



Govern your
Power BI environment

Support Business Efficiency

Hylke Peek

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Peek Data Consultancy

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I'm working on a lot of different stuff. Focus on **Azure** and **Power Platform**.

- Data Platform
- Data warehousing
- Analytics
- Azure data solutions
- Power Platform

Agenda

9:00 - Introduction to concepts

9:15 - Power BI Administration

10:30 – 10:45 – Refreshment break

11:30 - Premium Capacity Management

12:00 – 12:45 - Lunch break

13:30 - Development

14:45 - Data Governance and Security

15:00 – 15:15 – Refreshment break

16:00 – Half hour Wrap-up

Introduction to concepts

Why Power BI Governance?

Effective data governance is the key to maintaining data availability, quality, security and consistency across your organization.

Maturity levels

Optimized



Power BI governance is continuously improved by measuring the governance and process feedback.

Managed



Power BI governance is supporting the changing business needs.

Defined



Power BI is governed centrally in the same way as other tooling.

Repeatable



Power BI is governed separate from other tools but consistent in different projects.

Initial



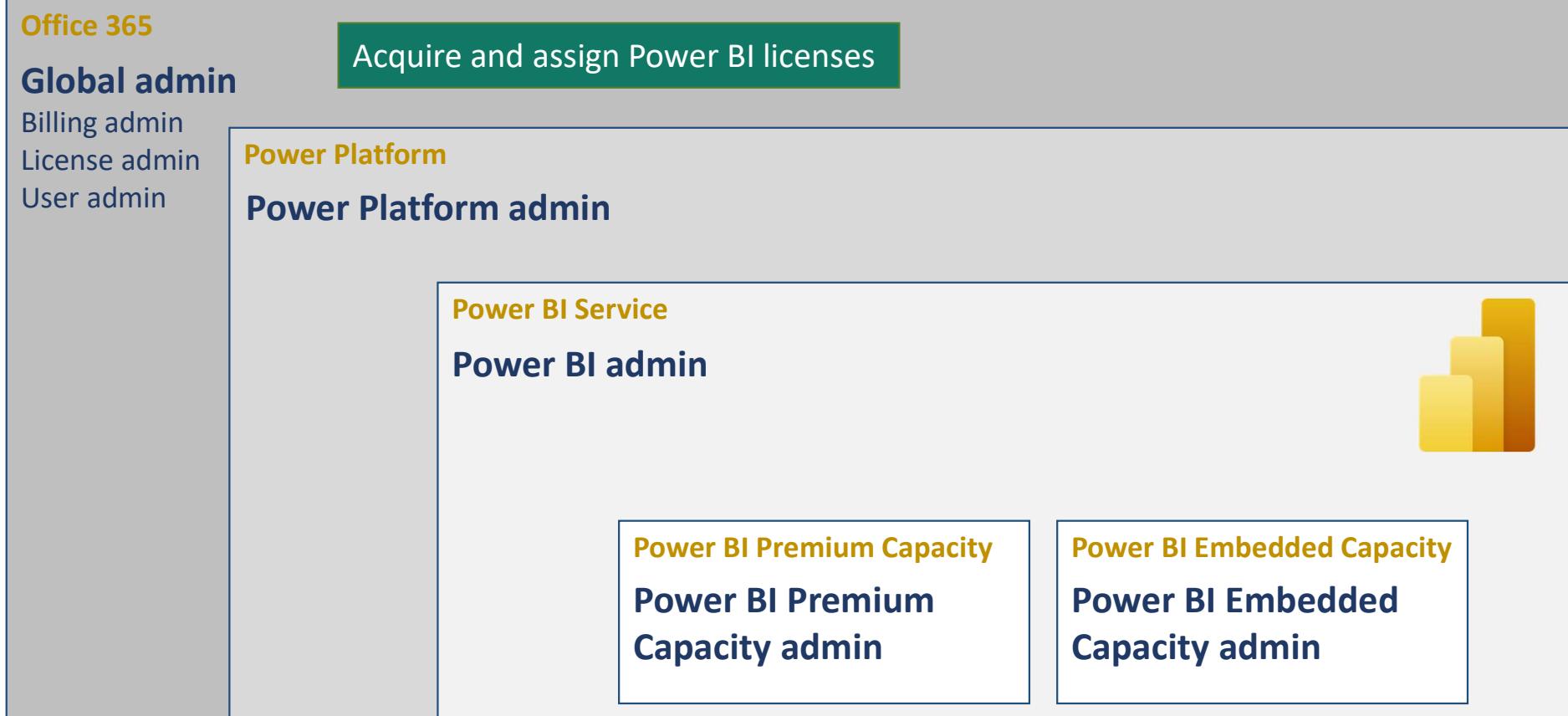
Power BI is just activated and maybe people thought about governance.



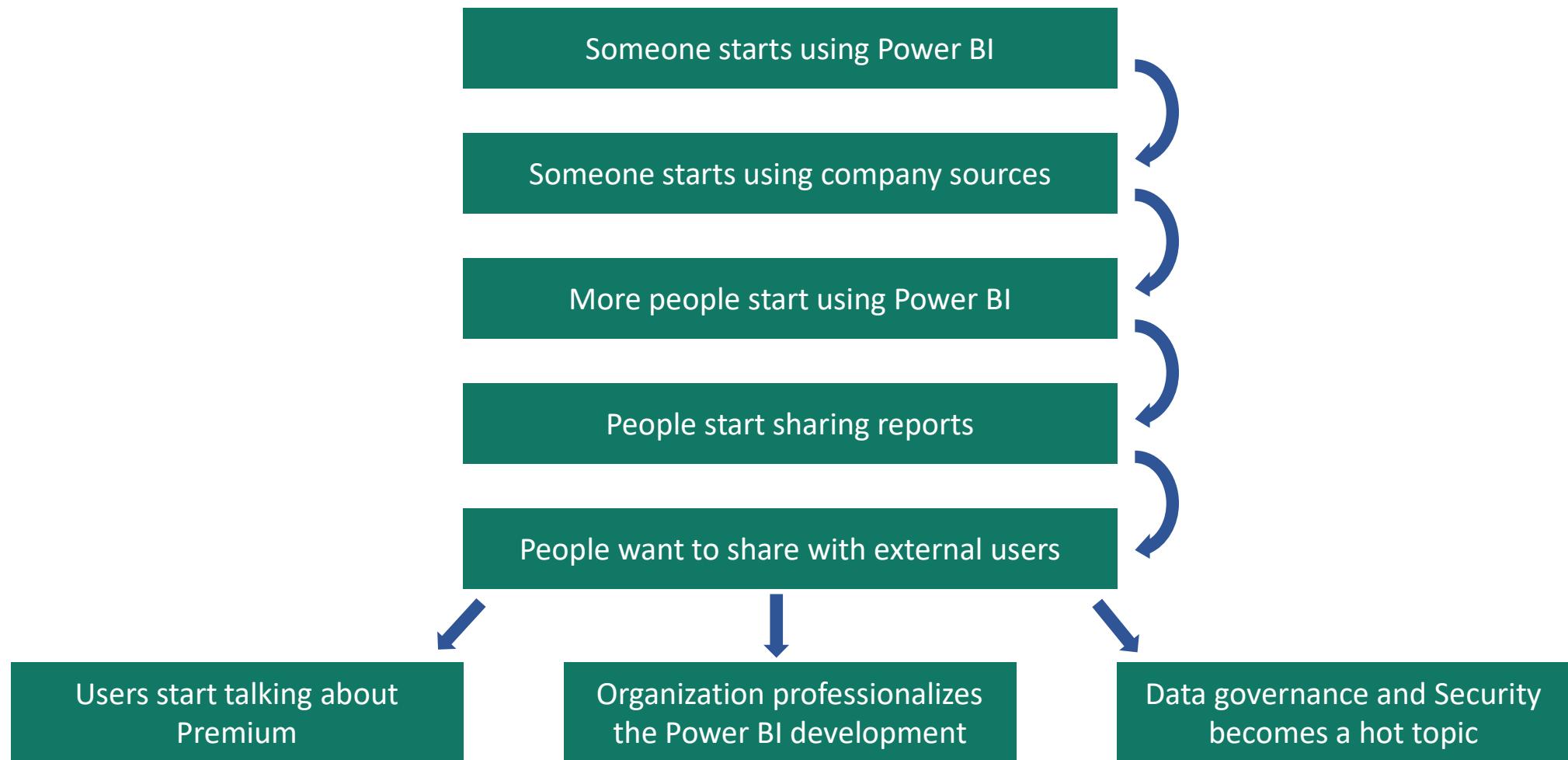
Where is your organization at this moment?

Power BI Administration

Relevant admin roles



Steps in using Power BI within an organization



Someone starts using Power BI

Licensing

Assignment

Licensing

Free

Work on your own

New Power BI report creators or report viewers in Premium Capacity environment

Pro

Share your reports and collaborate

Small/medium scale business with standard analytic requirements

Premium per user

AI and development features

Small/medium scale business with advanced analytic and/or development requirements

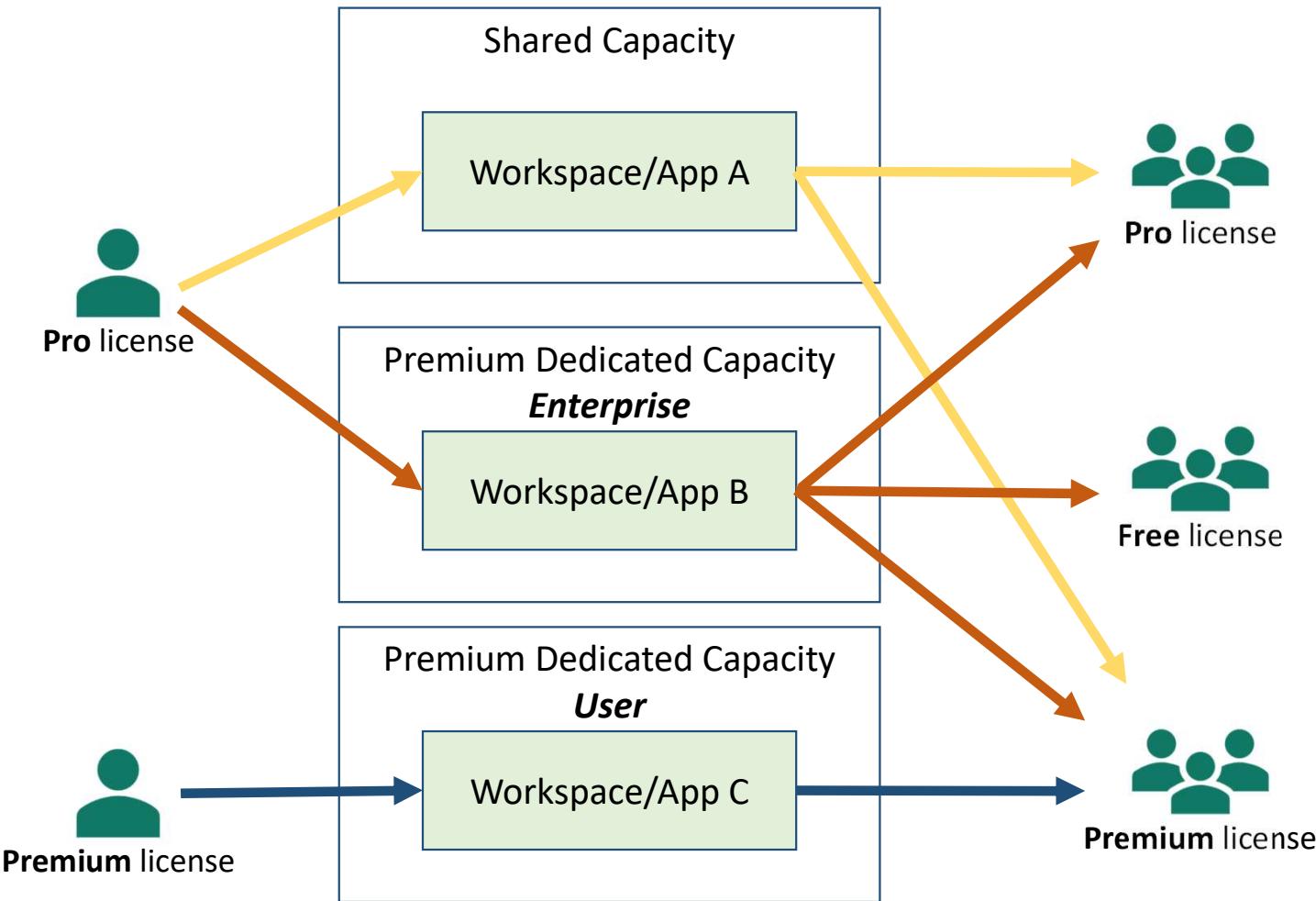
Premium Capacity

Advanced security, scalability options and many users (500+)

Enterprise scale business with advanced analytic and/or development requirements



Who can share with who?



