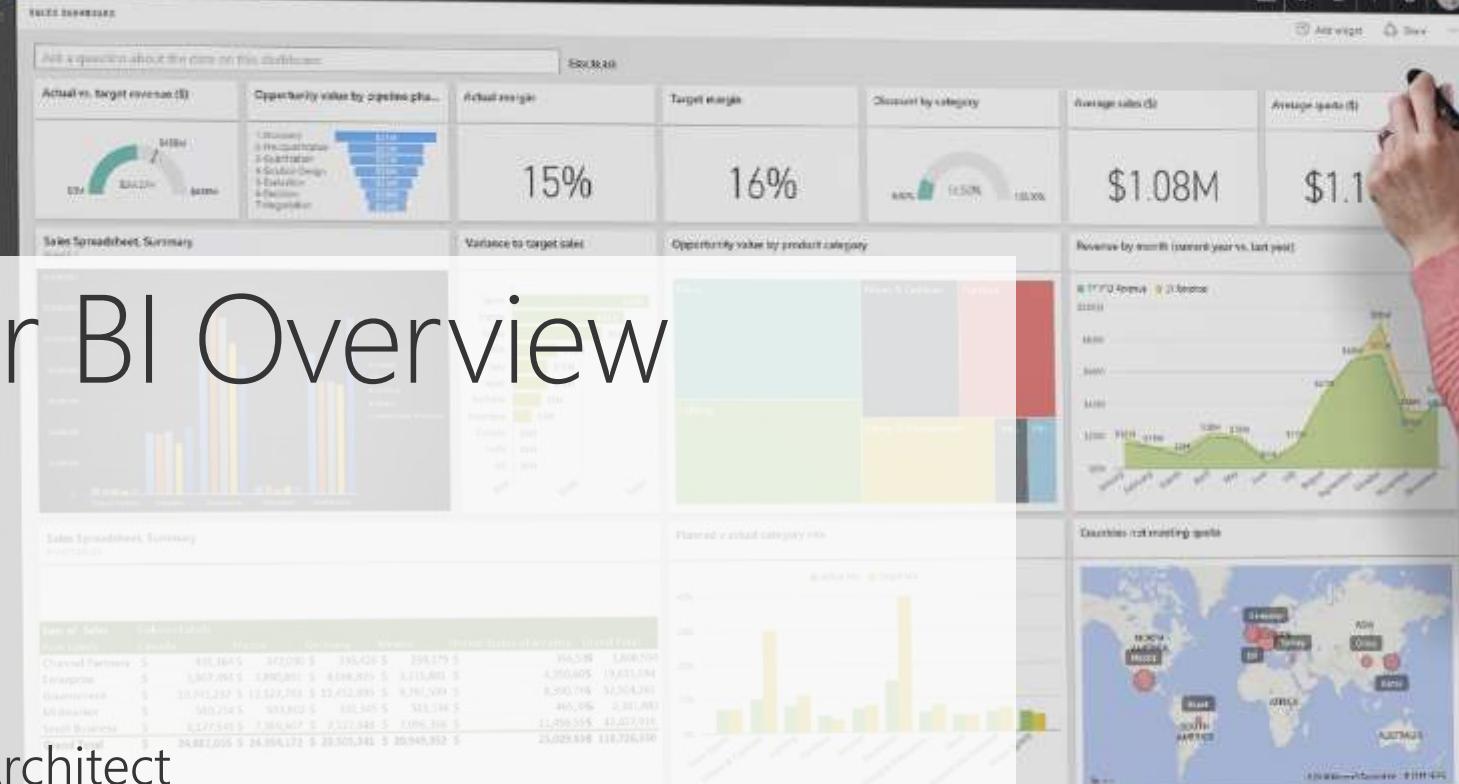




Power BI



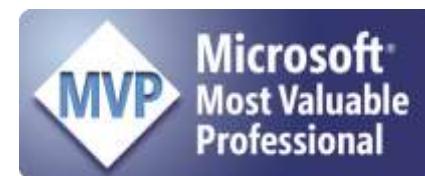
# Power BI Overview

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Data & AI Architect  
Microsoft, NYC MTC  
JamesSerra3@gmail.com  
Blog: JamesSerra.com



# About Me

- Microsoft, Big Data Evangelist
- In IT for 30 years, worked on many BI and DW projects
- Worked as desktop/web/database developer, DBA, BI and DW architect and developer, MDM architect, PDW/APS developer
- Been perm employee, contractor, consultant, business owner
- Presenter at PASS Business Analytics Conference, PASS Summit, Enterprise Data World conference
- Certifications: MCSE: Data Platform, Business Intelligence; MS: Architecting Microsoft Azure Solutions, Design and Implement Big Data Analytics Solutions, Design and Implement Cloud Data Platform Solutions
- Blog at [JamesSerra.com](http://JamesSerra.com)
- Former SQL Server MVP
- Author of book "Reporting with Microsoft SQL Server 2012"



# Overview



Power BI Desktop



Power BI service & What's new



Integration with other services



Power BI Premium



Administration



Summary



# Power BI: experience your data

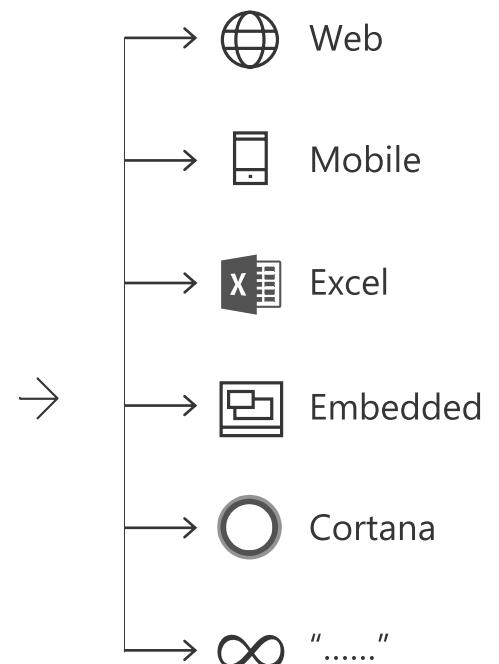
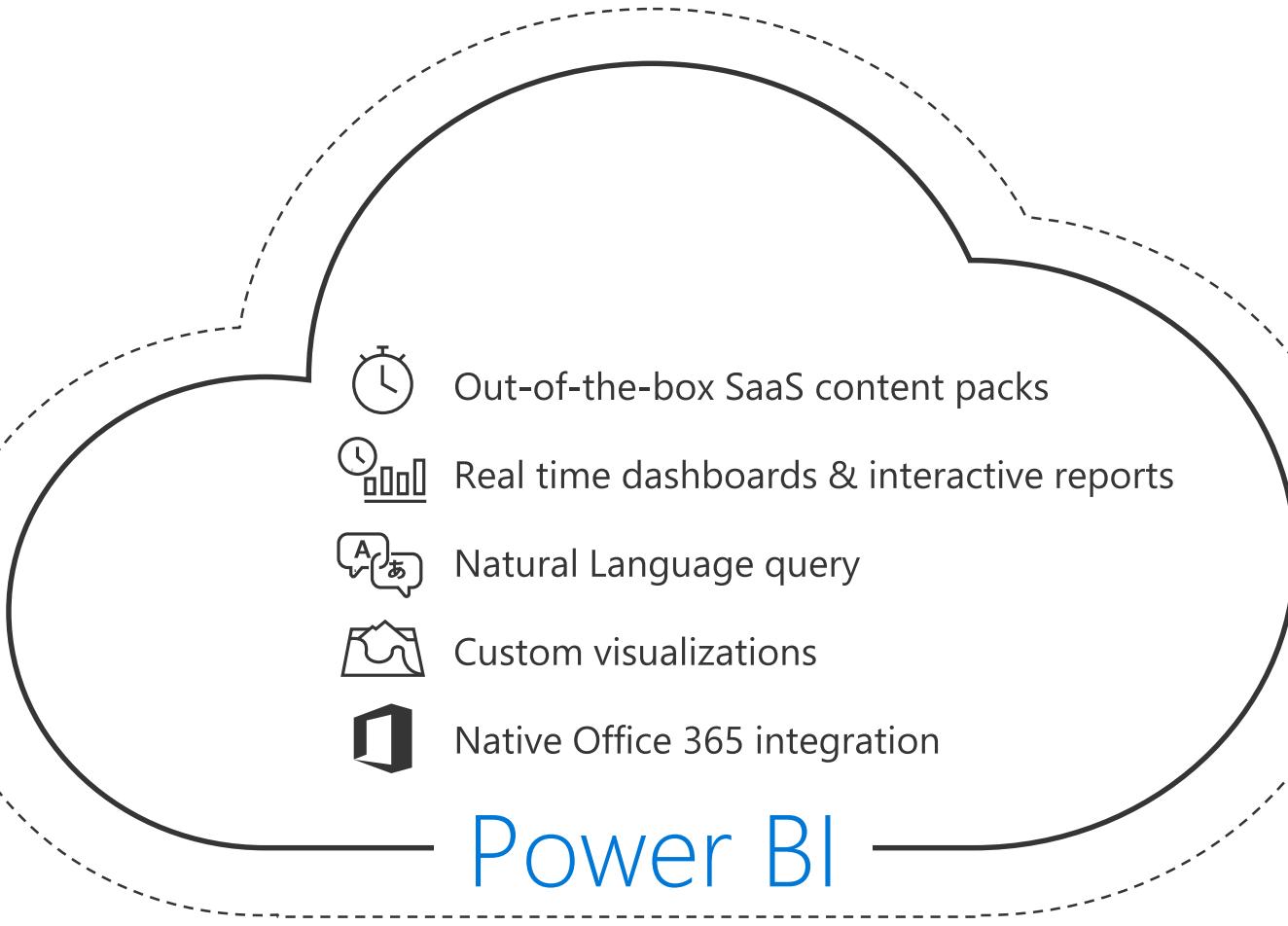
Any data, any way, anywhere



Cloud data

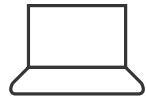


On-premises data



# Power BI product portfolio

Author



[Power BI Desktop](#)

Free data analysis  
and report authoring tool

Share and collaborate



[Power BI service](#)

Cloud-based modern  
business analytics solution

Large scale deployments



[Power BI Premium](#)

Dedicated capacity for  
increased performance

Share and collaborate



[Power BI Report Server](#)

On-premises report server

App dev



[Power BI Embedded](#)

Visual analytics embedded  
in your applications

# Power BI Desktop

Free companion authoring tool for the Power BI service



## Get Data

Easily connect, clean, and mashup data



## Analyze

Build powerful models and flexible measures



## Visualize

Create stunning interactive reports



## Publish

Share insights with others



## Collaborate

Empower your organization with self-service analytics



Download free from [PowerBI.com](http://PowerBI.com) or the Windows Store

# Power BI service

## Cloud-based SaaS BI solutions



Get started quickly



Secure, live connection to your data sources,  
on-premises and in the cloud



Auto insights and intuitive data exploration using  
natural language query



Pre-built dashboards and reports for popular SaaS  
solutions



Live, real-time dashboard updates



Deliver insights through other services such as  
SharePoint, PowerApps and Teams



# Power BI Premium

## Dedicated resources in the cloud



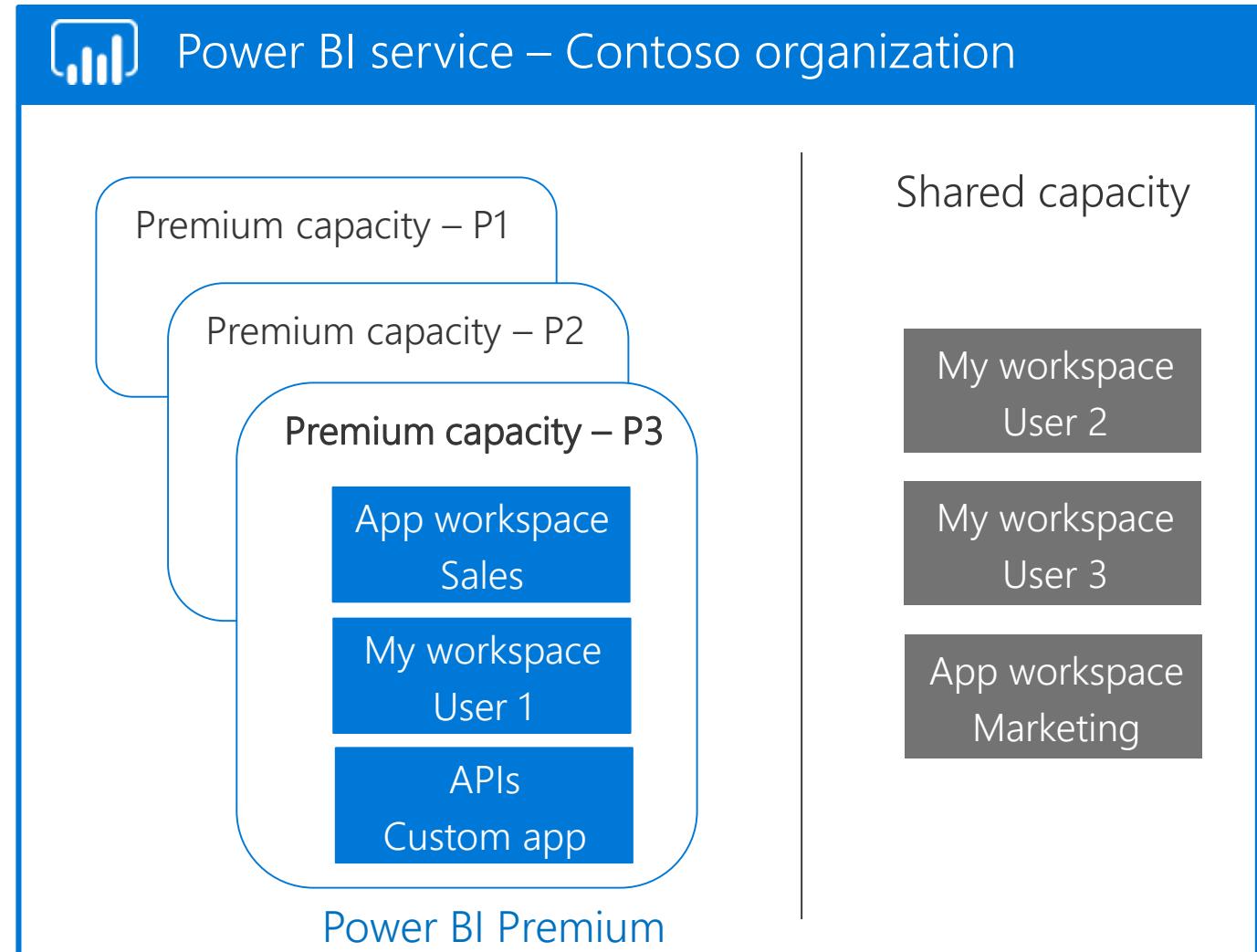
Greater scale and performance



Flexibility to license by capacity



Extending on-premises capabilities



# Power BI Report Server



## On-premise reporting solution

Power BI reports and SSRS report on-premises



## Connect to data

Over 70+. Data can be imported, queried directly or live connection to SSAS



## Power BI reports

Fully interactive reports on-premises to visualize your data and gain insights



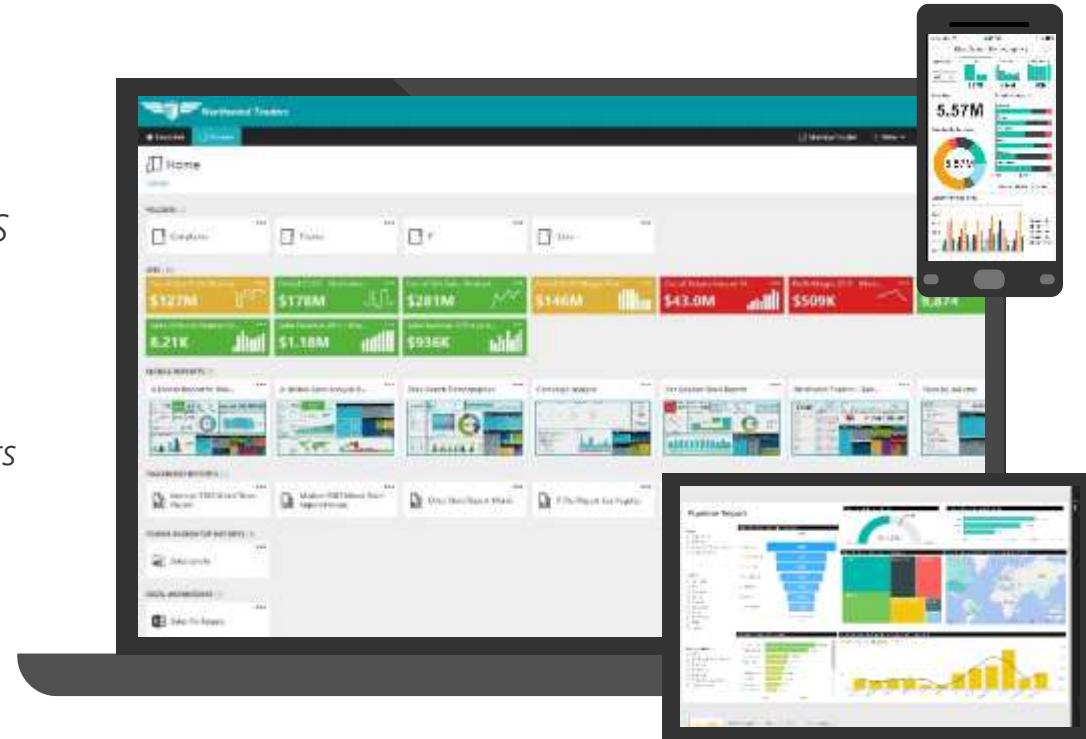
## SSRS reports

Precisely formatted operational reports



## Consume in multiple ways

Mobile Apps, Web Portal, Embedded in your organizational apps



# Power BI Embedded

Embed stunning, fully interactive reports and visuals into your applications



Spend time focusing on your product instead of building visual analytic features from scratch



Connect to countless data sources so that you can expose insights to your customers



Take advantage of our existing Custom Visual library or dream up the right visual for your customers



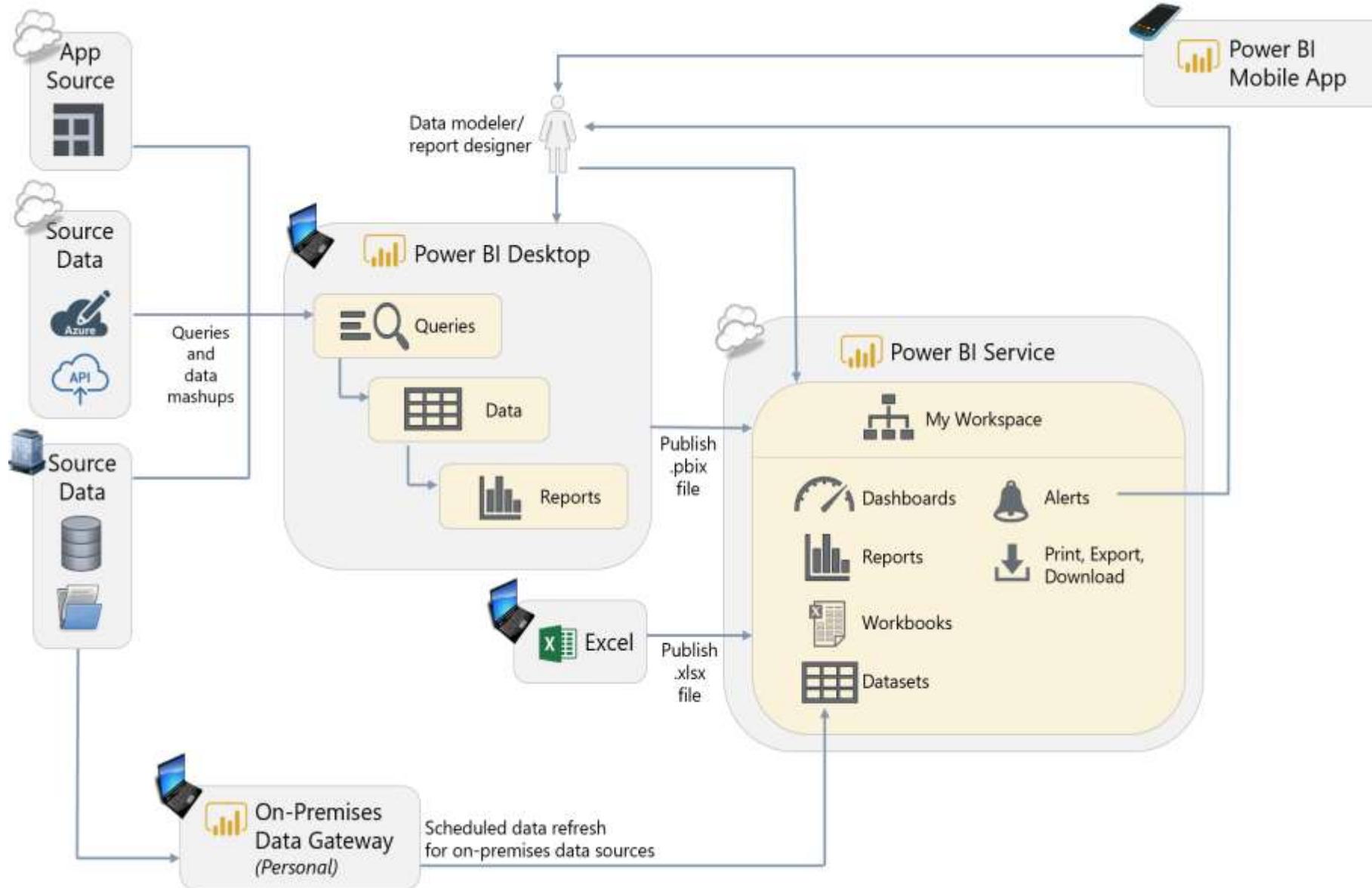
Embed consistent, easy-to-navigate visualization experiences across any device



