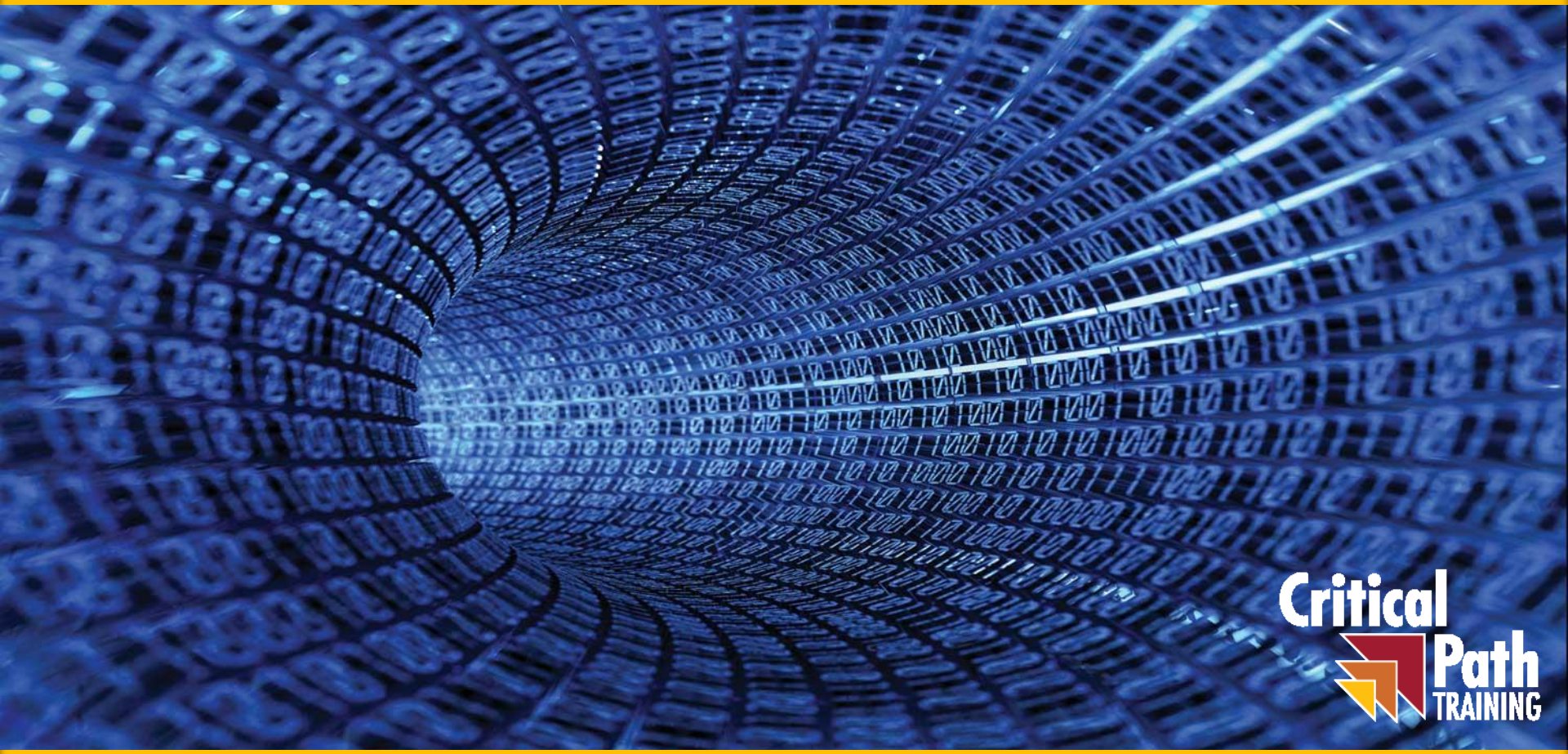
Managing Power BI Gateways and On-premises Data



Agenda

- Comparing Imported Datasets to Live Connect
- Refreshing Data using Storing Credentials
- Configuring a Dataset for Auto Refresh
- Installing and Configuring Personal Gateway
- Installing and Configuring On-premises Gateway
- Designing Datasets using DirectQuery Mode

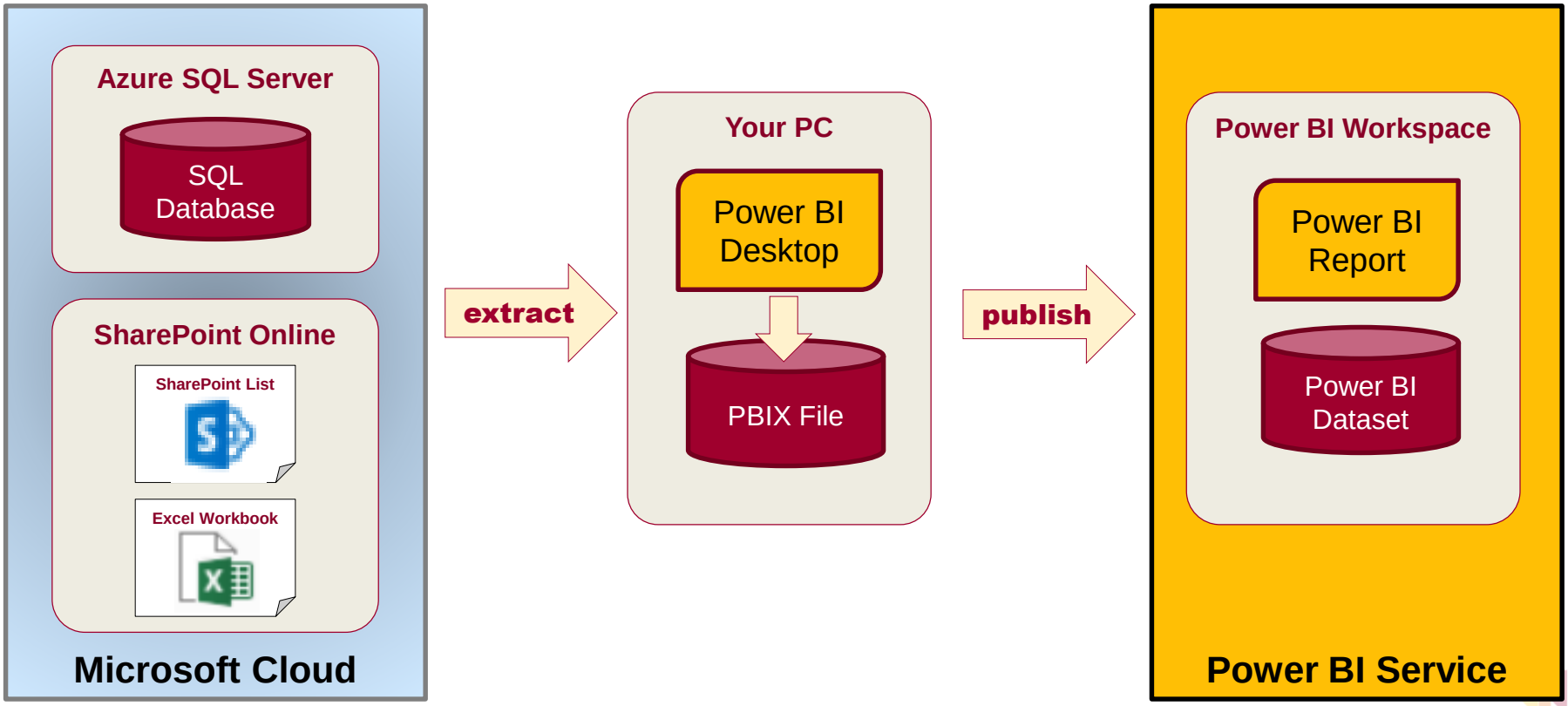
Imported Datasets Versus Live Connect

- Imported Dataset
  - Data is imported into storage within Power BI service
  - Entire dataset loaded into memory when in use
  - Reports and Datasets query data in imported dataset
  - Dataset size is maxed out at 1GB
  - Dataset must be refreshed when source data changes

- Dataset based on Live Connection
  - No data is imported or cached in the Power BI service
  - Reports and Datasets query data with live connection
  - No need to refresh data
  - No need to worry about 1GB dataset size limitation
  - Limitation are placed on features for querying and data modeling