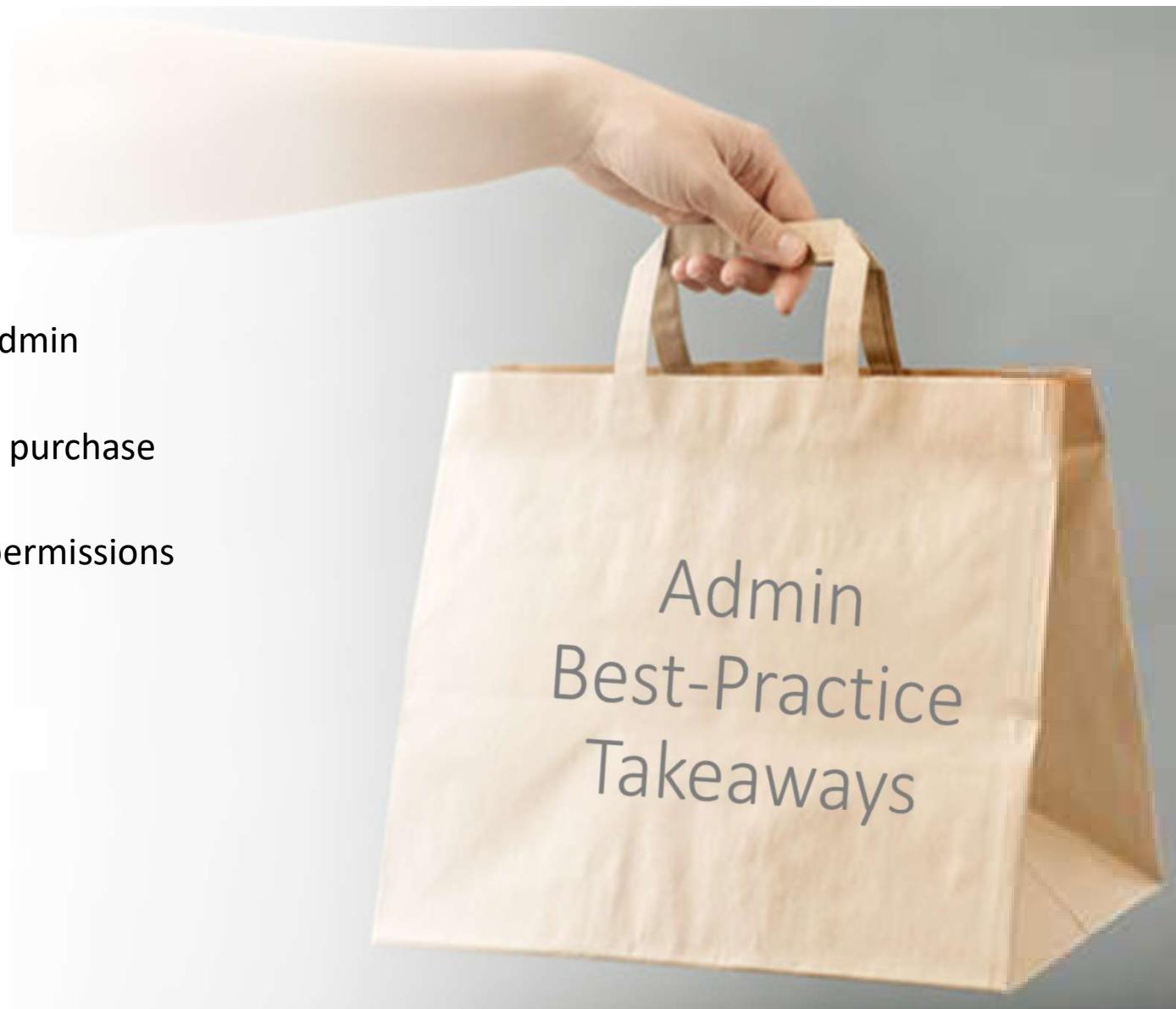
Assign and Purchase licenses

- Use the 365 admin center or Azure Portal
- Power BI Pro is part of Microsoft 365 E5
- Self-service sign-up, trials and purchasing

Setting: AllowSelfServicePurchase	Self-service purchase	Acquire trial
Enabled	Yes	Yes
OnlyTrialsWithoutPaymentMethod	No	Yes
Disabled	No	No

- Group based licensing
 - A new person to a group gets all the required licensing automatically
 - No double licenses
 - Depending on the acquired licenses
 - Available within Azure Portal

- Split roles Office Admin and Power BI admin
- Let people use trials but no self-service purchase
- Always use groups to assign roles and permissions

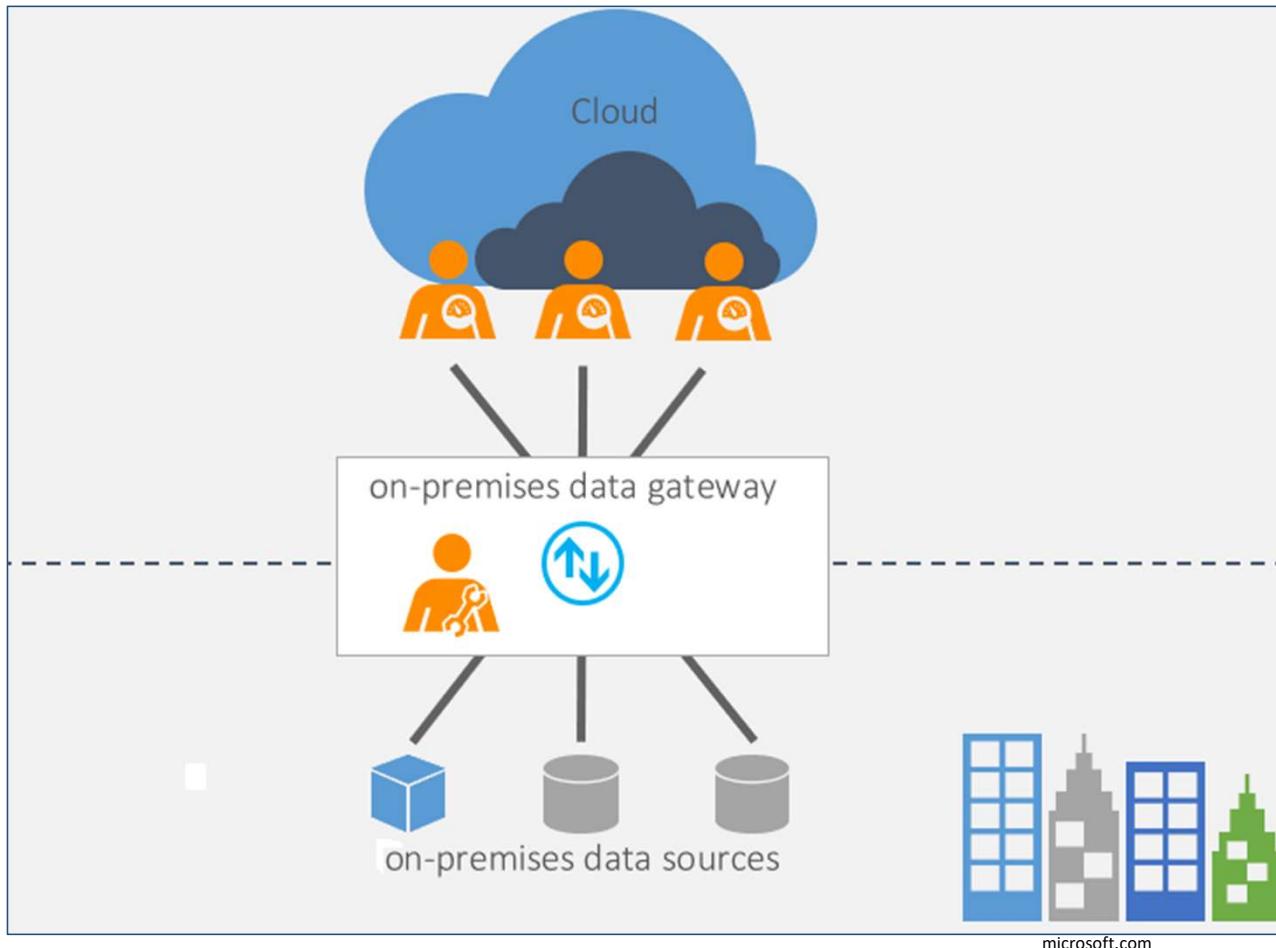


Someone starts using company sources

On-premise gateway

Azure resources

On-premise gateway



Install 1 gateway for all local sources

From this server you should be able to connect to all sources

2 nodes: Personal and Standard

You create a recovery key

You can have a cluster of gateways



Using Azure Resources



No need for a gateway

Maintain in Power BI - Data Sources

Power BI permissions ≠ Data Source permissions

- Use standard gateways
- Monitor gateway from time to time
- Save the recovery key securely



More people start using Power BI

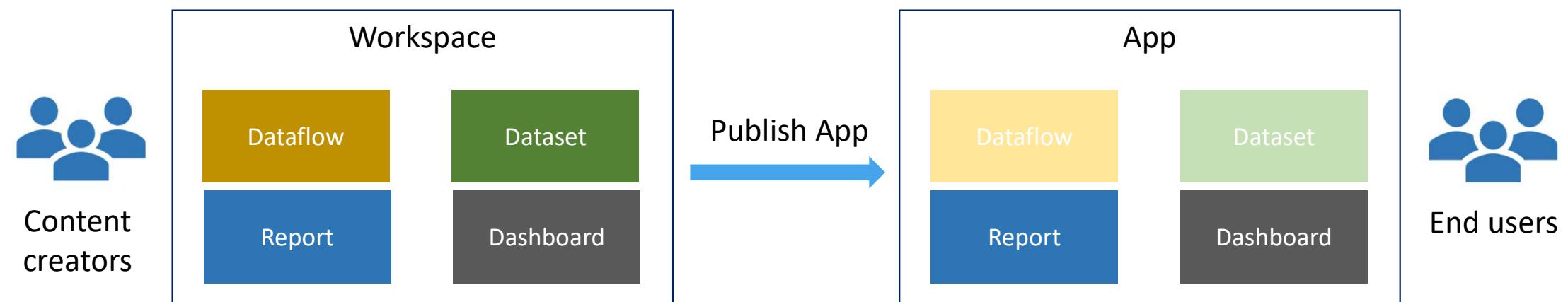
Workspace settings

Visuals

Workspaces and Apps

'Workspaces are places to collaborate with colleagues on specific content.'

'Apps are used to share content to others.'



Viewer

The screenshot shows the Power BI service interface. At the top, it displays "Power BI Synapse Fanshop". On the left is a navigation sidebar with icons for Home, Create, Browse, Data hub, Metrics, Apps, Knowledge center, Workspaces, and Synapse Fanshop (which is currently selected). The main area is titled "Synapse Fanshop" and contains a table with one item:

Name	Type	Owner	Refreshed	Next refresh	Endorsement	Sensitivity
Sales reporting	Report	Synapse Fanshop	9/8/22, 8:41:31 PM	—	—	—

At the bottom of the main area, there is a button labeled "View all reports (and dashboards)".

View all reports (and dashboards)

Contributer

The screenshot shows the Power BI workspace interface for 'Synapse Fanshop'. On the left is a vertical navigation bar with icons for Home, Create, Browse, Data hub, Metrics, Apps, Knowledge center, Workspaces, and Synapse Fanshop. The main area displays a list of content items. At the top, there are buttons for 'New' and 'Upload', and tabs for 'All', 'Content', and 'Datasets + dataflows', with 'Content' being the active tab. Below this is a table with columns for Name, Type, Owner, Refreshed, Next refresh, Endorsement, and Sensitivity. Two items are listed: 'Sales reporting' (Report, owner Synapse Fanshop, refreshed 9/8/22, 8:41:31 PM) and 'Sales reporting' (Dataset, owner Hylke Peek, refreshed 9/8/22, 8:41:31 PM). The second dataset row is highlighted with a yellow box.

Name	Type	Owner	Refreshed	Next refresh	Endorsement	Sensitivity
Sales reporting	Report	Synapse Fanshop	9/8/22, 8:41:31 PM	—	—	—
Sales reporting	Dataset	Hylke Peek	9/8/22, 8:41:31 PM	N/A	—	—

Create, edit, and delete all content in the workspace
Manage access for all content in the workspace

Member

The screenshot shows the Power BI workspace interface for 'Synapse Fanshop'. On the left is a navigation menu with options: Home, Create, Browse, Data hub, Metrics, Apps, Knowledge center, Workspaces, and Synapse Fanshop (which is selected). The main area displays two items: 'Sales reporting' (Report) and 'Sales reporting' (Dataset). At the top right are buttons for 'Create app' (highlighted with a yellow box), 'Access' (highlighted with a yellow box), and search. A modal window titled 'Access' is open, showing the 'Synapse Fanshop' workspace. It includes a text field 'Add admins, members, or contributors.' with a 'Learn more' link, a dropdown menu set to 'Member' (highlighted with a yellow box), and a list of users: Hylke Peek (Admin) and Sven Williams (Member). A search bar and a table for managing permissions are also visible.

Power BI Synapse Fanshop

Synapse Fanshop

+ New ▾ Upload ▾

All Content Datasets + dataflows

Name Type Owner Refreshed Next refresh Endorsement Sensitivity

Sales reporting Report Synapse Fanshop 9/8/22, 8:41:31 PM — — —

Sales reporting Dataset Synapse Fanshop 9/8/22, 8:41:31 PM N/A — — —

Create app

Access

Search

Access

Synapse Fanshop

Add admins, members, or contributors. [Learn more](#)

Enter email addresses

Member

Member

Contributor

Viewer

Search

NAME	PERMISSION
Hylke Peek	Admin
Sven Williams	Member

Manage apps
Manage some access for the workspace

Admin

Manage workspaces
Manage all access for the workspace

The screenshot shows the Power BI workspace management interface for the 'Synapse Fanshop' workspace. On the left, a sidebar lists various workspace categories: Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Knowledge center, Workspaces, and Synapse Fanshop (which is selected). The main content area displays two items: 'Sales reporting' (Report) and 'Sales reporting' (Dataset). A modal window titled 'Access' is open, showing the 'Synapse Fanshop' workspace settings. It includes fields for 'Enter email addresses' and a dropdown menu for selecting 'Member'. Below this, a table lists users with their names and current permissions: Hylke Peek (Admin) and Sven Williams (Member). A context menu for Sven Williams is open, showing options: Admin, Contributor, Viewer, and Remove. The 'Settings' panel on the right shows workspace details like 'About', 'Premium', and 'Azure connections', and allows for workspace name changes ('Synapse Fanshop') and descriptions ('Describe this workspace'). A large yellow box highlights the 'Workspace name' field and the 'Delete workspace' button at the bottom of the settings panel.