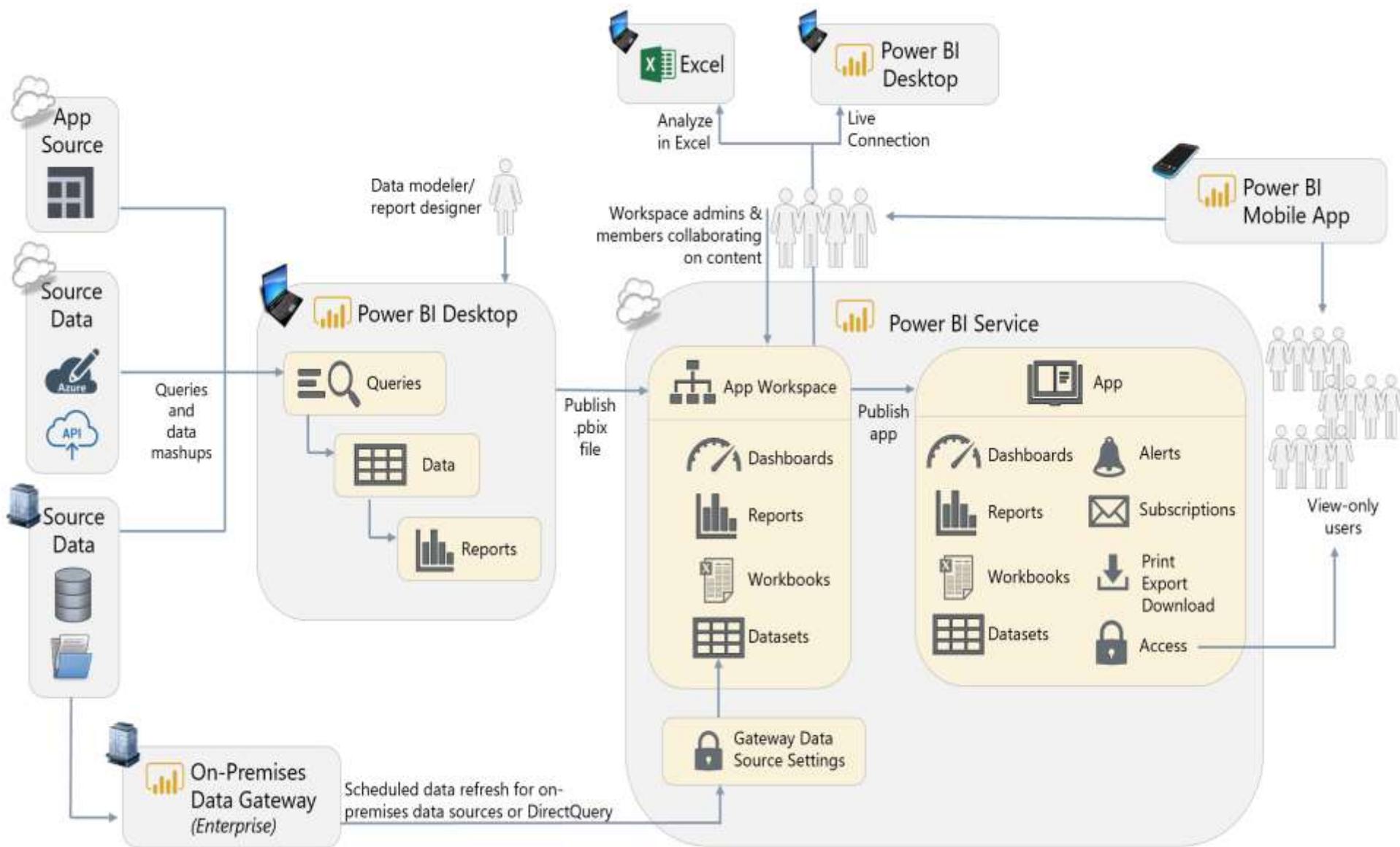
Leverage other familiar services like Visual Studio, Azure Web Apps and other Azure services



# Personal Power BI



# Large Team Collaboration



Overview



# Power BI Desktop

Power BI service



Integration with other services



Power BI Premium



Administration

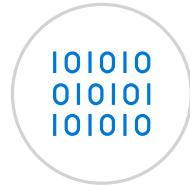


Summary



# Transforming with data

## The Business Analyst role



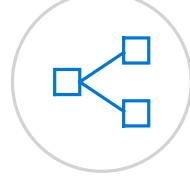
Get data



Analyze



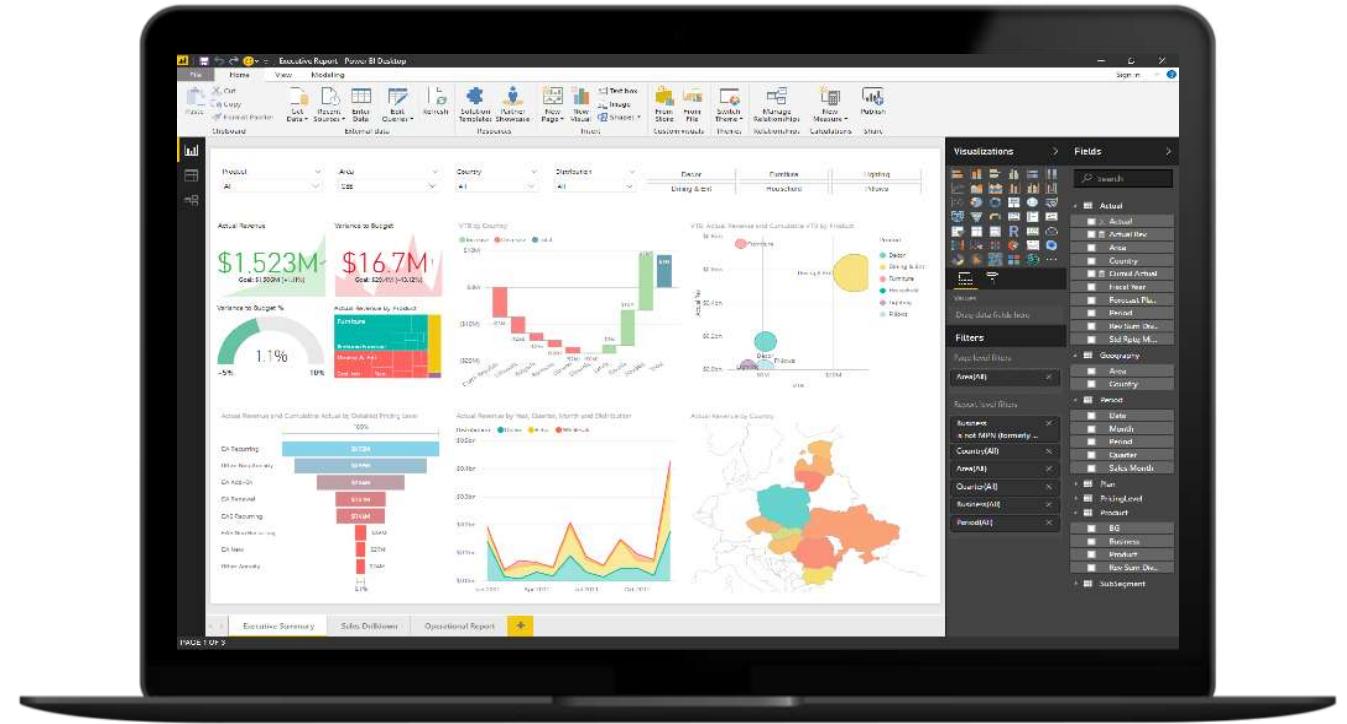
Visualize



Publish



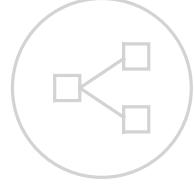
Collaborate



Power BI Desktop is a **free companion authoring tool** for the Power BI service, updated monthly with new features

# Get data

## Easily connect, clean, and mashup data



Connect to 80+ data sources, both on-premises and cloud

Shape, transform, and clean data for analysis

Live connectivity to on-premises and cloud data sources

Extend with custom data connectors for any data source

Prep your data using the familiar Power Query experience on the web



# Self-service prep for big data

## Ingest, transform & integrate big data with Power BI



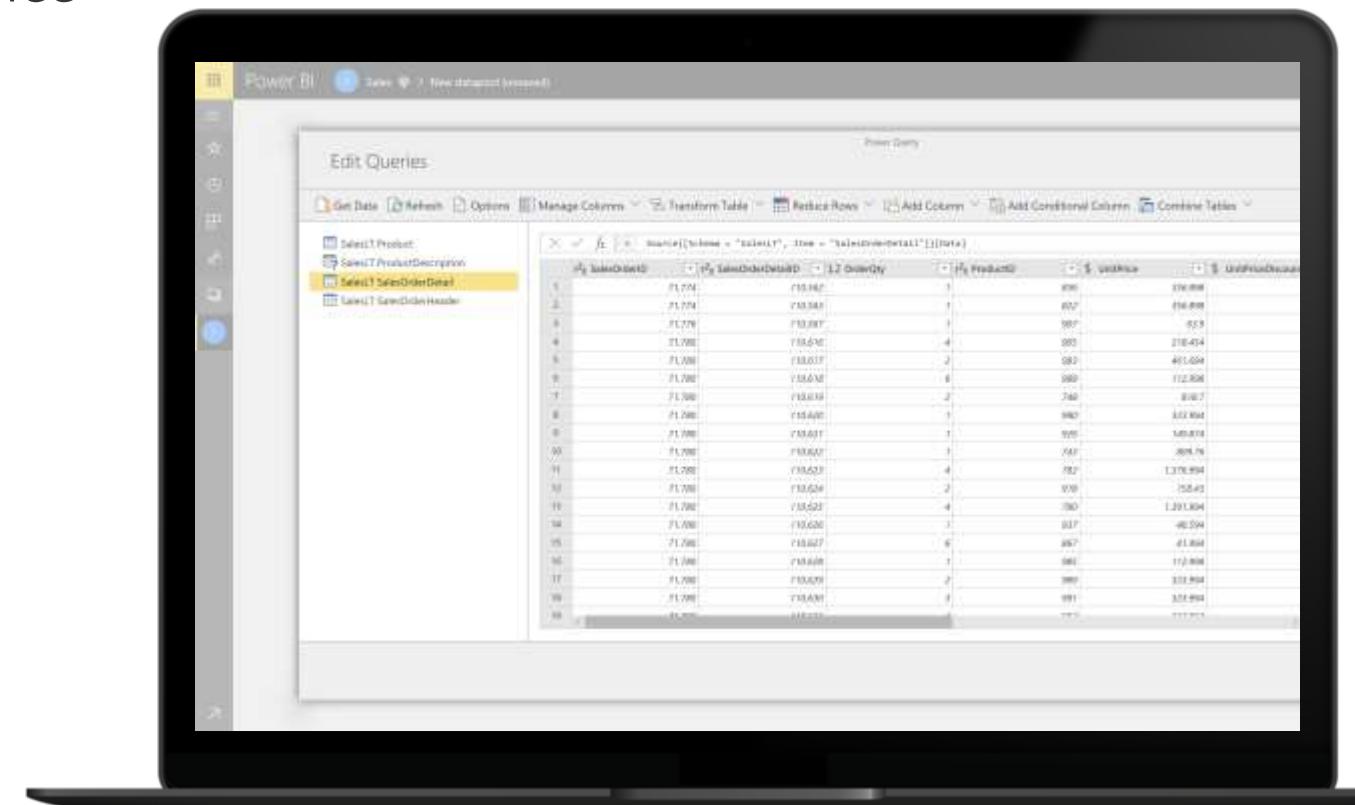
Prep your data using the familiar Power Query experience



Get started quickly with a common data model



Extend self-service prep to Azure Data Lake Storage



# Analyze

## Build powerful models and flexible measures



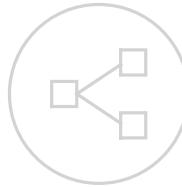
Automatically created model when connecting to data



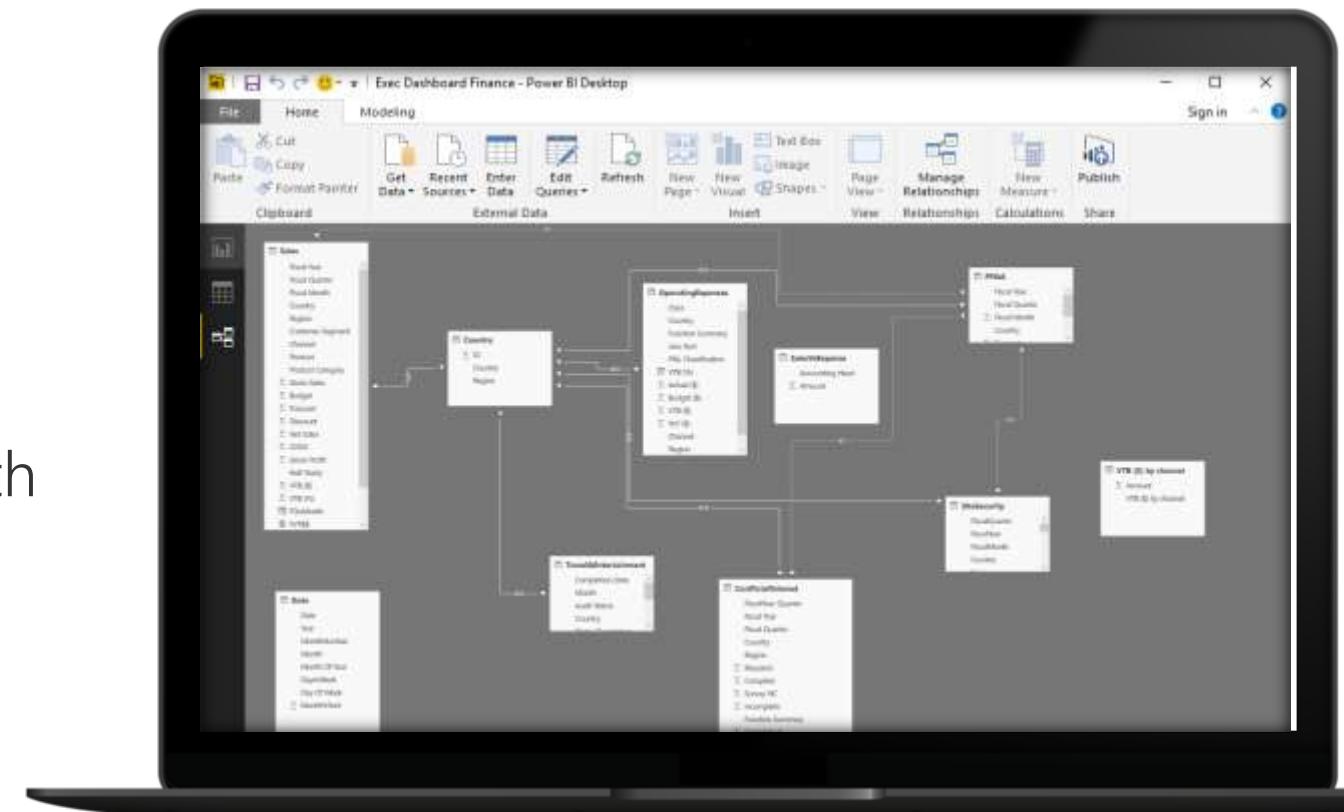
High-performance, in-memory engine



Point and click analysis with Quick Measures, Clustering, and Binning



Create powerful measures with familiar DAX formulas



# Visualize

## Create stunning interactive reports



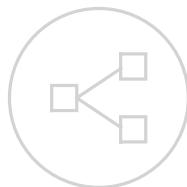
Author reports using 150+ visuals via a drag-and-drop canvas



Explore data across multiple interactive visualizations



Provide insights in the context of your business with Custom Visuals



Visualize your data story with bookmarks and custom navigation



# Publish

## Share insights with others



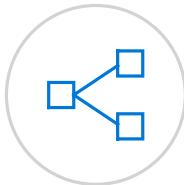
Publish directly to the cloud or on-premises



Automatic data refresh, so your reports are always up to date



Package your reports in apps for easy consumption and control



Manage your analytics content with admin and governance tools



# Collaborate

## Empower your organization



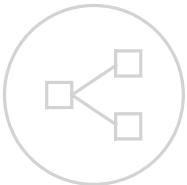
Provide access to reports and dashboards anywhere on any device



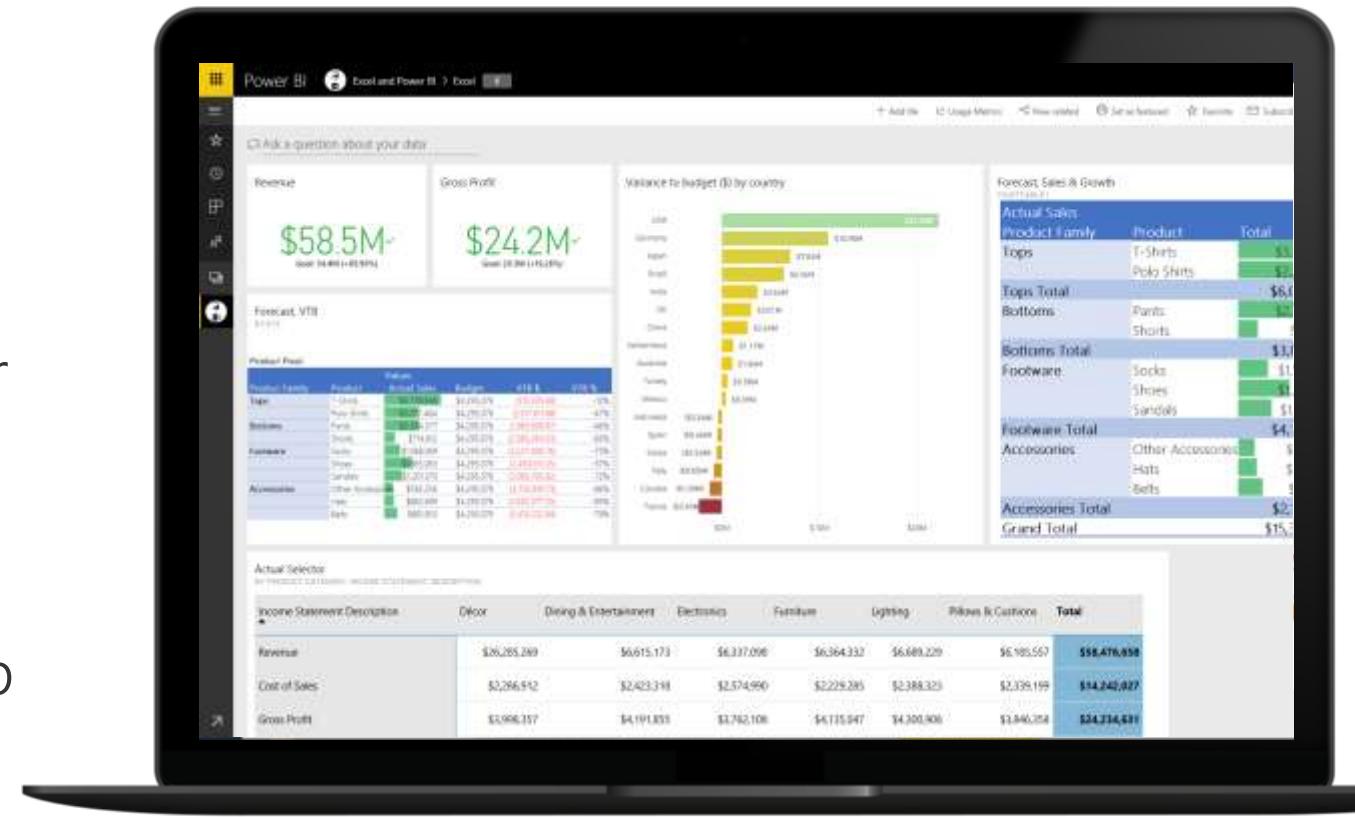
Enable users to ask questions and automatically discover insights from the data



Deliver insights through other services such as SharePoint and Teams



Connect live to your models in Excel and Power BI Desktop



# It is easy to Get Started

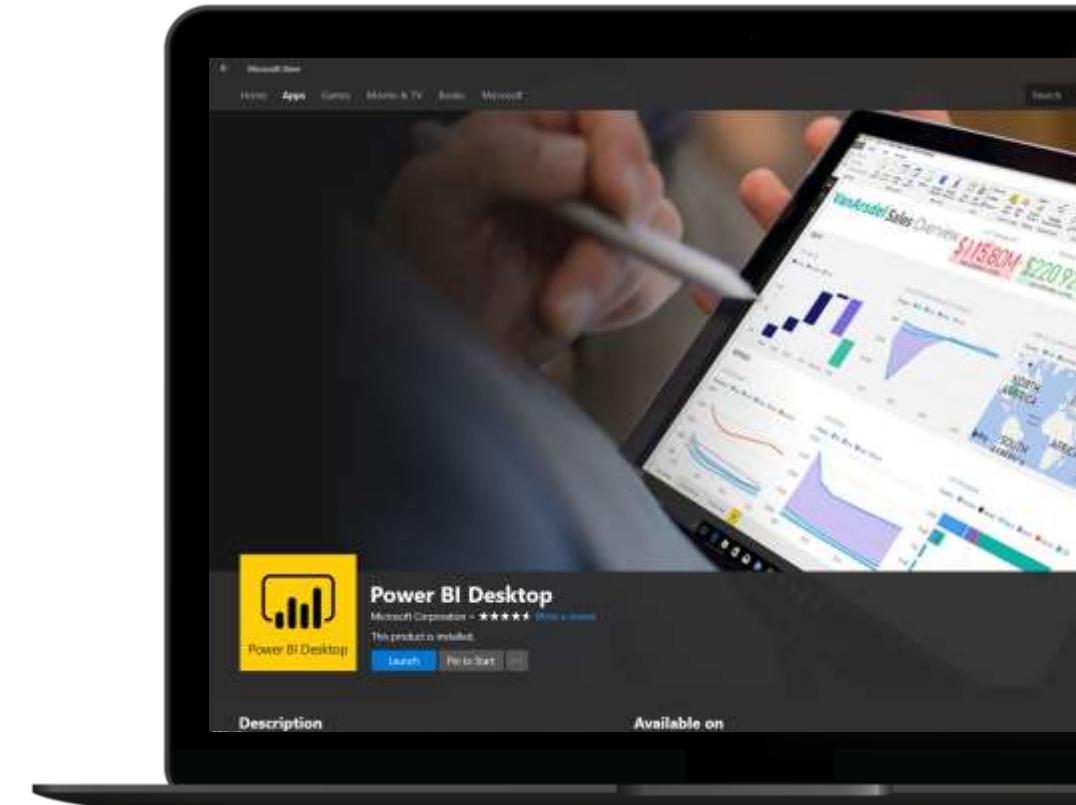
Download for free at [PowerBI.com](https://PowerBI.com) or the Windows Store

Benefit from continuous updates and  
community-driven innovation

Streamlined for no-code advanced analytics

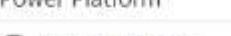
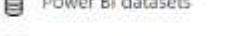
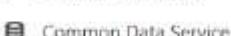
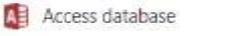
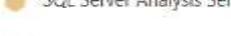
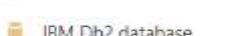
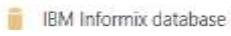
Built-in intelligence to speed up your  
analysis