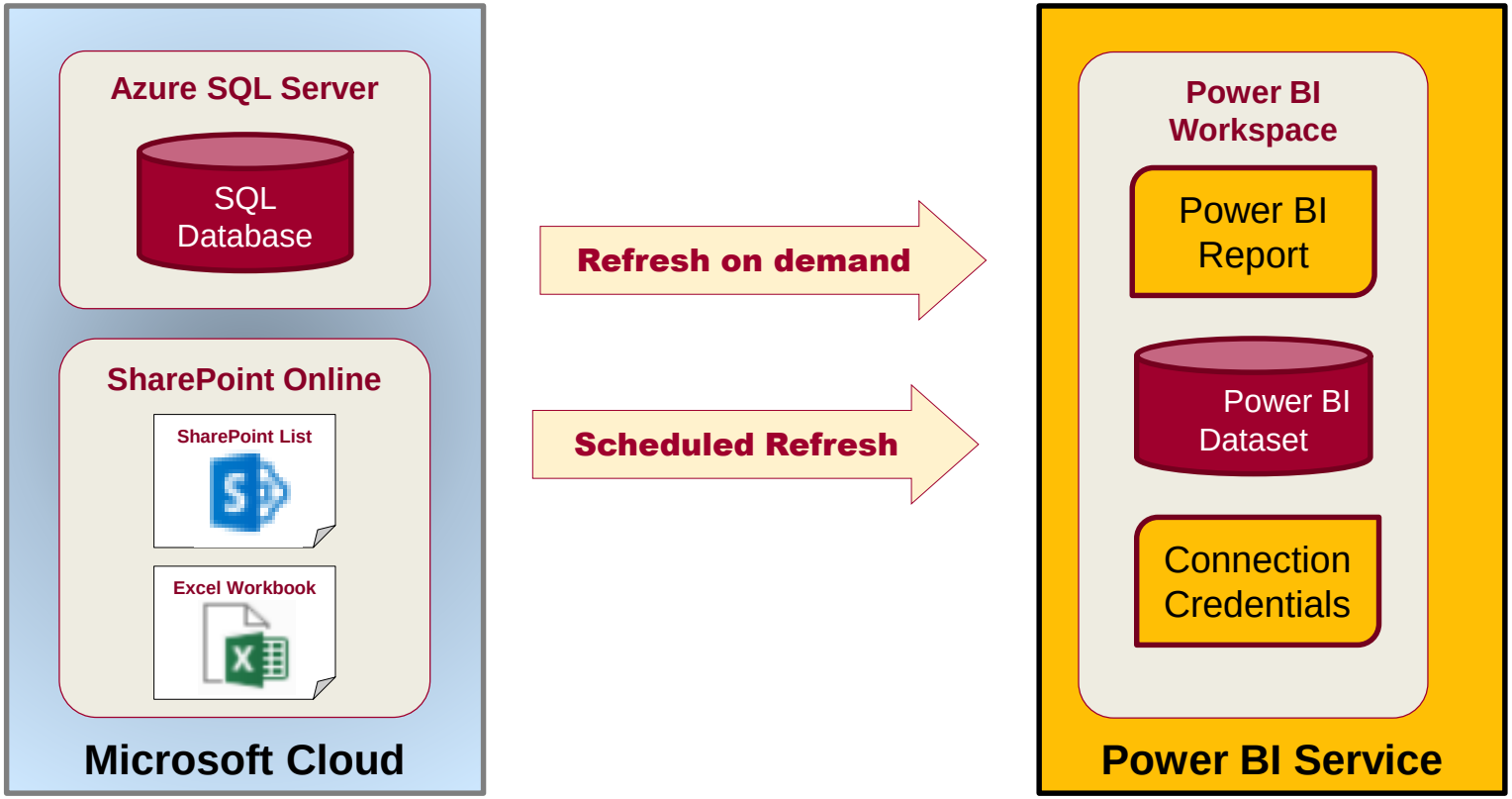
Importing Data from Cloud Data Sources

- Importing Datasets from Cloud Data Sources
  - Power BI Desktop saves data locally in PBIX file
  - PBIX file published to import dataset into Power BI Service



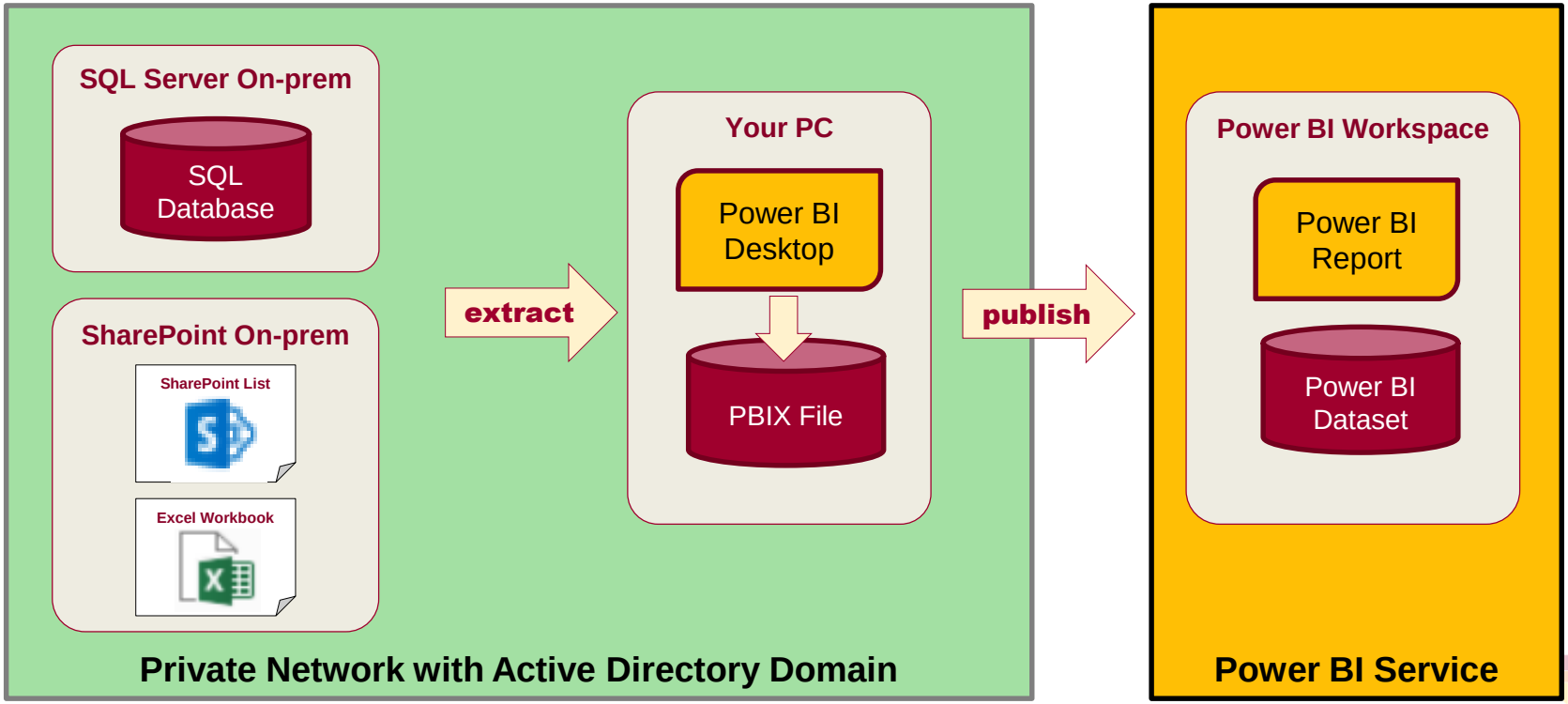
Refreshing Data from Cloud Data Sources

- Power BI Service Can Be Configured to Refresh Data
  - Power BI Desktop will never publish login credentials
  - You must configure data source credentials in Power BI service



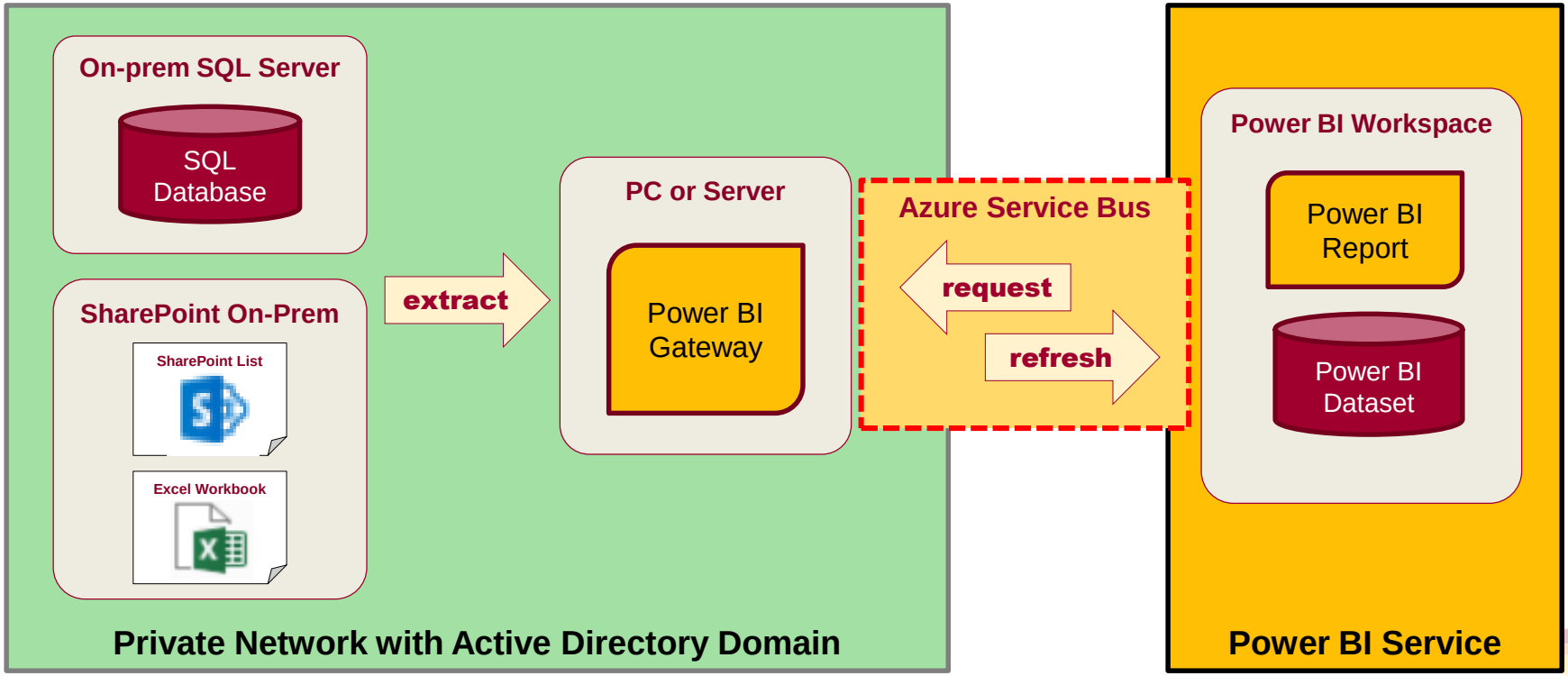
Importing Data from On-premises Data Sources

- What If Your Data Sources Live Inside an AD Domain?
  - Exacting and Publishing Data with PBIDT remains the same
  - Refreshing Data Becomes More Complicated
  - Power BI Service Cannot Directly Connect to Data Sources



What is a Power BI Gateway?