Power BI Synapse Fanshop

Synapse Fanshop

New Upload

All Content Datasets + dataflows

Name Type Owner Refreshed Next refresh Endorsement Sensitivity Include in app

Sales reporting Report Synapse Fanshop 9/8/22, 8:41:31 PM — — — No

Sales reporting Dataset Synapse Fanshop 9/8/22, 8:41:31 PM N/A — — —

Access

Synapse Fanshop

Add admins, members, or contributors. [Learn more](#)

Enter email addresses

Member

Add

Search

NAME	PERMISSION
Hylke Peek	Admin
Sven Williams	Member

Admin

Contributor

Viewer

Remove

Settings

Synapse Fanshop

About Premium Azure connections

Workspace image

Upload Delete

Workspace name *

Synapse Fanshop

Description

Describe this workspace

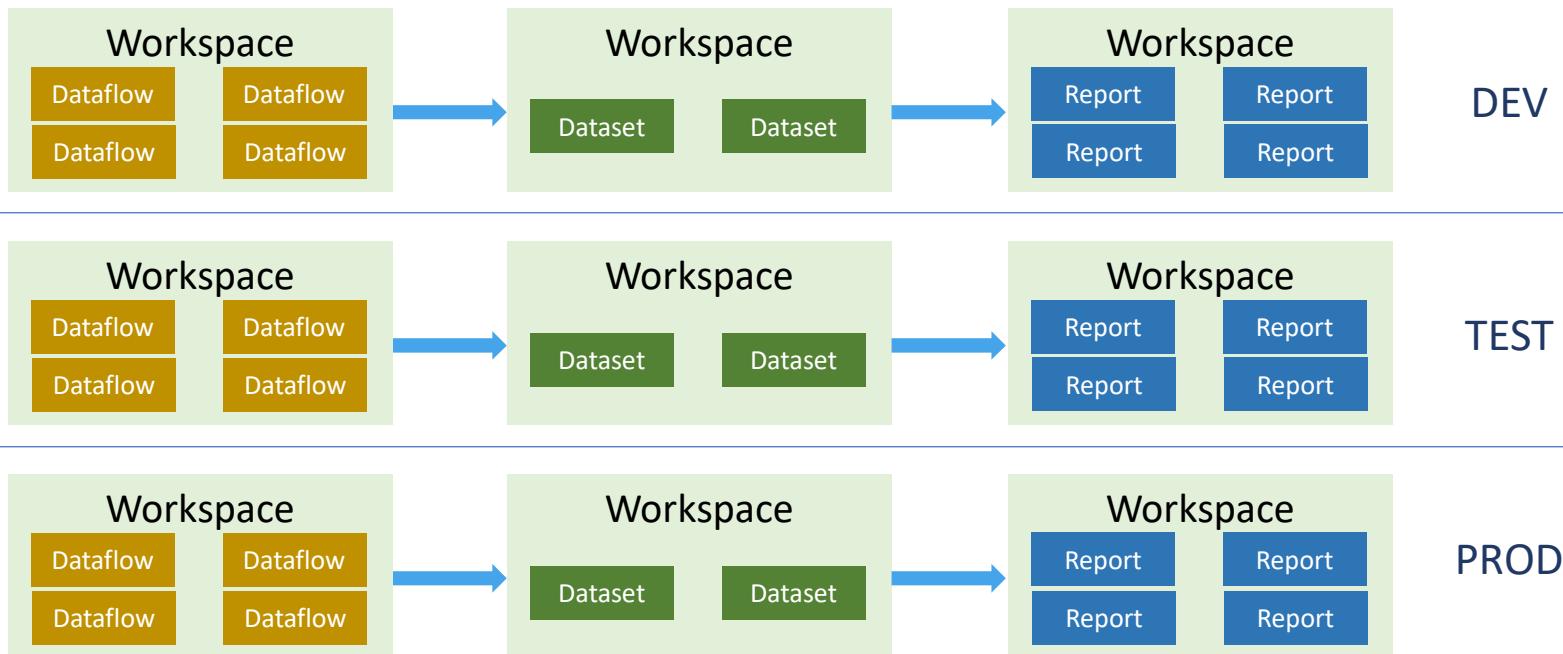
Learn more about workspace settings

Advanced

Delete workspace Save Cancel

Workspace best-practise

Each workspace has it's own purpose



Workspace Settings

Power BI Admin portal

Admin portal

- Home
- Create
- Browse
- Data hub
- Metrics
- Apps
- Deployment pipelines
- Knowledge center
- Workspaces
- My workspace

Tenant settings

Workspace settings

- >Create workspaces (new workspace experience)
Enabled for the entire organization
- Use datasets across workspaces
Enabled for the entire organization
- Block scheduled upgrade of empty workspaces
Enabled for the entire organization
- Block notifications for scheduled workspace upgrades
Disabled for the entire organization

Information protection

- Allow users to apply sensitivity labels for content
Disabled for the entire organization
- Require users to apply sensitivity labels to Power BI content (preview)
Disabled for the entire organization
- Apply sensitivity labels from data sources to their data in Power BI

Create workspace

Create workspaces (new workspace experience)
Enabled for the entire organization

Users in the organization can create app workspaces to collaborate on dashboards, reports, and other content. Even if this setting is disabled, an upgraded workspace will be created when a template app is installed.

Enabled

Apply to:

The entire organization

Specific security groups

Except specific security groups

Apply Cancel

Workspace Settings

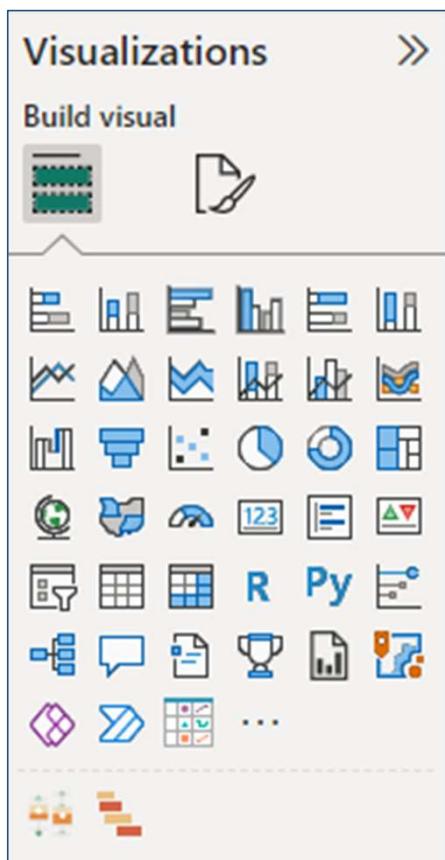
The screenshot shows the Power BI Admin portal interface. On the left is a sidebar with various navigation options: Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Knowledge center, Workspaces, and My workspace. The 'Workspaces' option is highlighted with a yellow box. The main content area is titled 'Admin portal' and contains a 'Tenant settings' section. This section includes a 'Workspace settings' subsection with four items: 'Create workspaces (new workspace experience)' (Enabled for the entire organization), 'Use datasets across workspaces' (Enabled for the entire organization), 'Block scheduled upgrade of empty workspaces' (Enabled for the entire organization), and 'Block notifications for scheduled workspace upgrades' (Disabled for the entire organization). Below this is an 'Information protection' subsection with three items: 'Allow users to apply sensitivity labels for content' (Disabled for the entire organization), 'Require users to apply sensitivity labels to Power BI content (preview)' (Disabled for the entire organization), and 'Apply sensitivity labels from data sources to their data in Power BI'.

Use datasets across workspaces

A configuration dialog for 'Use datasets across workspaces'. It shows the setting is currently 'Enabled for the entire organization'. A note below states: 'Users in the organization can use datasets across workspaces if they have the required Build permission.' There is a toggle switch labeled 'Enabled' which is turned on. Below the switch are three radio button options under 'Apply to': 'The entire organization' (selected), 'Specific security groups', and 'Except specific security groups'. At the bottom are 'Apply' and 'Cancel' buttons.



Visuals Settings



- How to deal with custom visuals?
 - Allow people to use them
 - Disallow downloads from custom visuals
 - Allow uncertified if policies allows you to
- Do we allow R and Python visuals?
- Which visuals can people see by default?
 - Make it easier for your end users to find the right visual

Power BI visuals

- ▷ Allow visuals created using the Power BI SDK
Enabled for the entire organization
- ▷ Add and use certified visuals only (block uncertified)
Disabled for the entire organization
- ▷ Allow downloads from custom visuals
Disabled for the entire organization

R and Python visuals settings

- ▷ Interact with and share R and Python visuals
Enabled for the entire organization

Organizational Visuals

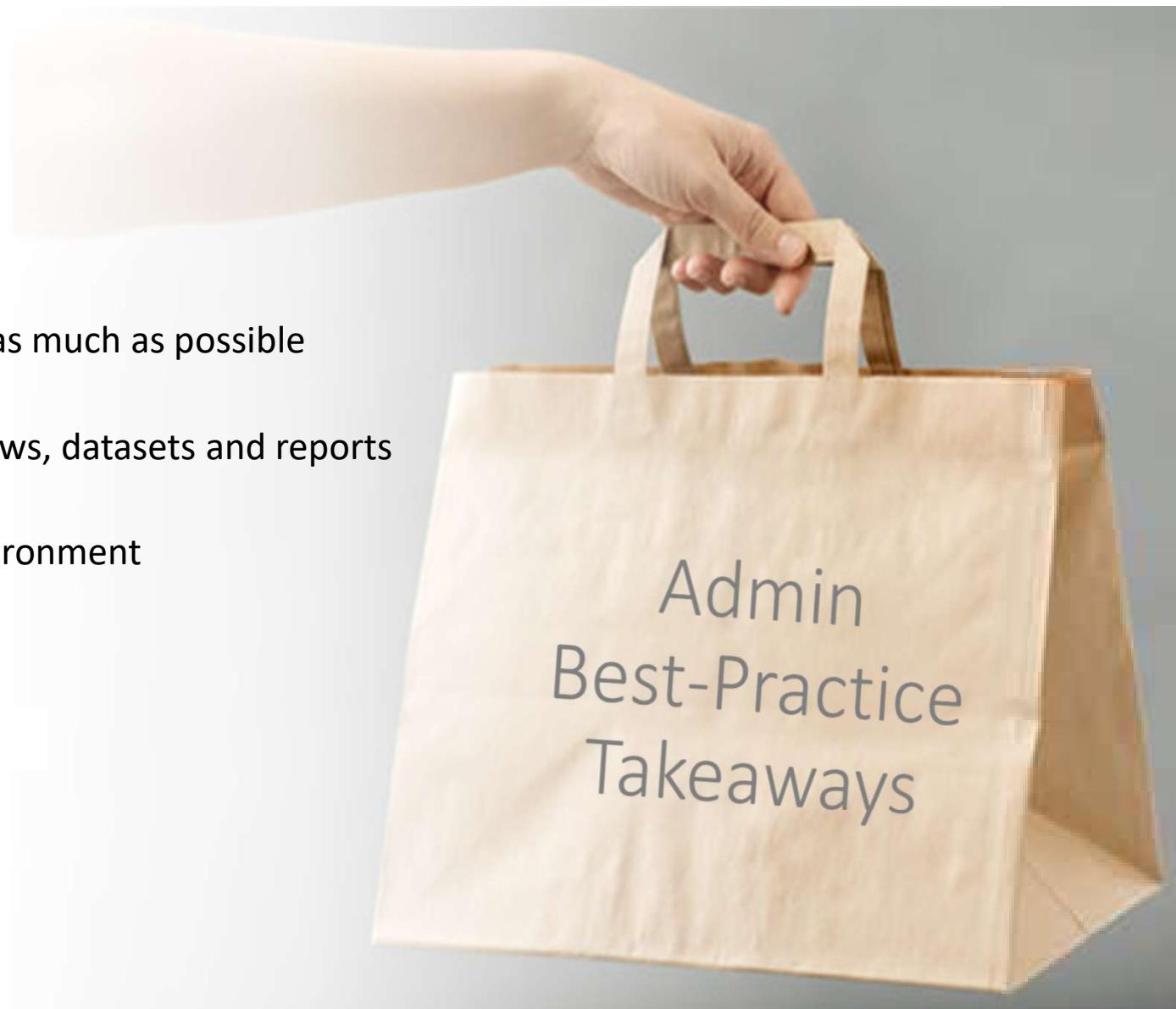
Add custom visuals and make them easy to use

The screenshot shows the Power BI Admin portal interface. On the left, there's a navigation sidebar with various options like Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Knowledge center, Workspaces, and Synapse Fanshop. The 'Organizational visuals' option is selected and highlighted with a blue arrow pointing from the main content area.

The main content area is titled 'Organizational visuals' and contains the following information:

- Add and manage Power BI visuals for your organization. [Learn more](#)
- Buttons for '+ Add visual', 'Refresh', and 'Export'.
- A table with columns: Visual, Source, Changed, and Visualization Pane.
- In the table, there is one item: 'Power KPI Matrix' (Source: AppSource, Changed: Jan 4, 2023), which is marked as 'Enabled'.
- Pagination controls: 'Items per page: 10', '1 - 1 of 1'.

To the right of the main content area is a 'Visualizations' catalog window. It includes a 'Build visual' section with icons for a grid and a pencil, and a large grid of various visualization icons. One specific icon, a matrix or grid icon, is highlighted with a yellow box and has a blue arrow pointing towards it from the bottom right.



- Use admin role carefully, use member as much as possible
- Create separate workspaces for dataflows, datasets and reports
- Create a set of workspace for each environment

People start sharing reports

Sharing options

Build permissions



How do you share reports with internal users?

Sharing options

Workspace



Use for collaboration only. Not for end users!

Individual content

App

Teams

Mobile App

Embedded

The screenshot shows the Power BI workspace sharing interface. At the top, it says "Power BI United FC [Development]". On the left, there's a sidebar with icons for Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Knowledge center, and Workspaces. The "United FC [Development]" workspace is selected. In the main content area, there's a table listing four items: "Datamodel Sales" (Report), "Datamodel Sales" (Dataset), "Fanshop Sales Data" (Dataflow), and "Reporting Sales" (Report). To the right, under the "Access" tab, there's a section for adding admins, members, or contributors. It has a text input field "Enter email addresses", a dropdown "Member", and a large green "Add" button. Below that, there's a table showing existing permissions:

NAME	PERMISSION	...
External users ⓘ	Member	...
Hylke Peek ⓘ	Admin	...
PowerBI_Access ⓘ	Admin	...

Sharing options

Workspace

Individual content

App

Teams

Mobile App

Embedded



Use for incidental sharing only. Maintaining permissions will be hard.

