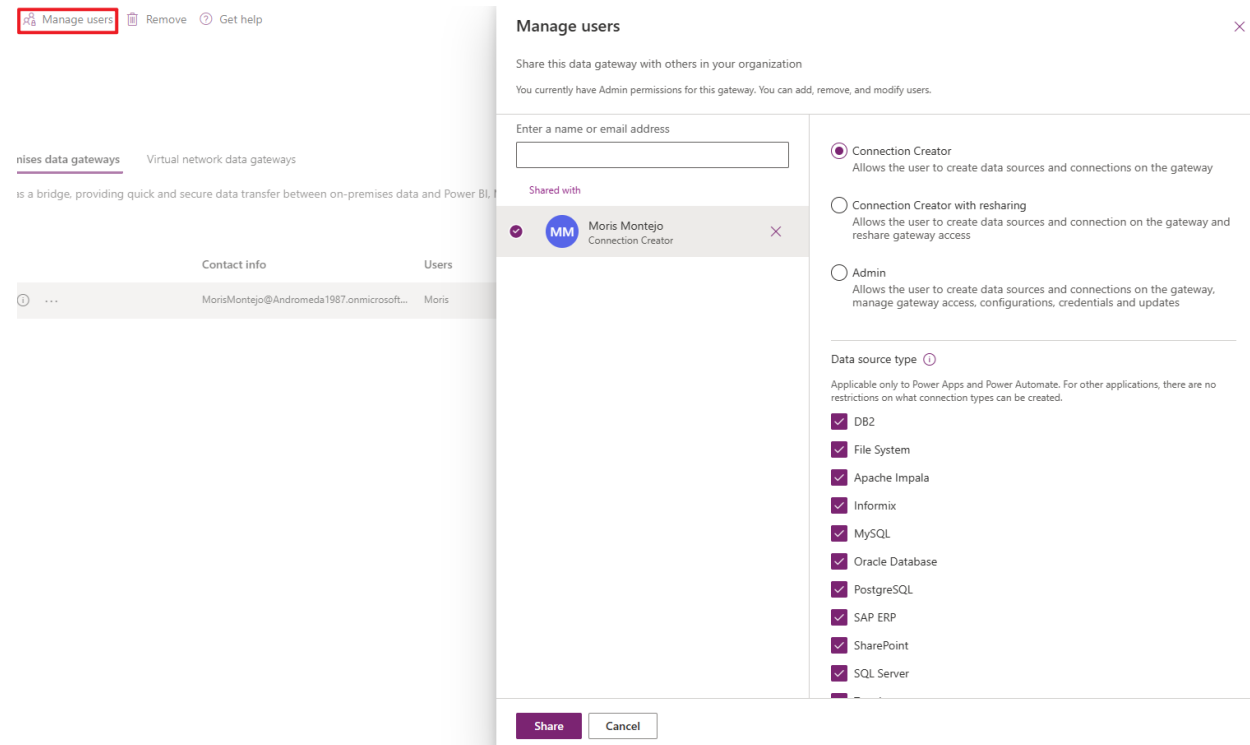
For **personal** gateways, this would show the owner of the personal gateway and cannot be changed due to the security scope of personal gateways.

For Data Gateway in **standard mode**, users can be added in any of these three categories (explained in more detail in next slide):

- Connection Creator
- Connection Creator with resharing
- Admin

Manage Data Gateway Users

- **Connection Creator** - Can create connections on the gateway to create for Apps and Flows but cannot share the gateway
 - Applies only to Power Apps and Power Automate
- **Connection Creator with resharing** – Same as **Connection Creator** but can also share the gateway for others to use
- **Admin** - Can manage gateway users, configuration, associated data sources, and connections



NOTE:

Connection Creator and **Connection Creator with resharing** do not apply to custom connectors in Power Apps and Power Automate.

While sharing gateways for **Connection Creators** and **Connection creators with resharing** permission levels, you can restrict the data source type that the user can connect over the gateway.

At least one data source type should be selected for the user to be successfully added.

Manage gateway installers

- Global, Power Platform, and Power BI Administrators can manage who can install the on-premises data gateway in your enterprise.
- This operation isn't available for gateway admins.
- This feature does not apply to personal data gateways.
- By default, data gateway installation is enabled for all users unless you restrict users in your organization from installing gateways.
- In admin center, you can enable **Restrict Users in your organization from installing gateways**, then add only allowed users to do so.