- Gateway connects Power BI to data source
  - Runs on PC or server joined to domain
  - Extracts data and returns it to Power BI service



Power BI Gateway Types

- Power BI Personal Gateway
  - Data transferred under identity of single user
  - Requires Power BI Pro and x64 bit Operating Systems
  - Can refresh data up to 8 times per day
  - Does not support DirectQuery mode
- Power BI On-premises Gateway
  - Data transferred under identity of any user
  - Requires Power BI Pro and x64 bit Operating System
  - Adds support for DirectQuery mode

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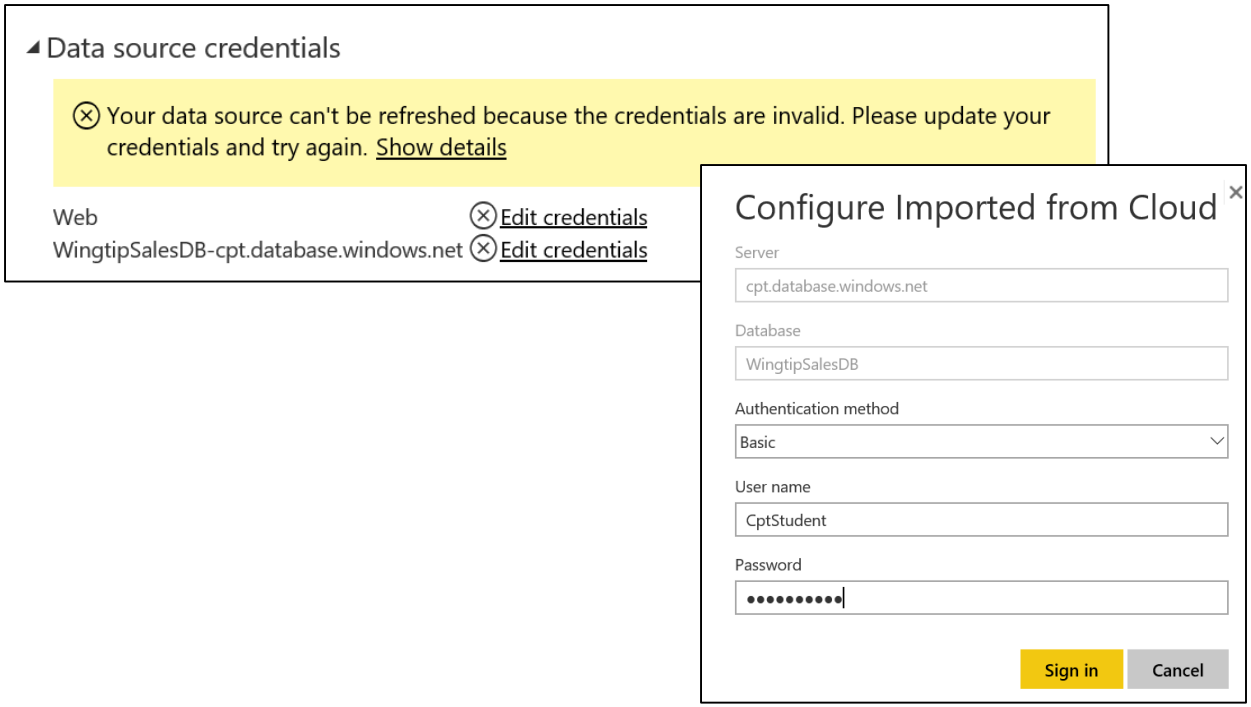
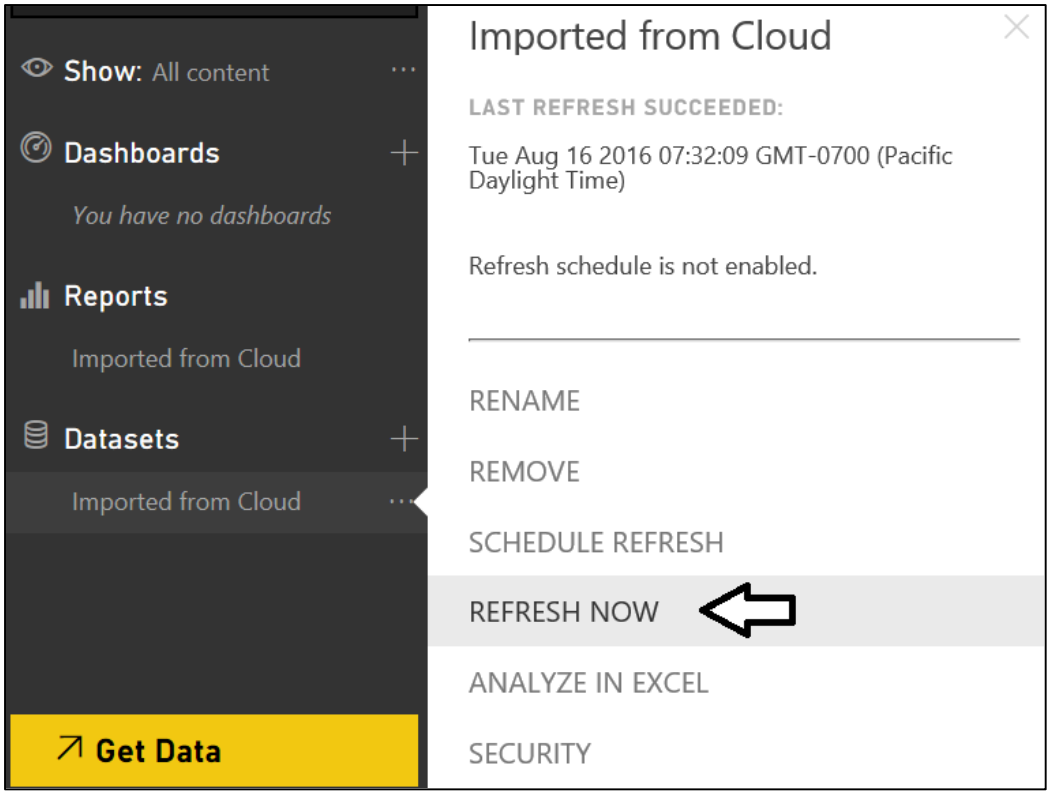
Configuring Credentials in the Cloud

- Power BI Desktop never Publishes Credentials
  - PBIDT caches credentials locally for its own use
  - Connection credentials must be configured in cloud
  - Power BI stores credentials in encrypted format



Manual Refresh

- Once you have configured credentials…
  - You can refresh on demand from Dataset flyout menu



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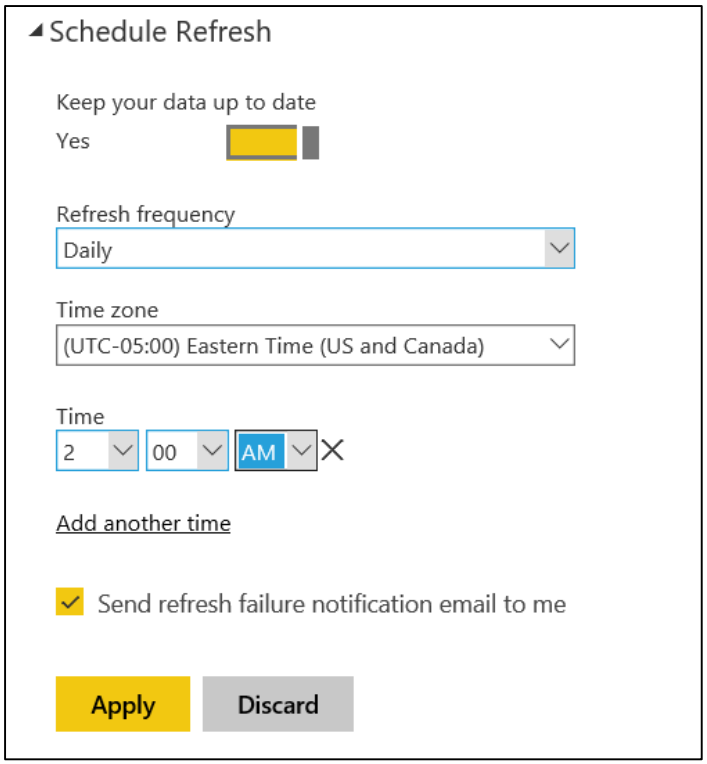
Configuring Scheduled Refresh

- Very easy to configure
  - Power BI Pro allows up to 8 refreshes per day
  - Power BI Standard allows one refresh per day