The screenshot shows the Power BI service interface. A modal window titled 'Send link' is open over a list of datasets. The dataset 'Reporting Sales' is selected. The modal contains a text input field with placeholder 'People in your organization with the link can view and share' and a dropdown below it. Below the input field is a text area labeled 'Enter a name or email address'. At the bottom of the modal are buttons for 'Send', 'Copy link', 'Mail', 'Teams', and 'PowerPoint'. In the background, the main Power BI dashboard shows a list of datasets: 'Datamodel Sales', 'Datamodel Sales', 'Fanshop Sales Data', and 'Reporting Sales'. The left sidebar includes navigation links like Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Knowledge center, and Workspaces.

Sharing options

Workspace

Individual content

App

Teams

Mobile App

Embedded

Default and the best way to share content within the organization.

The screenshot shows the 'Power BI Apps' interface. On the left is a navigation sidebar with icons for Home, Create, Browse, Data hub, Metrics, Apps (which is selected), Deployment pipelines, and Knowledge center. The main area has a green header bar with the text 'Default and the best way to share content within the organization.' The main content area is titled 'Apps' and contains the following information:

Name	Publisher	Published	App type	Version	Endorsement
United FC [Development]	Hylke Peek	1/6/23, 10:23:38 AM	Org app	—	—
Synapse Fanshop	Hylke Peek	1/5/23, 9:48:06 PM	Org app	—	—

Sharing options

Workspace

Individual content

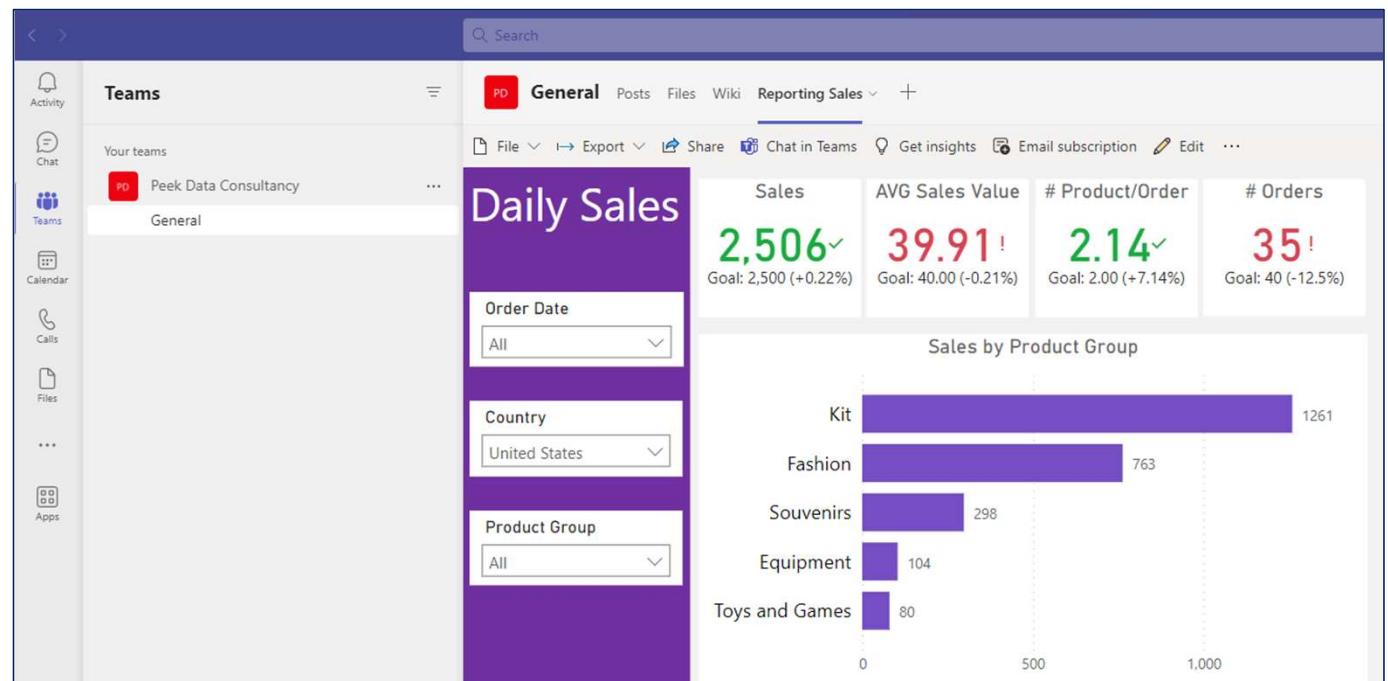
App

Teams

Mobile App

Embedded

Really good option to share content within the organization. Default enabled.



Sharing options

Workspace

Individual content

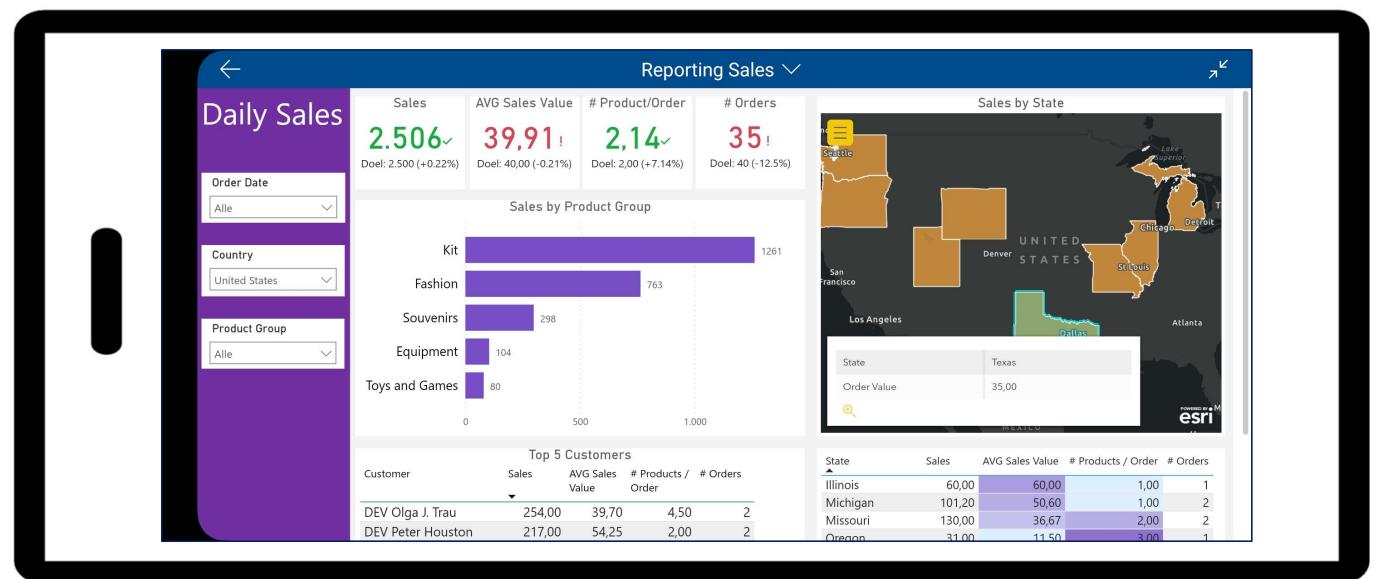
App

Teams

Mobile App

Embedded

Automatically available. You can build mobile optimized views.





Sharing options

Workspace

Individual content

App

Teams

Mobile App

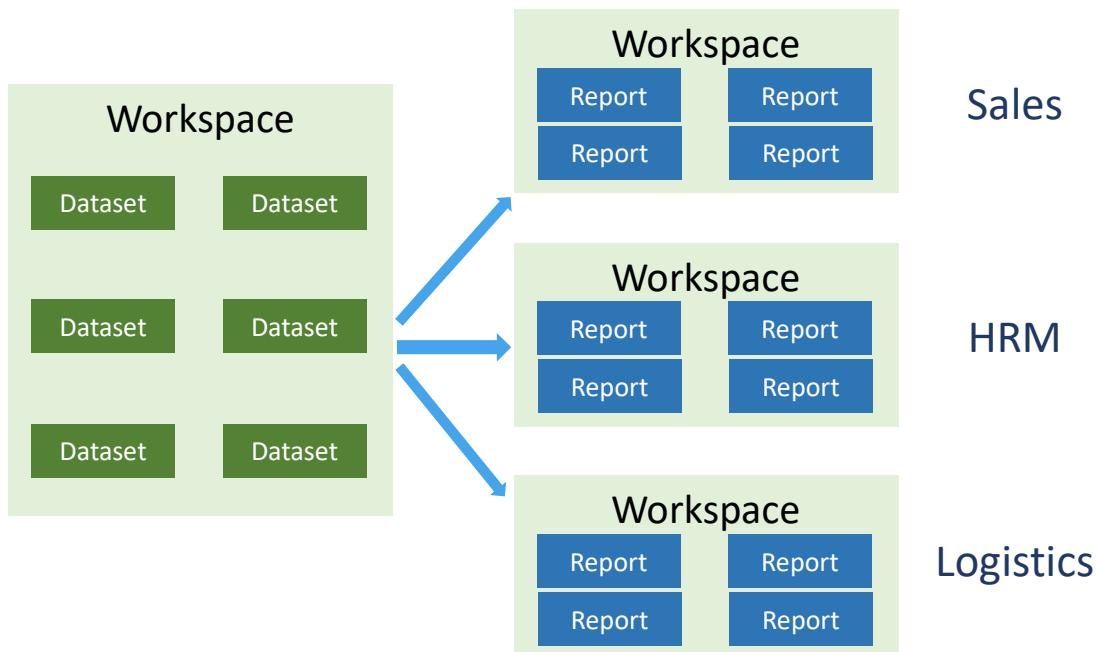
Embedded

Integrate reports in other applications.

The screenshot shows the Power BI interface with the title "Power BI United FC [Development]". On the left, there's a sidebar with icons for Home, Create, Browse, Data hub, Metrics, Apps, and Deployment pipelines. The "File" menu is open, showing options like Save a copy, Download this file, Print this page, Embed report, Generate a QR code, Settings, SharePoint online, Website or portal, Publish to web (public), and Developer Playground. A blue arrow points from the "Embedded" box on the left towards the "Embed report" option in the sharing menu.

Build Permission – Shared Datasets

Re-use a dataset for multiple reports across workspaces.



Build Permission - Options

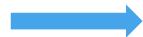
Workspace

App

Share report

Dataset

Request permission



Default permissions for Contributor, Member and Admin.

Power BI United FC [Development]

United FC [Development]

Add admins, members, or contributors. [Learn more](#)

Enter email addresses

Member

Add

NAME	PERMISSION
External users	Member
Hylke Peek	Admin
PowerBI_Access	Admin

Build Permission - Options

- Workspace
- App
- Share report
- Dataset
- Request permission



Set permissions through audiences during app publication.

The screenshot shows the 'Power BI Apps' interface with the 'Audience' tab selected. A specific audience named 'United FC [Development]' is highlighted. On the left, there's a navigation bar with options like Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Knowledge center, and Workspaces. The main area displays a 'Daily Sales' report card with metrics: Sales (2,506), AVG Sales Value (39.91), # Product/Order (2.14), and # Orders (35). Below the card is a bar chart titled 'Sales by Product Group' showing sales for Kit, Fashion, Souvenirs, Equipment, and Toys and Games. At the bottom is a table titled 'Top 5 Customers' with rows for DEV Olga J. Trau and DEV Peter Houston. On the right, there's a 'Manage Audience Access' section where 'Specific users or groups' is selected, and checkboxes for 'Allow people to share the datasets in this app audience' and 'Allow people to build content with the datasets in this app audience' are checked. A note says 'The advanced settings above are applicable to the audience including your workspace users.' At the bottom are 'Update app' and 'Cancel' buttons.

Build Permission - Options

Workspace

App

Share report

Dataset

Request permission



Set permissions when sharing individual reports.

The screenshot shows the Power BI interface with a 'Send link' dialog box overlaid. The dialog box has a title 'Send link Reporting Sales'. It asks 'Who would you like the link to work for?'. There are three options: 'People in your organization' (selected), 'People with existing access', and 'Specific people'. Under 'Settings', there are two checkboxes: 'Allow recipients to share this report' (unchecked) and 'Allow recipients to build content with the data associated with this report' (checked). A yellow box highlights the checked checkbox. At the bottom of the dialog are 'Apply' and 'Cancel' buttons.

Build Permission - Options

Workspace

App

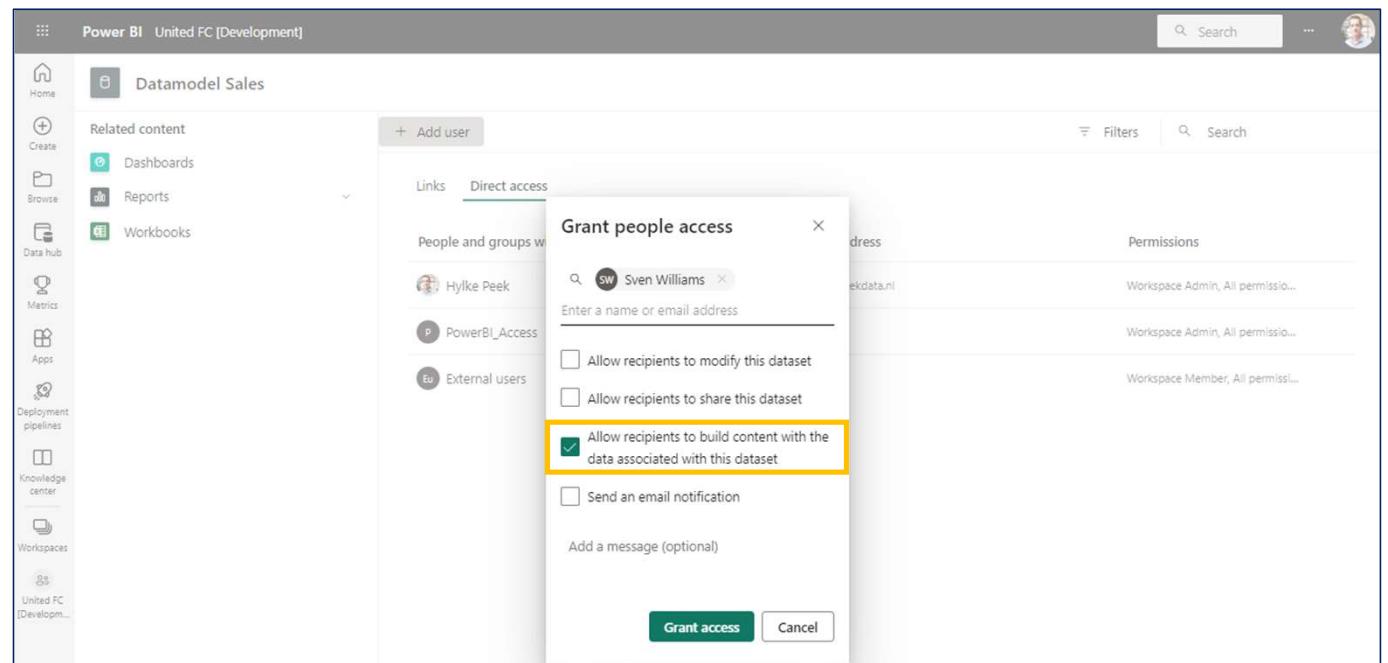
Share report

Dataset

Request permission



Set permissions to people who need access to this specific dataset.