Automatic updates from the Windows Store



# Power BI Desktop Data sources

Over 100+ data sources and growing

File	Database	Database	Online Services	Online Services	Other
 Excel	 IBM Netezza  MySQL database  PostgreSQL database  Sybase database  Teradata database  SAP HANA database  SAP Business Warehouse Application Server  SAP Business Warehouse Message Server  Amazon Redshift  Impala  Google BigQuery  Vertica  Snowflake  Essbase  AtScale cubes (Beta)  BI Connector  Dremio  Exasol  Indexima (Beta)	 Jethro (Beta)  InterSystems IRIS (Beta)  Kyligence  MarkLogic  Azure SQL database  Azure SQL Data Warehouse  Azure Analysis Services database  Azure Blob Storage  Azure Table Storage  Azure Cosmos DB  Azure Data Lake Storage Gen2 (Beta)  Azure Data Lake Storage Gen1  Azure HDInsight (HDFS)  Azure HDInsight Spark  HDInsight Interactive Query  Azure Data Explorer (Kusto)  Azure Cost Management (Beta)	 SharePoint Online List  Microsoft Exchange Online  Dynamics 365 (online)  Dynamics NAV  Dynamics 365 Business Central  Dynamics 365 Business Central (on-premises)  Microsoft Azure Consumption Insights (Beta)  Azure DevOps (Beta)  Azure DevOps Server (Beta)  Salesforce Objects  Salesforce Reports  Google Analytics  Adobe Analytics  appFigures (Beta)  Data.World - Get Dataset (Beta)  Facebook  GitHub (Beta)	 Planview Enterprise One - PRM (Beta)  Planview Projectplace (Beta)  QuickBooks Online (Beta)  Smartsheet  SparkPost (Beta)  Stripe (Beta)  SweetIQ (Beta)  Planview Enterprise One - CTM (Beta)  Twilio (Beta)  tyGraph (Beta)  Webtrends (Beta)  Zendesk (Beta)  Emigo Data Source (Beta)  Intune Data Warehouse (Beta)  Microsoft Graph Security (Beta)  TeamDesk (Beta)  Industrial App Store  Quick Base  Dynamics 365 Customer Insights (Beta)  Entersoft Business Suite (Beta)	 Web  SharePoint list  OData Feed  Active Directory  Microsoft Exchange  Hadoop File (HDFS)  Spark  R script  Python script  ODBC  OLE DB  BI360 - Budgeting & Financial Reporting  Denodo  Information Grid (Beta)  Paxata  QubolePresto (Beta)  Roaruler (Beta)  Workforce Dimensions (Beta)  SurveyMonkey (Beta)  Tenforce (Smart)List (Beta)  Blank Query
 Power Platform	 Power BI datasets  Power BI dataflows  Common Data Service	 Azure	 Azure SQL database  Azure SQL Data Warehouse  Azure Analysis Services database  Azure Blob Storage  Azure Table Storage  Azure Cosmos DB  Azure Data Lake Storage Gen2 (Beta)  Azure Data Lake Storage Gen1  Azure HDInsight (HDFS)	 Microsoft Azure Consumption Insights (Beta)  Azure DevOps (Beta)  Azure DevOps Server (Beta)  Salesforce Objects  Salesforce Reports  Google Analytics  Adobe Analytics  appFigures (Beta)  Data.World - Get Dataset (Beta)	 Planview Enterprise One - CTM (Beta)  Twilio (Beta)  tyGraph (Beta)  Webtrends (Beta)  Zendesk (Beta)  Emigo Data Source (Beta)  Intune Data Warehouse (Beta)  Microsoft Graph Security (Beta)  TeamDesk (Beta)
 Database	 SQL Server database  Access database  SQL Server Analysis Services  Oracle database  IBM Db2 database  IBM Informix database (Beta)	 Essbase  AtScale cubes (Beta)  BI Connector  Dremio  Exasol  Indexima (Beta)	 Azure Cosmos DB  Azure Data Lake Storage Gen1  Azure HDInsight (HDFS)  Azure HDInsight Spark  HDInsight Interactive Query  Azure Data Explorer (Kusto)	 Facebook  GitHub (Beta)  MailChimp (Beta)  Marketo (Beta)  Mixpanel (Beta)	 Industrial App Store  Quick Base  Dynamics 365 Customer Insights (Beta)  Entersoft Business Suite (Beta)

# Shape data into the format and structure you need

## Common data-shaping tasks

Remove rows

Rename/Remove tables and columns

Change a data type

Delete Relationships

Pivot columns and group rows

Modify a table name

Identify and fix errors

Merge or append queries to combine data from multiple queries into a single query

Extract week day, month name, hour from date/time values

Transform data to fit your needs using intuitive UI

- Select data for inclusion
- Cleanse data and remove errors
- Precisely tune the query step sequence: re-order, add, edit or delete steps as needed
- Modify data types to support specific calculation requirements

Very powerful for advanced scenarios such as Mashups

Run R scripts

[Shape and combine data](#)

# Data Connectivity Modes in Power BI Desktop

	Import	DirectQuery	Live/Exploration
Overview	<ul style="list-style-type: none"><li>ETL</li><li>Data download</li></ul>	<ul style="list-style-type: none"><li>Select specific tables</li><li>No data download</li><li>Queries triggered from Report visuals</li></ul>	<ul style="list-style-type: none"><li>Explore source objects from Report surface</li><li>No data download</li><li>Queries triggered from Report visuals</li></ul>
Supported Data Sources	<ul style="list-style-type: none"><li>All sources (&gt;80 sources)</li></ul>	<ul style="list-style-type: none"><li>SQL Server</li><li>Azure SQL Database</li><li>Azure SQL Data Warehouse</li><li>SAP HANA</li><li>Oracle</li><li>Teradata</li></ul>	<ul style="list-style-type: none"><li>SQL Server Analysis Services (Tabular &amp; Multidimensional)</li></ul>
Max # of data sources per report	<ul style="list-style-type: none"><li>Unlimited</li></ul>	<ul style="list-style-type: none"><li>One</li></ul>	One
Data Transformations	<ul style="list-style-type: none"><li>All transformations (100's)</li></ul>	<ul style="list-style-type: none"><li>Partial support (varies by data source)</li></ul>	None
Mashup Capabilities	<ul style="list-style-type: none"><li>Merge (Joins)</li><li>Append (Union)</li><li>Parameterized queries</li></ul>	<ul style="list-style-type: none"><li>Merge (Joins)</li><li>Append (Union)</li></ul>	None
Modeling Capabilities	<ul style="list-style-type: none"><li>Relationships</li><li>Calculated Columns &amp; Tables</li><li>Measures</li><li>Hierarchies</li></ul>	<ul style="list-style-type: none"><li>Calculated Columns</li><li>Measures</li><li>Change Column Types</li></ul>	None

With Power BI Desktop, you can connect to your data in three ways:

- Import
- DirectQuery
- LiveConnect

# User-driven innovation with continuous updates

## Reporting

- Bookmarking (preview)
- Selection pane and visual display controls
- Bookmark links for shapes and images (preview)
- Spotlight
- Scatter and bubble markers
- Increase the number of data points shown in scatter charts
- Drillthrough to another report page
- Explain the increase/decrease insights (preview)
- Ribbon chart
- Theming preview update—chart style controls
- Accessibility improvements: Accessible See data and keyboard shortcut helper dialog
- High density scatter chart sampling
- Cartesian gridline style control
- Visio visual (preview) Show values on rows for matrix
- Color scales on font colors for table and matrix
- Custom subtotal settings per level of matrix
- Line styles and legend options
- Scatter chart performance improvements
- New table and matrix visuals are now generally available
- Renaming fields in visuals
- Custom visuals store integration
- Relative date filters

- Responsive layout for visuals (preview)
- New waterfall chart option—breakdown
- Data bars for new table and matrix (preview)
- Markers on line and area charts
- Consume Power BI reports with keyboard navigation and screen reader support and create accessible reports
- Visuals font family setting
- Horizontal Image Slicer
- Shade area of the line
- Bing maps improvements
- Map themes
- Improved geo hierarchy experience
- High density line sampling
- Relative date slicer (preview)
- New table visual (preview)
- Combo chart data label enhancements
- More URL support in table and matrix
- Mailto links in textbox

## Analytics

- Quick measures for SSAS live connections
- Sales from new customers quick measure
- Cell-level formatting for multidimensional AS models
- What if parameters
- New scatter chart analytics features
- Symmetry shading
- Ratio line
- New quick measure: weighted average
- Quick measures from the community: Star rating and concatenated list of values
- Bidirectional cross filtering for DirectQuery is now generally available
- Report level measures for live connections to Analysis Services tabular models and Power BI service datasets
- 2 new quick measures (preview): Total for category and Rolling average
- Bin by count

## Data connectivity

- Vertica connector (beta)
- SAP BW connector: support for additional member properties
- Azure Consumption Insights connector
- Improvements to the Dynamics 365 for Financials connector
- Live connect to the Power BI service is generally available
- Google BigQuery connector (beta)
- Snowflake connector general availability
- Power BI service Live Connect to On-Premises and Push datasets
- Impala connector GA
- Amazon Redshift GA
- SAP BW connector—DQ support (beta)
- IBM Netezza connector (beta)
- New connector: Dynamics 365 for Customer Insights
- Combine files—ability to reference "First File" as example

## Other

- Two new transforms:
- Extract text before/after/between delimiters
- Unpivot only selected columns
- "Add Column From Examples" enhancements
- Power BI Desktop in the Windows Store
- Improved access to help content

<https://powerbi.microsoft.com/en-us/blog/category/features/>

# Storytelling and customization with bookmarks

Keep track of states in your exploration

Tell a story with your data guiding your data consumers

Create a custom navigation within a report

Dynamically switch between visuals to tell your story



# Built-in intelligence to empower everyone

Quick measures for advanced calculations

Out-of-the-box forecasting and through custom visuals

Grouping, binning, and clustering

Built in integration with R



# Streamlined for accessible advanced analytics

Keep track of states in your exploration



Tell a story with your data guiding your data consumers



Create a custom navigation within a report



What-if analysis

# Power BI Desktop in the Windows Store

Empowering everyone in the organization to explore their data

Monthly updates applied automatically

Support for non-admin installation

Administration tools powered by Windows



Overview



Power BI Desktop



# Power BI service

Integration with other services



Power BI Premium



Administration



Summary



# Power BI service

## Cloud-based SaaS solutions



Get started quickly



Secure, live connection to your data sources,  
on-premises and in the cloud



Auto insights and intuitive data exploration using  
natural language query



Pre-built dashboards and reports for popular SaaS  
solutions



Live, real-time dashboard updates



Deliver insights through other services such as  
SharePoint, PowerApps & Teams



Sharing and collaboration of dashboards, reports & datasets

# Get started quickly

Get started quickly with Power BI Pro trial & free download of Power BI Desktop

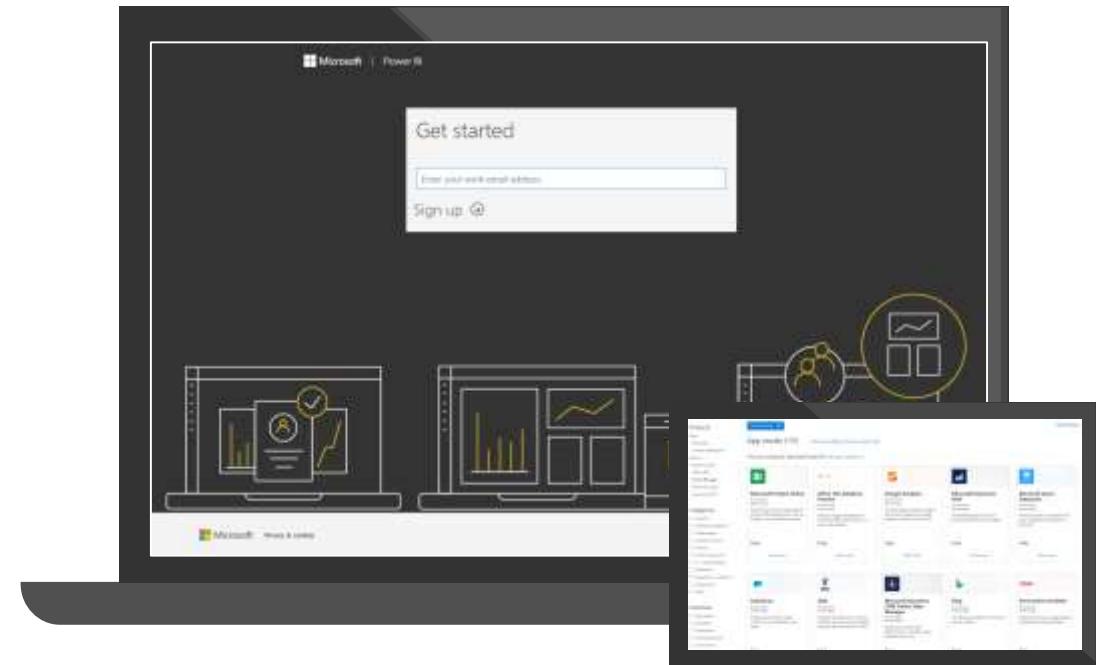
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Quickly provision end-to-end solutions for your business data with pre-built solution templates from Microsoft and our partners



---

Use Quick Insights on a new data set – Power BI will analyze the data and deliver new insights



# Secure, live connection to your data sources on-premises and in the cloud

Keep your data anywhere

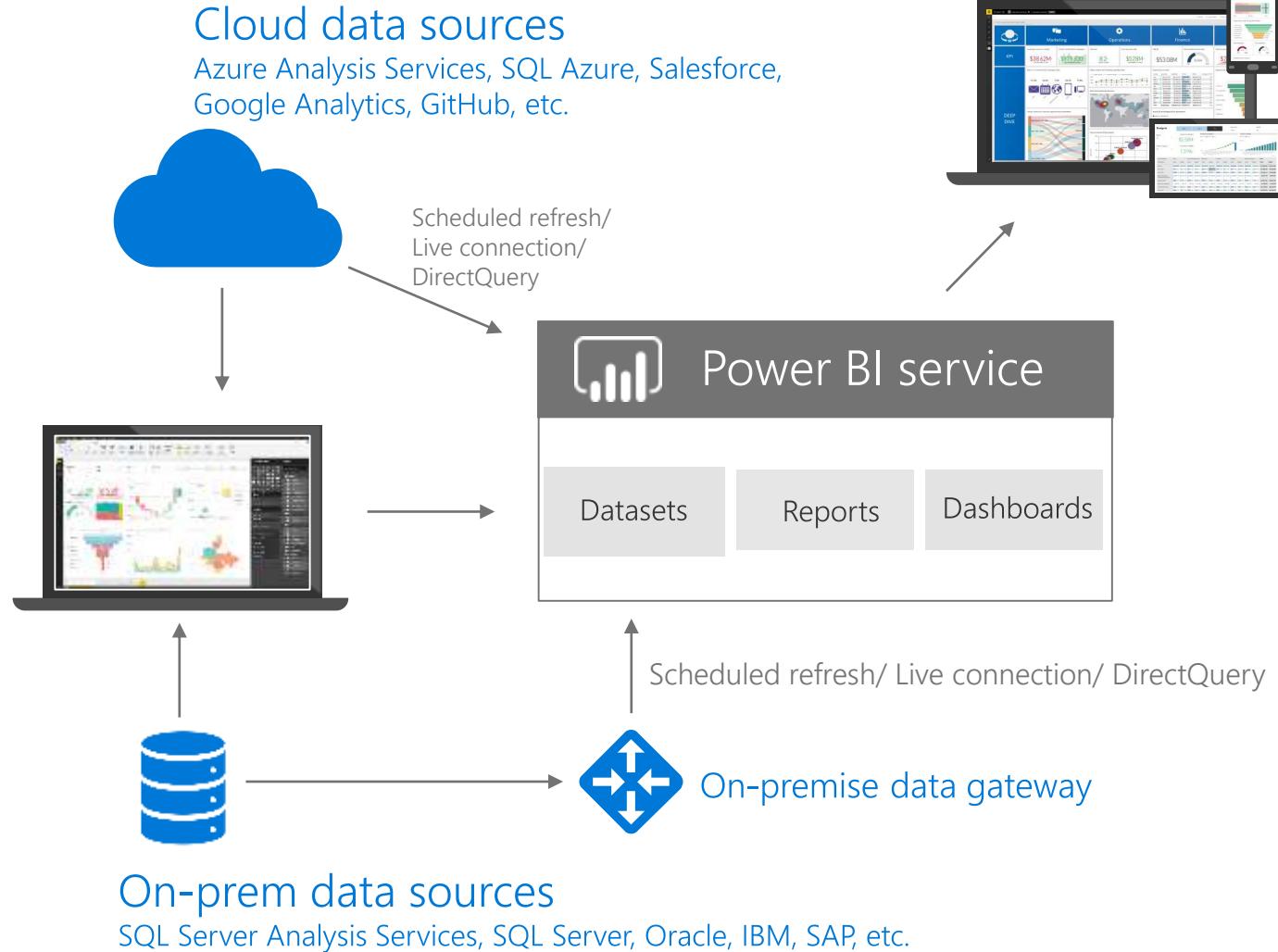
Secure live connections to your data

Secure through Azure Service Bus

Keep your data fresh

Access and refresh the data via

- Direct Query to cloud and on-premises data sources
- Live connectivity to Analysis Services
- Import, with scheduled refresh
- REST APIs to stream data



# Centralized data access with on-Premises Data Gateway



IT can centrally manage access control to data sources



BI governance: IT can monitor and audit usage



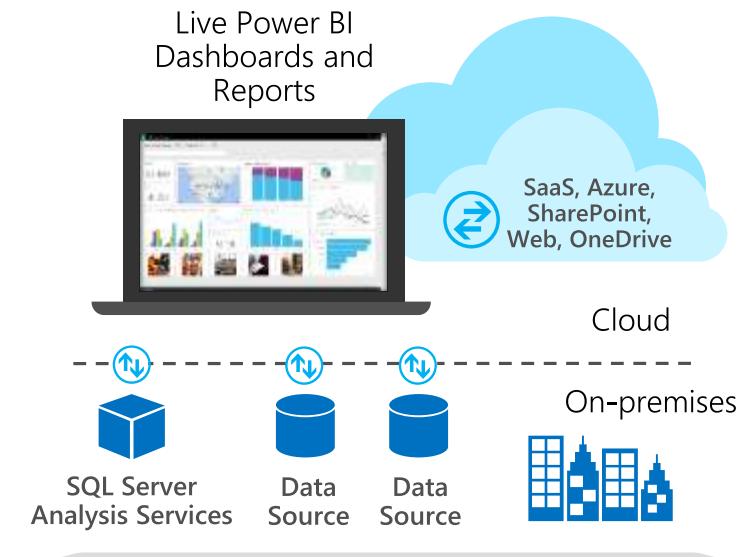
Supports live, interactive query to on-premises data sources (e.g. SQL Server) and scheduled refresh



One gateway for multiple cloud services and experiences



Supported services: Power BI, PowerApps, Microsoft Flow, Azure Logic Apps



# Create dashboards for what matters most

Build dashboards to monitor your most important business metrics

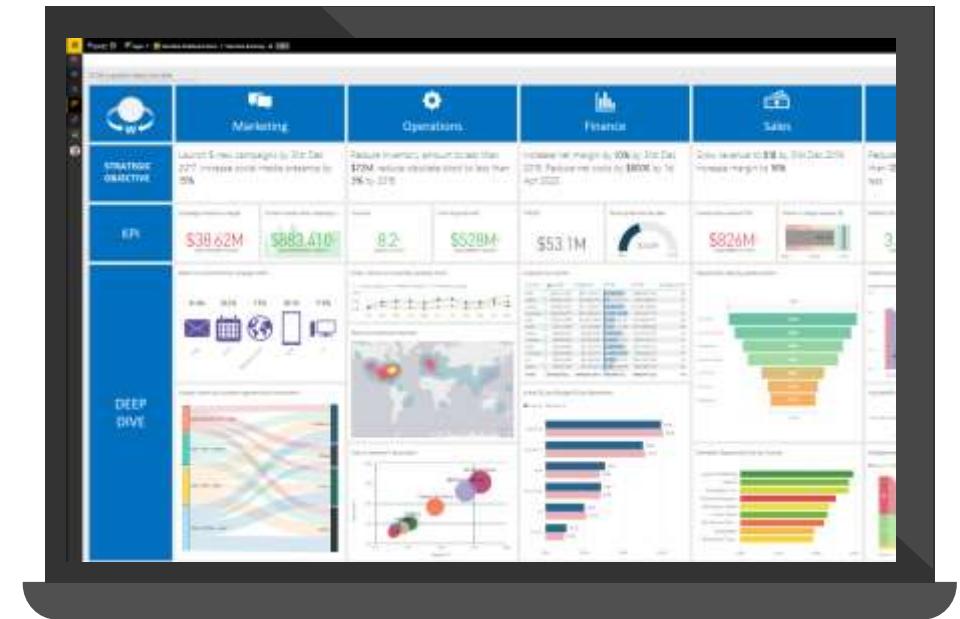
Combine on-premises and cloud data in a single pane of glass

Data is visualized as tiles that you can resize, move, rename, pin, delete, or add a hyperlink

Choose different views (Full Screen, Fit to Screen, In-Focus)

Set your featured and favorite dashboards for what you visit the most

Customize with images, videos, web code, text boxes and color schemes



# Automatically generate data insights

Automatically generate visualizations based on your data

---

Build a dashboard quickly

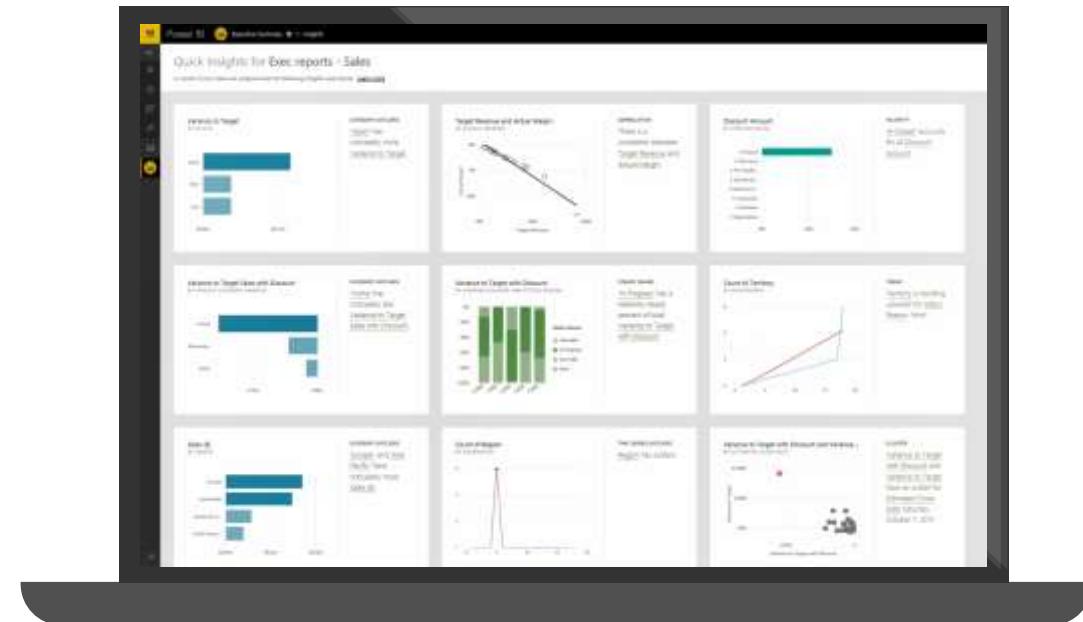
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Find insight in your data you may have missed

