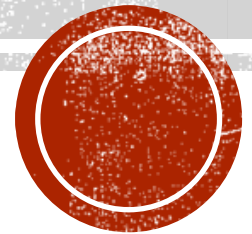


# AZURE MODERN DATA WAREHOUSE (MDW)

Jamey Johnston, M.S.

@STATCowboy





# JAMEY JOHNSTON

Sr. Data Scientist/Engineer



Professor - Texas A&M MS Analytics

## Education

Texas A&M - MS in Analytics

LSU - BS in Spatial Analysis

## Photographer

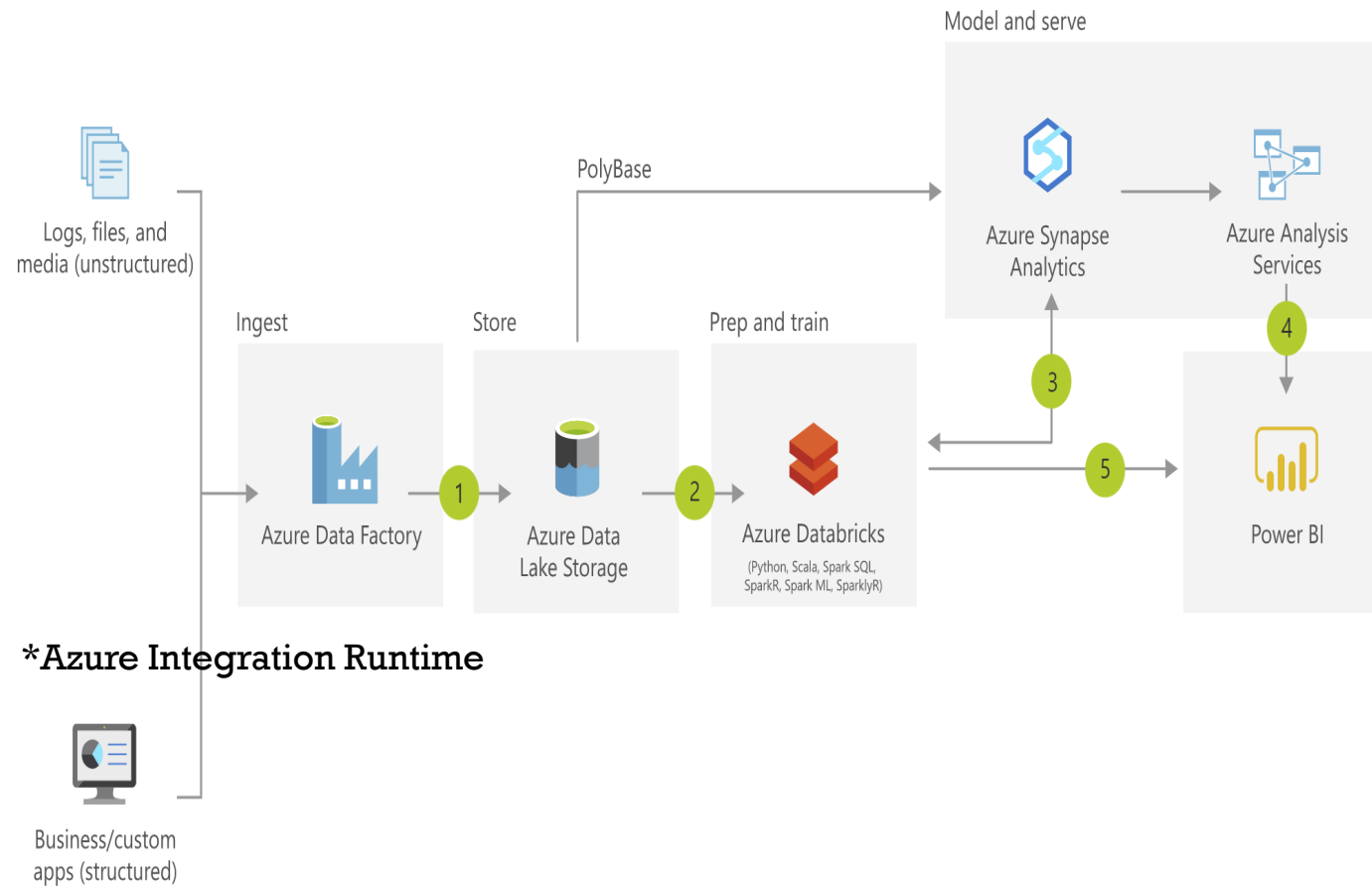
<http://jamey.photos>

## Blog

<http://STATCowboy.com>

## Code

<https://github.com/STATCowboy/Azure-Modern-Data-Warehouse>



# AZURE MODERN DATA WAREHOUSE

<https://azure.microsoft.com/en-us/solutions/architecture/modern-data-warehouse>



### Azure Data Factory

- Combine all your structured, unstructured and semi-structured data (logs, files, and media) using Azure Data Factory to Azure Data Lake Services gen2. \*Azure Integration Runtime needed for on-prem data.

### Azure Data Lake Services gen2

- Leverage data in Azure Blob Storage to perform scalable analytics with Azure Databricks and achieve cleansed and transformed data.

### Azure Synapse Analytics (formerly SQL DW)

- Cleansed and transformed data can be moved to Azure Synapse Analytics (formerly SQL DW) to combine with existing structured data, creating one hub for all your data. Leverage native connectors between Azure Databricks and Azure SQL Data Warehouse to access and move data at scale.