Power BI - United FC [Development]

Datamodel Sales

Related content

- Home
- Create
- Browse
- Data hub
- Metrics
- Apps
- Deployment pipelines
- Knowledge center
- Workspaces
- United FC [Development]

Links Direct access

People and groups w...

+ Add user

Search

Filters

Search

Grant people access

Sven Williams

Enter a name or email address

Allow recipients to modify this dataset

Allow recipients to share this dataset

Allow recipients to build content with the data associated with this dataset

Send an email notification

Add a message (optional)

Grant access Cancel

dress

Permissions

ekdata.nl

Workspace Admin, All permis...

Workspace Admin, All permis...

Workspace Member, All permis...

Build Permission - Options

Workspace

App

Share report

Dataset

Request permission



A user requesting permission to the dataset.

The screenshot shows the Power BI Data hub interface. On the left, there's a sidebar with various navigation options like Home, Create, Browse, Data hub, Metrics, Apps, Knowledge center, Workspaces, and My workspace. The main area is titled 'Data hub' with the sub-section 'Recommended'. It lists three datasets: 'Datamodel Sales Dataflows', 'Sales reporting', and 'Datamodel Sales'. A modal window titled 'Request Build permissions' is open over the datasets. It contains the text: 'An email will be sent to the dataset owner requesting Build permission for this dataset.' Below this is a text input field with the placeholder 'Add a message (optional)' containing the text 'I need permission!'. In the bottom right corner of the modal, there's a button labeled 'Send'. To the right of the modal, there's a Microsoft Teams message card. The message is from 'Sven Williams (sven@peekdata.nl)' to 'Hylke Peek'. The subject is 'Microsoft Power BI <no-reply-powerbi@microsoft.com> has requested Build access to the Power ...'. The message body says: 'Sven Williams (sven@peekdata.nl) has requested Build access to the Power ...'. Below the message, there's a 'Grant access >' button. At the very bottom of the screenshot, there's a table showing dataset details:

	Name	Type	Endorsement	Owner
	Sales reporting	Dataset	-	Hylke Peek
	Datamodel Sales Dataflows	Dataset	-	Sven Williams
	Datamodel Sales	Dataset	Certified	(Hidden)





What would be the best way to share content in your organization? And why?



- Don't share reports to end-users through a workspace
- Keep control over people who have build permissions

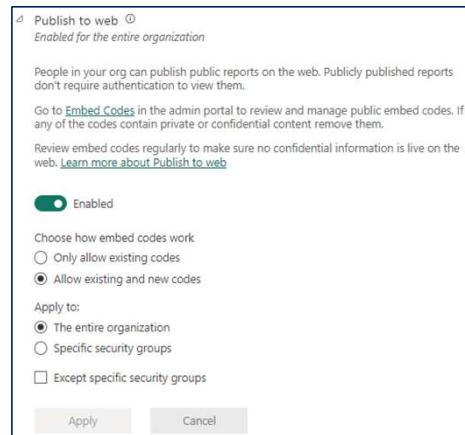
People want to share with external users

Few number of users

Power BI Embedded

Few number of Users – Public Sharing

1. Enable setting in admin portal



2. Publish report or dashboard to Web

The screenshot shows the Power BI service interface. A context menu is open over a report, with the 'Publish to web (public)' option highlighted. A modal window titled 'Embed in a public website' provides instructions and a 'Create embed code' button.

3. Copy the url or html

The screenshot shows the Power BI Admin portal. It displays a published report titled 'Daily Sales' with various charts and tables. On the left, there are sharing options including a URL (https://app.powerbi.com/view?r=eyJrIjoiMTdiNzcoI), a 'Copy' button, and an 'HTML you can paste into a website' section with an iframe code. Other sharing options like 'Placeholder image' and 'Default Page' are also visible.

4. A new embed code has been created!

The screenshot shows the Power BI Admin portal. It displays the 'Embed Codes' page, which lists a single embed code for a report named 'Reporting Sales - Daily Sales' published by 'United FC [Development]' with 'Hylke Peek' as the publisher. The status is 'Active'.

Few number of Users – View content (B2B)

1. Enable setting(s) in admin portal

The screenshot shows two sections of the Azure Admin Portal under 'Power BI' settings:

- Allow Azure Active Directory guest users to access Power BI**: Enabled for the entire organization. Apply to: The entire organization.
- Invite external users to your organization**: Enabled for the entire organization. Apply to: The entire organization.

2. Invite user in AAD

The screenshot shows the 'New user' creation page in the Microsoft Azure Active Directory. The 'Select template' section has 'Invite user' selected. The 'Identity' section contains the following fields:

- Name: Hylke Peek
- Email address: hylke@denofdata.com
- First name: (empty)
- Last name: (empty)

3. User receives an email (and accepts)

The screenshot shows an email invitation from 'Hylke Peek' to 'Hylke Peek | Den of Data'. The subject is 'Microsoft-uitnodigingen namens Peek Data Consultancy'. The message body includes instructions to accept the invitation by clicking a link. It also contains a note about accepting the invitation.

4. Add user to an audience

The screenshot shows the 'Manage Audience Access' page for 'United FC [Development]'. Under 'Grant access to', 'Specific users or groups' is selected. A search bar shows 'hylke_'. Below it, a card displays 'Hylke Peek | Den of Data' with the email 'hylke_denofdata.com#EXT#@peekdata.com'. Other options include 'Entire organization' and 'Workspace users'.

Data security is possible for these external users!

Few number of Users – Manage content (B2B)

1. Enable setting(s) in admin portal

Allow Azure Active Directory guest users to edit and manage content in the organization
Enabled for a subset of the organization

Users can invite Azure Active Directory business-to-business (B2B) guest users to have the browse experience and request access to content. [Learn more](#).

Enabled

Apply to:

The entire organization
 Specific security groups

External users Enter security groups

Except specific security groups

Only guest users who meet the criteria can edit and manage content in the organization

2. Copy and share link

App link

United FC [Development]

Give people the link below, or direct them to Apps > Get apps in the Power BI service.

<https://app.powerbi.com/Redirect?action=OpenApp&appid=e8d45a8e->

3. Add user to workspace

Access

United FC [Development]

Add admins, members, or contributors. [Learn more](#)

Enter email addresses

Member

Search

NAME	PERMISSION	...
External users	Member	...
Hylke Peek	Admin	...
PowerBI_Access	Admin	...

The external users should use the link provided!

Power BI Embedded

The screenshot shows a Power BI dashboard titled "Peek Data Consultancy" set against a background of a cloudy sky over a field with wind turbines. The dashboard includes the following components:

- Daily Sales:** A summary card showing Sales (2,506), AVG Sales Value (39.91), # Product/Order (2.14), and # Orders (35). It also displays a progress bar for each metric.
- Order Date:** Filter dropdown set to "All".
- Country:** Filter dropdown set to "United States".
- Product Group:** Filter dropdown set to "All".
- Sales by Product Group:** A horizontal bar chart showing sales for Kit (1,261), Fashion (763), Souvenirs (298), Equipment (104), and Toys and Games (80).
- Sales by State:** A map of the United States where states are colored orange based on sales volume.
- Top 5 Customers:** A table listing customer details: DEV Olga J. Trau, DEV Peter Houston, DEV Janaina Barreiro, DEV Chad J. Tedford, and DEV Lee J. Chapla.
- State Performance:** A table showing state-wise performance metrics: Illinois, Michigan, Missouri, Oregon, Texas, Utah, Washington, and Wyoming.

Embed reports, dashboards, and tiles in a custom application

Can be used for internal and/or external users.

Embed your content for customers



'App owns data'



Use your own authentication method



App users don't need a Power BI license



The app doesn't use the client credentials to authenticate to Power BI but a service principal

Setup

1. Get Power BI Embedded or Premium

The screenshot shows the Microsoft Azure Marketplace page for 'Power BI Embedded'. It includes the service summary, user reviews (3.9 stars), and a 'Create' button.

2. Admin settings

The screenshot shows the 'Developer settings' section of the Power BI Admin settings. It lists two items: 'Embed content in apps' (Enabled for the entire organization) and 'Allow service principals to use Power BI APIs' (Enabled for a subset of the organization).

3. Service Principal

The screenshot shows the 'API permissions' section for a service principal named 'Peek Data Embedded App'. It lists permissions granted to the 'Azure Active Directory Graph' and 'Power BI Service'.

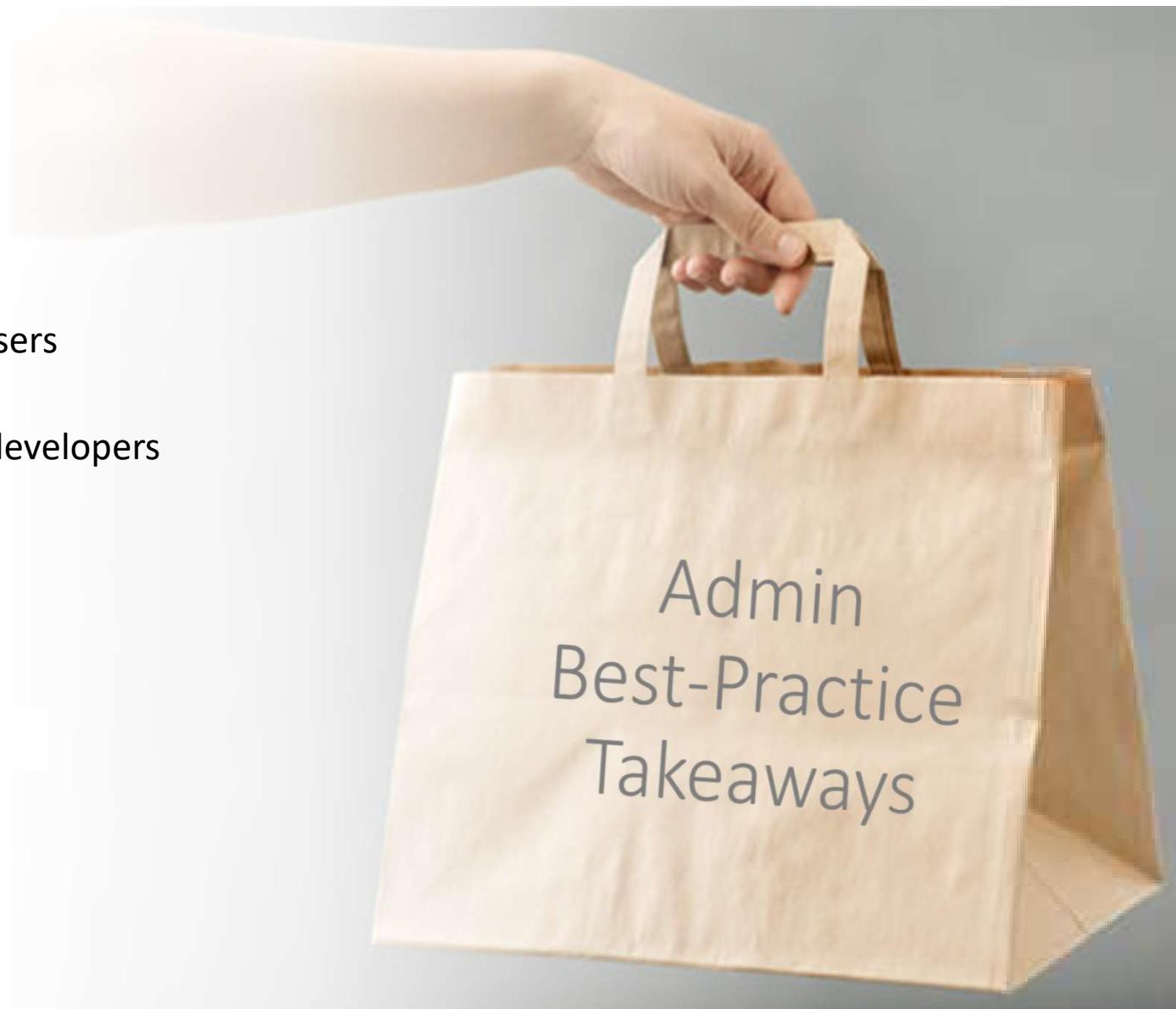
API / Permissions name	Type	Description
App.Read.All	Delegated	View all Power BI apps
Content.Create	Delegated	Create content
Dashboard.Read.All	Delegated	View all dashboards
Dashboard.ReadWrite.All	Delegated	Read and write all dashboards

4. Workspace settings

The screenshot shows the 'Settings' dialog box for a workspace named 'United FC Embedded'. It includes sections for 'About', 'Premium' (selected), and 'Azure connections'. Under 'Premium', it shows license mode (Embedded selected), capacity selection (pbepeekdatashopsales - West Europe), and workspace connection (powerbi://api.powerbi.com/v1.0/myorg/United%20FC%20Embedded). A 'Copy' button is at the bottom.



- Create separate group(s) for external users
- Discuss different sharing options with developers





Premium

When is Power BI Premium relevant?