---

Built on a growing set of advanced algorithms

<https://docs.microsoft.com/en-us/power-bi/service-insight-types>



Quick insights

# Ask questions of your data – the way you would ask a person

---

Type questions in plain language – Power BI Q&A will provide the answers

---

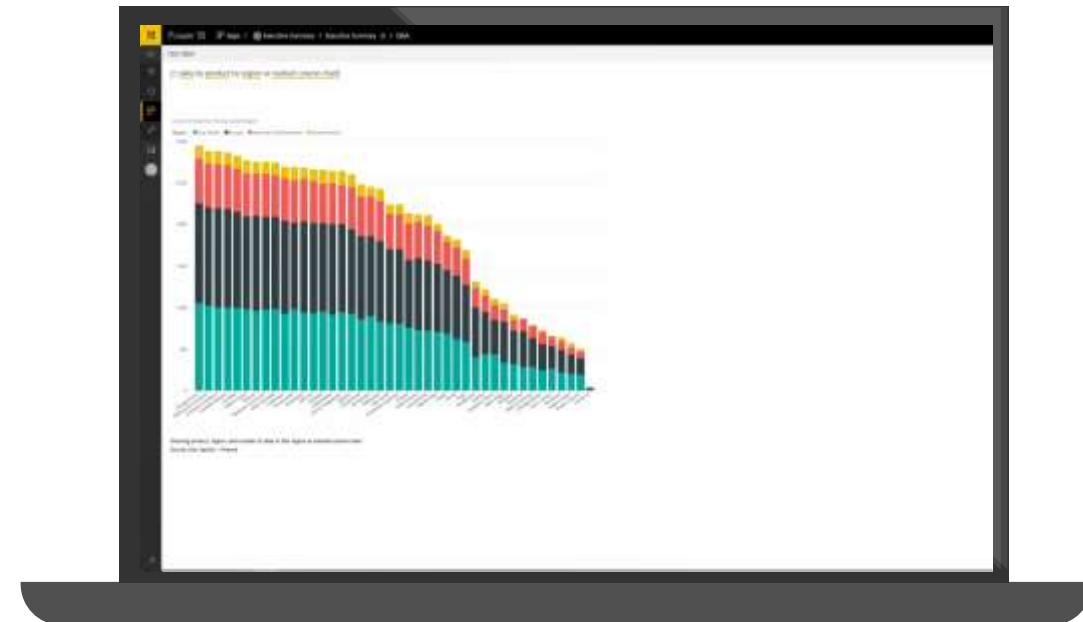
Q&A will provide suggested questions, terms and visuals for your dataset

---

Q&A intelligently filters, sorts, aggregates, groups, and displays data based on the question

---

Pin the answers to your dashboard



# Built-in intelligence to empower everyone

Point and click to explain the increase/decrease

---

Data transformations "by example"

---

Relationship and data type detection

---

Built in integration with R



# Share your work and collaborate with others

## Share a dashboard with colleagues and others

- Colleagues in and out of your organization can interact and view dashboards and associated reports (read-only)
  - Control re-sharing of dashboard
- 

## Collaborate in a group workspace

- Everyone in group can view and edit dashboards and reports
  - Members can be restricted to view only
- 

## Create an app and publish it to your organization

- Any user with access to app can view and create personalized copies of dashboard, reports
  - Publish to App library to share with entire organization or groups
- 

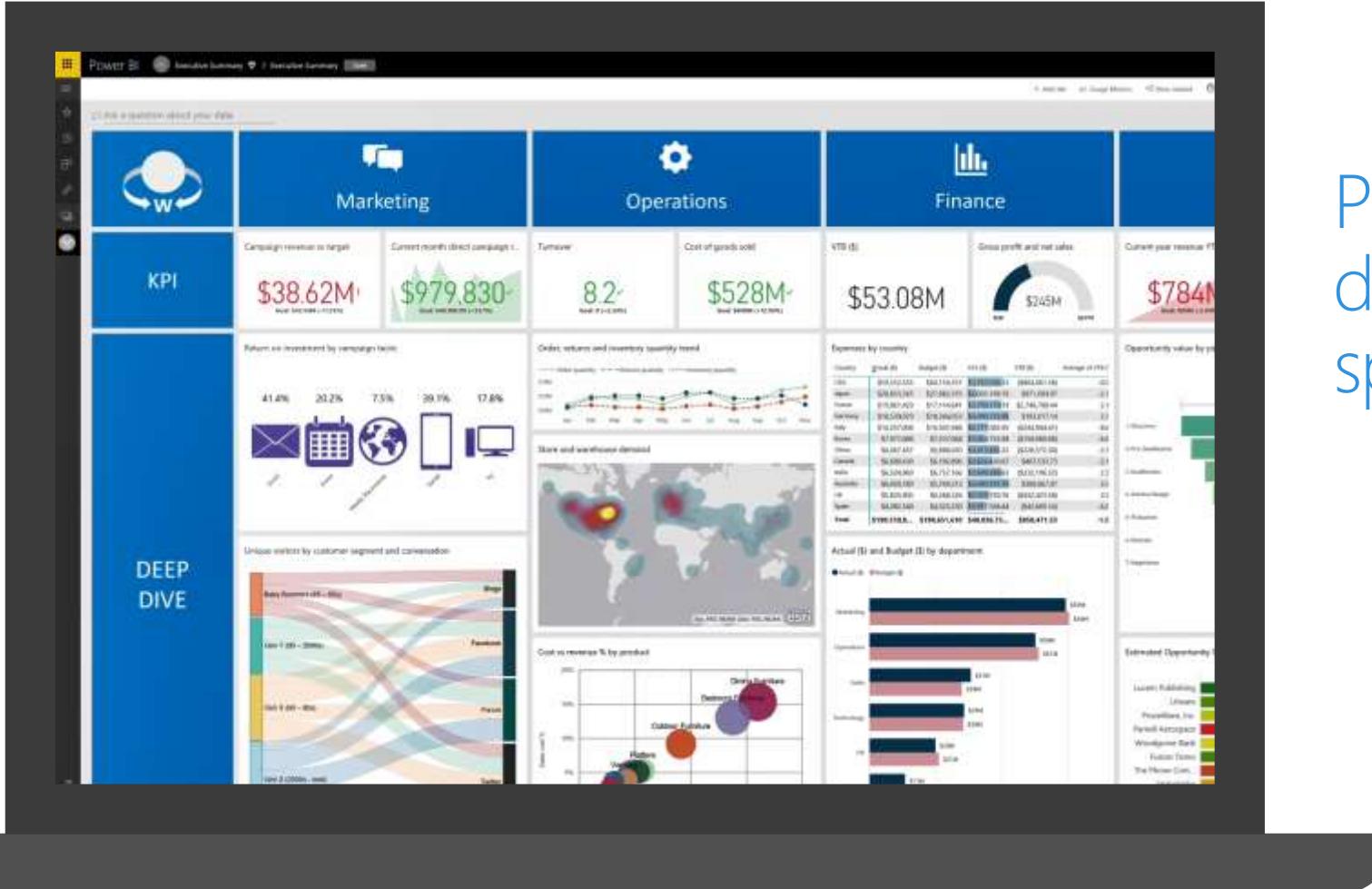
## Embedded analytics

- Embed interactive visuals into company websites & apps



# Power BI Apps

## Distribute to all users



Package reports,  
dashboards and more to  
specific groups and users

# Stay connected from any device



Access Power BI dashboards and reports with native mobile apps for Windows, iOS and Android



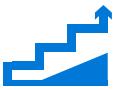
Easy sign-in step with support for Single Sign-on (SSO)



Orientation-aware and location aware apps



Annotate visualization and share snapshot with others



Configure data-driven alerts for your critical KPIs



Generate and scan QR codes, or scan bar codes for report filtering



Open and interact with Reporting Services mobile reports and KPIs



Windows



iOS



Android

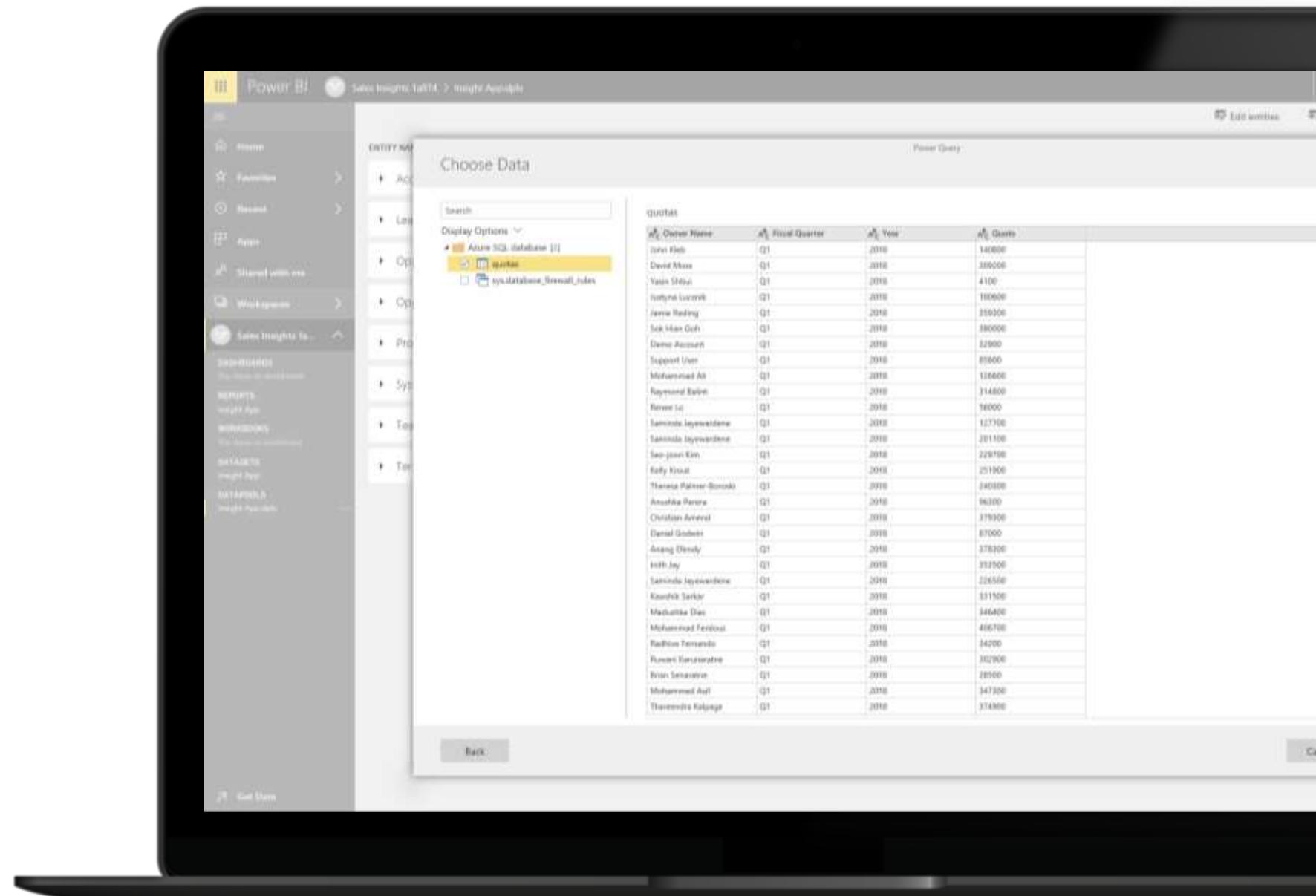
# What's new

# Dataflows - Self-service prep for big data

Prep your data using  
the familiar Power  
Query experience

Get started quickly with  
a common data model

Unify access to data  
between Power BI and  
Azure Data Lake Storage



# Data + AI professionals can use the full power of the Azure Data Platform

Reports & dashboards

Datasets

Dataflows



Azure Data Factory



Azure Databricks



Azure SQL DW



Azure ML

Azure Data Lake Storage Gen2

CDM folder

CDM folder

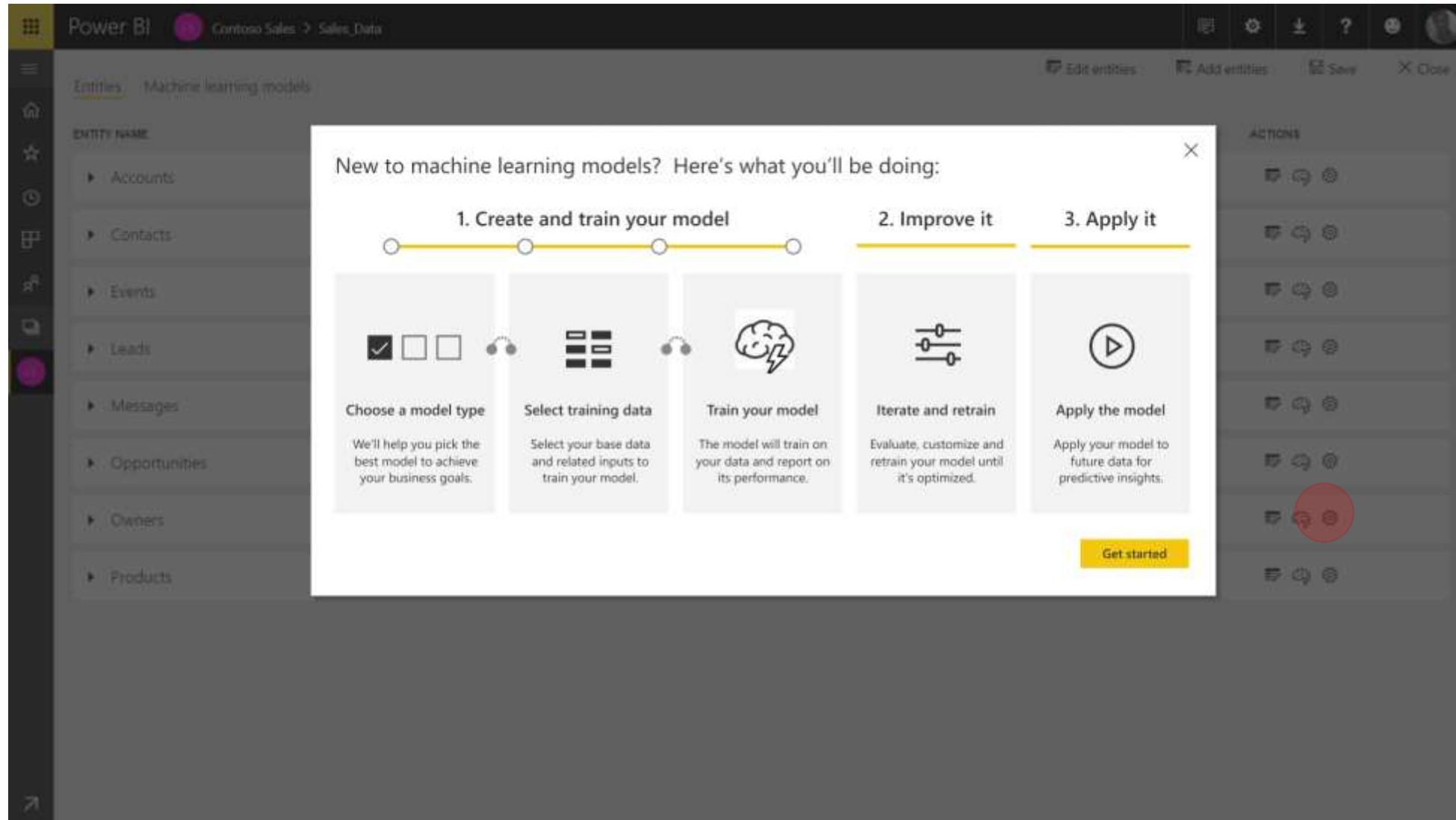
CDM folder

Business analysts

Low/no code

Data scientists  
Data engineers  
Low to high code

# Automated Machine Learning



Power BI | Contoso Sales > Sales\_Data

Entities: Machine learning models

ENTITY NAME:

- Accounts
- Contacts
- Events
- Leads
- Messages
- Opportunities
- Owners
- Products

Actions:

- Edit entities
- Add entities
- Save
- Close

New to machine learning models? Here's what you'll be doing:

1. Create and train your model
2. Improve it
3. Apply it

Choose a model type

Select training data

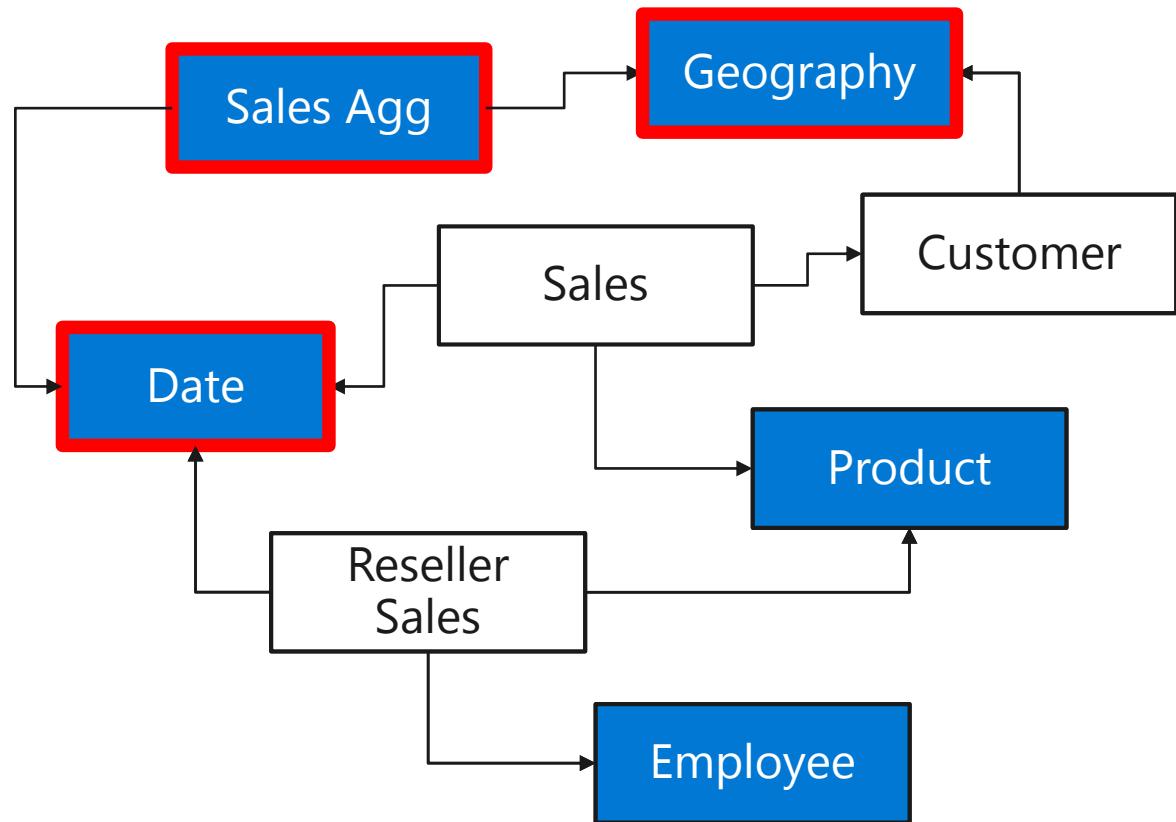
Train your model

Iterate and retrain

Apply the model

Get started

# Aggregations



```
SummarizeColumns(  
    Date[Year],  
    Geography[City],  
    "Sales", Sum(Sales[Amount])  
)
```

**Hits in-memory cache**

# Integration with other services

Overview



Power BI Desktop



Power BI service



Power BI Premium



Administration



Summary



# Integration with Power BI

Deliver insights through other services

Collaborate and share insights with teams in your organization using existing services

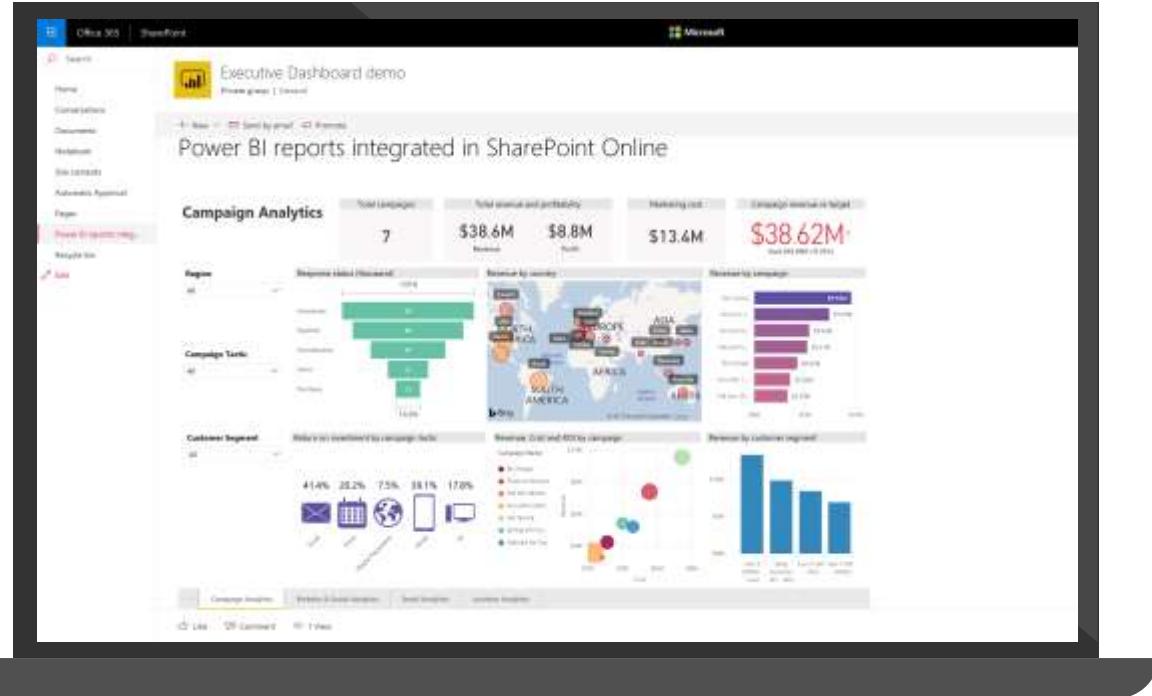
---

Fully interactive reports integrated into your service



# SharePoint integration

Fully interactive reports integrated into your SharePoint site



Centralize your data, simplify it with queries you create, and share it in highly visual reports.