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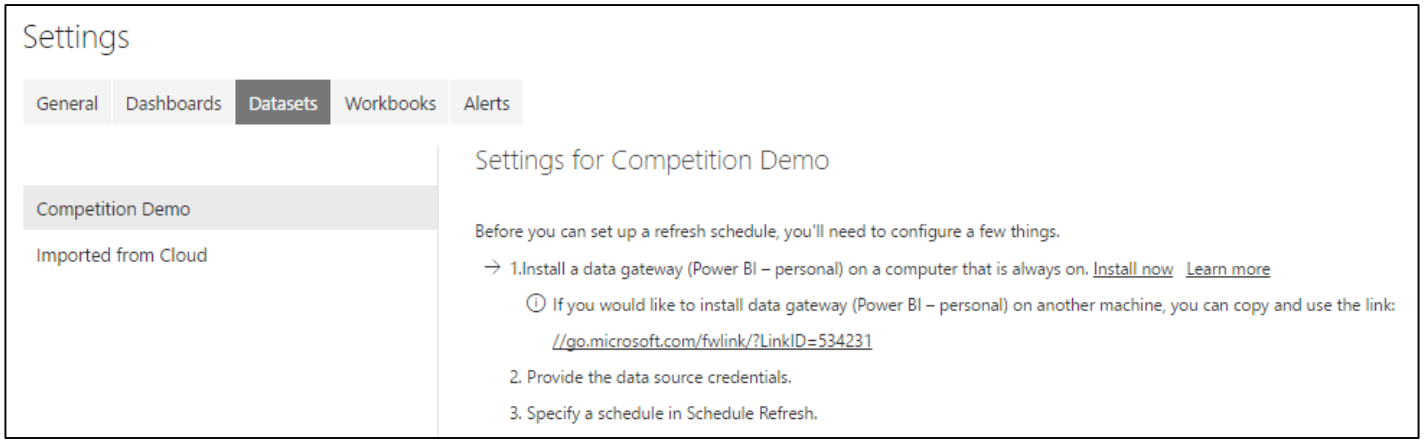
Data Refresh Might Require a Gateway

- Power Service cannot connect directly to…
  - Local files on your PC
  - Files in your local network
  - Data sources in an Active Directory domain

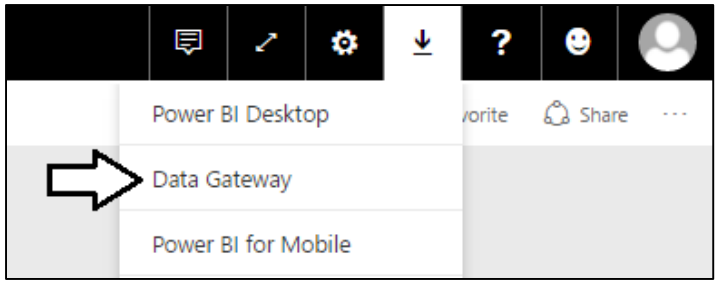


Install Gateway As Service vs Application

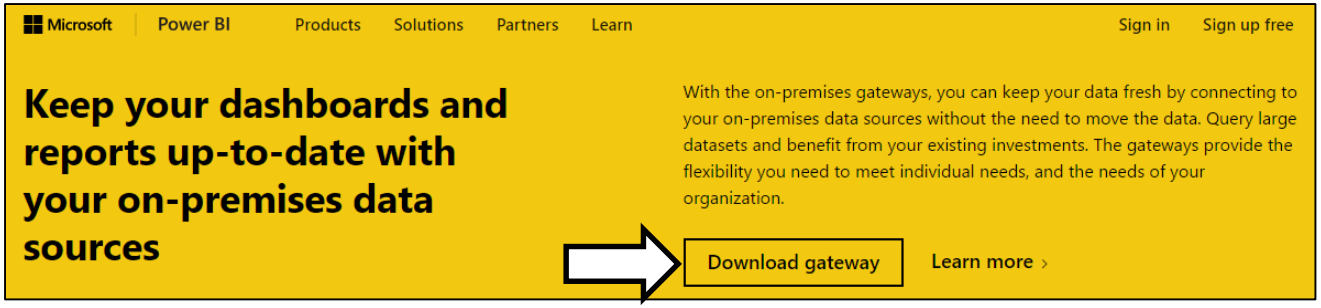
- Installing Personal Gateway with Admin Perms
  - Gateway runs as Windows service
  - Requires configuring Windows password for connecting
  - Refresh fails if password has expired
- Installing Personal Gateway w/o Admin Perms
  - Gateway runs as standard Windows application
  - User must be logged into PC for refresh to occur
  - Gateway runs under identity of currently logged in user

Downloading Power BI Gateway Install File

- Select **Data Gateway from** Download menu

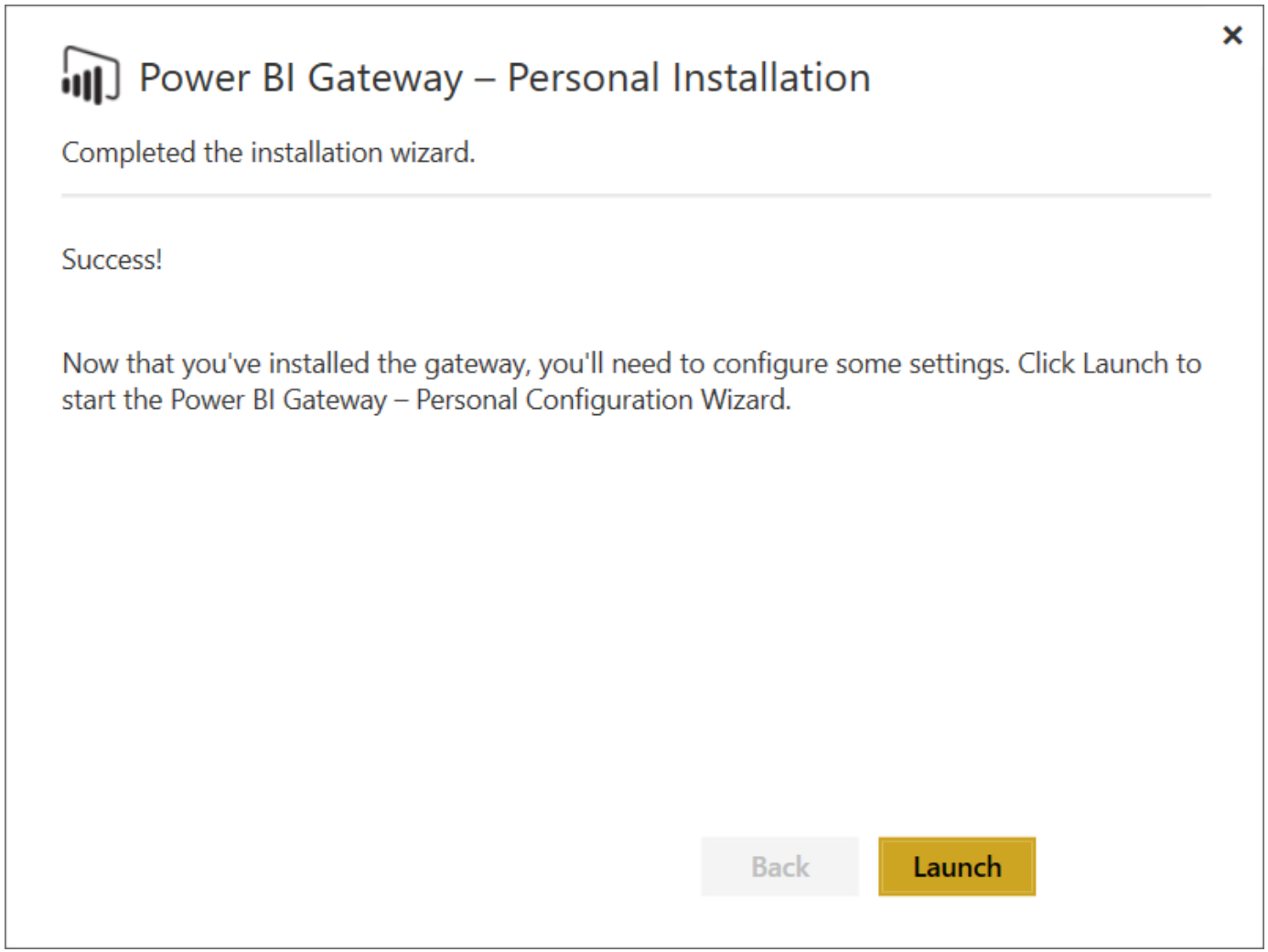


- Click **Download** button on download page
  https://powerbi.microsoft.com/en-us/gateway/