### Azure Analysis Services and Power BI

- Build operational reports and analytical dashboards on top of Azure Data Warehouse to derive insights from the data and use Azure Analysis Services to serve thousands of end users using Power BI.

### Azure Databricks

- Run ad hoc queries directly on data within Azure Databricks.

# AZURE MODERN DATA WAREHOUSE



# AZURE SYNAPSE ANLYTICS - FUTURE

- “Azure Synapse is a limitless analytics service that brings together enterprise data warehousing and Big Data analytics.”



<https://azure.microsoft.com/en-us/services/synapse-analytics/>

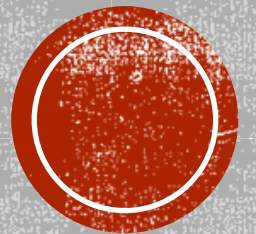




A close-up photograph of a blue computer keyboard. A person's hand is visible, with the index finger pointing directly at a large, rectangular button labeled 'DEMO' in bold, white, sans-serif capital letters. To the right of the 'DEMO' button is a blue arrow key pointing to the left. The background is slightly blurred, showing other keys like '[' and ']' above the 'DEMO' button.

**DEMO**

**PRESENTING AZURE!**



# POWER BI OVERVIEW

## Power BI Desktop

- Windows app to author self-service data driven analytic reports
- Install from Microsoft Store (monthly updates automagically!)

## Power BI Service

- MS hosted service for publishing Power BI reports and dashboards
- <http://app.powerbi.com>

## Power BI Mobile

- App for Windows, iOS (phones and tablets) & Android

## On-premises Data Gateway

- Bridge to query & load data from on-premises data sources to Power BI Service

## Power BI Report Server

- On-premises version of the PowerBI.com service (limited features than cloud version)



# M

- Used in Power Query for Data Wrangling
- <https://docs.microsoft.com/en-us/powerquery-m/power-query-m-reference>

# DAX

- Used to create columns, measures, calculations in Power BI (in Excel, too!)
- <https://docs.microsoft.com/en-us/dax/data-analysis-expressions-dax-reference>

## POWER BI LANGUAGES







Python

Supports Python  
for data  
wrangling and  
visualizations



R

Supports R for  
data wrangling  
and  
visualizations



Dataflows

Integrates Data  
Lake and ETL  
technology  
directly into  
Power BI

<https://www.jamesserra.com/archive/2018/08/power-bi-dataflows/>

# POWER BI FEATURES





## Power BI Desktop

It's Free!



## Power BI Pro

Low price of \$9.99 month!  
Publish to Power BI Service



## Power BI Premium

Adds support for dedicated capacity and an enterprise pricing model and new features  
Varies by dedicated capacity needs (i.e. Nodes)



[https://\*\*power\*\*bi.microsoft.com/Official-Site/Pricing](https://powerbi.microsoft.com/Official-Site/Pricing)

# POWER BI LICENSING



# POWER BI DESKTOP

Report, Data & Relationship View

**Get Data**

**Power Query**

**Publish to Service**

**Melbourne**

Property ID: 16760

Property Type: All

Neighborhood: All

Property Location

Average of Occupancy Rate and Average of Revenue (USD) by Reporting Month

Revenue (USD) MoM% by Year, Quarter and Month

**VISUALIZATIONS**

**FILTERS**

**FIELDS**

Page level filters

Report level filters

DRILLTHROUGH

Keep all filters

Off

Drag drillthrough fields here

Property ID

Property Type

Reporting Mo...

Reservation D...

Revenue (Nati...

Revenue (USD)

Revenue (USD...

Scraped Durin...