# Excel & Power BI

Easily aggregate objects from multiple Excel files on the same dashboard in Power BI



## Analyze in Excel

Use Excel to view and interact with a dataset you have in Power BI

## Import Excel data into Power BI

Connect to the data in your workbook so you can create Power BI report and dashboards

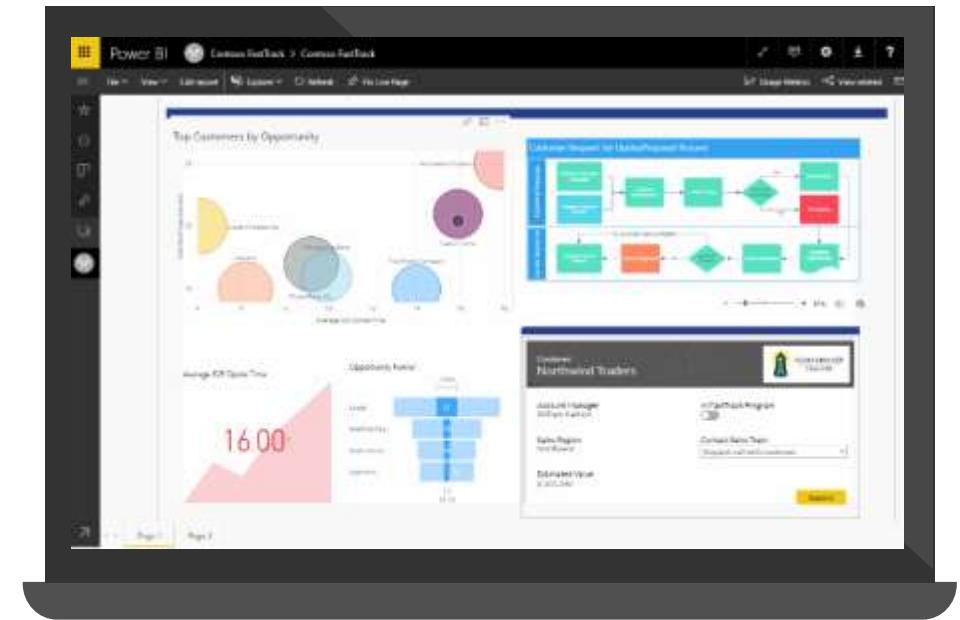
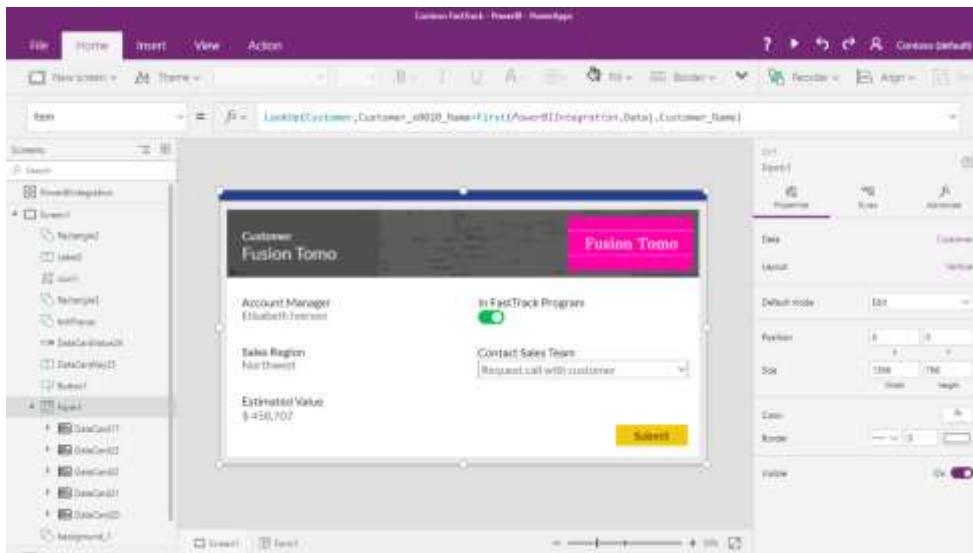
## Upload your Excel file to Power BI

Bring your Excel file into Power BI to view and interact with it just as you would in Excel Online. Pin ranges to Dashboards

# PowerApps integration

Take actions within Power BI

Add PowerApps to Power BI



PowerApps Reference links

[PowerApps](#)

[Blog](#)

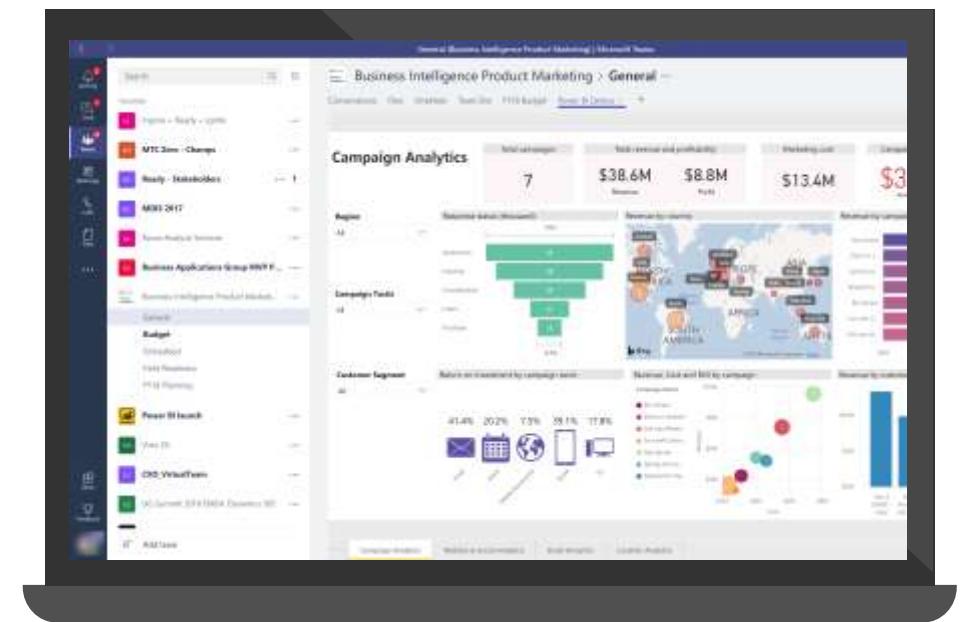
[Documentation](#)

[Guided Learning](#)

# Microsoft Teams & Power BI

Interact with Microsoft Teams using Power BI

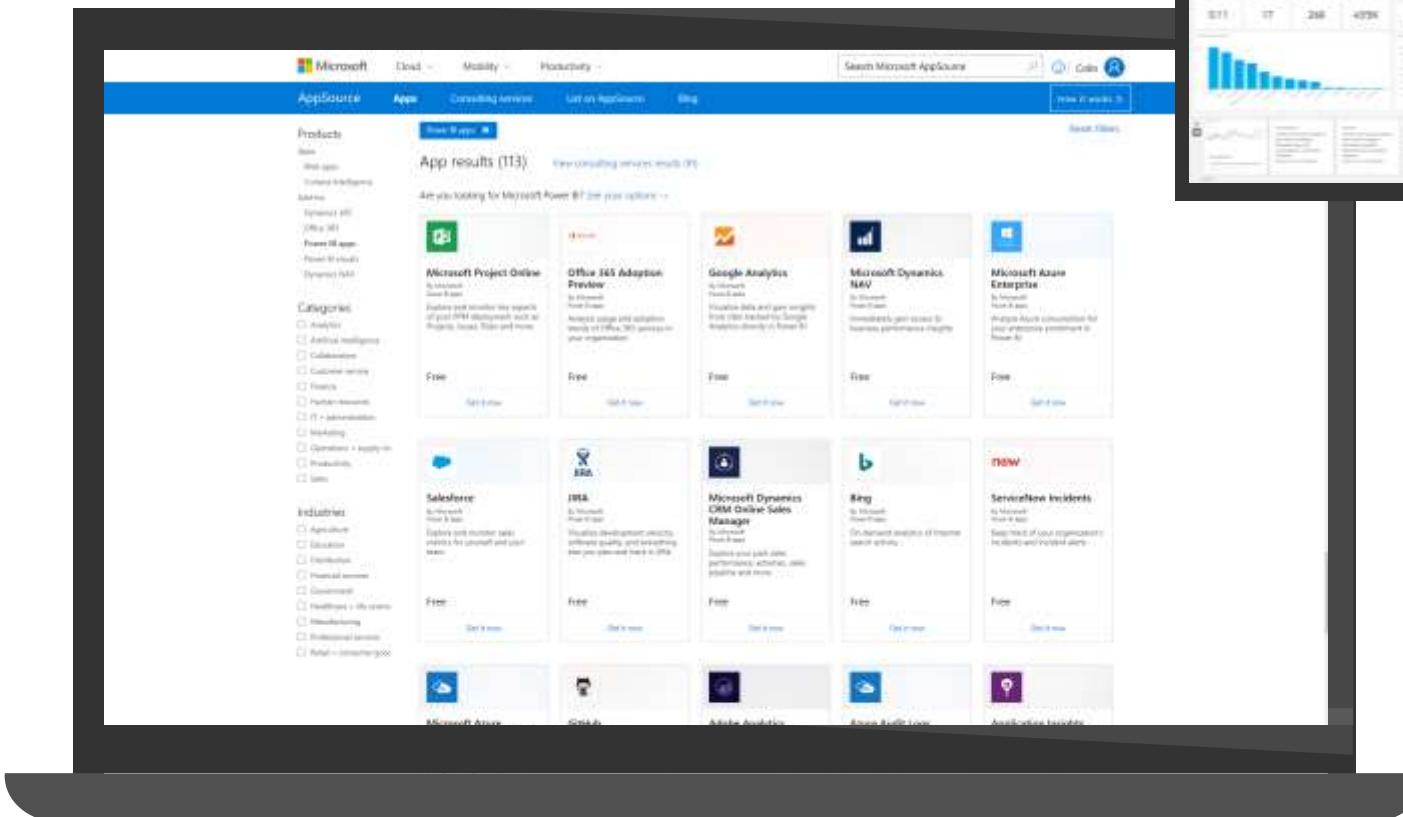
Improve collaboration and social analytics  
with fully interactive reports in Teams



For more info refer to:

<https://powerbi.microsoft.com/en-us/blog/power-bi-teams-up-with-microsoft-teams/>

# Accelerate deployment with Solution Templates and Partner solutions



Address common BI needs with solution templates that incorporate technical and business best practices

Set up a template in minutes, then focus on making it right for you

Easily find a partner who can customize Power BI to meet your unique needs

# Power BI Premium

Overview



Power BI Desktop



Power BI service



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Summary



# Power BI Premium

## Dedicated resources in the cloud



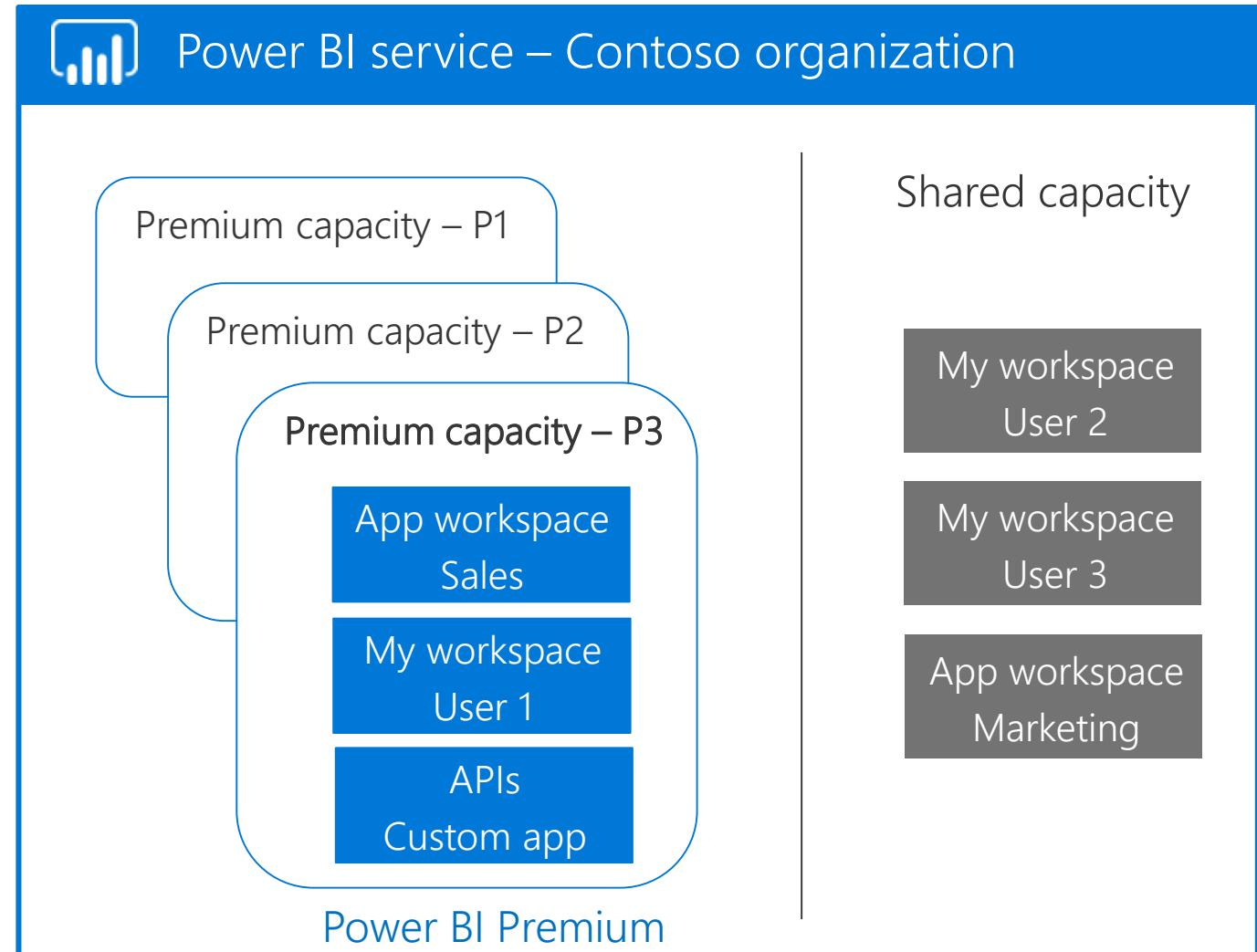
Greater scale and performance



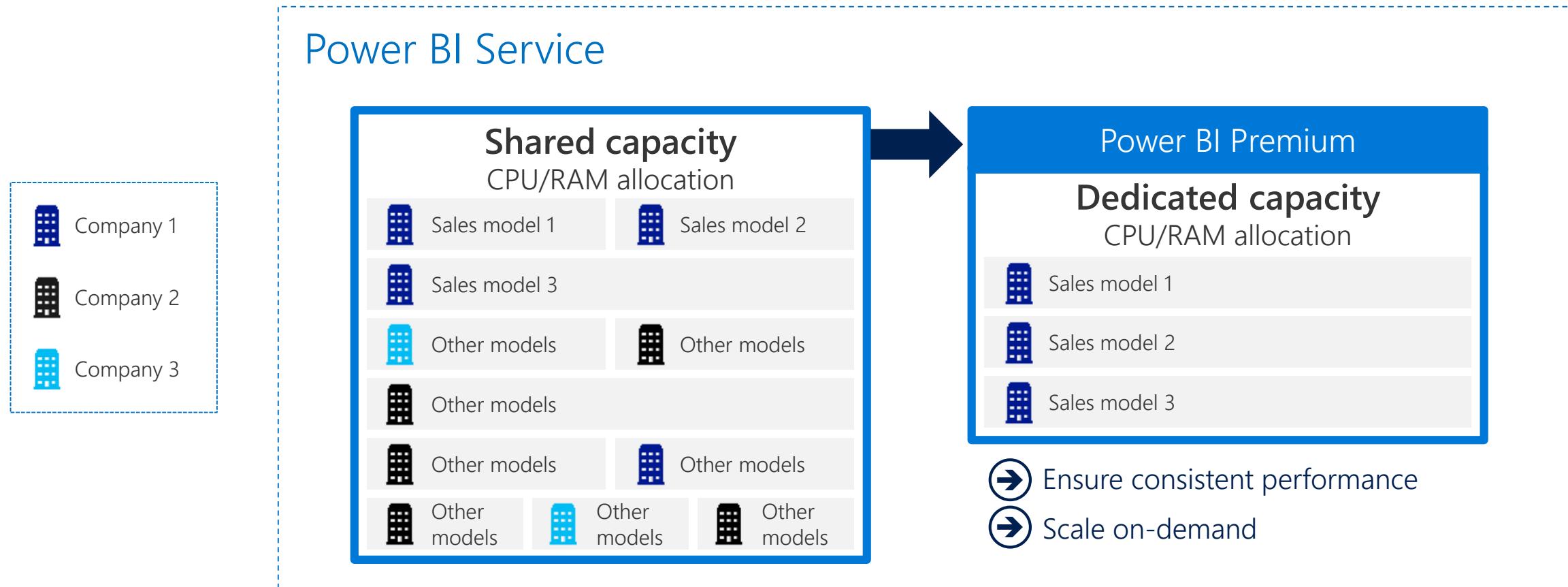
Flexibility to license by capacity



Extending on-premises capabilities



# Assign workspaces to your dedicated capacity



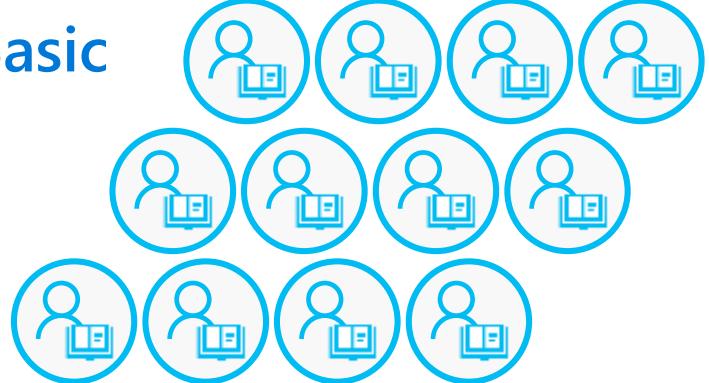
Models run on distributed hardware  
servicing multiple tenants