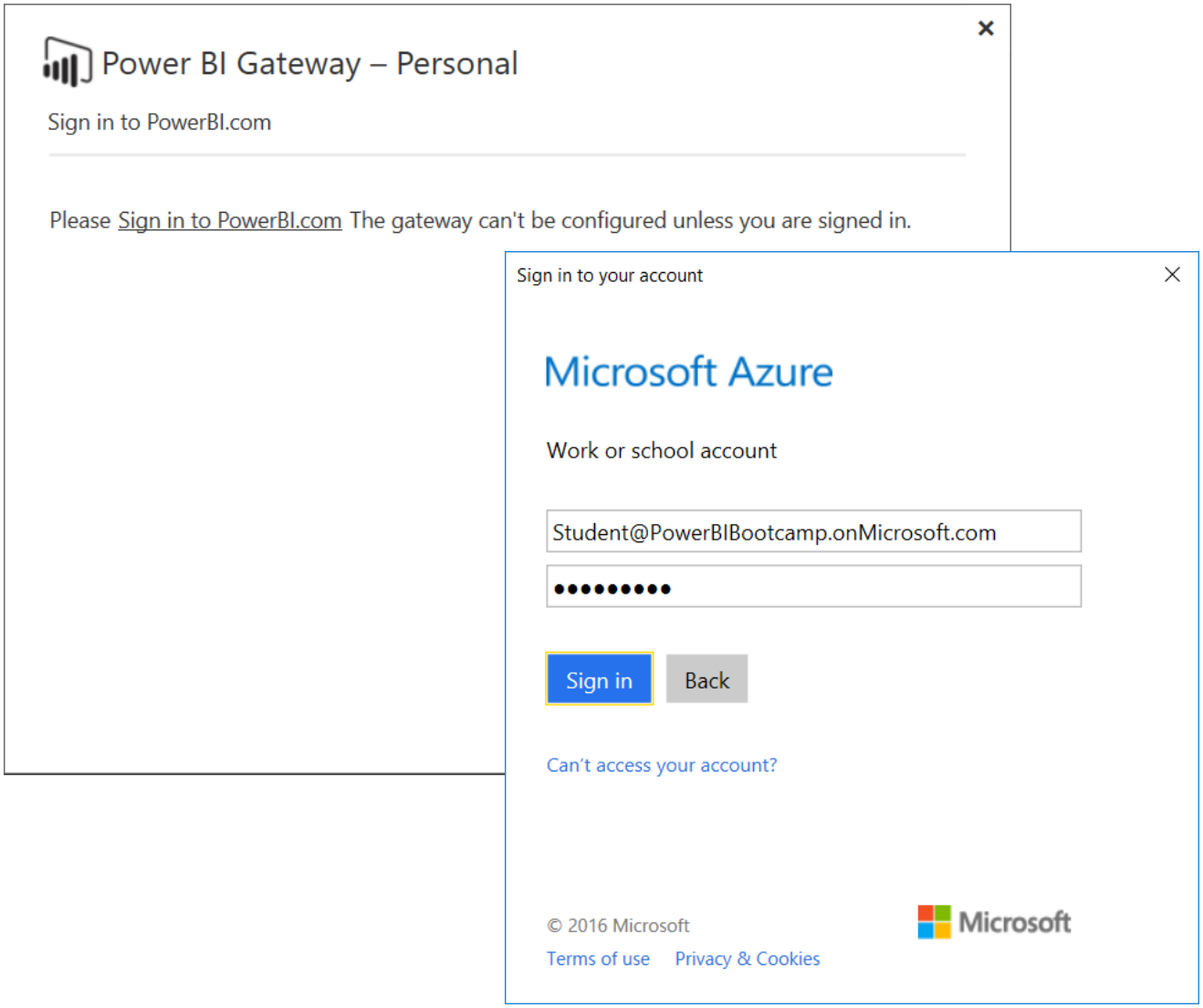


- Installation file for all gateways named **PowerBIGatewayInstall.exe**

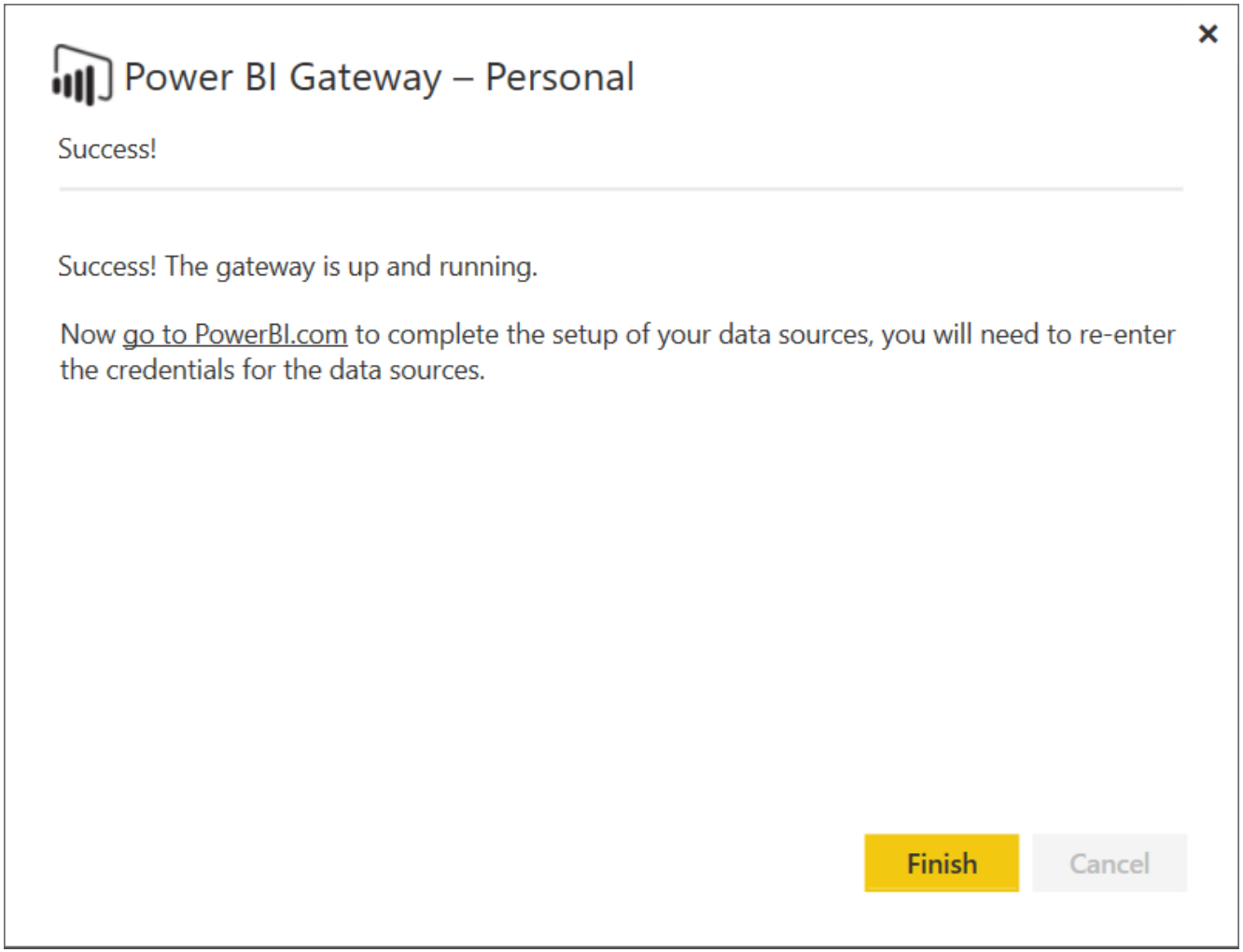
Personal Gateway Installation



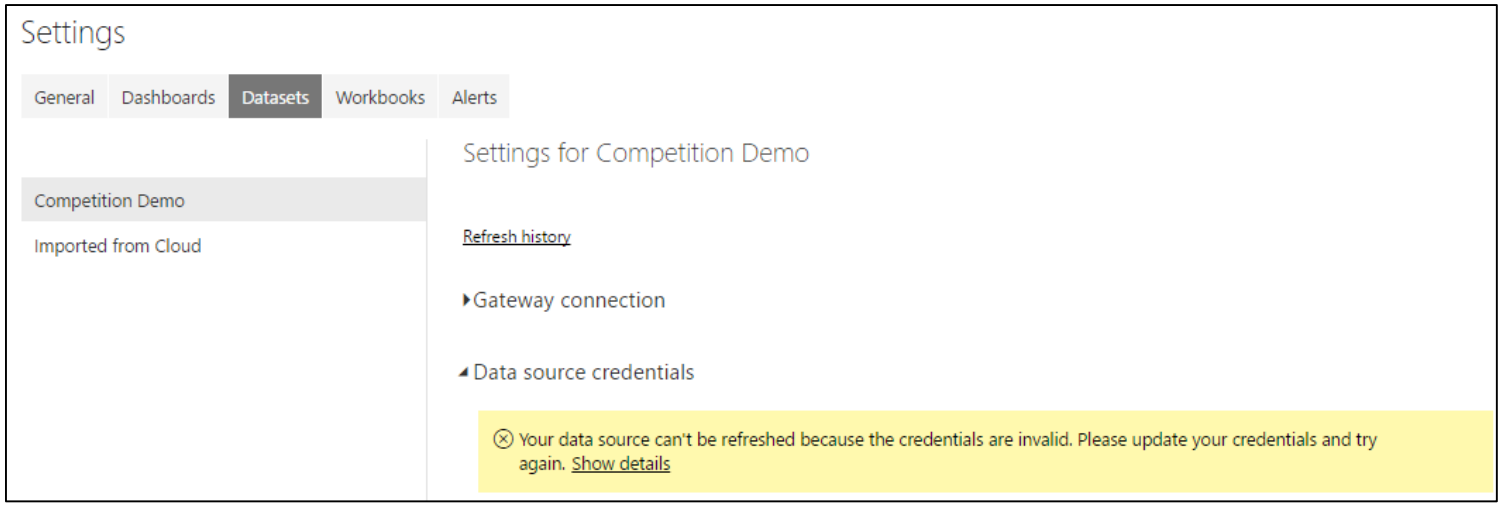
Personal Gateway Sign-in

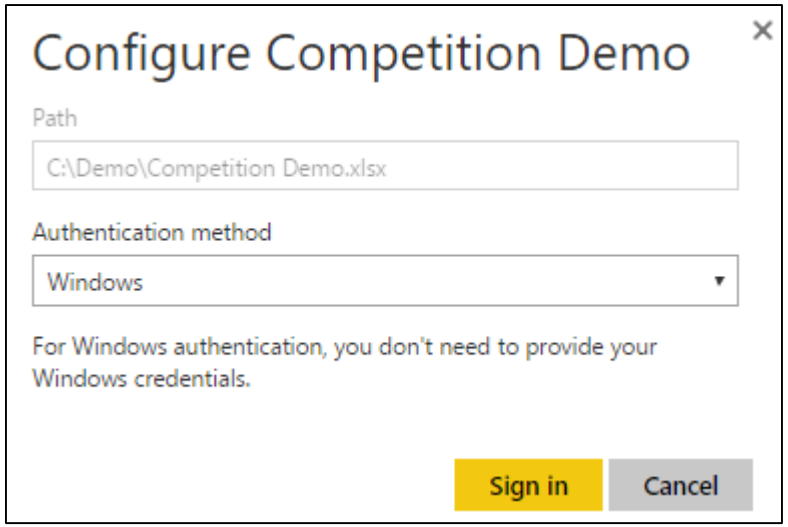


Personal Gateway Configuration



Configuring Data Source Through Gateway





Outbound Ports – Personal Gateway

- Gateway communicates through outbound ports
  - Gateway does not require inbound ports