Manage gateway installers

Manage who can install gateway in your organization. This does not impact gateway administration capabilities. [Learn more.](#)

Restrict users in your organization from installing gateways
☒ On

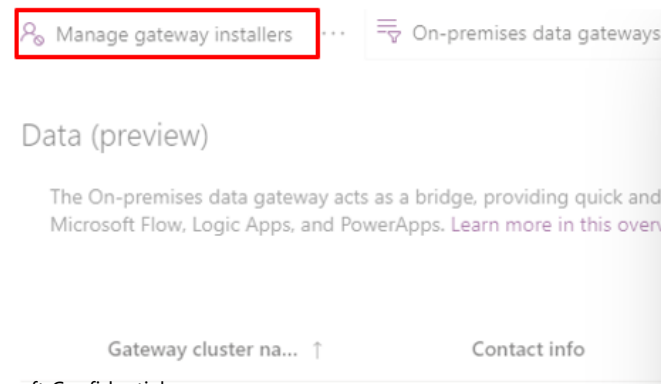
Users who can install gateways

Enter a name or email address

Add

Current gateway installers

MOD Administrator
admin@M365x983765.onmicrosoft.com



Manage gateway installers

Manage who can install gateway in your organization. This does not impact gateway administration capabilities. [Learn more.](#)

Restrict users in your organization from installing gateways
☐ Off

High-availability clusters for data gateway

- Gateway high-availability clusters helps to ensure that your organization can access on-premises data resources from supported cloud services.
- Gateway admins use such clusters to avoid single points of failure when accessing on-premises data resources.
- The gateway cloud service always uses the primary gateway in a cluster unless that gateway isn't available, in that case, service switches to the next available gateway in the cluster.
- After you create a cluster of two or more gateways, all gateway management operations like adding data sources and granting permissions apply to every gateway in the cluster.
- Make sure the gateway members in a cluster are running the same gateway version, as different versions could cause unexpected failures based on supported functionality.

Communication settings for Data Gateway

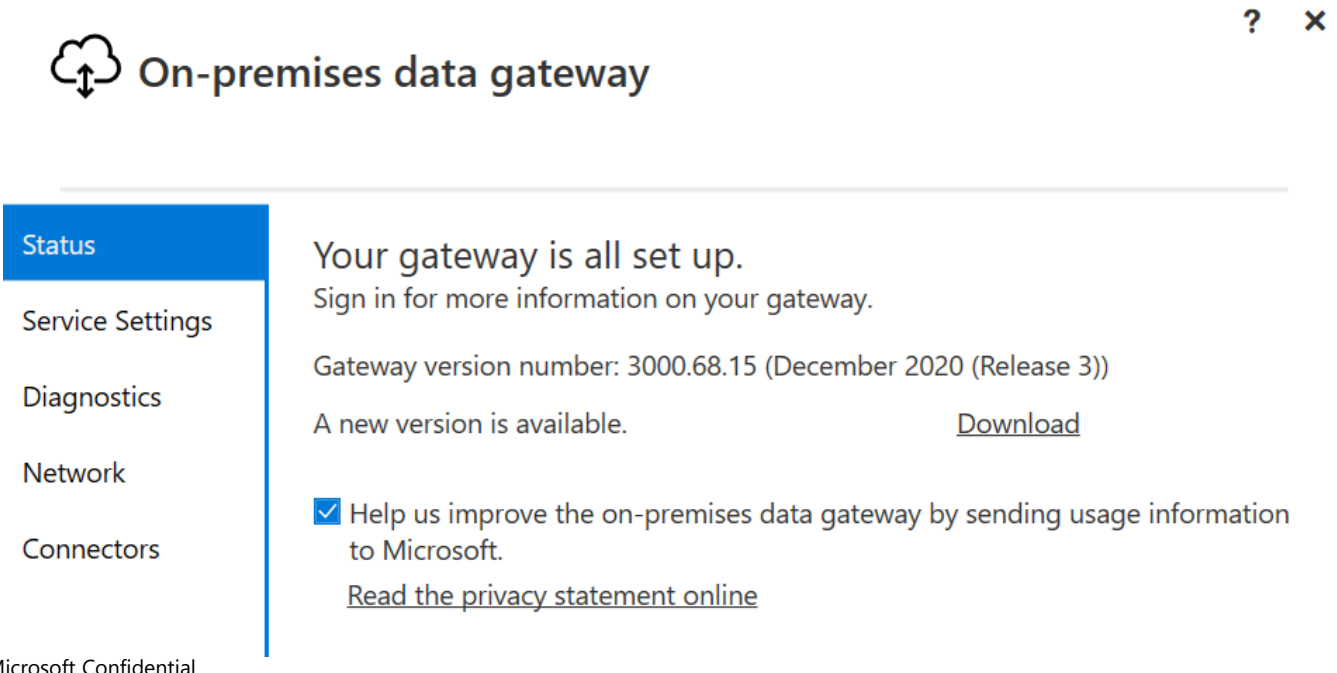
- Relies on **Azure Service Bus** for cloud connectivity.
- Correspondingly establishes outbound connections to its associated Azure region.
- If you registered for either a Power BI tenant or an Office 365 tenant, your Azure region defaults to the region of that service. Otherwise, your Azure region might be the one closest to you.
- If a firewall blocks outbound connections, configure the firewall to allow outbound connections from the gateway to its associated Azure region.
- The gateway communicates on the following outbound ports: TCP 443, 5671, 5672, and from 9350 through 9354.
- The gateway does **not** require inbound ports.
- The gateway communicates with Service Bus by using an IP address along with a fully qualified domain name (FQDN). If you force the gateway to communicate via HTTPS, it will strictly use FQDNs only and won't communicate by using IP addresses.