# Distribute content to all users

Pro



Basic



Self service BI  
Author & publish

Power BI Service

Power BI Premium

**Dedicated capacity**  
V-cores/RAM allocation

workspaces



Dashboards



Reports

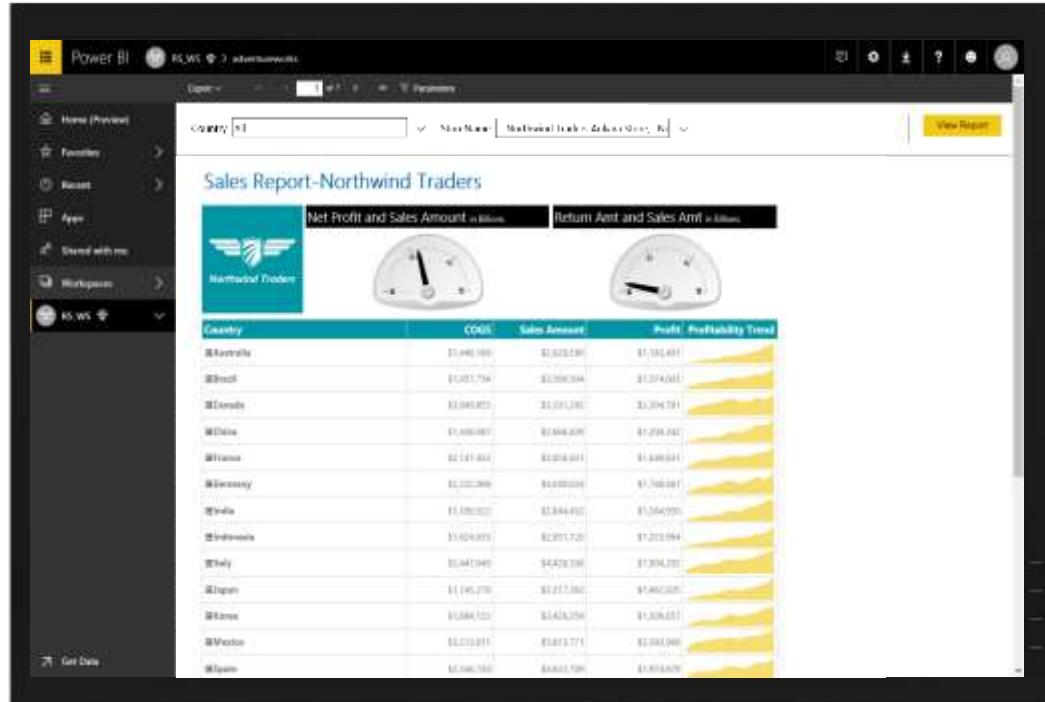


Datasets

View reports/dashboards  
Distributed via Power  
BI Apps

# Pixel perfect paginated reports in Power BI

[Publish SQL Server Reporting Services \(SSRS\)](#)  
reports to Power BI



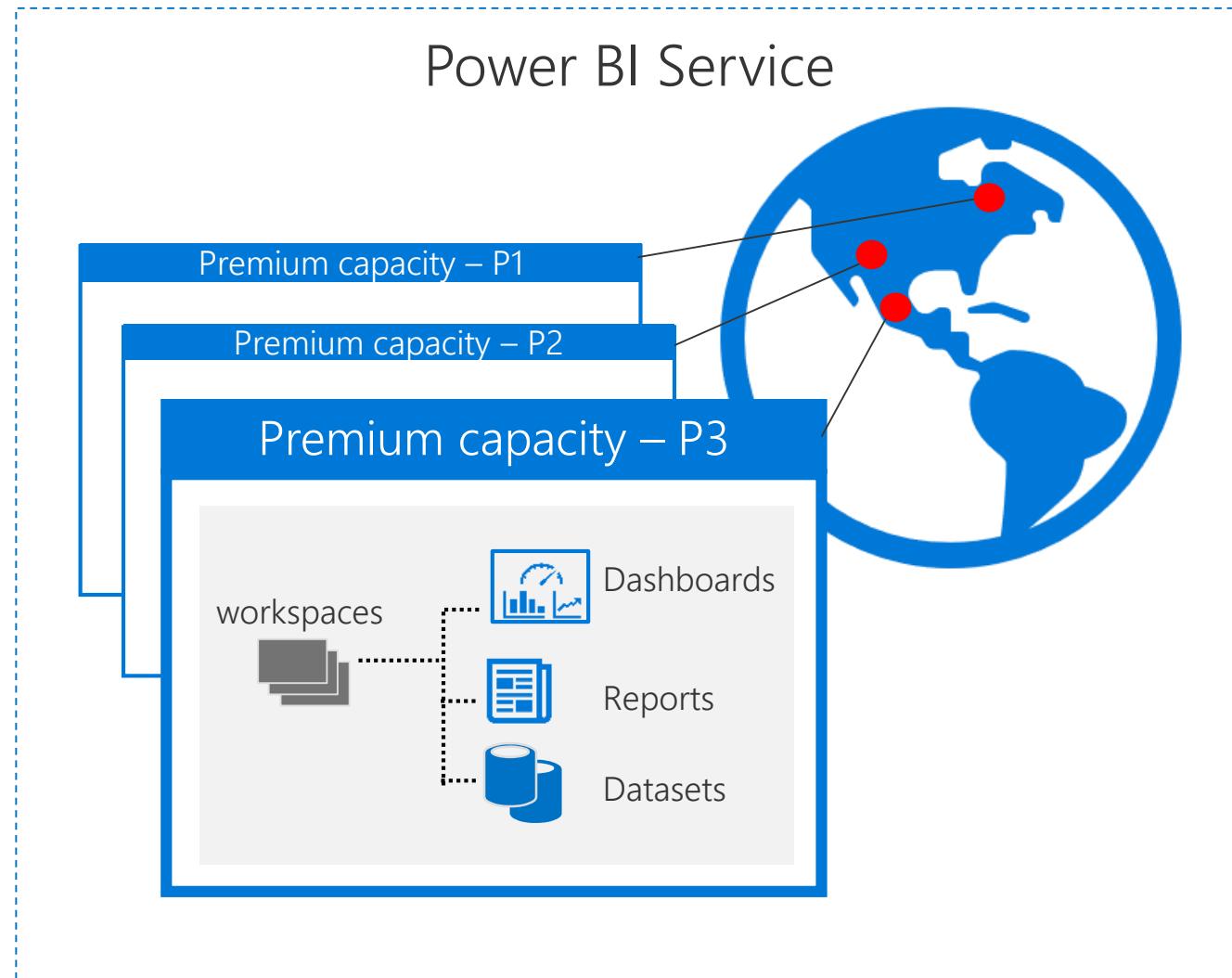
# Multi-Geo



Geo location to support compliance



Increase performance with queries  
nearest to your data



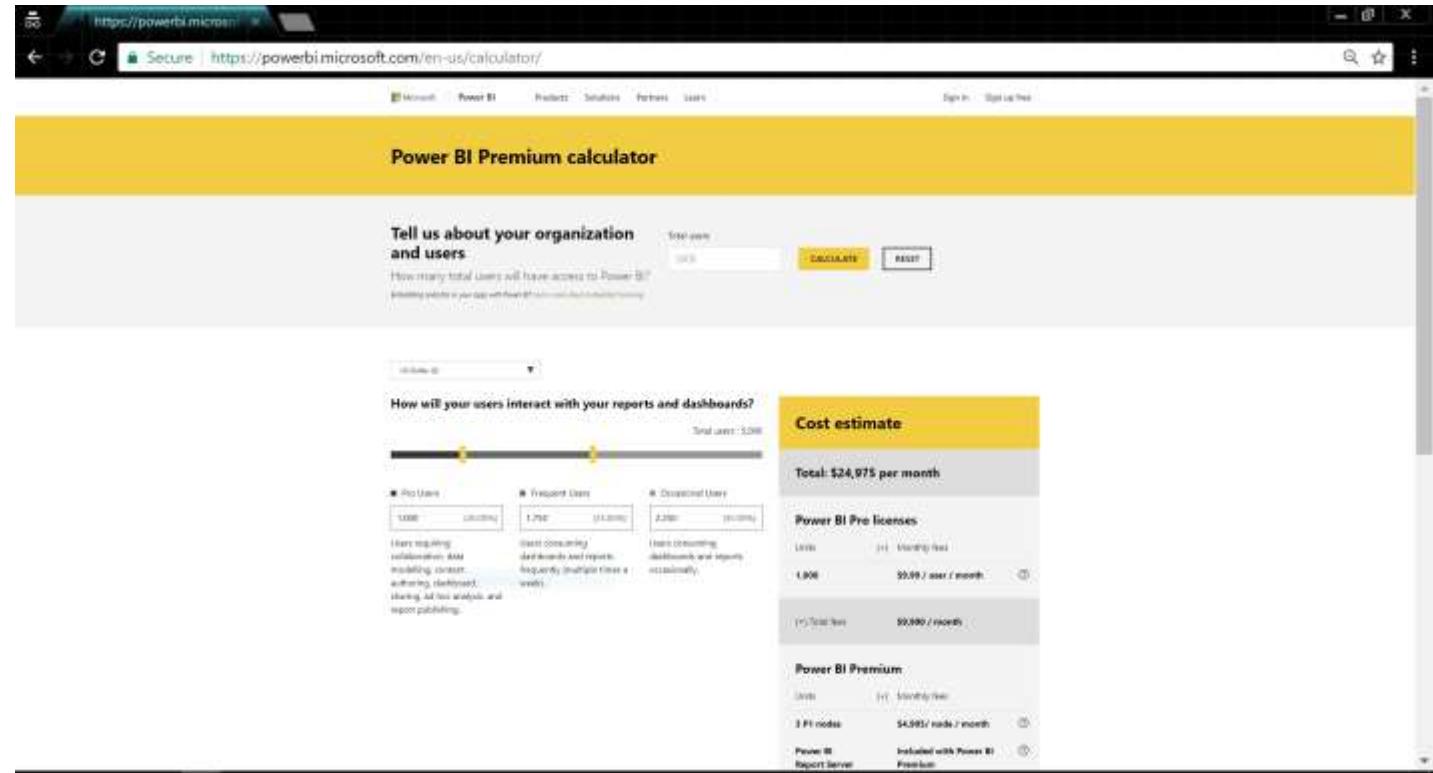
# Capacity sizing guidance

1

Use the Power BI Premium calculator\*

2

See the [Premium capacity planning and deployment whitepaper](#) for more



\*The Premium calculator is based on a P1 node. V-core pooling is available for other node configurations. See [this](#) for more on v-core pooling.

# Additional Resources

Power BI Premium click through demo

<https://aka.ms/pbipremclickthru>

---

Power BI Premium whitepaper

<https://aka.ms/pbipremiumwhitepaper>

---

Power BI Premium calculator

<https://powerbi.microsoft.com/en-us/calculator/>

---

Documentation

<https://docs.microsoft.com/en-us/power-bi/service-premium>

---

Power BI Premium support for large datasets

<https://powerbi.microsoft.com/en-us/blog/announcing-power-bi-premium-support-for-larger-datasets/>

Overview



Power BI Desktop



Power BI service



Integration with other services



Power BI Premium



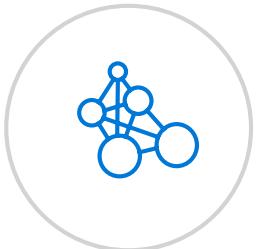
# Administration



Summary



# Power BI: built for the enterprise



## Comprehensive BI solution

Model, analyze, author, and distribute business insights with one product

Works with Microsoft and third-party data services and technologies



## Easy to deploy and manage

Deploy in minutes and distribute BI content with a few clicks

Support DevOps practices and IT processes



## Unique global scale

Flexibility to deploy your BI solution where you reside with global presence

Scale your solution to your entire organization and external partners

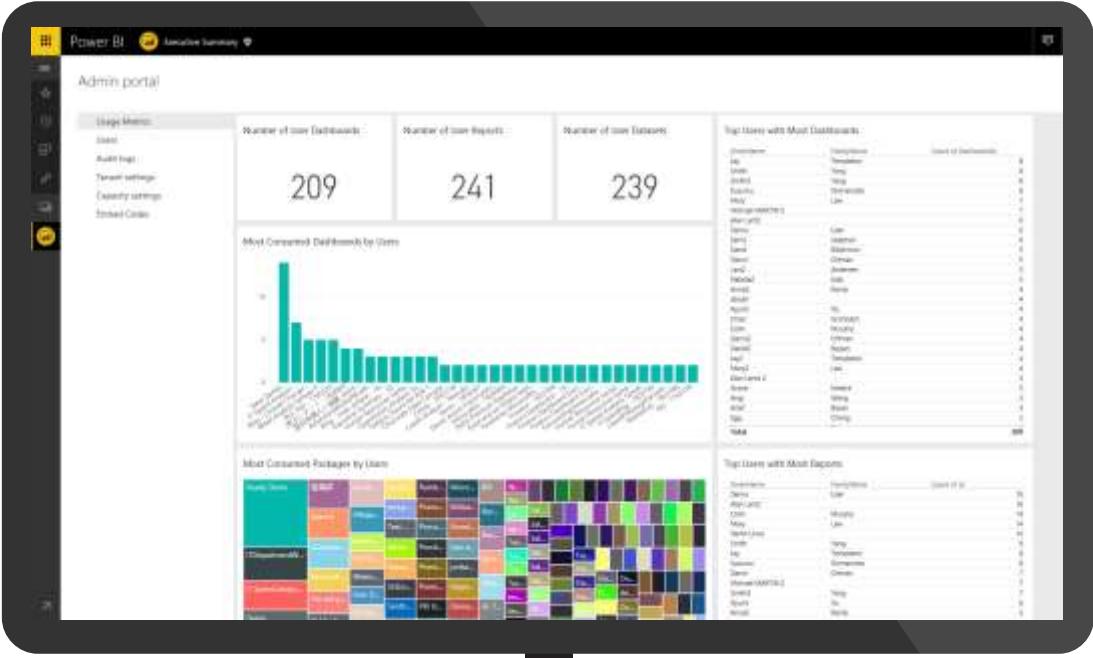


## Security, governance, and compliance

Rely on a BI platform that complies with stringent industry standards and certifications

Keep data secure and control how data is accessed and used

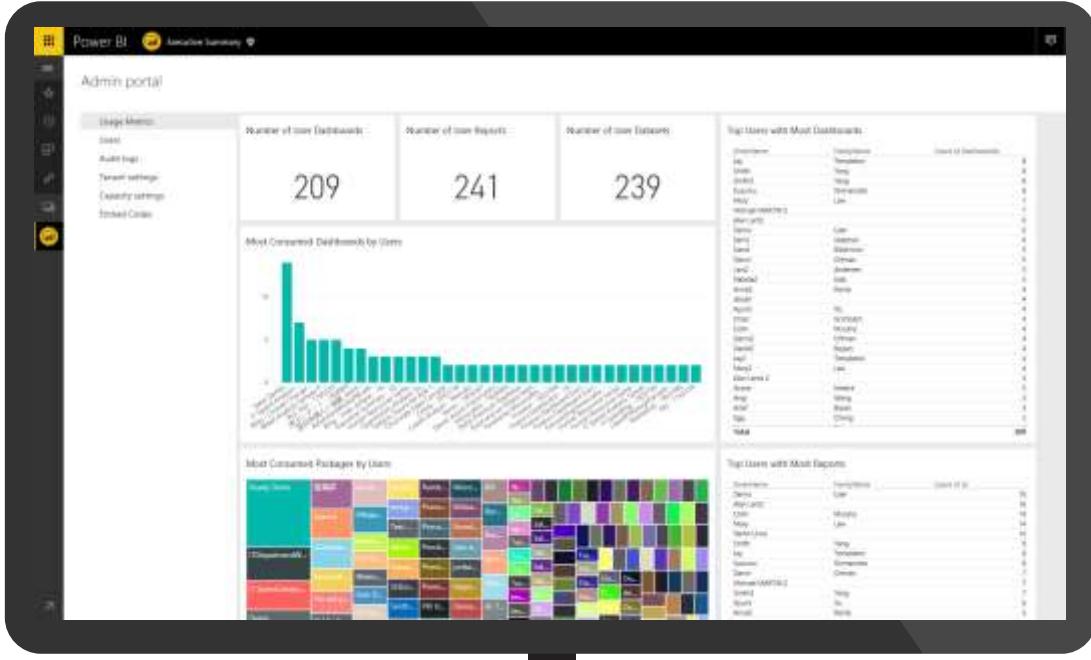
# Power BI Admin portal



The admin portal includes items such as usage metrics, access to the Office 365 admin center, tenant management and settings.

The admin portal is accessible to all users who are Global Admins in Office 365 or have been assigned the Power BI service administrator role.

# Power BI Admin Portal | Usage Metrics

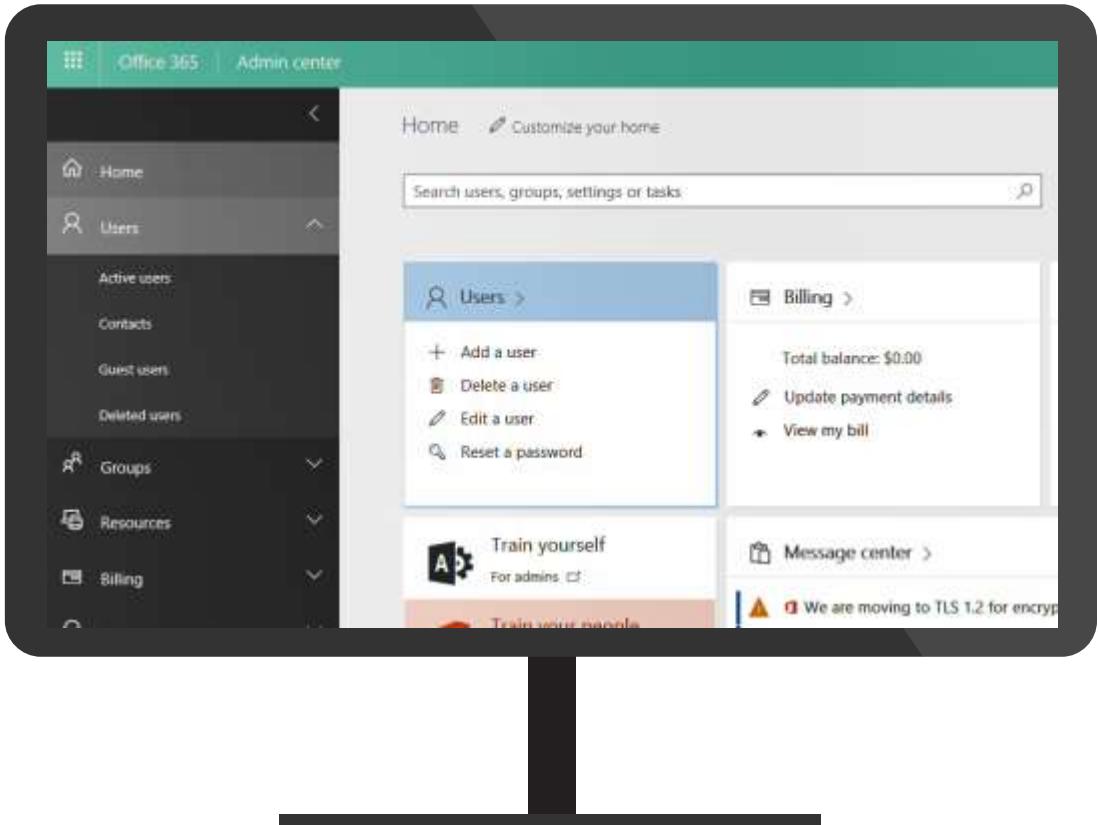


Distinct count of all dashboards, reports, and datasets in the user workspace

Most consumed dashboard by number of users who can access it.

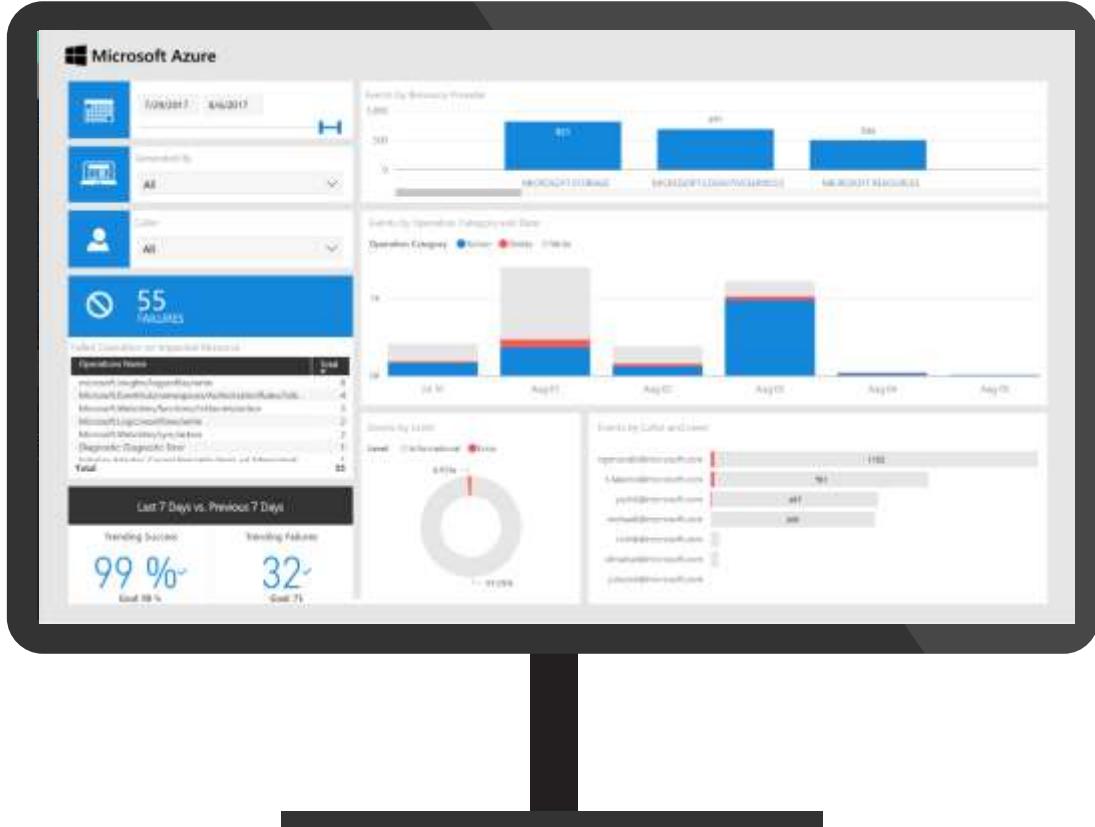
The most popular content users connected to. This would be anything the users could reach through the Get Data process, so SaaS content packs, Organizational content packs, files or databases

# Users



User management, for Power BI, is done in the Office 365 admin center, so this section allows you to quickly reach the area to manage users, admins, and groups within Office 365.

# Audit logs



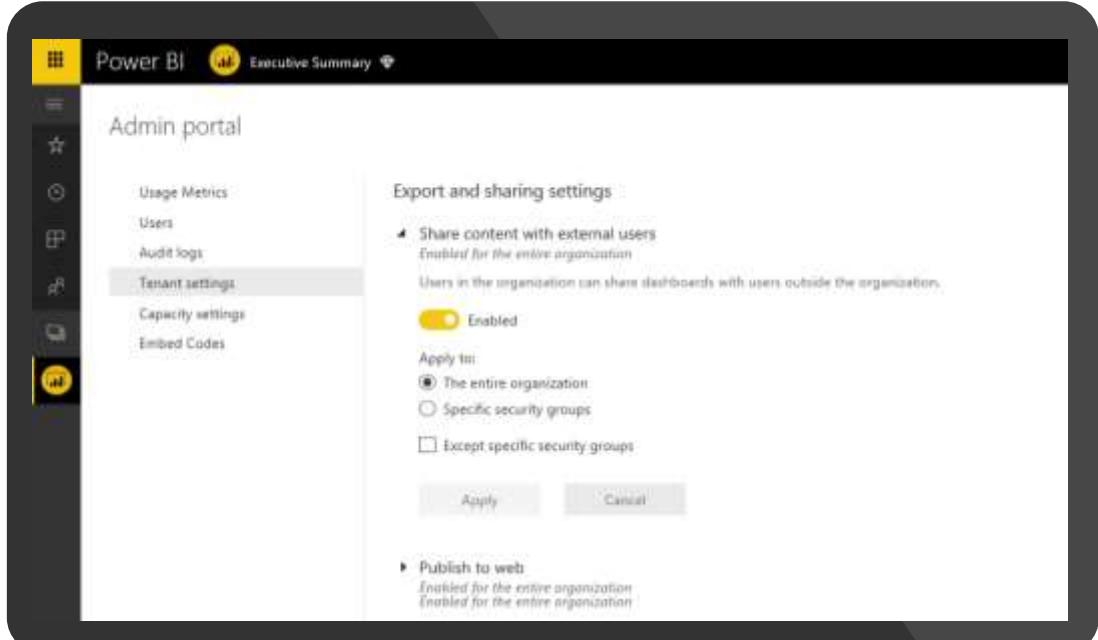
The logs are located within the Office 365 Security & Compliance center.

This section allows you to quickly access that area within Office 365.