Domain names	Outbound ports	Description
*.powerbi.com	443	HTTPS
*.analysis.windows.net	443	HTTPS
*.login.windows.net	443	HTTPS
*.servicebus.windows.net	5671-5672	Advanced Message Queuing Protocol (AMQP)
*.servicebus.windows.net	443, 9350-9354	Listeners on Service Bus Relay over TCP (requires 443 for Access Control token acquisition)
*.frontend.clouddatahub.net	443	HTTPS
*.core.windows.net	443	HTTPS
login.microsoftonline.com	443	HTTPS
login.windows.net	443	HTTPS

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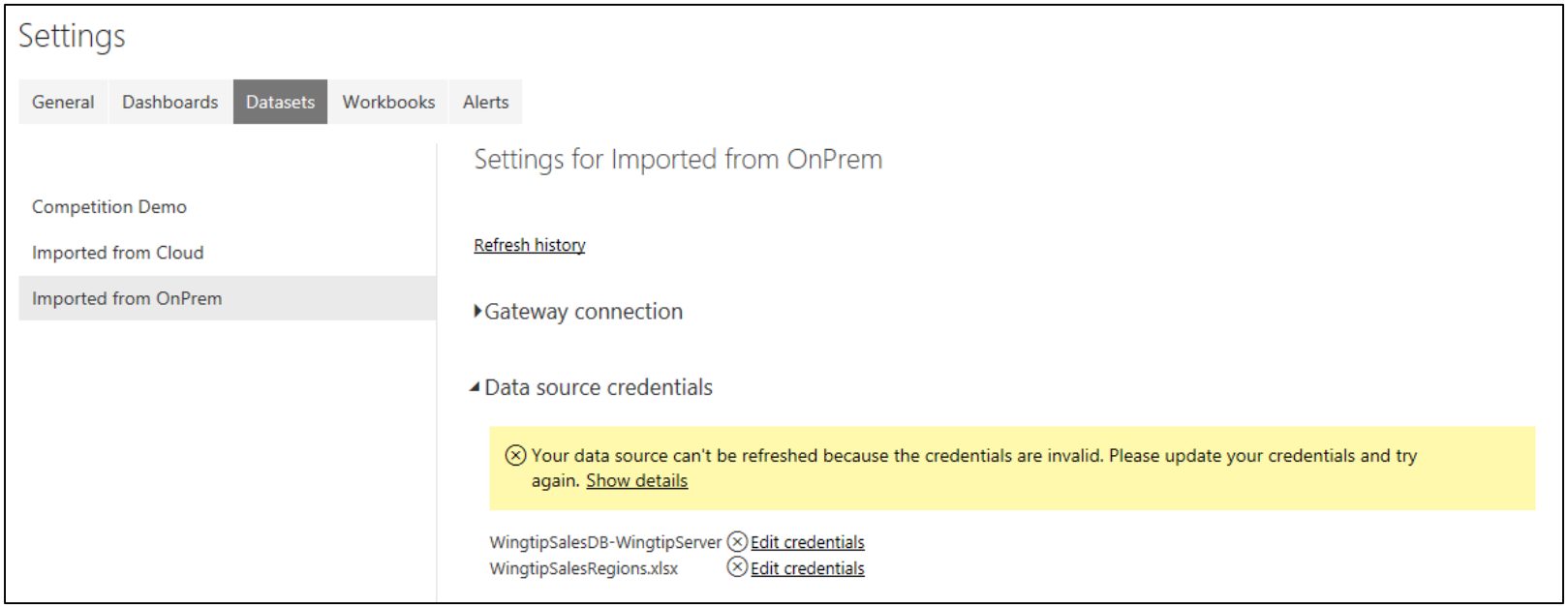
When to Use On-Premises Gateway

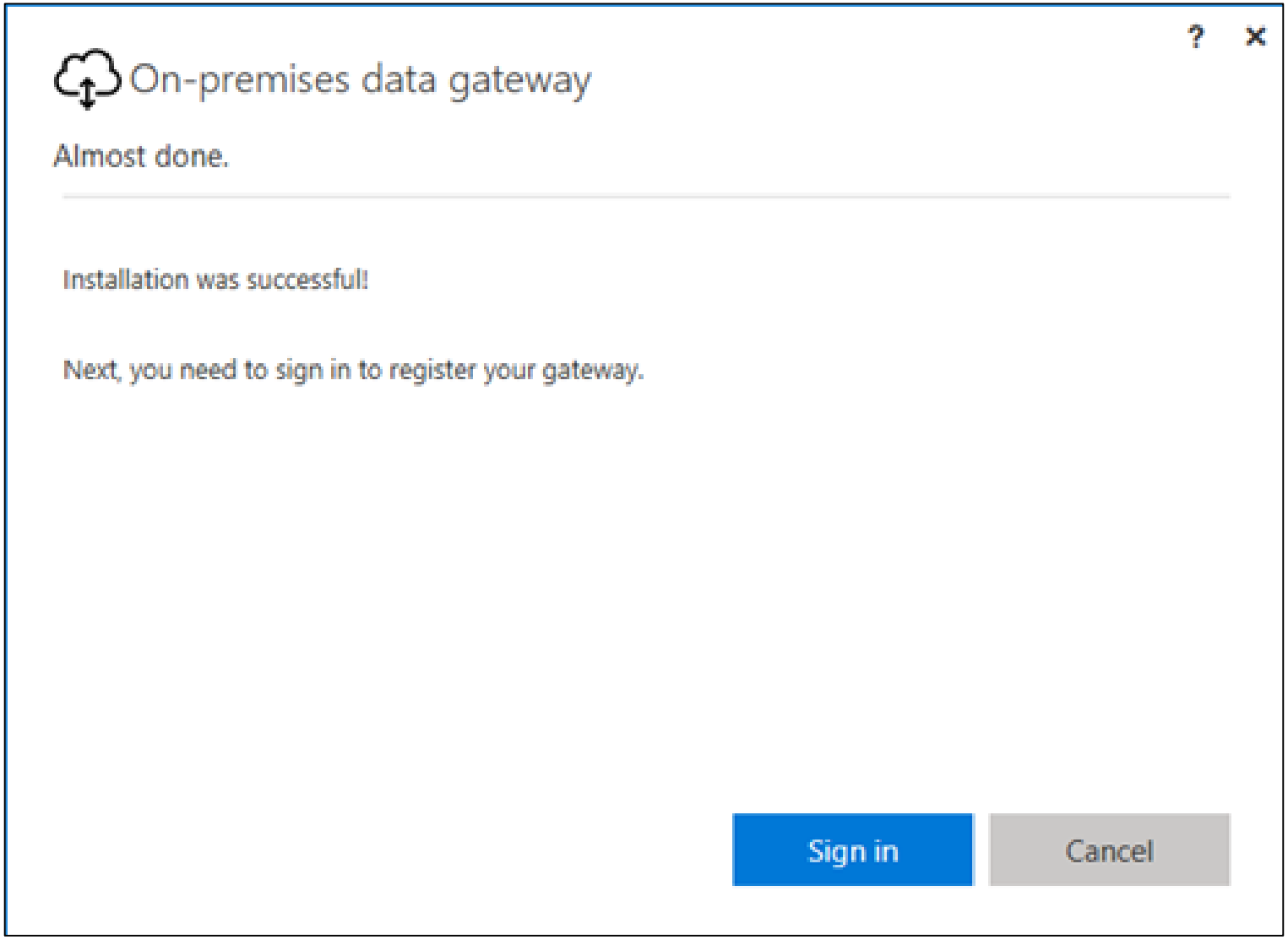
- Common Motivation
  - Connecting to on-premises data sources for refersh