500+ users



Enterprise scale:

- Multiple large models (100 GB+)
- Geographic distribution



Development requirements

- Deployment pipelines
- XMLA-endpoint
- Dataflows



Advanced Analytics

Power BI Premium Features

Platform	Data	Development	End-user
Capacity	Automatic aggregations	Deployment pipelines	Datamarts
Auto scale V-Cores	Asynchronous refresh	Dataflows	Insights
BYOK	Hybrid tables	XMLA endpoint	Advanced AI
Multi-geo deployment	Query caching	Power BI embedded	
Back-up and restore	Model size limit		

Power BI Premium Features

Platform	Data	Development	End-user
Capacity	Automatic aggregations	Deployment pipelines	Datamarts
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Capacity – Embedded vs Premium

	Embedded	Premium
Use case	Embed visuals into your own applications for external users.	Same as Embedded. And share content within your organization at enterprise level.
Licensing	Same as Premium, but using A SKUs	Same as Embedded, but using EM and P SKUs
Billing	Hourly	Monthly / Yearly
Other	Missing some features like Power BI Report server and Unlimited content sharing	All features

Capacity - Licensing

A set of resources for exclusive use. Previously known as '*Dedicated Capacity*'.

Capacity SKUs	Dataset				Dataflow		Export API
	V-cores	Max memory (GB)	DirectQuery/Live connection (per second)	Max memory per query (GB)	Model refresh parallelism	Dataflow parallel tasks	Max concurrent pages
EM1/A1	1	3	3.75	1	5	4	20
EM2/A2	2	5	7.5	2	10	8	25
EM3/A3	4	10	15	2	20	16	35
P1/A4	8	25	30	6	40	32	55
P2/A5	16	50	60	6	80	64	95
P3/A6	32	100	120	10	160	64	175
P4/A7	64	200	240	10	320	64	200
P5/A8	128	400	480	10	640	64	200

Microsoft.com

You can have multiple SKUs.

Assign workspaces to a capacity

High workloads

Premium Capacity P3 (32 vCores)

App and Workspace
Sales

App and Workspace
Finance

App and Workspace
Production

Low workloads

Shared Capacity

Personal
Workspaces

App and Workspace
Inventory

Multiple capacities

You buy a total capacity size, not just 1 capacity.

Premium Capacity P3 (32 vCores)

App and Workspace
Sales

App and Workspace
Finance

App and Workspace
Production



Premium Capacity P2 (16 vCores)

App and Workspace
Sales

Premium Capacity P1 (8 vCores)

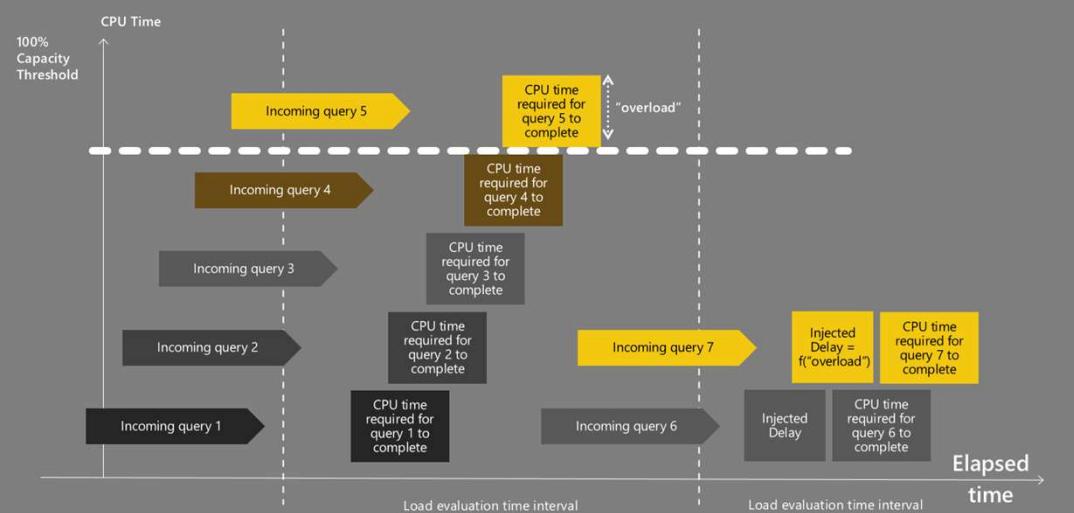
App and Workspace
Finance

Premium Capacity P1 (8 vCores)

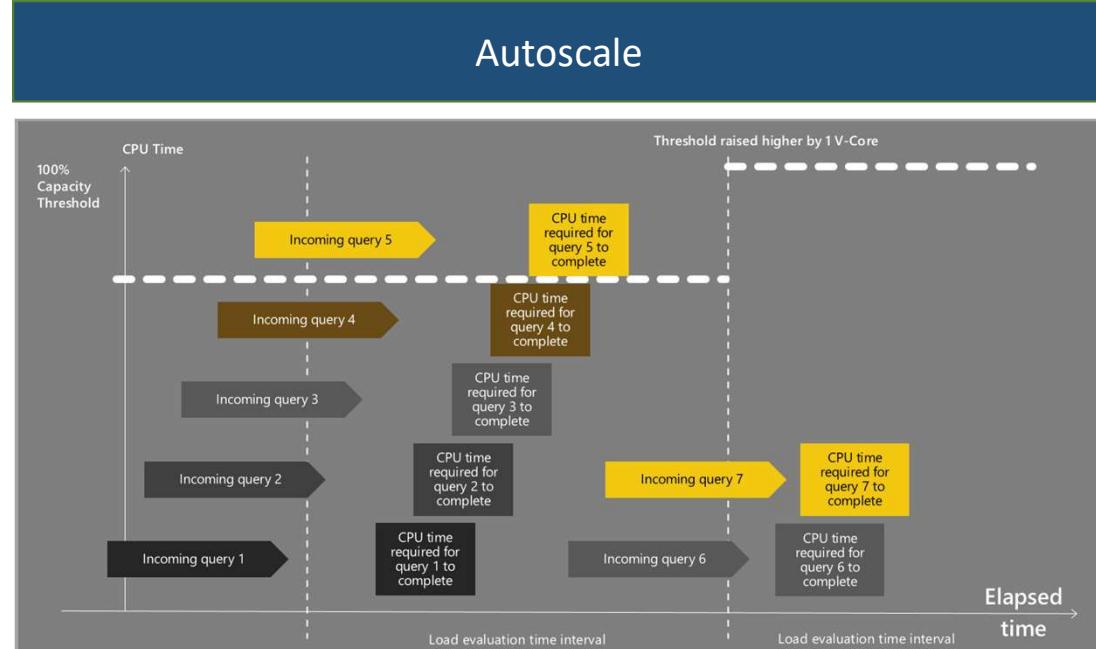
App and Workspace
Production

Auto-scale V-Cores

Overload



Autoscale



Microsoft.com

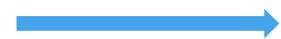
Microsoft.com

Capacity needed is calculated by:

- Calculations completed within the 30 seconds interval
- Average of background processes over the last 24 hours (Data refreshes, subscriptions, XMLA-writes)

Configure Auto-scale

Resourcegroup in azure



Create a new resourcegroup or use an existing one.

Microsoft Azure Search resources, services, and docs (G+/-) ...

Home > Resource groups > Create a resource group X

Basics Tags Review + create

Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

Project details

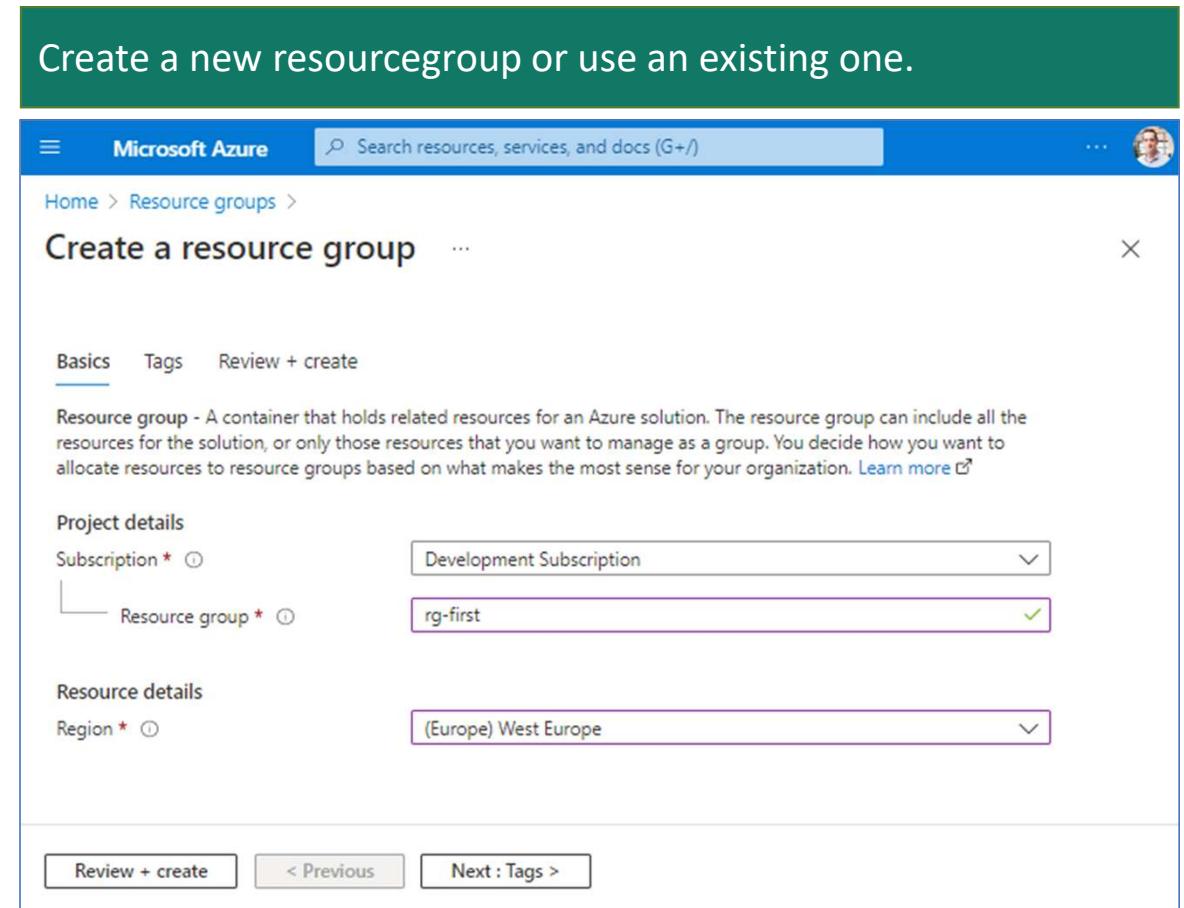
Subscription * Development Subscription

Resource group * rg-first ✓

Resource details

Region * (Europe) West Europe

Review + create < Previous Next : Tags >

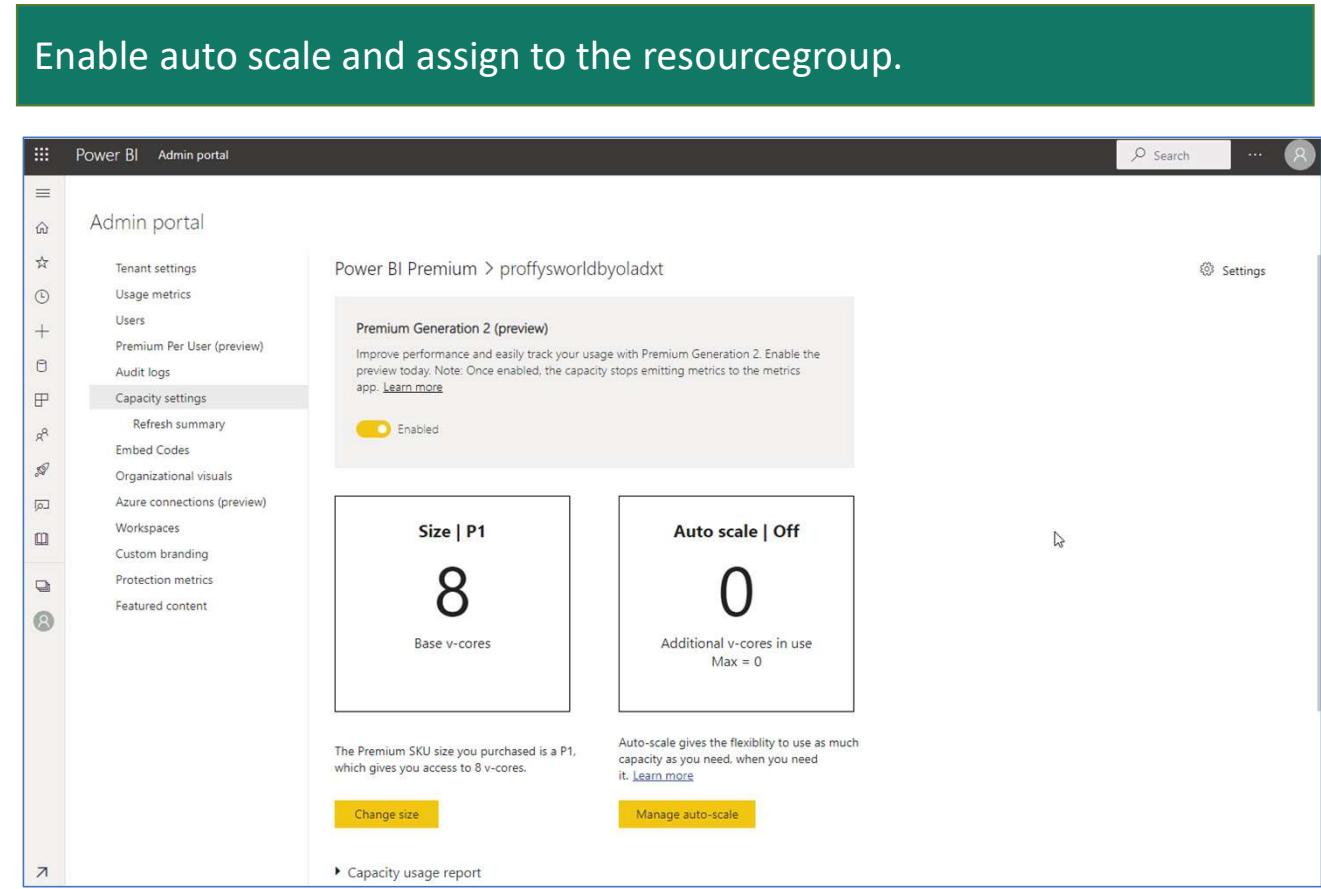


Configure Auto-scale

Enable Auto-scale



Enable auto scale and assign to the resourcegroup.