## Log analytics app from AppSource

Reference docs for more info: <https://docs.microsoft.com/en-us/power-bi/service-admin-auditing>

# Tenant settings

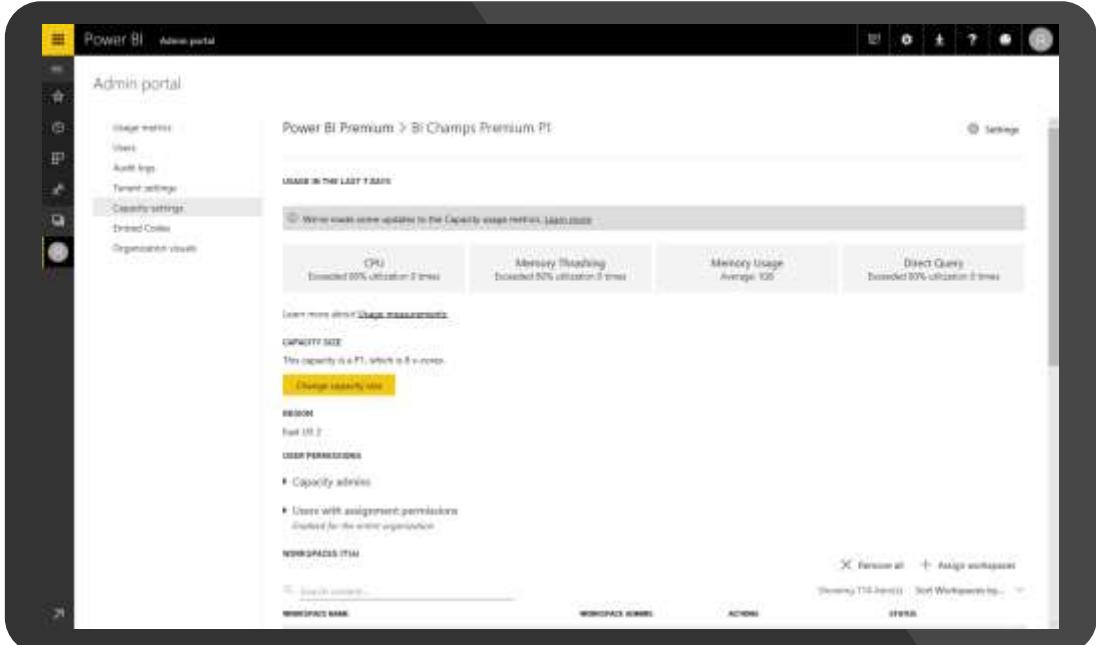


Tenant settings give you granular control over what features are made available to your organization

## Settings:

- Share content with external users
- Publish to web
- Export data
- Export reports as PowerPoint presentations
- Print dashboards and reports
- Publish content packs and apps to the entire organization
- Create template organization content packs and apps
- Ask questions about data using Cortana
- Use Analysis in Excel with on-premises datasets
- Use ArcGIS Maps for Power BI
- User global search for Power BI
- Integrate with and share R visuals
- Create audit logs for internal activity auditing and compliance
- Usage metrics for content creators
- Per-user data in usage metrics for content creators
- Data classification for dashboards
- Embed in apps

# Capacity settings



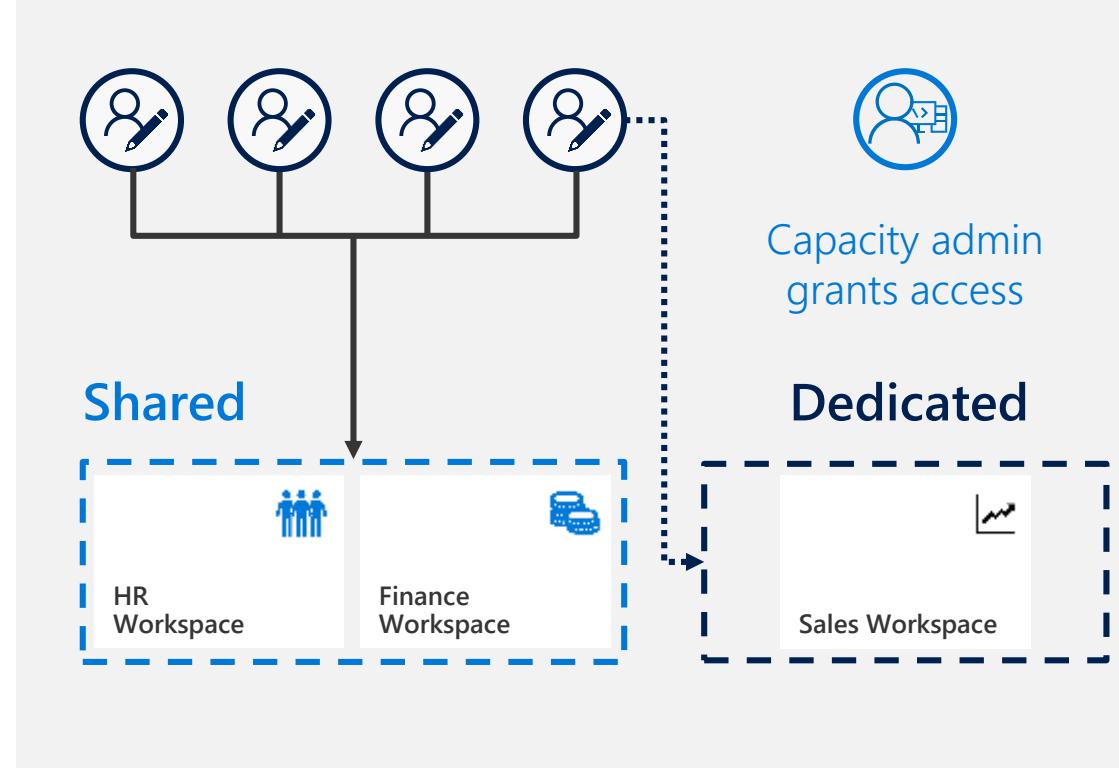
The Premium settings tab allows you to manage any Power BI Premium and Power BI Embedded capacity that has been purchased for your organization.

All users within your organization will see the Premium settings tab, but will only see contents within it, if they are assigned as either **Capacity admin** or a user that has assignment permissions.

# IT capabilities

## Whitelisting

Capacity admin can allow specific users to use capacity when needed.



## Full auditing capabilities

Office 365 admin can access audit logs that capture information about Premium capacities.



# Managing Power BI Premium Content

## Permissions



Two levels of assignment permissions

## Management



Work with a consistent management experience

## Workspaces



Easily assign workspaces

## Capacity

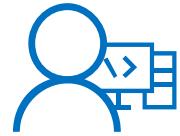


Move content from shared to dedicated capacity

# Permissions

## Two levels of assignment permissions

### Capacity admins



- Add capacity
- Assign admins
- Granting workspace permissions
- Bulk assign workspaces to capacity
- Remove workspaces from capacity
- Monitor capacity usage

### Power BI Pro user with assignment permissions



- Assign workspaces to capacity
- Grant other Pro users access to their capacity workspace

# Management

Work with a consistent management experience



Capacity admin



Pro user with assignment permissions

The screenshot shows the Power BI Admin portal with the 'Capacity settings' page selected. The main content area displays usage metrics for the last 7 days, including CPU, Memory Thrashing, Memory Usage, and Direct Query. It also shows the capacity size (8 v-cores) and region (East US 2). The 'USER PERMISSIONS' section lists 'Capacity admins' and 'Users with assignment permissions'. The 'WORKSPACES (715)' section shows a table with columns for WORKSPACE NAME, WORKSPACE ADMINS, ACTIONS, and STATUS. A search bar and a 'Remove all' button are also present.

All administrative actions for Power BI Premium in one place – the Power BI admin portal

Manage the capacity owner list

# Workspaces

## Assign workspaces to dedicated capacity



Capacity admin



Pro user with assignment permissions

The screenshot shows the Power BI Admin portal interface. On the left, the navigation menu includes 'Usage metrics', 'Users', 'Audit log', 'Tenant settings', **Capacity settings** (which is selected), 'Embed Codes', and 'Organization health'. The main content area displays 'Power BI Premium > BI Champs Premium P1' usage metrics for the last 7 days, including CPU and Memory Threshing. Below this, sections for 'Capacity size', 'Region', and 'User permissions' are shown. A 'WORKSPACES (1111)' section lists workspaces with a search bar. An 'Assign workspaces' dialog box is overlaid on the page, titled 'Assign workspaces' for 'BI Champs Premium P1'. It contains the following options:

- Apply to:**
  - Workspaces by users
  - Specific workspaces
  - The entire organization's workspaces
- Assigning the entire organization's workspaces to dedicated capacity gives all current and future users the permission to manage individual workspaces to this capacity. This dedicated capacity will become the organization's default capacity. [Learn more](#)

At the bottom of the dialog are 'Apply' and 'Cancel' buttons.

Migrate the entire organization workspaces

Migrate specific users' workspaces to capacity

Migrate specific workspaces to capacity

# Capacity

Move content from shared to dedicated capacity



Capacity admin



Pro user with assignment permissions

The screenshot shows the Power BI workspace management interface. On the left, there's a sidebar with 'Favorites', 'Recent', 'Apps', 'Shared with me', and 'Workspaces'. The 'Workspaces' section is expanded, showing a list of workspaces: 'Additional Finance Reports', 'Exec reports - Finance', 'Exec reports - HR', 'Exec reports - IT', 'Exec reports - Marketing', 'Exec reports - Operations', 'Exec reports - Sales', 'Logos and Images', 'RFQ Process Flow', and 'Sales Reports'. The 'Executive Summary' workspace is currently selected. A blue line highlights the 'Edit workspace' dialog box that is overlaid on the workspace list. The dialog box has sections for 'Privacy' (set to 'Private - Only approved members can see what's inside' and 'Members can only view Power BI content'), 'Workspace members' (with an 'Add' button and a list of members including 'admin@contoso.com' with roles 'Admin', 'Admin', 'Member', 'Admin', and 'Admin'), and 'Advanced' settings (with 'Dedicated capacity' turned 'On' and a dropdown for 'Choose an available dedicated capacity for this workspace' set to 'BI Capacity Premium P1'). At the bottom of the dialog are 'Delete workspace', 'Save', and 'Cancel' buttons.

Easy to identify workspaces with Premium

Seamlessly move content from Capacity to Shared and back again

# Power BI AAD B2B

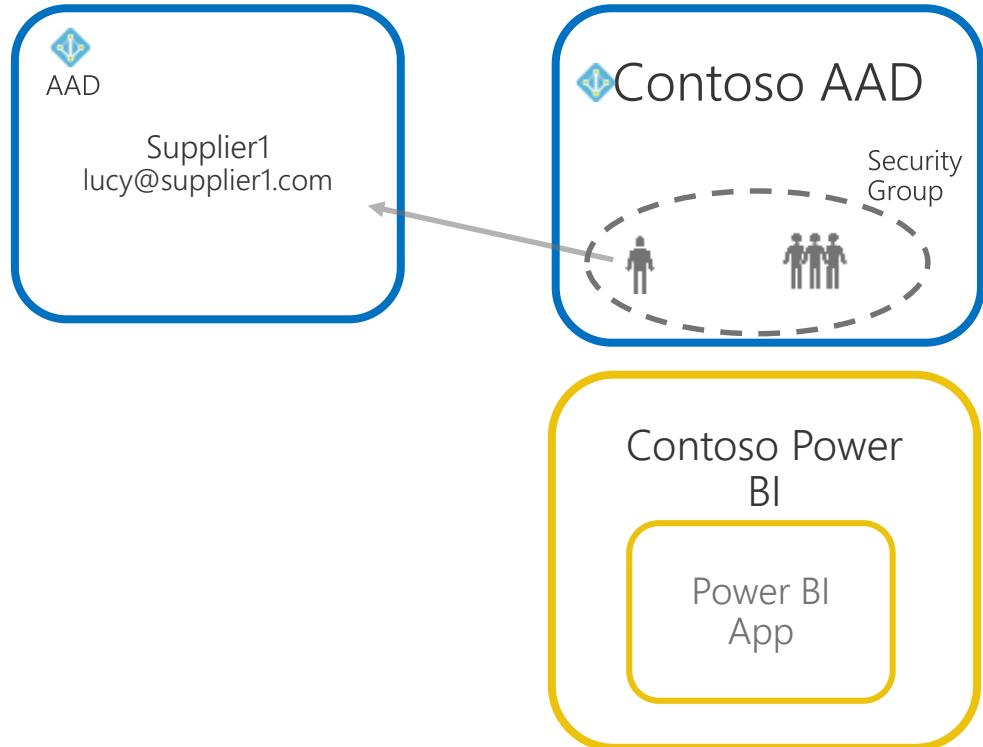
Guest users sign with their own identity

Guest user identity is managed by partner organization's IT team

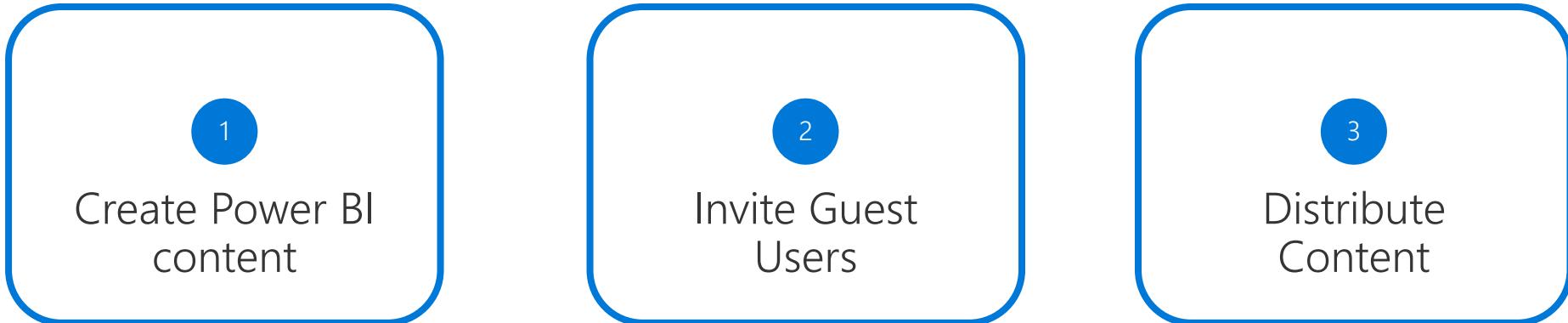
*If guest user leaves the partner organization, they immediately lose access to Contoso's BI portal*

Contoso can apply governance policies to its content

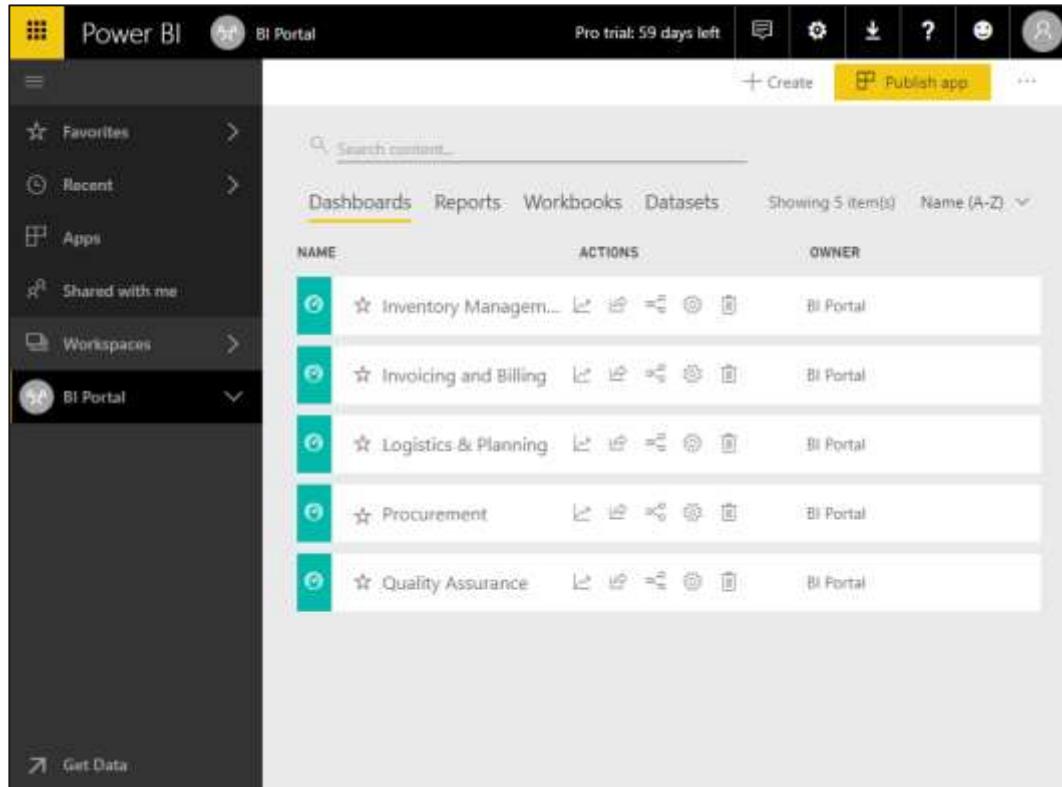
Contoso does not need to build embedded applications with custom authentication



# Power BI + AAD B2B - Steps



# 1. Create Content



Contoso creates Power BI App to serve as the BI portal<sup>1</sup>

1. Create App Workspace
2. Add other authors to App Workspace
3. Create content inside App workspace

Once content is created, Contoso can invite guest users from partner organizations

<sup>1</sup>Power BI Apps are the recommended approach to build BI portals

## 2. Invite Users

Contoso invites users from partner organizations to its tenant.

Two Options:

### 1. Planned Invitations

- Invite users ahead of time from the AAD portal
- Invite large number of users
- Create security groups for easy management

### 2. Adhoc Invitations

- Ad-hoc invites by content creators during distribution

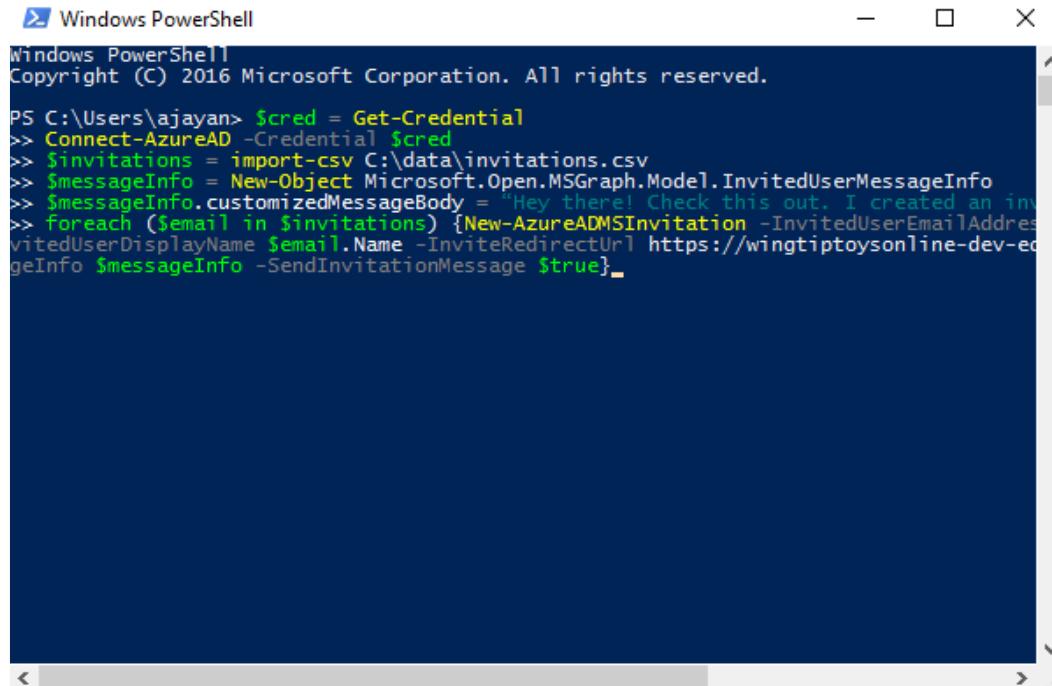
# 2. Invite Users | Planned Invitations



## Planned invitations from AAD portal

1. AAD portal -> New guest user
2. Add message for external user and invite
3. Guest user accepts invite
4. Guest user objects are created in Contoso's AAD

# 2. Invite Users | Planned Invitations

A screenshot of a Windows PowerShell window. The title bar says "Windows PowerShell". The content area shows PowerShell commands for inviting users in bulk. The commands include connecting to Azure AD, importing a CSV file of invitations, creating a new object for each invitation, setting a customized message body, and then foreaching over the invitations to create a new Azure AD MS invitation for each. The commands are as follows:

```
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\ajayan> $cred = Get-Credential
>> Connect-AzureAD -Credential $cred
>> $invitations = import-csv C:\data\invitations.csv
>> $messageInfo = New-Object Microsoft.Open.MSGraph.Model.InvitedUserMessageInfo
>> $messageInfo.customizedMessageBody = "Hey there! Check this out. I created an invi
>> foreach ($email in $invitations) {New-AzureADMSInvitation -InvitedUserEmailAddress $email.EmailAddress -InvitedUserDisplayName $email.Name -InviteRedirectUrl https://wingtiptoysonline-dev-ed
geInfo $messageInfo -SendInvitationMessage $true}.
```

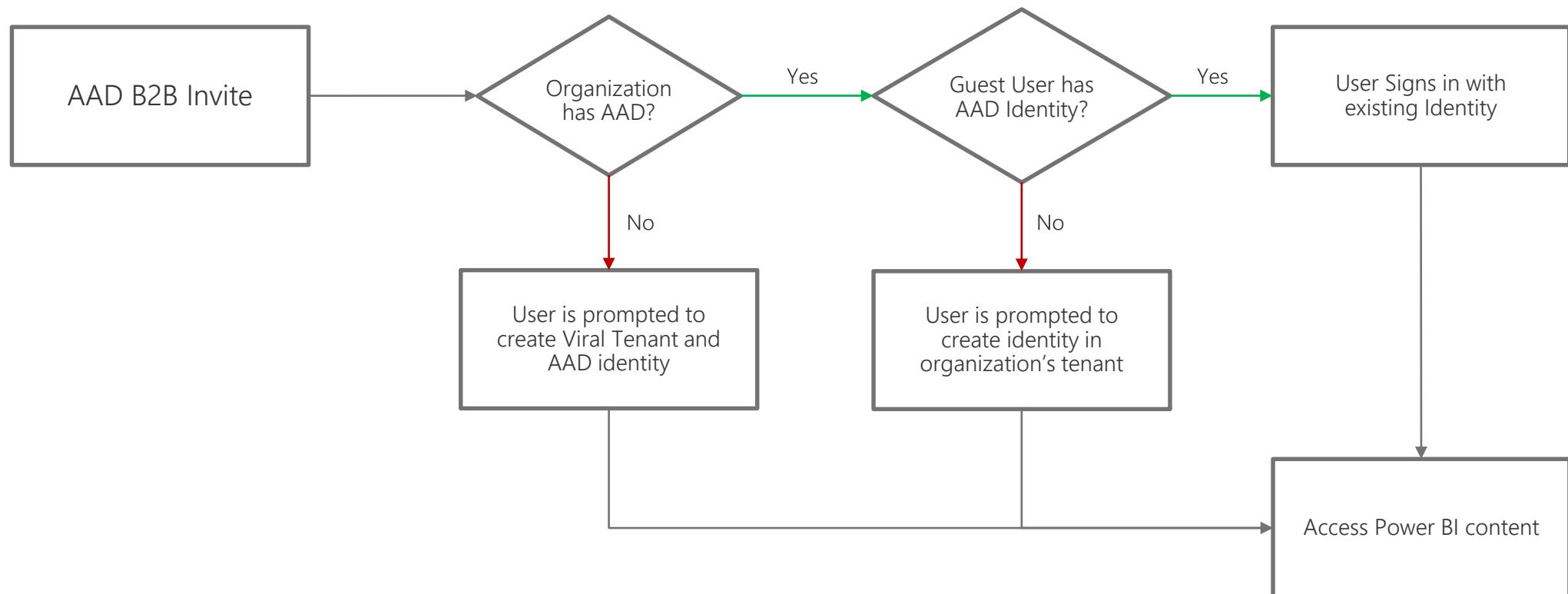
Planned invitations from AAD portal – Bulk invites