State

Zip code

Property

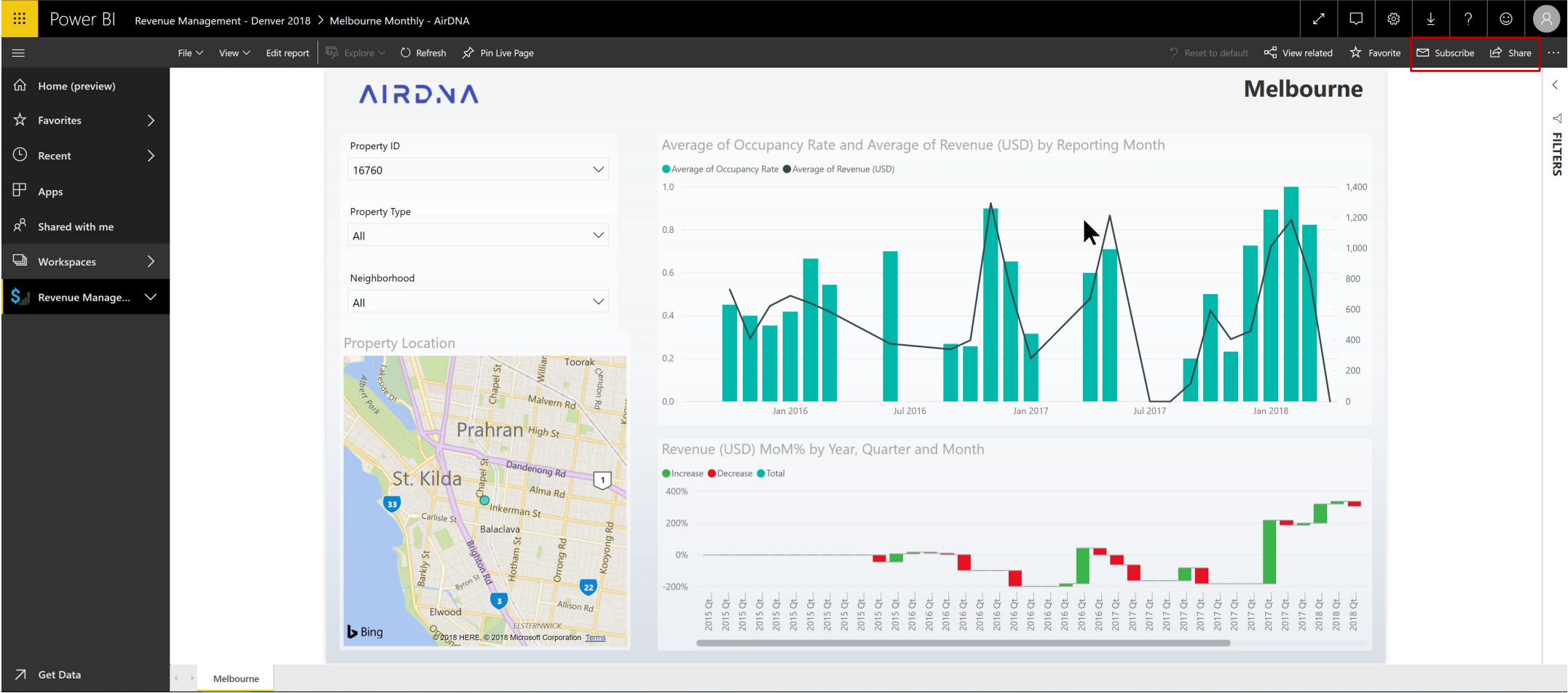


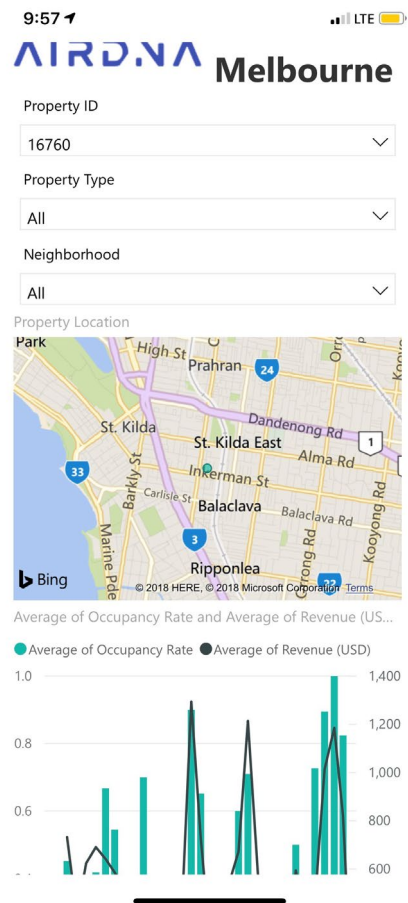




Close

# POWER BI SERVICE

Share & Subscribe







9:56  

[Search](#)

## Microsoft Power BI

Microsoft Corporation

 [OPEN](#) 

4.7 ★★★★★  
5.43K Ratings

4+  
Age

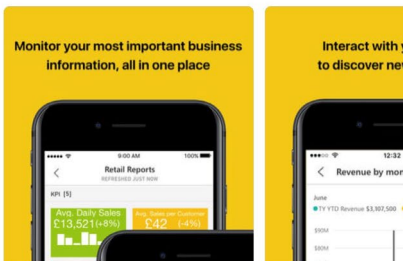
### What's New

[Version History](#)

Version 17.1 6d ago

- When you receive a link in a report that has an active URL filter (query string) applied to it, the report will open pre-filtered. [more](#)

### Preview

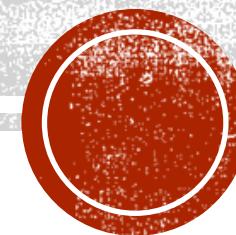


Monitor your most important business information, all in one place

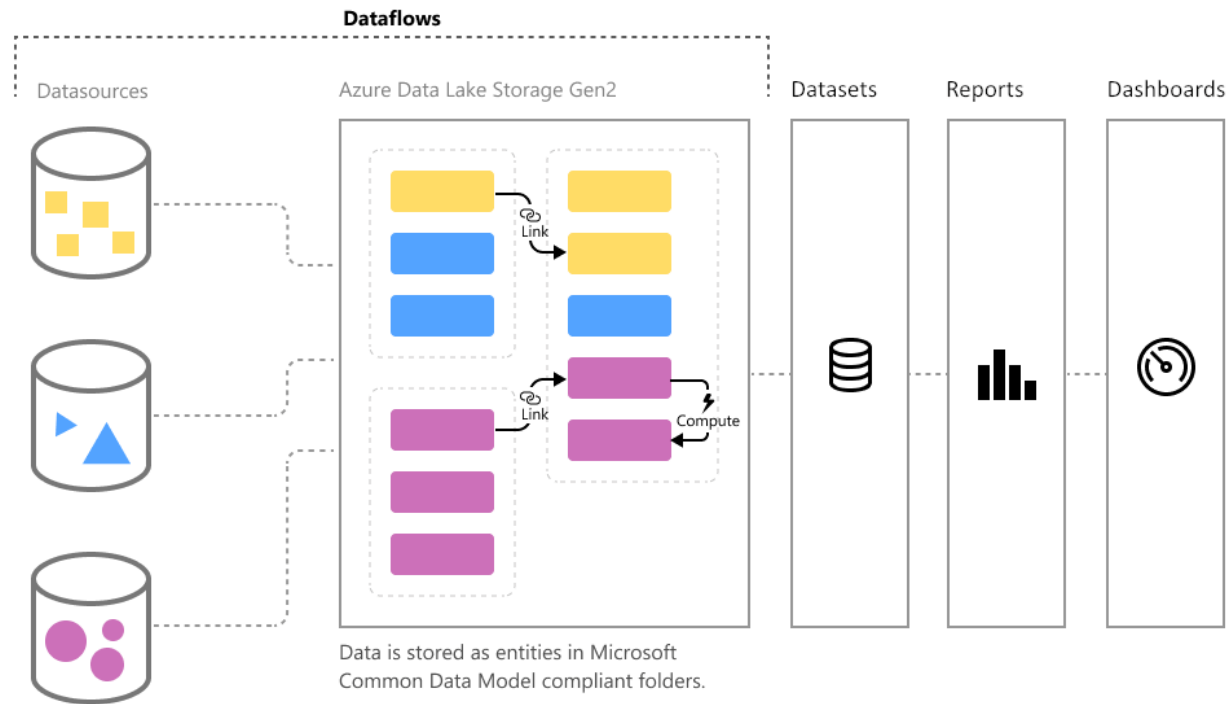
Interact with your data to discover new insights