Power BI Admin portal

Admin portal

Tenant settings

Usage metrics

Users

Premium Per User (preview)

Audit logs

Capacity settings

Refresh summary

Embed Codes

Organizational visuals

Azure connections (preview)

Workspaces

Custom branding

Protection metrics

Featured content

Power BI Premium > proffysworldbyoladxt

Premium Generation 2 (preview)

Improve performance and easily track your usage with Premium Generation 2. Enable the preview today. Note: Once enabled, the capacity stops emitting metrics to the metrics app. [Learn more](#)

Enabled

Size | P1

8

Base v-cores

The Premium SKU size you purchased is a P1, which gives you access to 8 v-cores.

[Change size](#)

Auto scale | Off

0

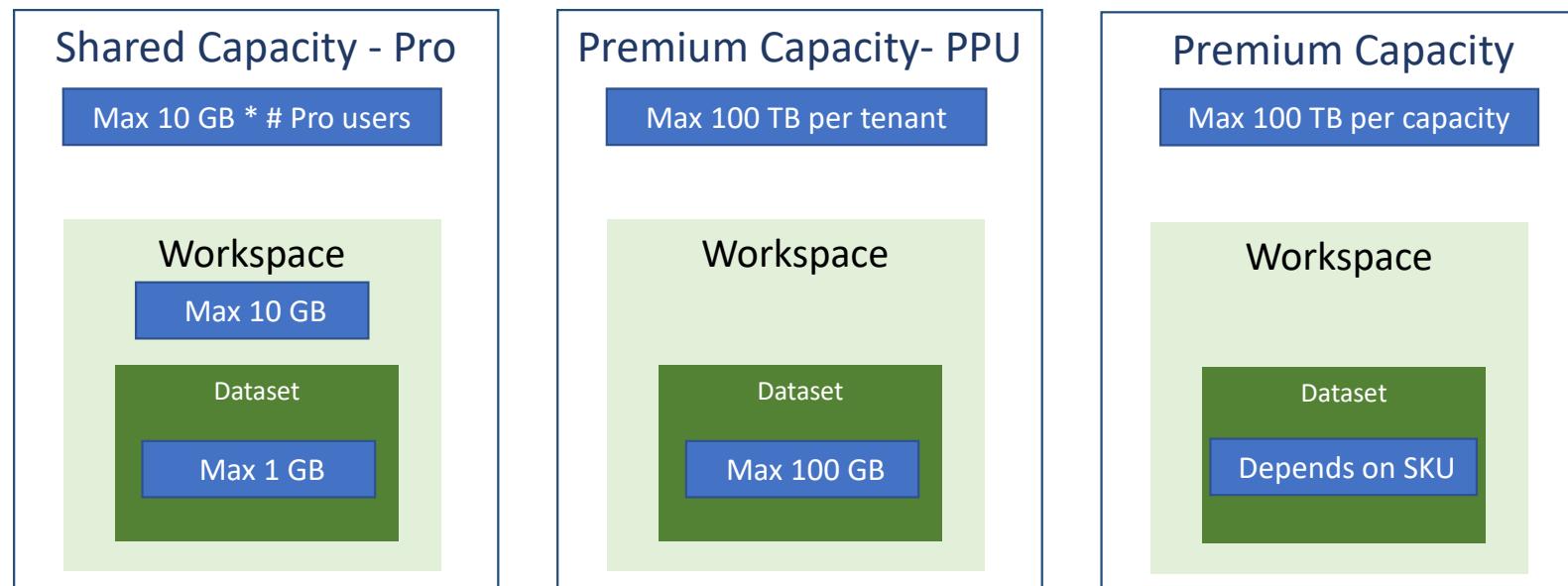
Additional v-cores in use
Max = 0

Auto-scale gives the flexibility to use as much capacity as you need, when you need it. [Learn more](#)

[Manage auto-scale](#)

Capacity usage report

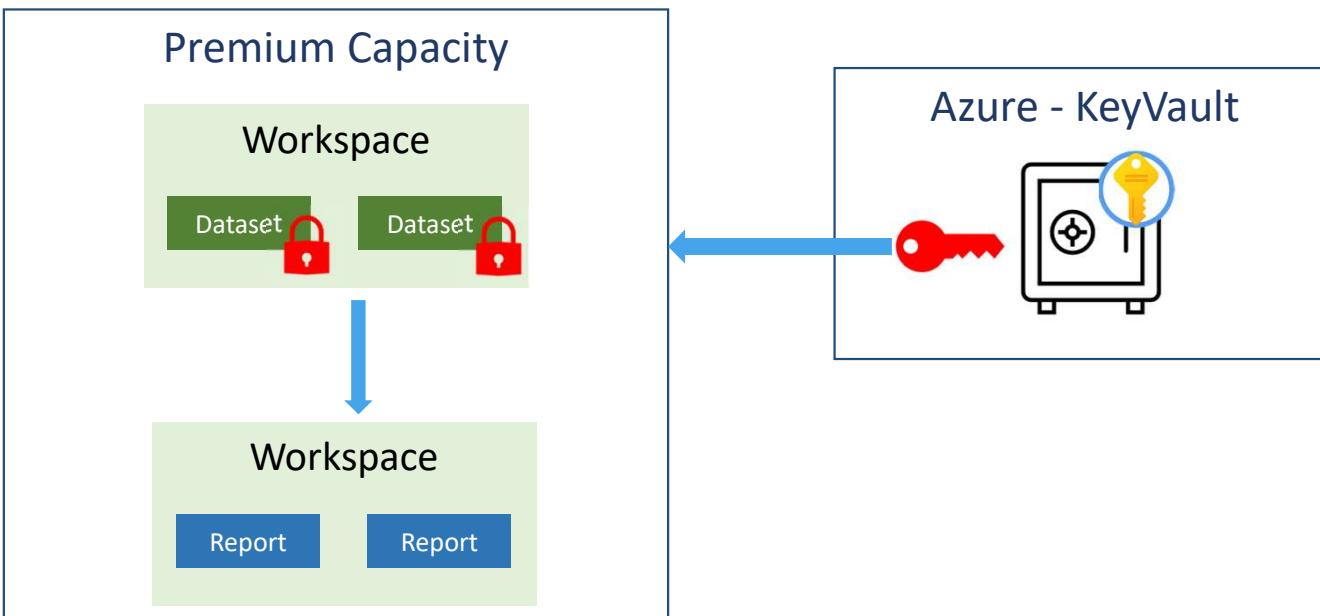
Capacity and Model size limit



P1 → +- 25 GB
P2 → +- 50 GB
P3 → +- 100 GB
P4 → +- 200 GB
P5 → +- 400 GB

BYOK

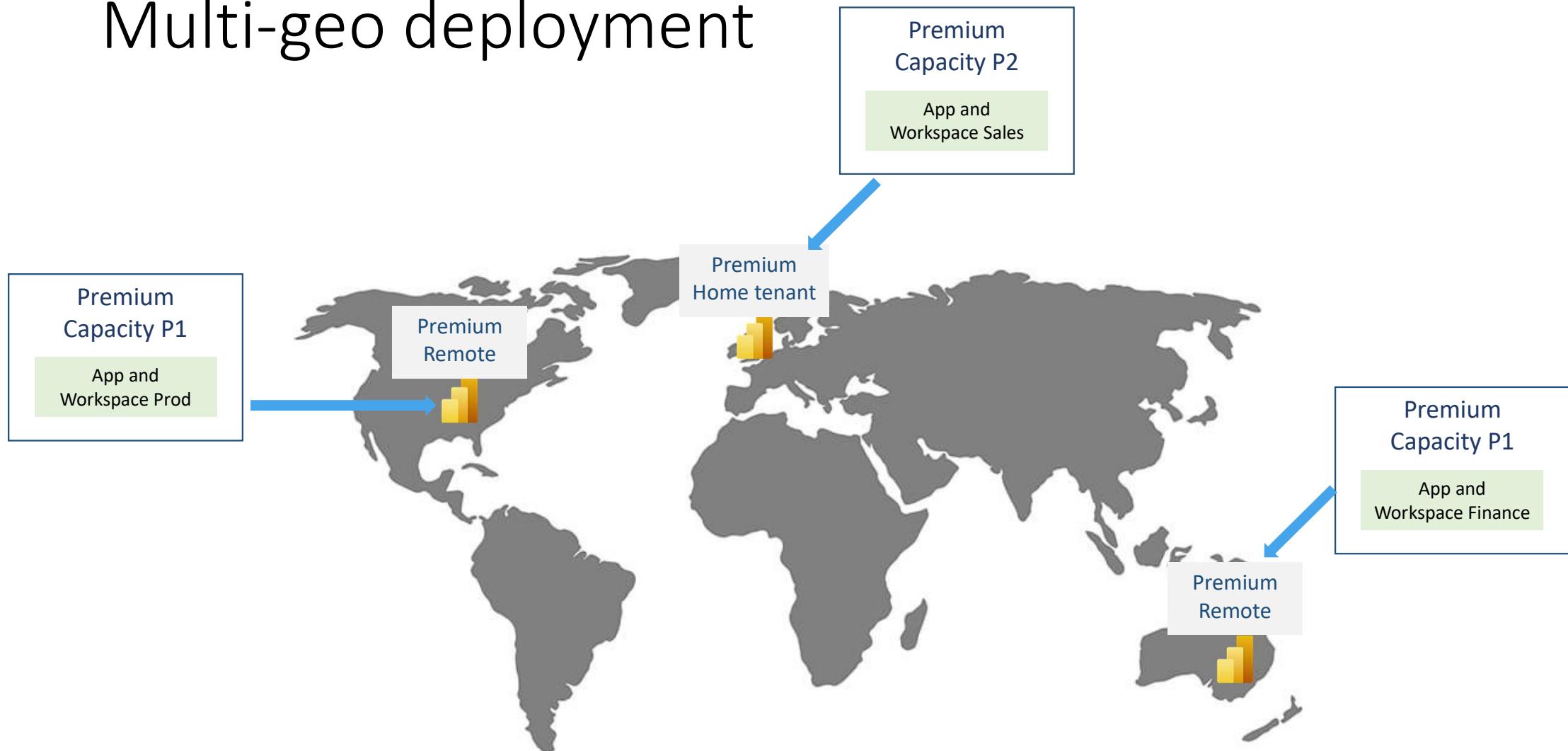
Use your own key to encrypted data at rest for imported datasets



Not available for:

- Live connections
- Other objects like reports, streaming datasets, and Excel-workbooks.
- Power BI Goals

Multi-geo deployment



Multi-geo deployment

Supports residency requirements

Region is not 1 location

All workspace content resides in that region

You can change regions for capacities

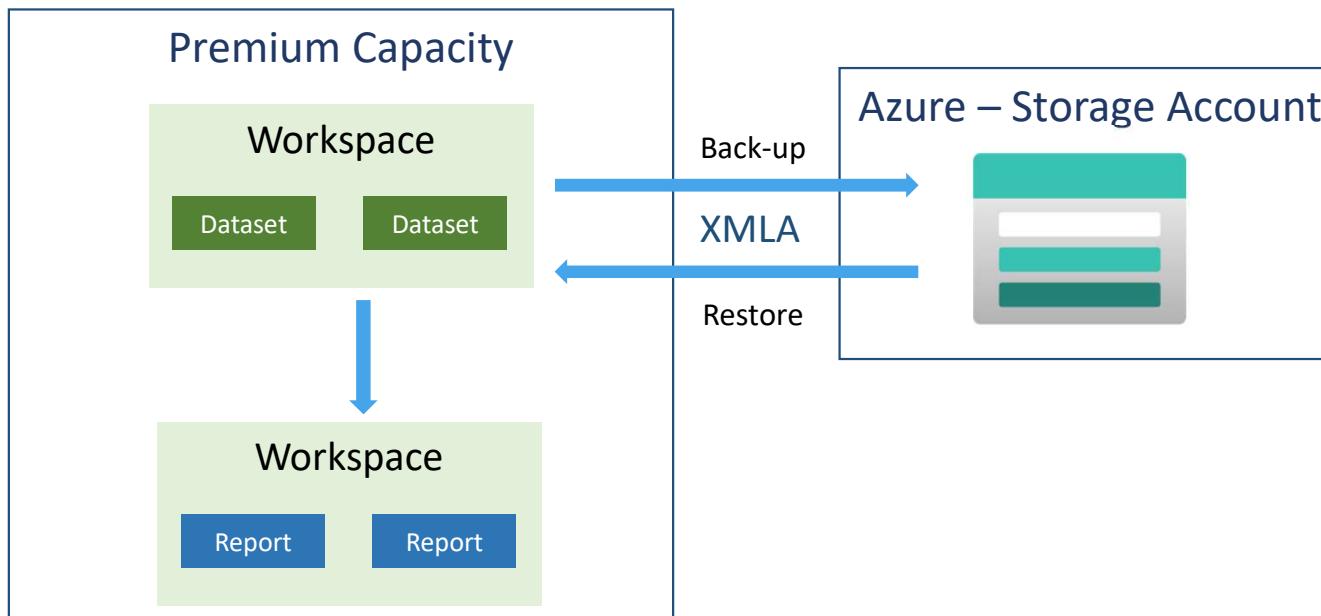
Dataflows isn't supported on remote regions



Stored in Capacity Region	Always stored in Home Region
Data models	Excel Workbooks
Query cache	Metadata like tile names, permissions and credentials