For bulk invites, use PowerShell commandlets

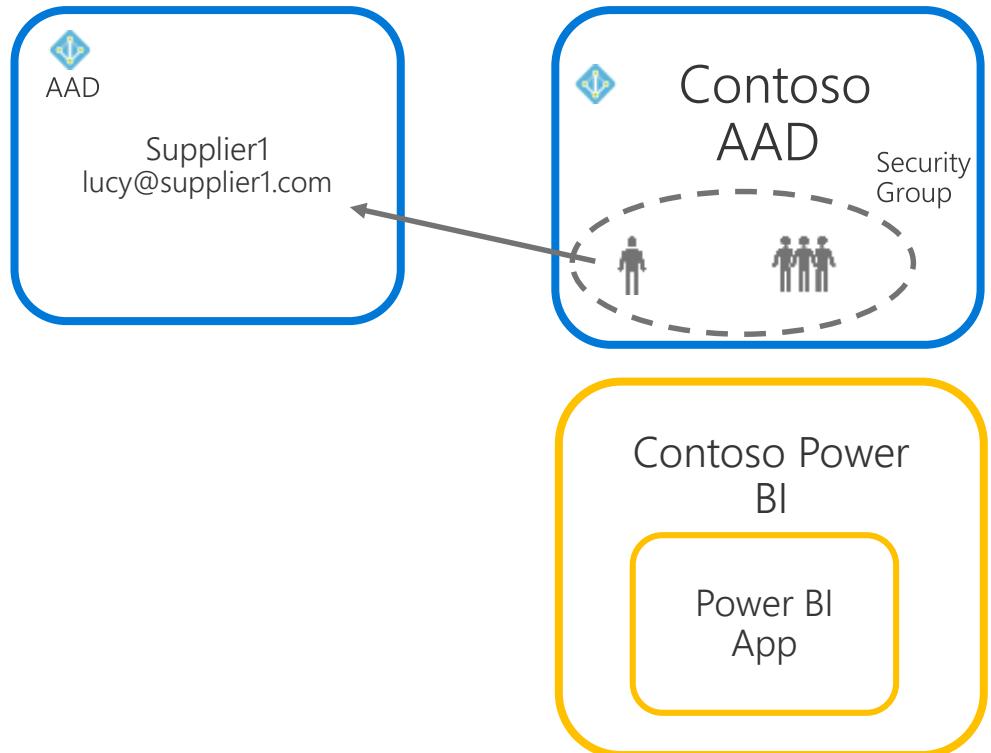
<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-b2b-code-samples>

## 2. Invite Users

Works with any business email address

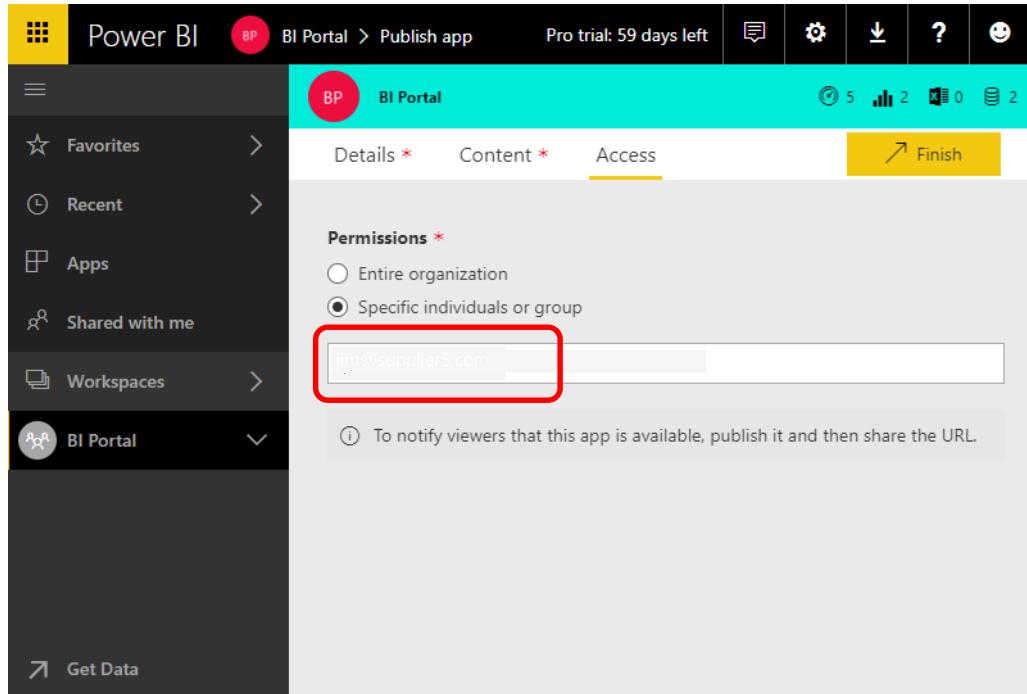


## 2. Invite Users | Creating Security Groups



- After inviting guest users, Contoso can create Security Groups to manage user access
- Security Groups can contain both internal and guest users

# 2. Invite Users | Adhoc Invitations

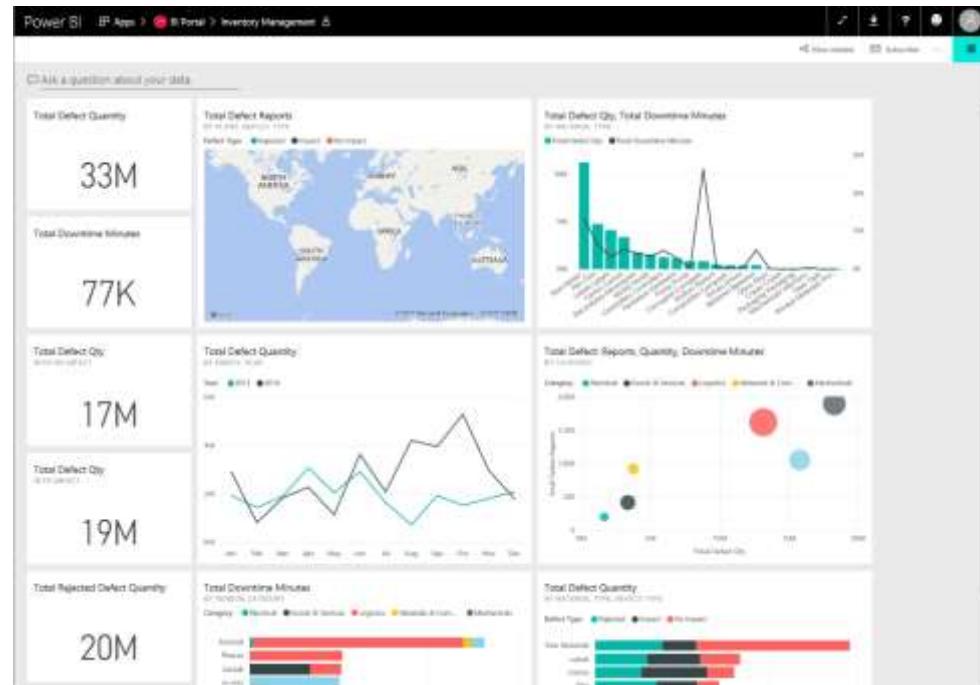


- End users can ad-hoc invite guest users when distributing apps as well
- For large scale deployments, we recommend the planned invitations approach along with Security Groups

Invites are needed just the first time content is shared with guest users.

Once guest users have been added to Contoso's AAD, Contoso can subsequently share Power BI content without further invites

# 3. Distribute

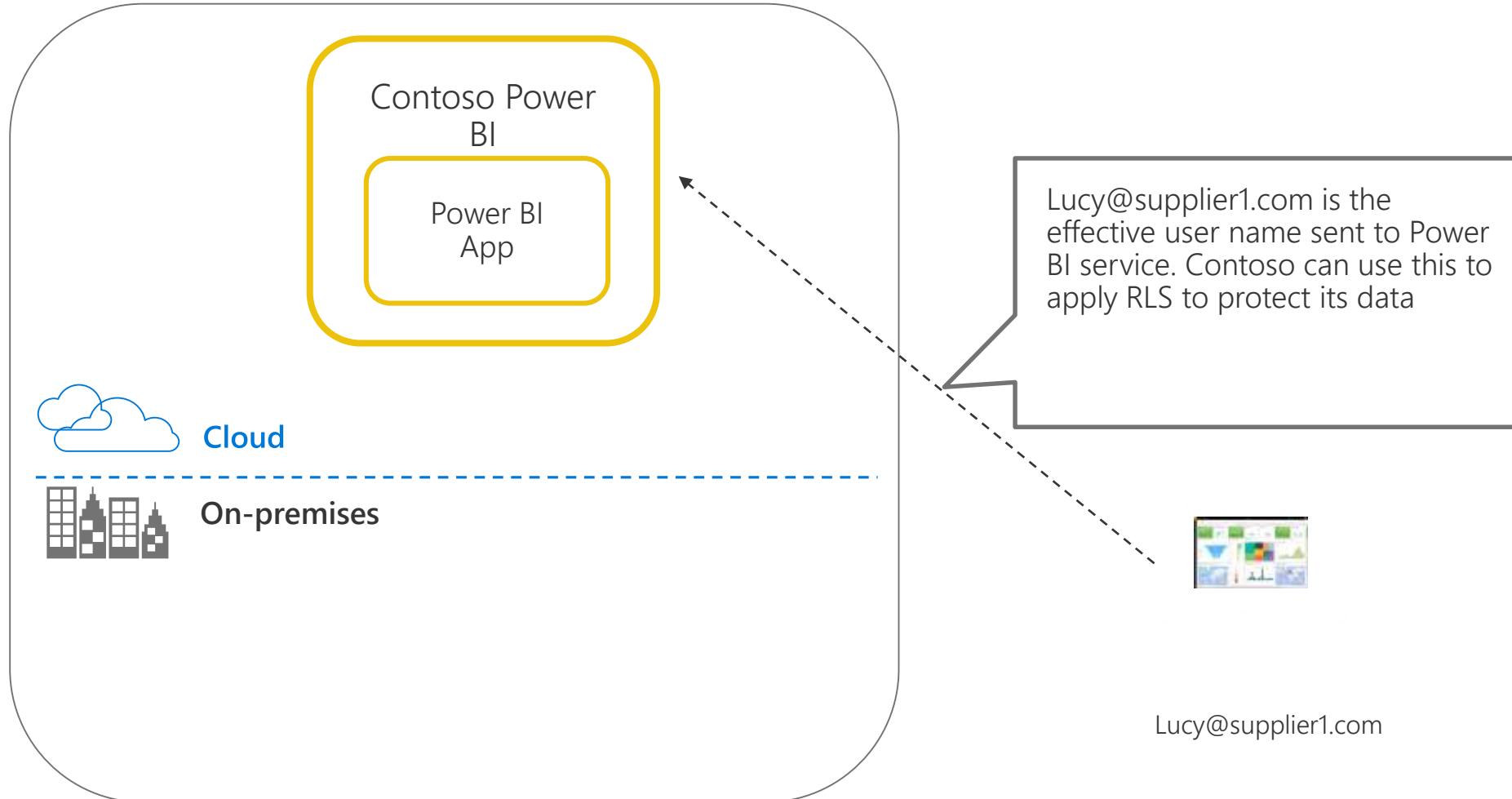


Contoso distributes content by publishing the app

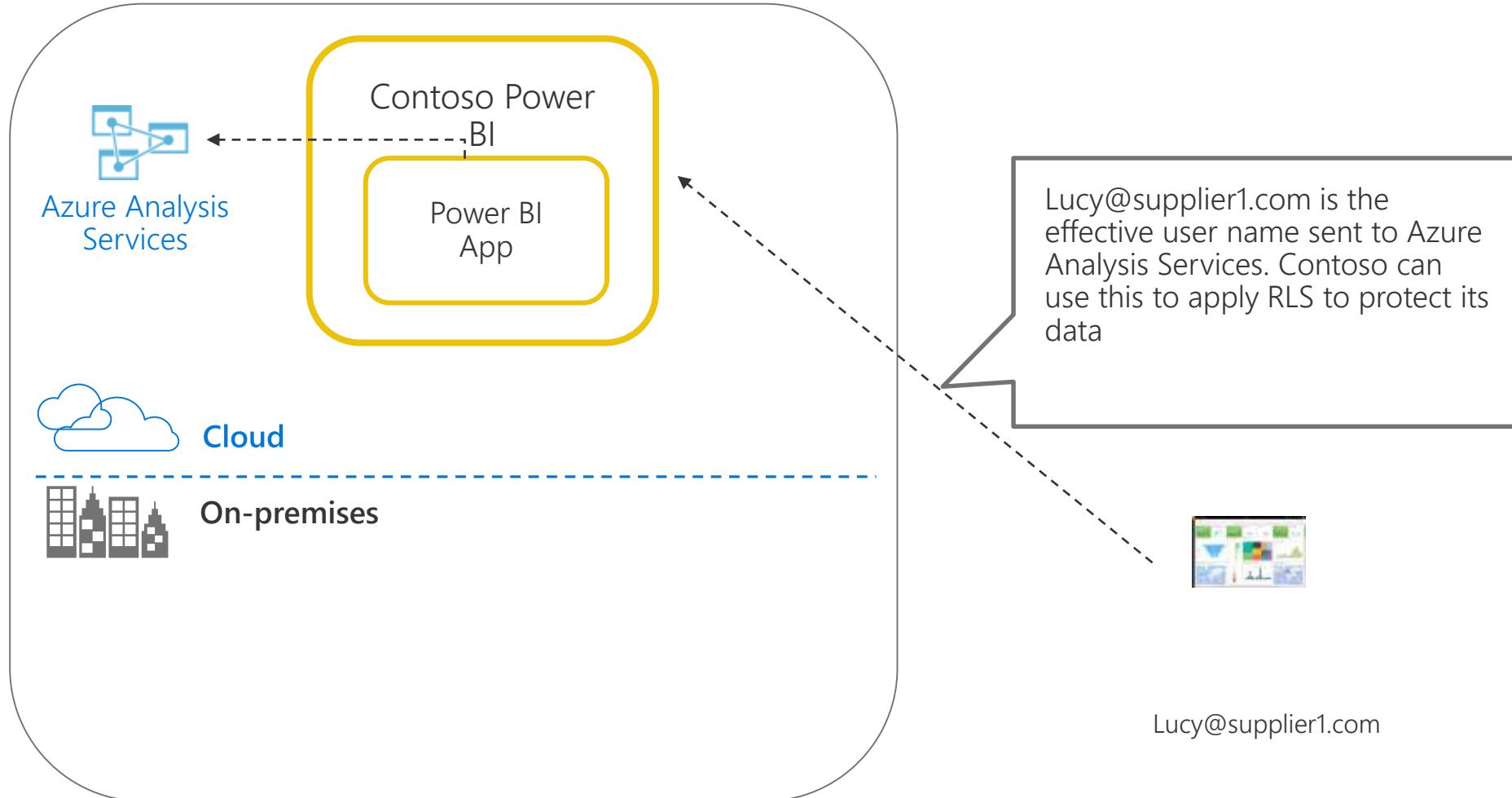
1. Existing Guest users who have previously been added to Contoso's tenant are auto-completed  
Adhoc invitations to other users can also be sent at this point
2. Guest users get email with link to App
3. Guest users sign-in with their organization's identity to consume Contoso's app
4. Guest user can access Contoso's App

*\*At release, guest users will have to accept invites before trying to access the Power BI app. In the near future, we will automatically find out pending invites during app access and redirect the user for a seamless experience*

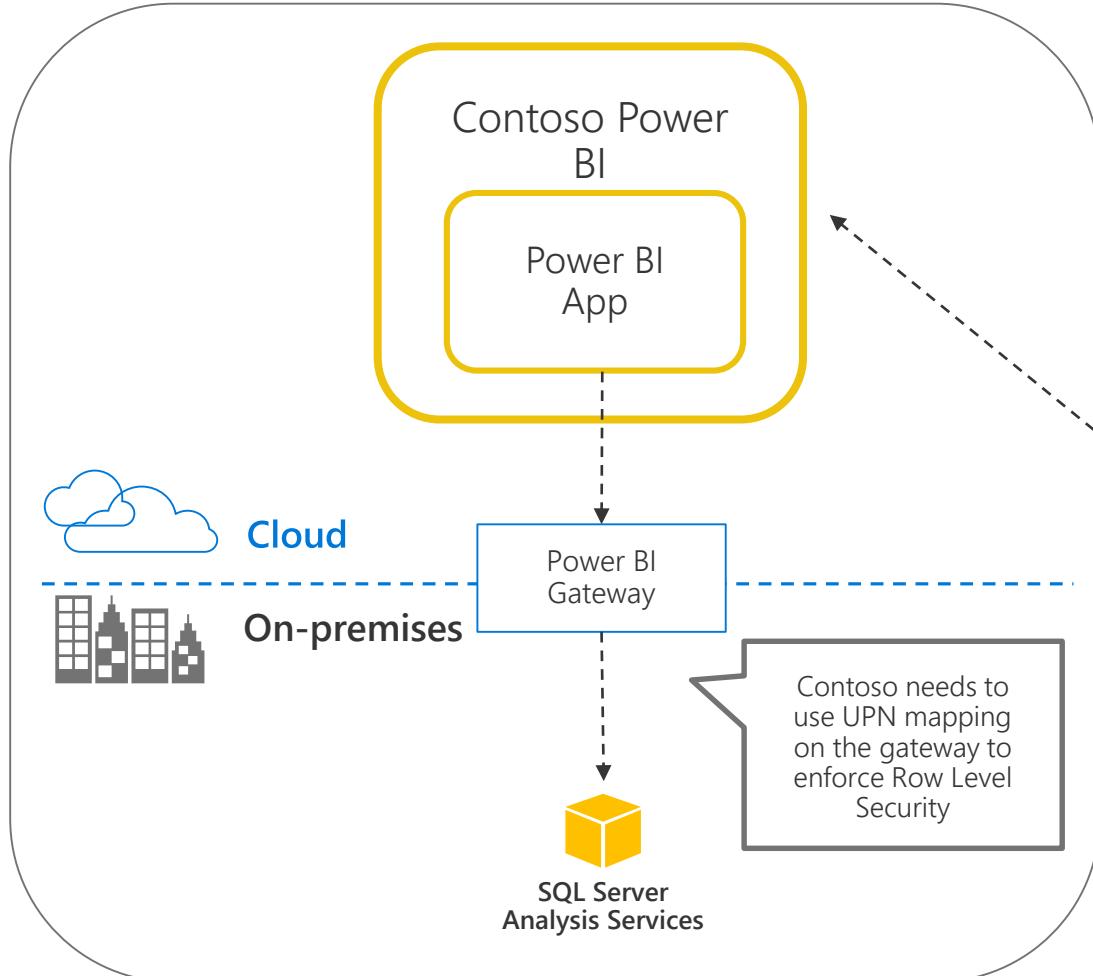
# Row Level Security | Import Models



# Row Level Security | Azure Analysis Services



# Row Level Security | On Premises AS Model



Contoso's on-premises Active Directory does not know about guest users

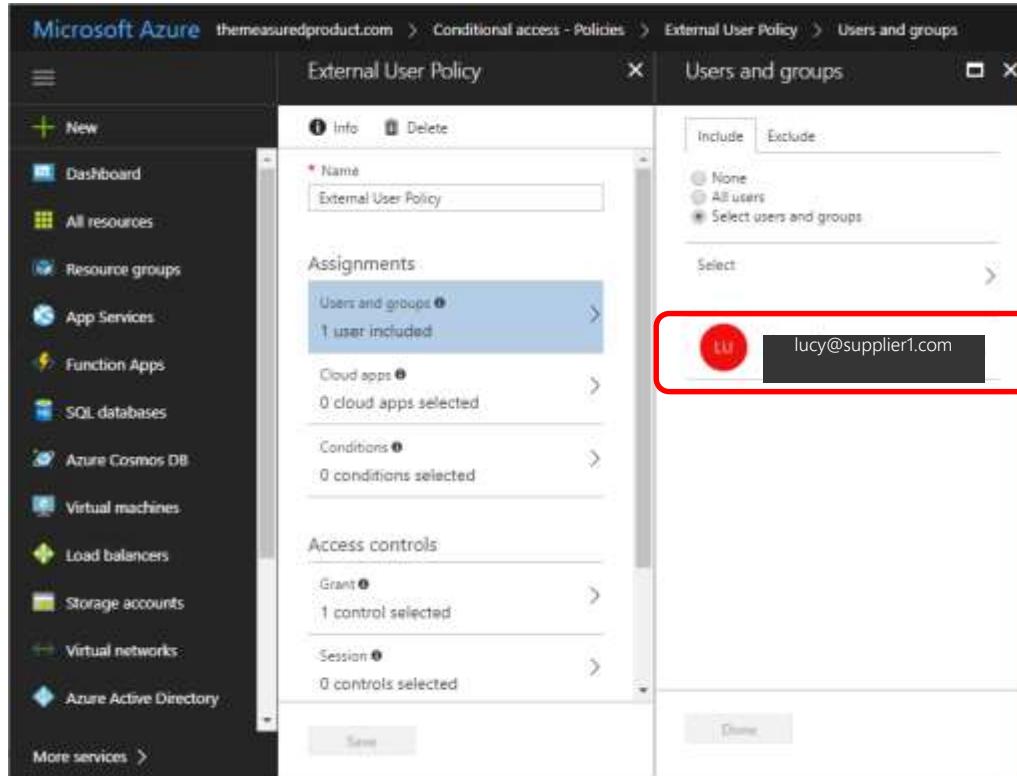
So Contoso cannot directly assign roles to guest users to enforce Row Level Security in their on-premises AS server

Instead, Contoso needs to use UPN mapping in the Data Gateway to enforce Row Level Security



Lucy@supplier1.com

# Governance



The screenshot shows the Azure portal interface for managing Conditional Access Policies. The left sidebar lists various Azure services. The main area shows the 'External User Policy' configuration. The 'Users and groups' tab is active, displaying a list of users assigned to the policy. One user, 'lucy@supplier1.com', is highlighted with a red box.

Contoso can use AAD authorization policies to protect its data

- Conditional Access Policies
- Risk based authentication

<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-b2b-mfa-instructions>

Admins can set various policies for external B2B invites

- Turn off invitations by end users
- Only admins and users in the Guest Inviter role can invite
- Admins, the Guest Inviter role, and members can invite
- All users, including guests, can invite

<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-b2b-delegate-invitations>

Overview



Power BI Desktop



Power BI service



Integration with other services



Power BI Premium



Administration



Summary



# Resources

Power BI Documentation

<https://docs.microsoft.com/en-us/power-bi/>

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Power BI Guided Learning

<https://docs.microsoft.com/en-us/power-bi/guided-learning/>

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Power BI Webinars

<https://docs.microsoft.com/en-us/power-bi/webinars>

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Power BI Whitepapers

<https://docs.microsoft.com/en-us/power-bi/whitepapers>

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Power BI Blogs

<https://powerbi.microsoft.com/en-us/blog/>

It's easy to get started...  
**PowerBI.com**



# Q & A



James Serra, Big Data Evangelist

Email me at: [JamesSerra3@gmail.com](mailto:JamesSerra3@gmail.com)

Follow me at: [@JamesSerra](https://twitter.com/JamesSerra)

Link to me at: [www.linkedin.com/in/JamesSerra](https://www.linkedin.com/in/JamesSerra)

Visit my blog at: [JamesSerra.com](https://JamesSerra.com) (where this slide deck is posted under the "Presentations" tab)