Today Games Apps Updates Search

# POWER BI MOBILE







# POWER BI DATAFLOWS



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

<https://powerbi.microsoft.com/pt-pt/blog/introducing-power-bi-data-prep-with-dataflows/>

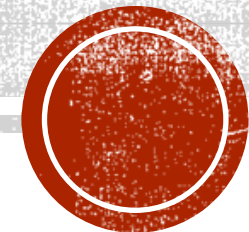
**Add entities to start creating your dataflow**

**Define new entities**  
Choose a data source to define the entities for your dataflow. You can map your data to standard Common Data Model entities, or define custom entities instead.  
[Learn more](#)  
**Add new entities**

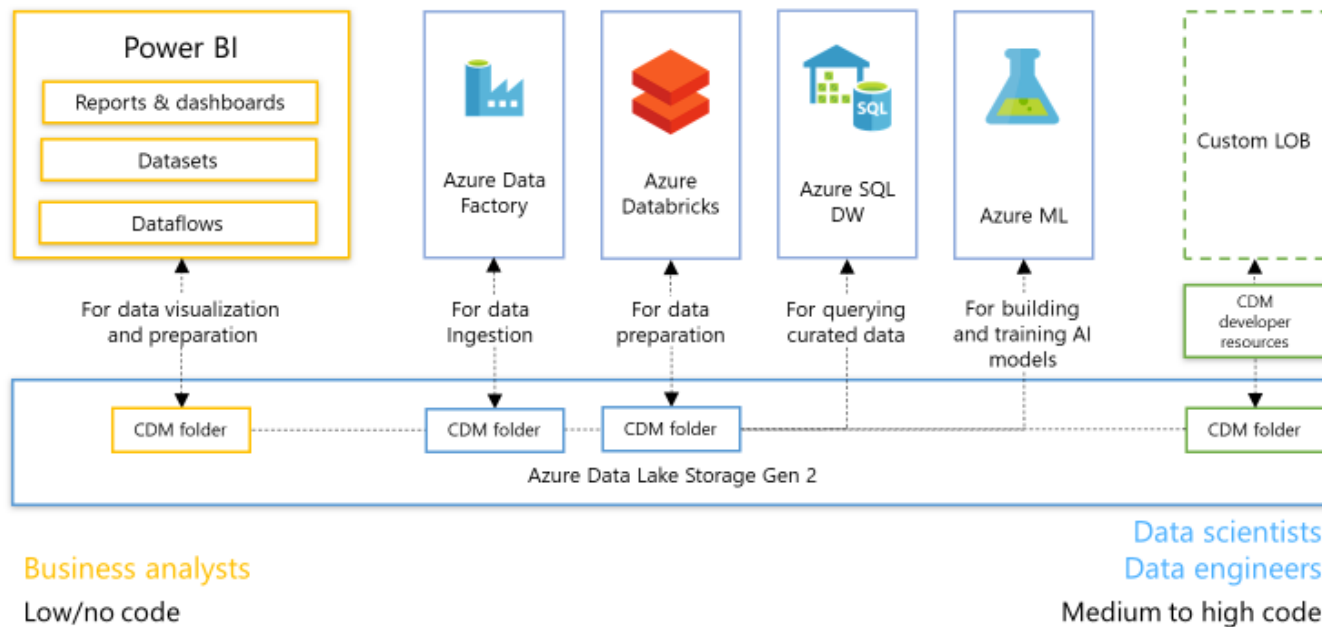
**Link entities from other dataflows**  
Linking to entities from other dataflows reduces duplication and helps maintain consistency across your organization.  
[Learn more](#)  
**Add linked entities**

The screenshot shows the Power BI 'Choose data source' window. A pink dashed arrow points from the 'Add new entities' button to the 'Choose data source' window. Another pink dashed arrow points from the 'Add linked entities' button to the 'Link entities from other dataflows' section. The screenshot also shows a map of North America and a bar chart with a tooltip for 'State: Pennsylvania' and 'Weather: 22'.