Update an on-premises data gateway

- We release an update every month, and each of these updates includes new features along with the latest Mashup Engine.
- If you're running a gateway cluster, we recommend that you update all nodes in the cluster at the same time.
- Download the latest standard mode gateway or personal mode gateway and run the installation program.

You can check your current version from the Gateway Status screen

Note: Currently, Microsoft actively supports only the last six releases of the on-premises data gateway.



The screenshot shows the 'On-premises data gateway' interface. At the top, there's a title bar with a cloud icon and the text 'On-premises data gateway', followed by a question mark and a close button. Below this is a sidebar with a blue header 'Status' and four menu items: 'Service Settings', 'Diagnostics', 'Network', and 'Connectors'. The main content area displays the status: 'Your gateway is all set up. Sign in for more information on your gateway.' It then shows the 'Gateway version number: 3000.68.15 (December 2020 (Release 3))' and states 'A new version is available.' with a 'Download' link. At the bottom, there's a checkbox that is checked, with the text 'Help us improve the on-premises data gateway by sending usage information to Microsoft.' and a link to 'Read the privacy statement online'.

On-premises data gateway

Status

Service Settings

Diagnostics

Network

Connectors

Your gateway is all set up.
Sign in for more information on your gateway.

Gateway version number: 3000.68.15 (December 2020 (Release 3))

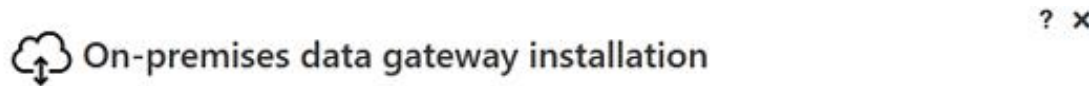
A new version is available. [Download](#)

☒ Help us improve the on-premises data gateway by sending usage information to Microsoft.
[Read the privacy statement online](#)

Update an on-premises data gateway

Download the latest gateway and run the installation program.

If the version you're trying to install isn't newer than the version already installed, you'll receive one of the following error messages.



❗ The on-premises data gateway installation has failed.

[Learn more](#)

You are trying to reinstall a version already installed on the machine. If you would like to proceed, please uninstall the current version and reinitiate the install.



❗ The on-premises data gateway installation has failed.

[Learn more](#)

It looks like you are trying to install an older version. If you want to do this, please uninstall the current version first.

Update an on-premises data gateway

If you install a newer version, you'll be prompted to update.

After the installation finishes, see a new updated version of information from the **Status** screen of the Gateway.

On-premises data gateway update

Getting ready to update the on-premises data gateway.