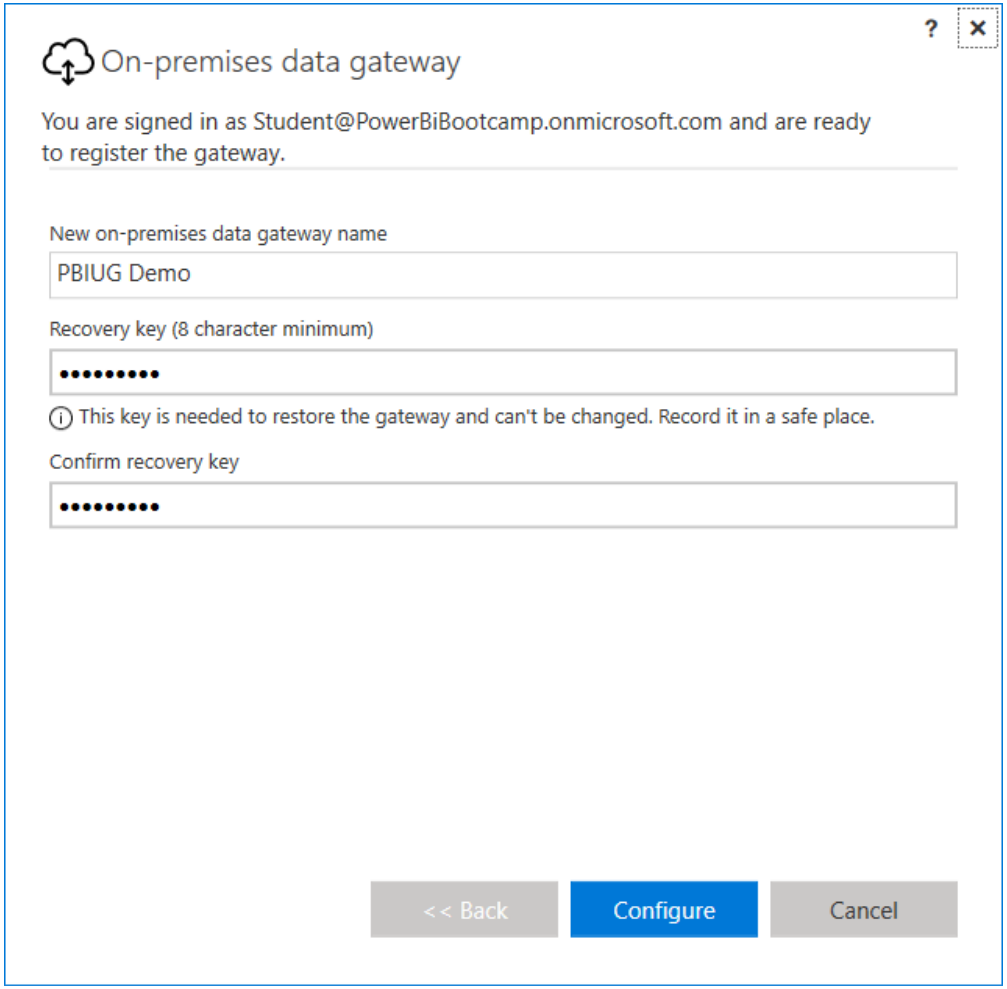
On-Premises Gateway

- Enables IT to deploy & manage shared gateways
  - Each gateway can service large number of users
  - IT can install and manage multiple gateways
  - Eliminates need to for individual users to install personal gateways
  - Replaces several older Power BI Gateways
- On-premises Gateway gives more control to IT
  - IT can centrally manage user access to underlying data sources
  - IT can monitor and gain visibility into gateway usage
- Does On-Premises Gateway support High Availability?
  - Not yet as of Q3 of 2016
  - Microsoft working on plans to provide high availability architecture