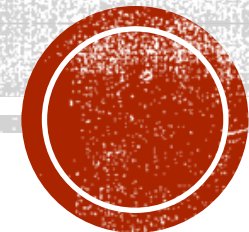
# POWER BI DATAFLOWS



<https://docs.microsoft.com/en-us/power-bi/service-dataflows-create-use>

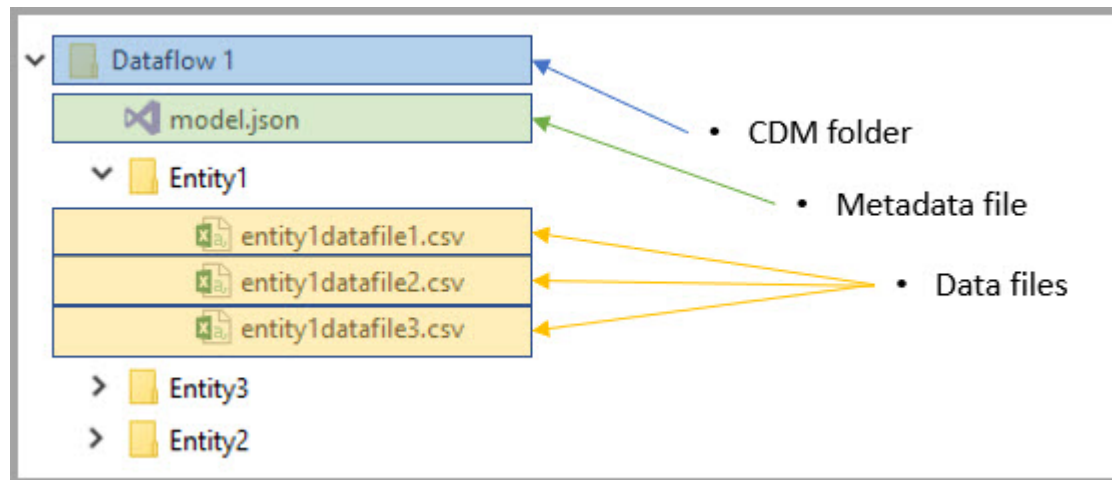


# POWER BI DATAFLOWS & ADLS INTEGRATION

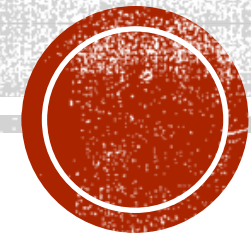


<https://docs.microsoft.com/en-us/azure/storage/blobs/data-lake-storage-introduction>





# POWER BI DATAFLOWS CDM FOLDER



Admin portal

- Usage metrics
- Users
- Audit logs
- Tenant settings
- Capacity settings
- Embed Codes
- Organization visuals
- Dataflow settings (preview)

### Dataflow storage (preview)

Connect to Azure Data Lake Storage Gen 2

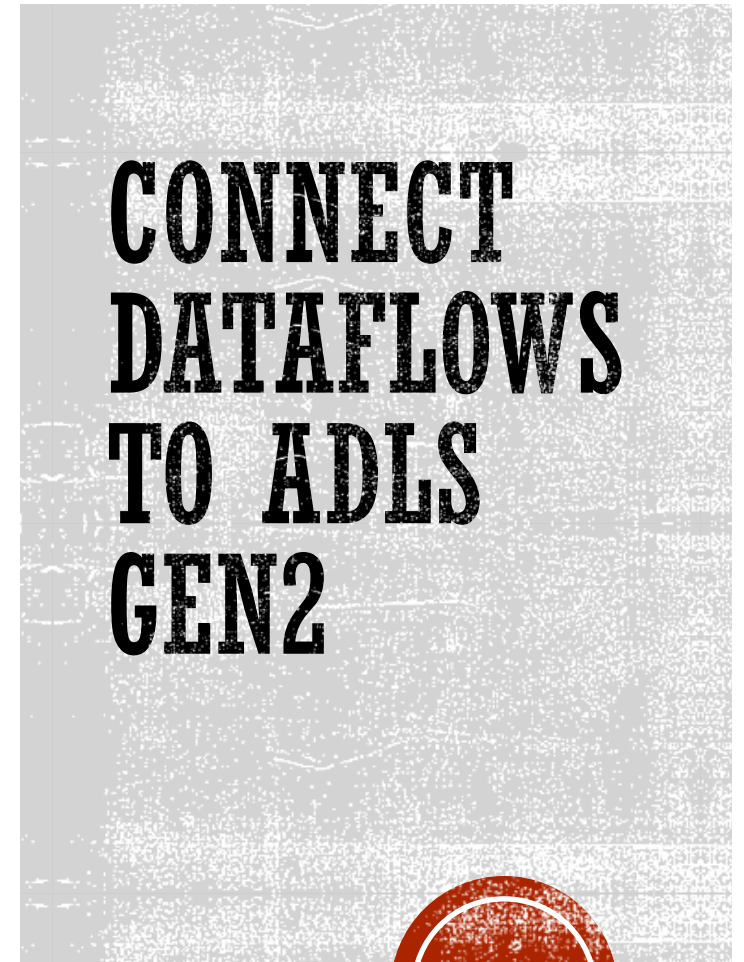
Enter your Azure Data Lake Storage details. [Learn more](#)

Subscription ID

Resource group name

Storage account name

[Cancel](#) [Continue](#)



<https://docs.microsoft.com/en-us/power-bi/service-dataflows-connect-azure-data-lake-storage-gen2>

## Create an app workspace

Advanced ^

Dedicated capacity ⓘ

☒ On

Choose an available dedicated capacity for this workspace

P2 capacity - Central US ▼

[Learn more about Premium capacity.](#)

Dataflow storage (preview) ⓘ

☒ On

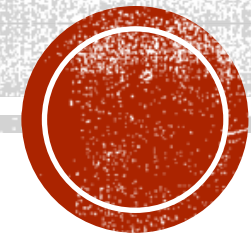
All new dataflows and dataflow data in this workspace will be stored in your organization's Azure Data Lake Storage Gen2 account.