Please review [minimum requirements](#) for installing the On-premises data gateway. Not meeting these requirements may result in performance bottlenecks.

Install update to

C:\Program Files\On-premises data gateway

☒ I accept the [terms of use](#) and [privacy statement](#).

Update

Close

Your gateway is all set up.

Sign in for more information on your gateway.

Gateway version number: 3000.68.15 (December 2020 (Release 3))

A new version is available.

[Download](#)

Your gateway is all set up.

Sign in for more information on your gateway.

Gateway version number: 3000.72.6 (February 2021)

☒ Help us improve the on-premises data gateway by sending usage information to Microsoft.

[Read the privacy statement online](#)

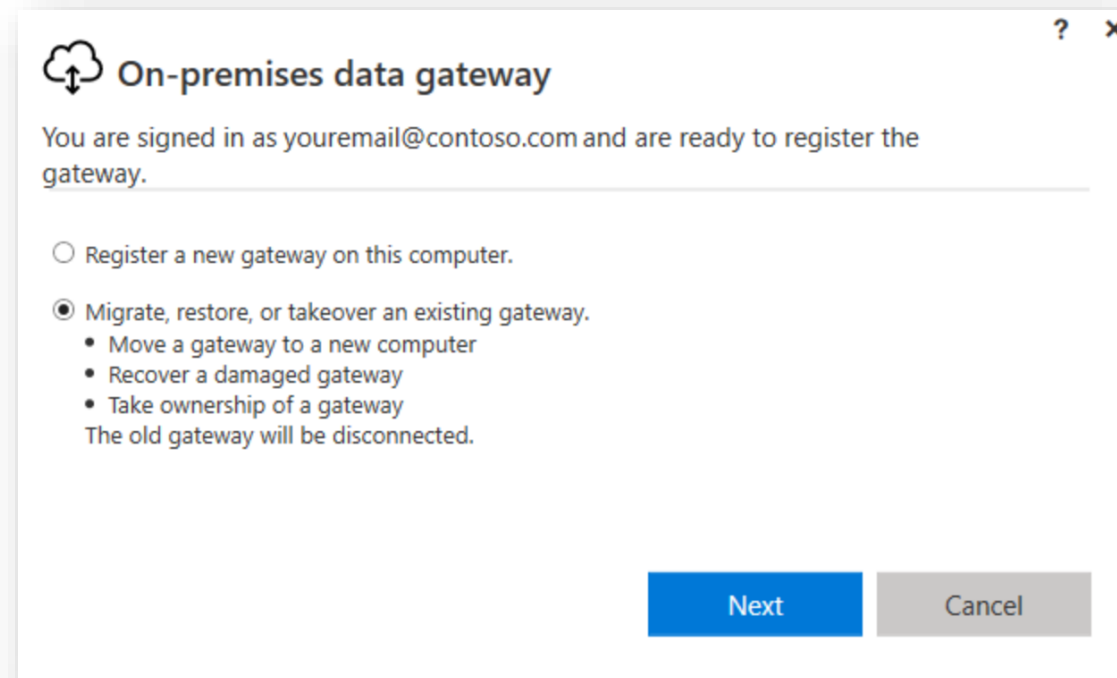
Migrate, restore, or take over a data gateway

If you're restoring the gateway on the computer that has the original gateway installation, you must first uninstall the gateway on that computer.

If you remove or delete a gateway cluster in any of the cloud services, you will not be able to restore it.

To restore or migrate:

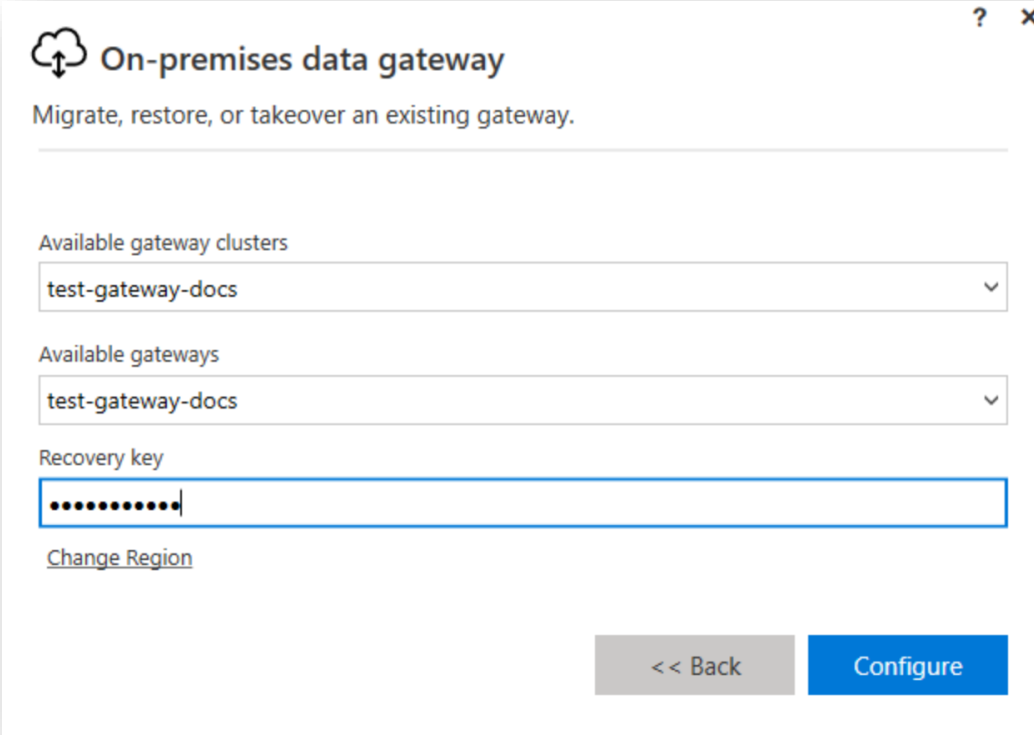
- Run the gateway installer on a computer where you want to migrate, restore, or take over an on-premises data gateway.
- After you've signed-in to your Office 365 account, register the gateway. Select Migrate, restore, or takeover an existing gateway > Next.



Migrate, restore, or take over a data gateway

Select from the available clusters and gateways then enter the recovery key for the selected gateway. You created and safely stored the recovery key when you originally installed the gateway -> Configure.

After the configuration finishes, the process of migrating, restoring, or taking over is complete.



The screenshot shows a configuration window titled "On-premises data gateway" with a cloud icon and a question mark. Below the title is the instruction "Migrate, restore, or takeover an existing gateway." The window contains three dropdown menus: "Available gateway clusters" with "test-gateway-docs" selected, "Available gateways" with "test-gateway-docs" selected, and "Recovery key" with a masked input field containing ten dots. Below the recovery key field is a link labeled "Change Region". At the bottom right are two buttons: "< Back" and "Configure".

Use PowerShell to manage gateways

Two scopes are supported by cmdlets:

- Individual is used to access entities that belong to the current user.
- Organization is used to access entities across the entire tenant. Only Power BI service admins or the O365 global admins are allowed to use this option.

Limitations:

- These PowerShell scripts may not work as expected for GCC customers and hence aren't supported in GCC.
- These PowerShell scripts are also not supported for VNET gateways.

Supported in PowerShell 7.0.6 or higher

<https://learn.microsoft.com/en-us/powershell/gateway/overview?view=datagateway-ps>

Add-DataGatewayCluster
Add-DataGatewayClusterDatasourceUser
Add-DataGatewayClusterUser
Get-DataGatewayCluster
Get-DataGatewayClusterDatasource
Get-DataGatewayClusterDatasourceStatus
Get-DataGatewayClusterDatasourceUser
Get-DataGatewayClusterStatus
Get-DataGatewayDatasource
Get-DataGatewayInstaller
Get-DataGatewayRegion
Get-DataGatewayTenantPolicy
Install-DataGateway
Remove-DataGatewayCluster
Remove-DataGatewayClusterDatasource
Remove-DataGatewayClusterDatasourceUser
Remove-DataGatewayClusterMember
Remove-DataGatewayClusterUser
Set-DataGatewayCluster
Set-DataGatewayClusterDatasource
Set-DataGatewayInstaller
Set-DataGatewayTenantPolicy

Questions?

Lab 1 and 2

Lab Description

Lab 1. Install an on-premises data gateway

Lab 2. Build an app using On-premise data gateway



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