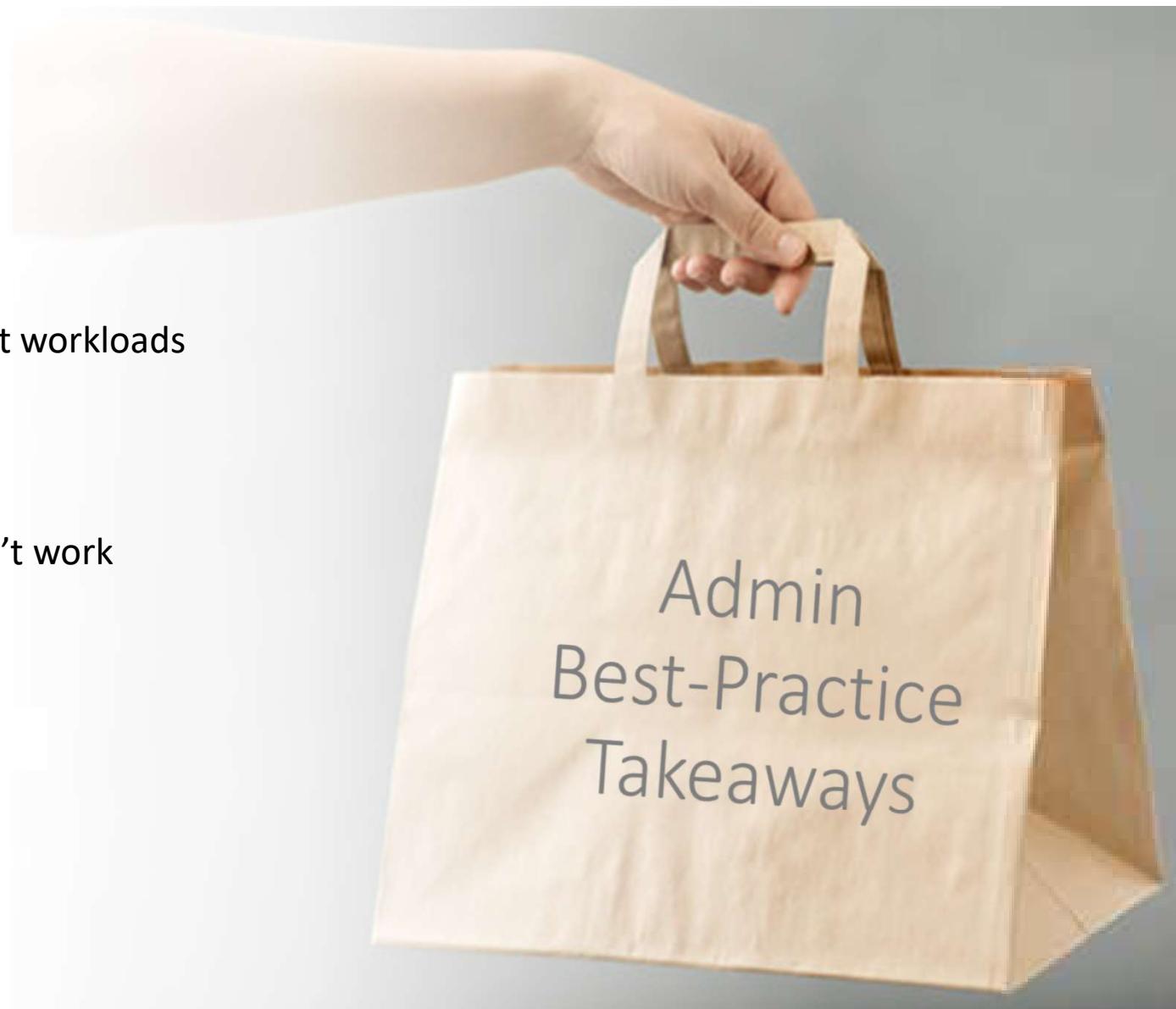
Back-up and restore

Back-up and restore dataset using your storage account



Use SQL Server Management Studio (**SSMS**), **PowerShell** or any other tool that can handle XMLA-endpoints.





- Use multiple capacities to split different workloads
- Use large data format as default
- Use auto scale when other options don't work

Development

XMLA-endpoint

Dataflows

Incremental Refresh

Power BI Rest API

Query Caching

Deployment

External Tools



XMLA-endpoint

A connectivity channel between applications and the SSAS engine running Power BI datasets



Premium Capacity

Workspace

Dataset

Dataset

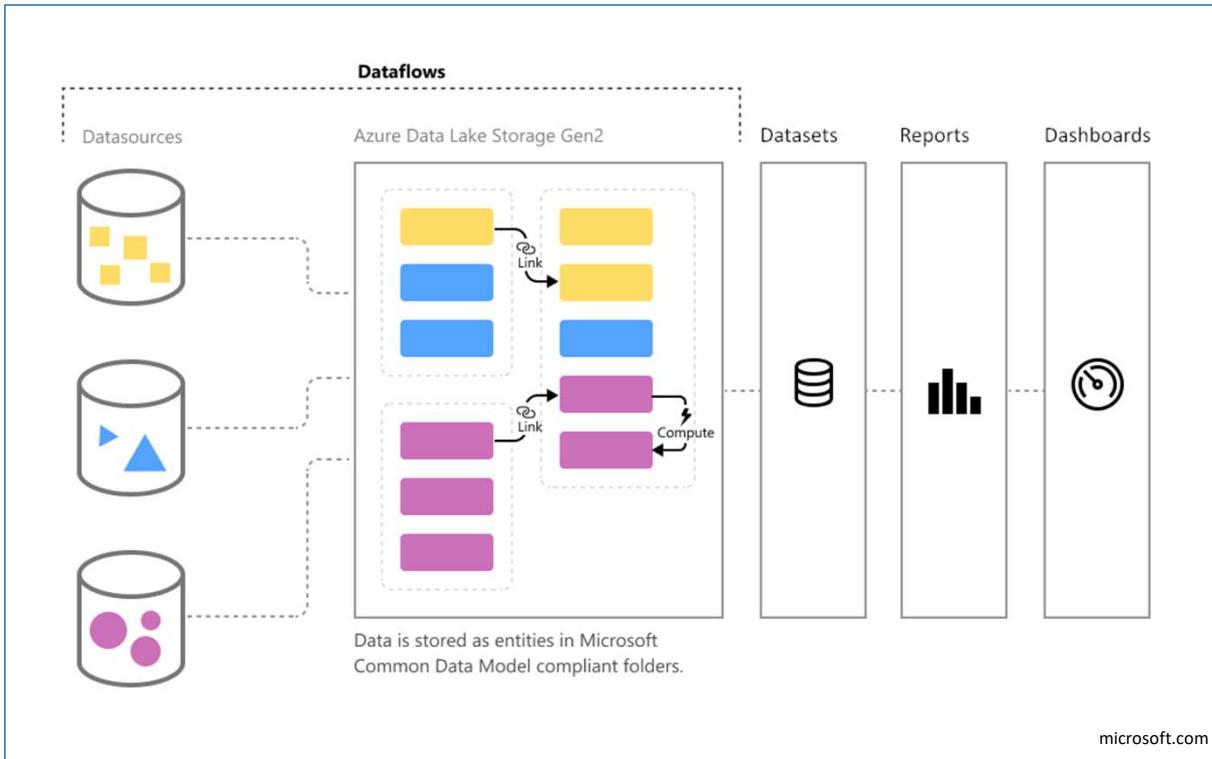
Why use this?

Using other tools for development

Querying for monitoring

Automated deployment

Dataflows



Why use this?

Reuse integration and transformation

Reuse output in other applications

Deliver a defined set of entities to analysts who can build their own models

Perform ETL at scale in Power BI

It's not a replacement for a datamart or datamodel!

Dataflows and ADLS Gen2

1. Set Tenant-assigned ADLS Gen2 account

Admin portal

Tenant settings
Usage metrics
Users
Premium Per User
Audit logs
Capacity settings
 Refresh summary
Embed Codes
Organizational visuals
Azure connections
Workspaces
Custom branding
Protection metrics
Featured content

Connect to Azure resources

▫ Tenant-level storage
 Connect an Azure Data Lake Gen2 storage account. [Learn more](#)
 Subscription 5adfc066-d6af-41ab-b19f-7451f9a75ba1
 Resource group rg-peekdata-unitedfc
 Storage account saapeekdatashopsales
 Configured by Hylke Peek on 2023-01-23T12:00:00Z
 Disconnect from Azure

▫ Workspace-level storage permissions
 Allow workspace admins to connect their own storage account

Save **Cancel**

First assign a storage before creating a dataflow

Unassign ADLS involves manual recreation

2. Assign storage to workspace

Settings

United FC [Development]

About Premium **Azure connections**

▫ Storage
 Connect an Azure Data Lake Gen2 storage account. [Learn more](#)
 Connect to Azure
 Use the default Azure connection

3. Create dataflow

Power BI United FC [Production] Fanshop Sales Data | ...

Tables Machine learning models

TABLE NAME	TABLE TYPE	ACTIONS
Customer	Custom	
Product	Custom	
Productgroup	Custom	
SalesorderDetail	Custom	
SalesorderHeader	Custom	

4. Check-out your data in ADLS

Search for resources Refresh All

Upload Download Open Preview New Folder Select All Copy Paste

powerbi > United FC [Production] > Fanshop Sales Data

Name	Access Tier	Last Modified
Customer.csv.snapshots		
Product.csv.snapshots		
Productgroup.csv.snapshots		
SalesorderDetail.csv.snapshots		
model.json.snapshots		
SalesorderHeader.csv	Hot (inferred)	
model.json	Hot (inferred)	



Dataflows: Enhanced compute engine

Optimize the use of dataflows

Perform direct queries over dataflow entities

Reduce refresh time of long-running dataflows using joins, distinct, filters, and group by

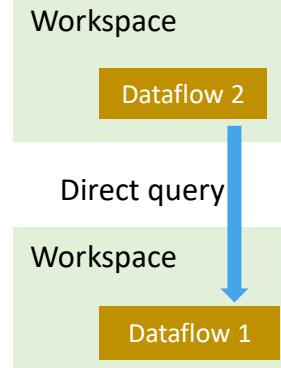
Disabled

Enabled

Optimized

Default disabled. Enables when dataflow is referenced by a table or other dataflow

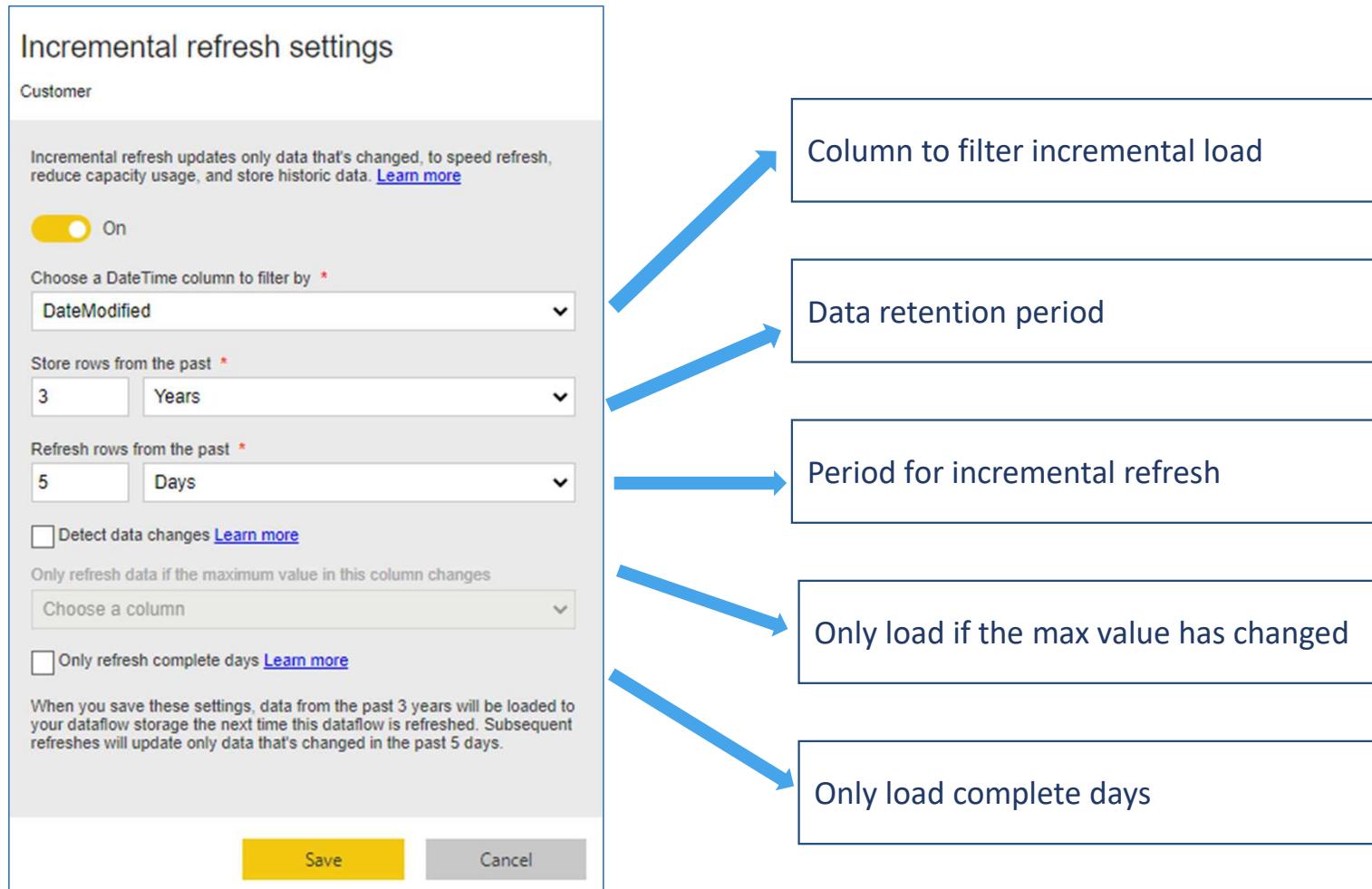
Premium Capacity



It only works on top of a dataflow and within the capacity!



Incremental Refresh



Power BI Rest Api

A (huge) set of web services that can work with Power BI objects



Automate deployment



Monitoring



Automate management tasks



Embed reports in custom apps



Refresh datasets



Back-up scenarios