- Linked entities will only be supported between workspaces in the same storage account.
- Dataflow permission management may be affected. [Learn more](#)

Save

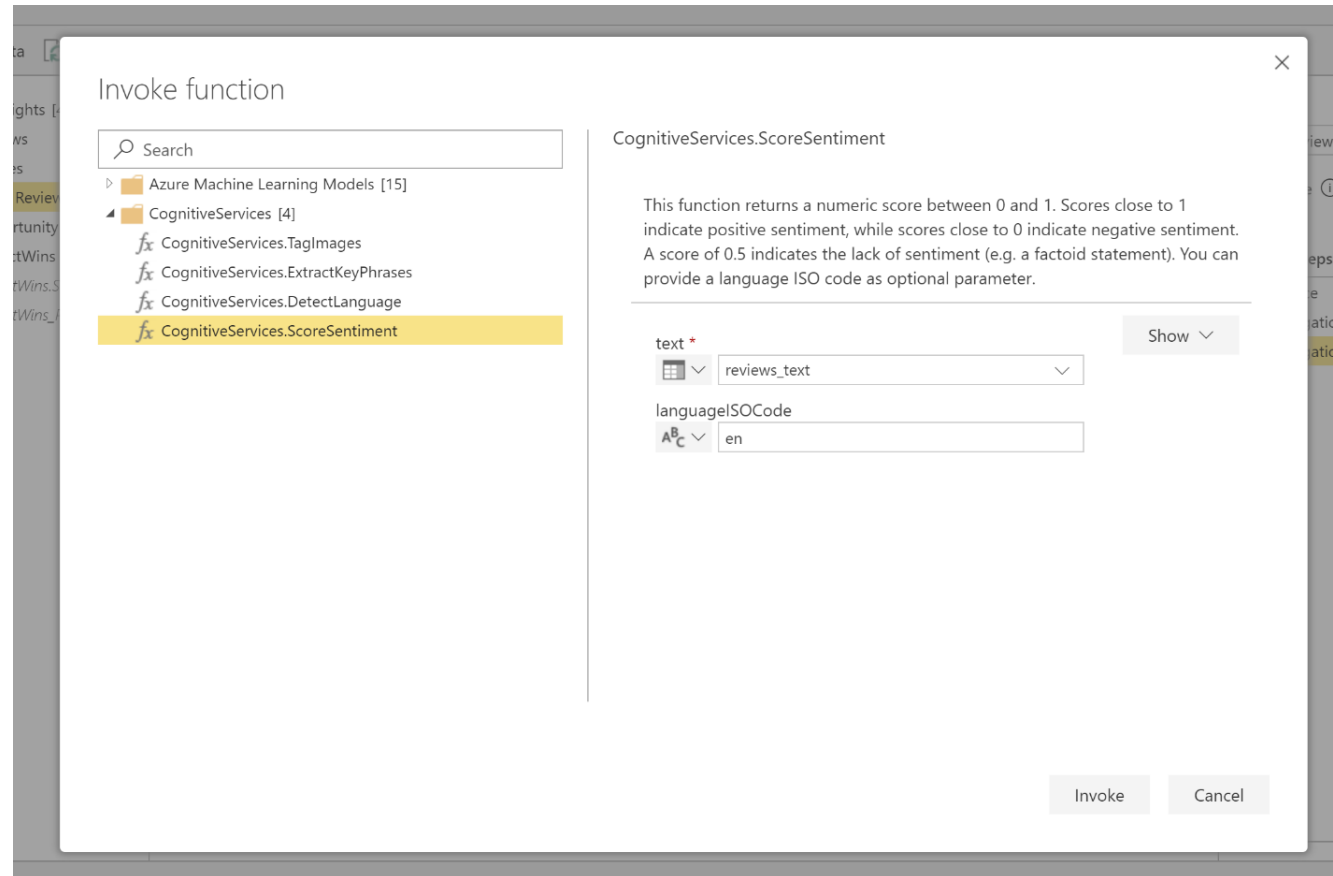
Cancel

# CONFIGURE WORKSPACE FOR POWER BI DATAFLOWS

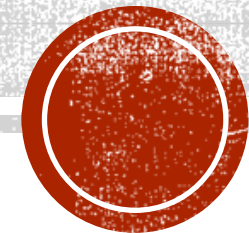


<https://docs.microsoft.com/en-us/power-bi/service-dataflows-configure-workspace-storage-settings>