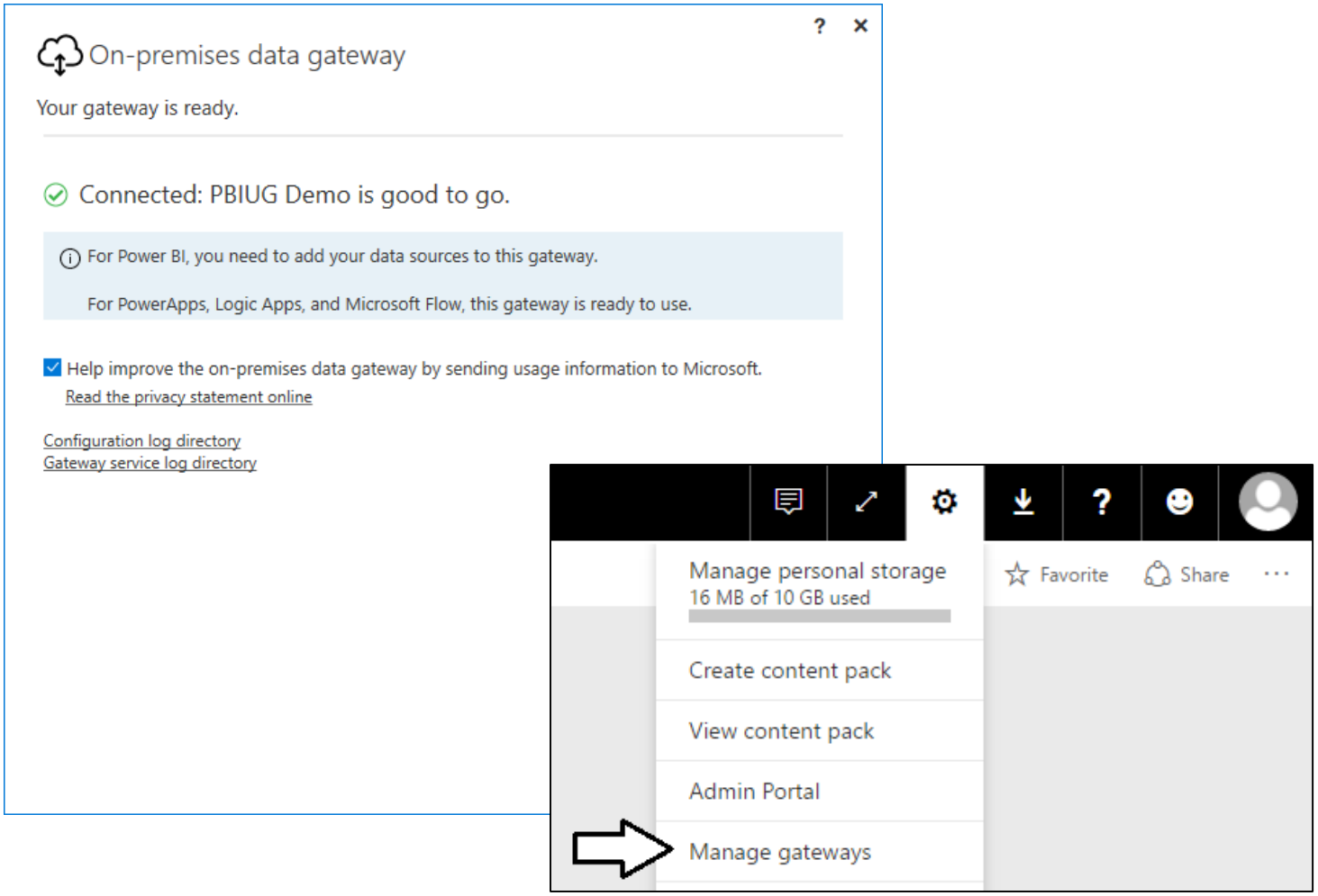
On-Premises Gateway Installation



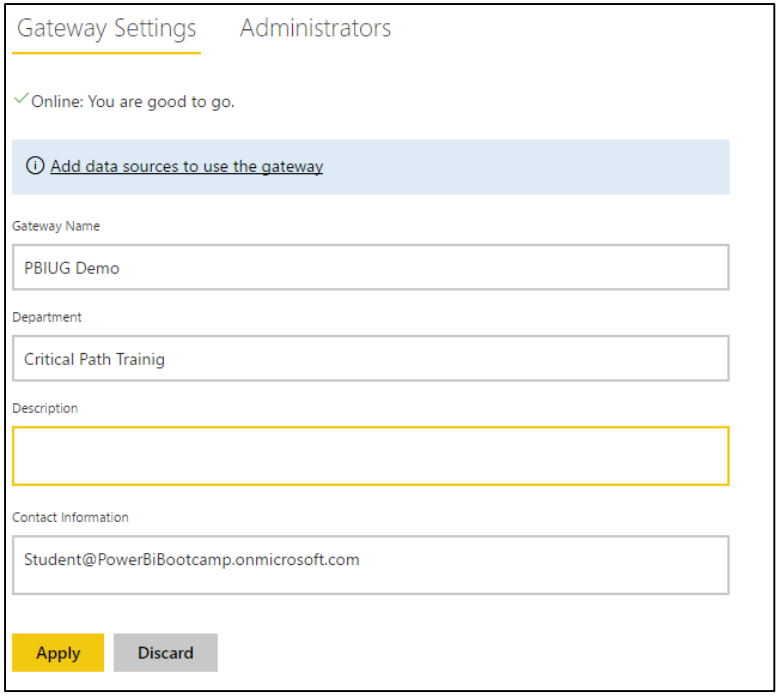
On-prem Gateway Names & Recovery Keys

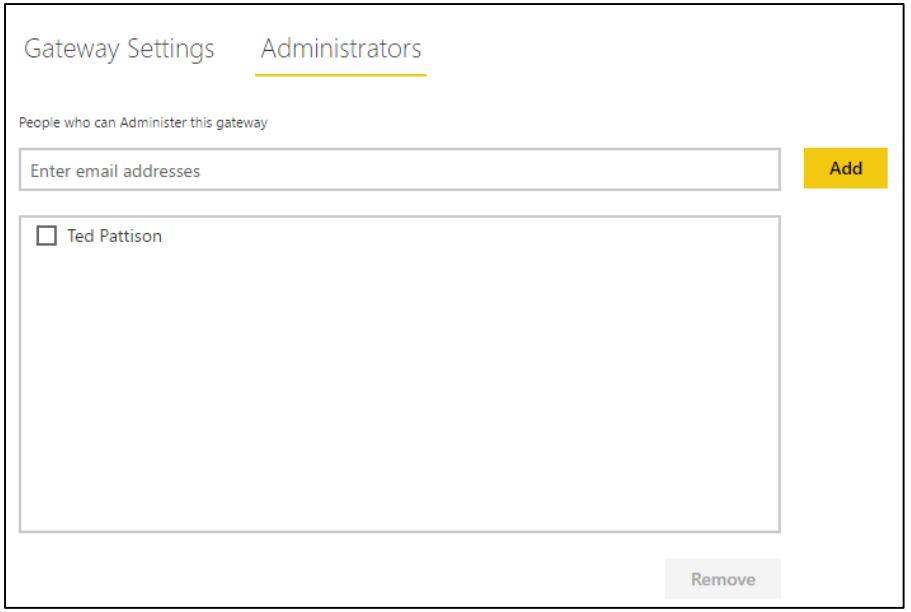


Getting the Gateway Up and Running

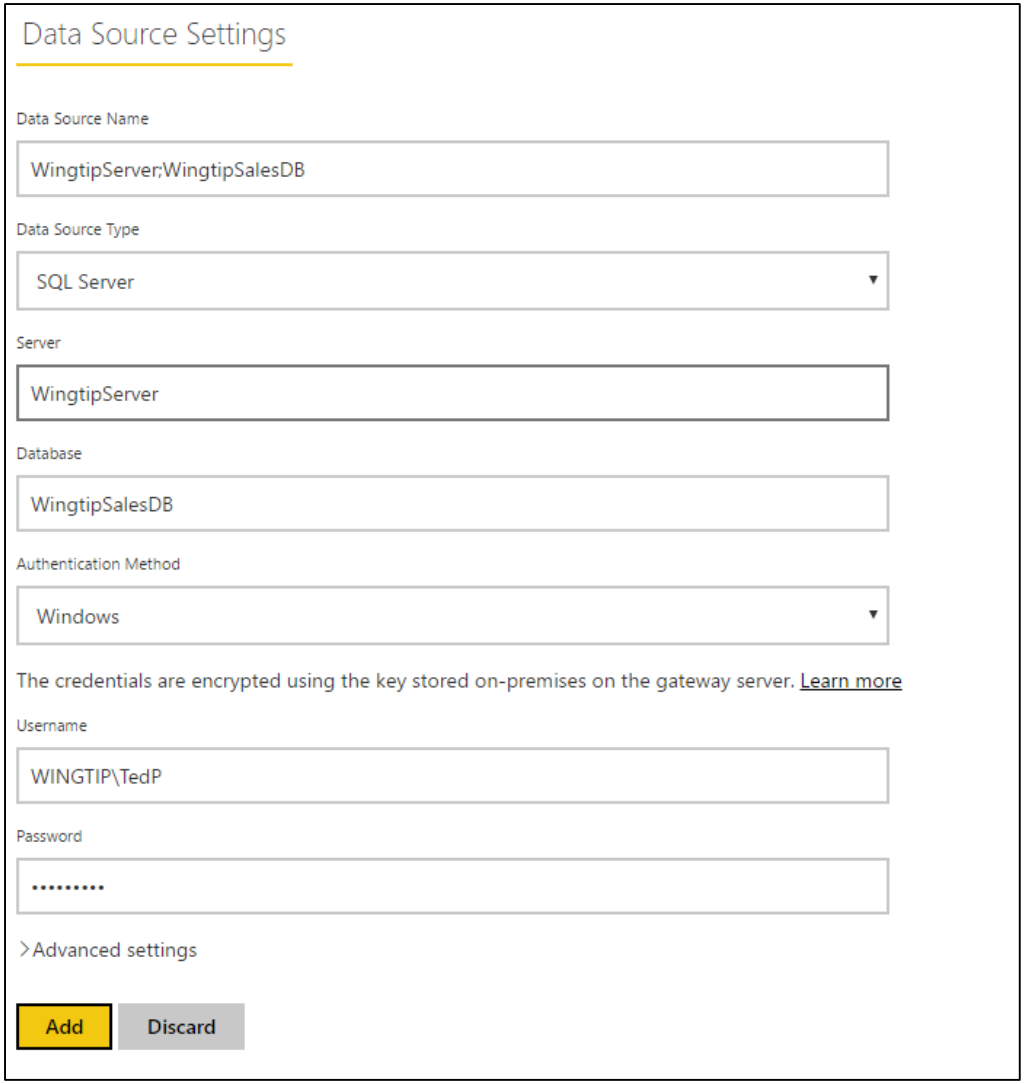


Configuring Gateway in Power BI Service

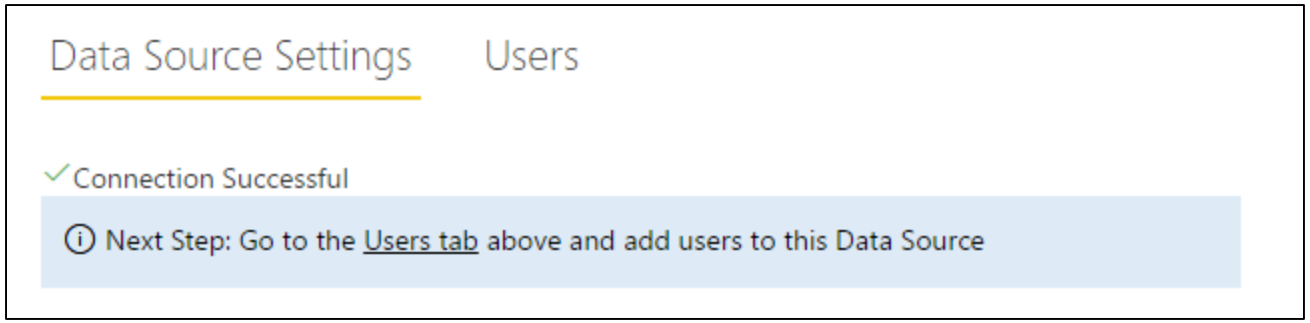


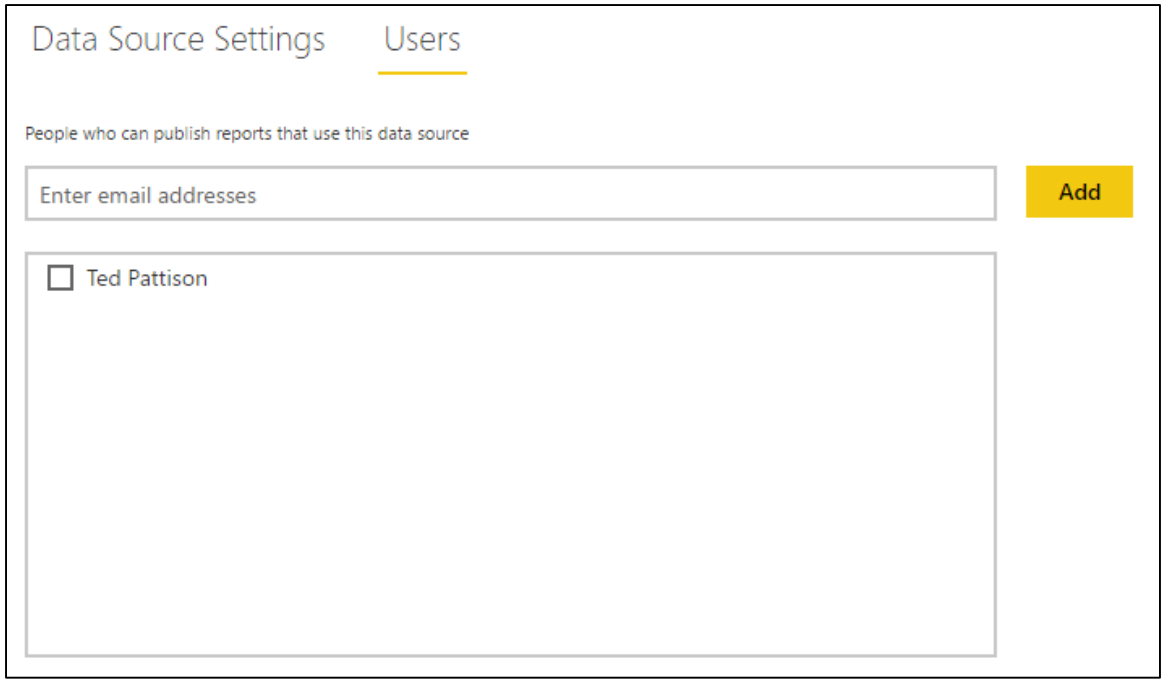


Configuring Data Sources in Gateway



Configuring Users





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*.frontend.clouddatahub.net	443	HTTPS
*.core.windows.net	443	HTTPS
login.microsoftonline.com	443	HTTPS
*.msftncsi.com	443	Used to test internet connectivity if the gateway is unreachable by the Power BI service.

On-premises Gateway with SSAS

- On-premises Gateway adds functionality to SSAS
  - Sets EffectiveUserName property for Power BI user
  - EffecitveUserName is email of current user
  - Office 365 UPN should match a UPN within local AD
  - Associated Windows account added to SSAS roles
  - Allows for role-based security and row-level security
  - EffectiveUserName settings is in the format
    - UPN must be same in local AD and Azure AD

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Supported Data Sources

Data source	Live/DirectQuery	User configured manual or scheduled refresh
Analysis Services Tabular	Yes	Yes
Analysis Services Multidimensional	Yes	Yes
SQL Server	Yes	Yes
SAP HANA	Yes	Yes
Oracle	Yes	Yes
Teradata	Yes	Yes
File	No	Yes
Folder	No	Yes
SharePoint list (on-premises)	No	Yes
Web	No	Yes
OData	No	Yes
IBM DB2	No	Yes
MySQL	No	Yes
Sybase	No	Yes

Limitations of DirectQuery

- DirectQuery imposes the following limitations
  - All tables must come from a single database
  - Many types of query steps are not supported
  - Relationship filtering limited to single direction
  - Time intelligence capabilities are not available
  - No special treatment of date columns
  - Calculated columns not allowed
  - By default, limitations placed on DAX in measures

Summary

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