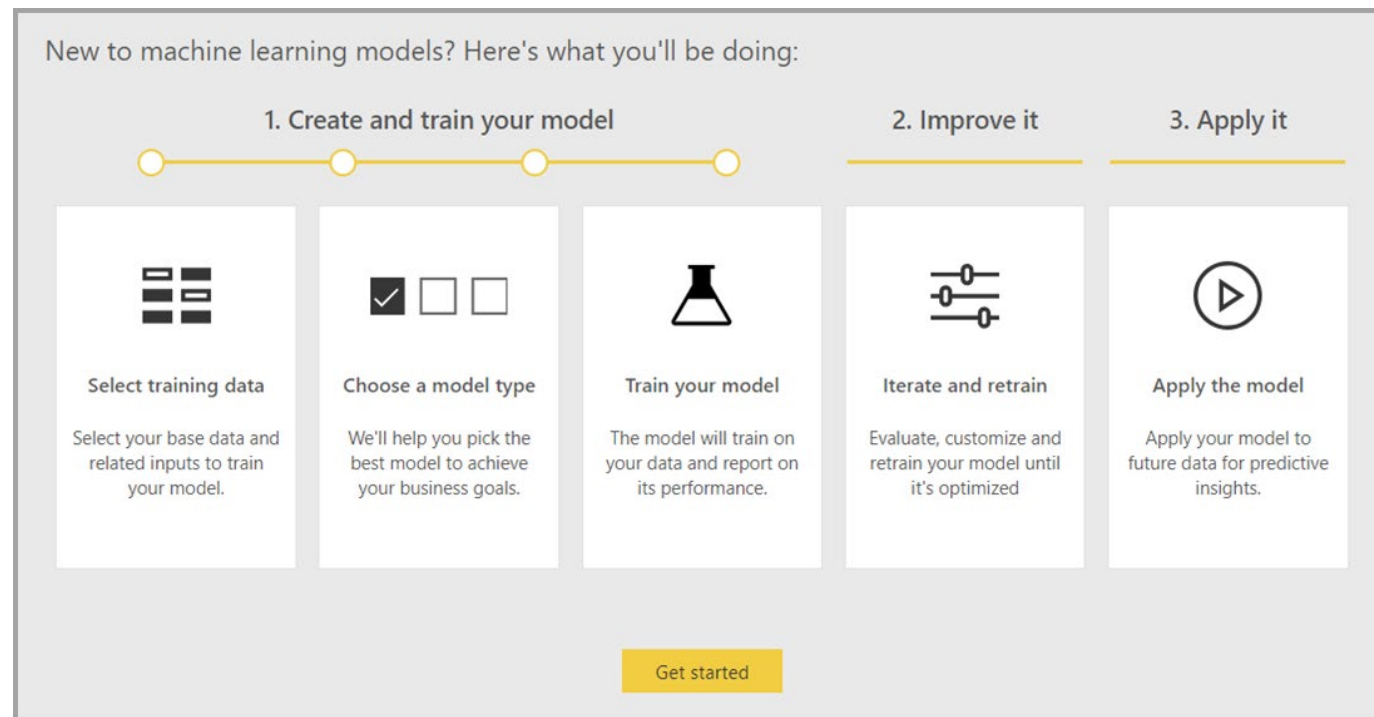




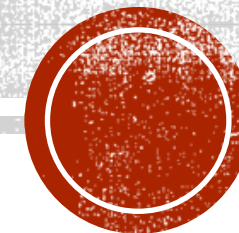
# COGNITIVE SERVICES IN POWER BI DATAFLOWS



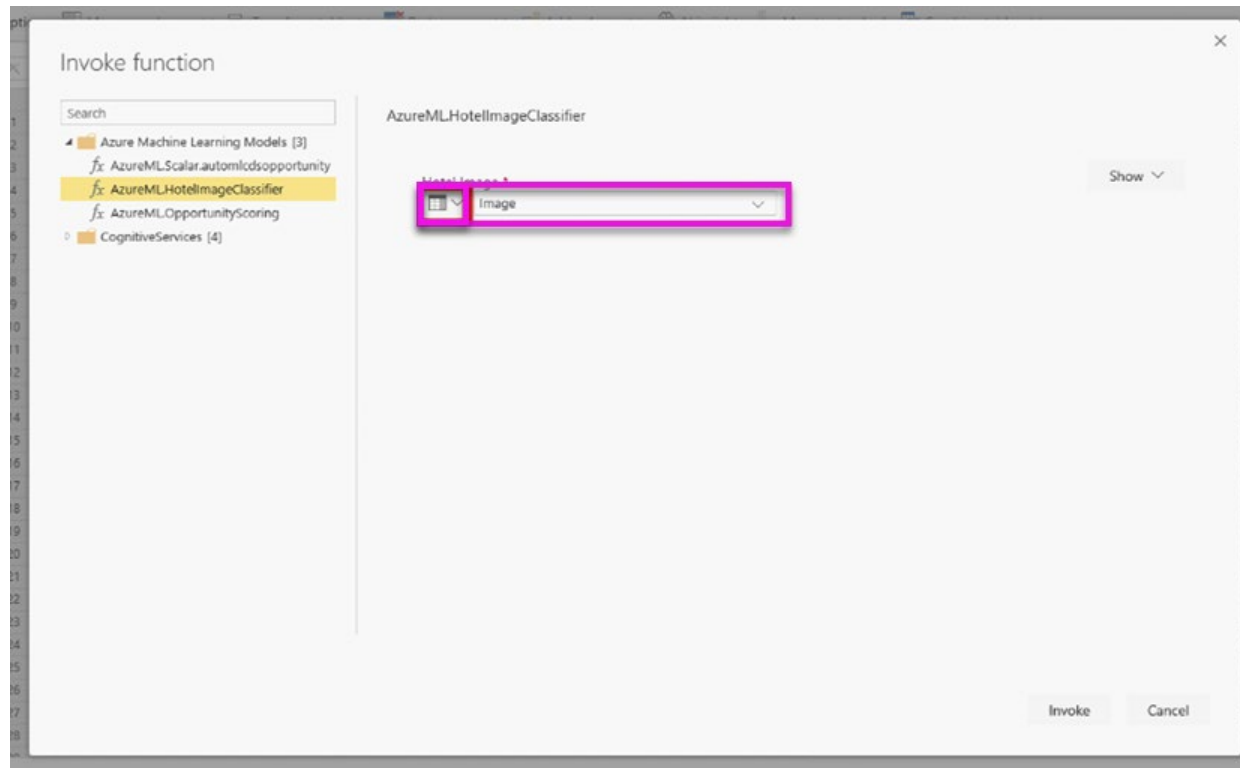
<https://docs.microsoft.com/en-us/power-bi/service-cognitive-services>



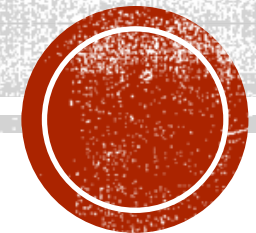
# AUTOMATED ML IN POWER BI DATAFLOWS



<https://docs.microsoft.com/en-us/power-bi/service-machine-learning-automated>



# AZURE ML IN POWER BI DATAFLOWS



<https://docs.microsoft.com/en-us/power-bi/service-machine-learning-integration>



EXPLORER

Search for resources

Collapse All

Refresh All

Quick Access

(Local and Attached)

Storage Accounts

Internal Consumption (cawa@microsoft.com)

Storage Accounts

cawablobgrs (Blob Storage)

Blob Containers

doc-article

febbuild

Tables

cawabloblrs (Blob Storage)

cawablobgrs (Blob Storage)

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doc-article

Upload

Download

Open

New Folder

Copy URL

Select All

Copy

Paste

Rename

Delete

Make Snapshot

Manage Snapshot

Refresh

doc-article

Search by prefix (case-sensitive)

Name	Last Modified	Blob Type	Content Type	Size	Lease State
.acrolinx-config.edn	Fri, 16 Dec 2016 00:35:51 GMT	Block Blob	application/octet-stream	1.9 KB	
.gitignore	Fri, 16 Dec 2016 00:35:51 GMT	Block Blob	application/octet-stream	179 B	
.openpublishing_build.ps1	Fri, 16 Dec 2016 00:35:51 GMT	Block Blob	application/octet-stream	746 B	
.openpublishing_publish.config.json	Fri, 16 Dec 2016 00:35:51 GMT	Block Blob	application/json	1.4 KB	
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10931e126d51ac3d9c0c45adcc0378029e1c14	Fri, 16 Dec 2016 00:35:52 GMT	Block Blob	application/octet-stream	4.5 KB	
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active-directory-aadconnect-design-concepts.md	Fri, 16 Dec 2016 00:35:57 GMT	Block Blob	text/x-markdown	8.5 KB	
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active-directory-aadconnect-feature-automatic-upgrade.md	Fri, 16 Dec 2016 00:35:57 GMT	Block Blob	text/x-markdown	7.3 KB	

Showing 1 to 100 of 1,000 cached items

1 2 3 4 5 ... 10 > Load more

Activities

Actions

Properties

URL

https://cawablobgrs.blob.core.windk

Type

Blob Container

Public Read Access

Off

Lease State

available

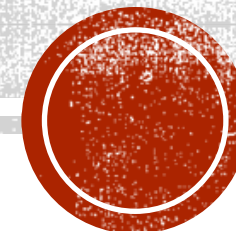
Lease Status

unlocked

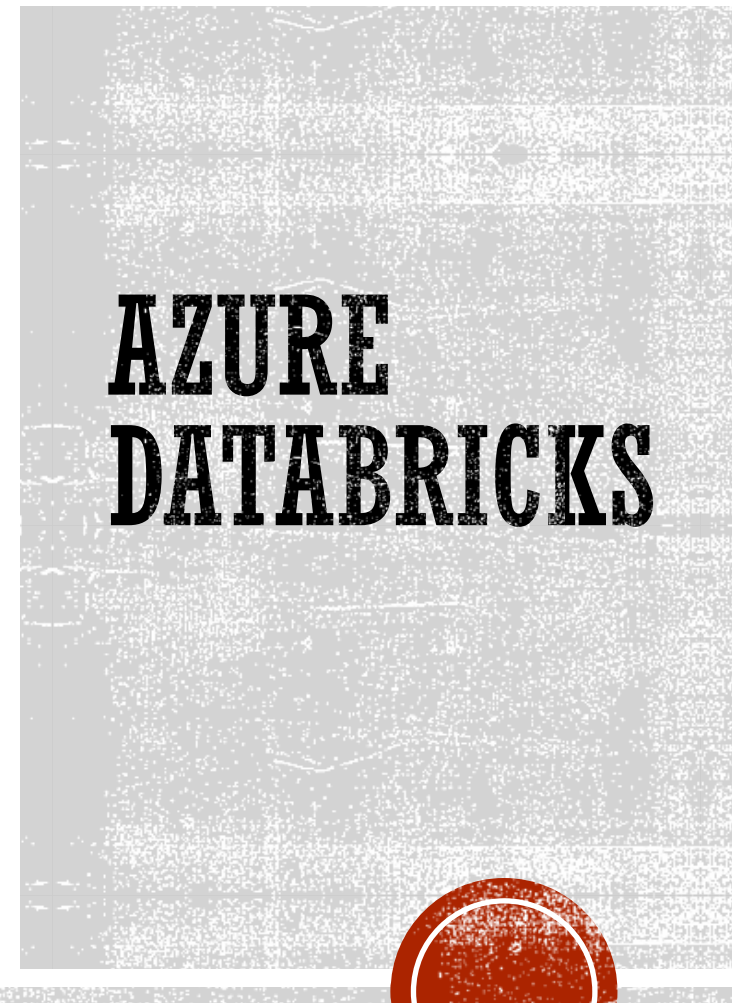
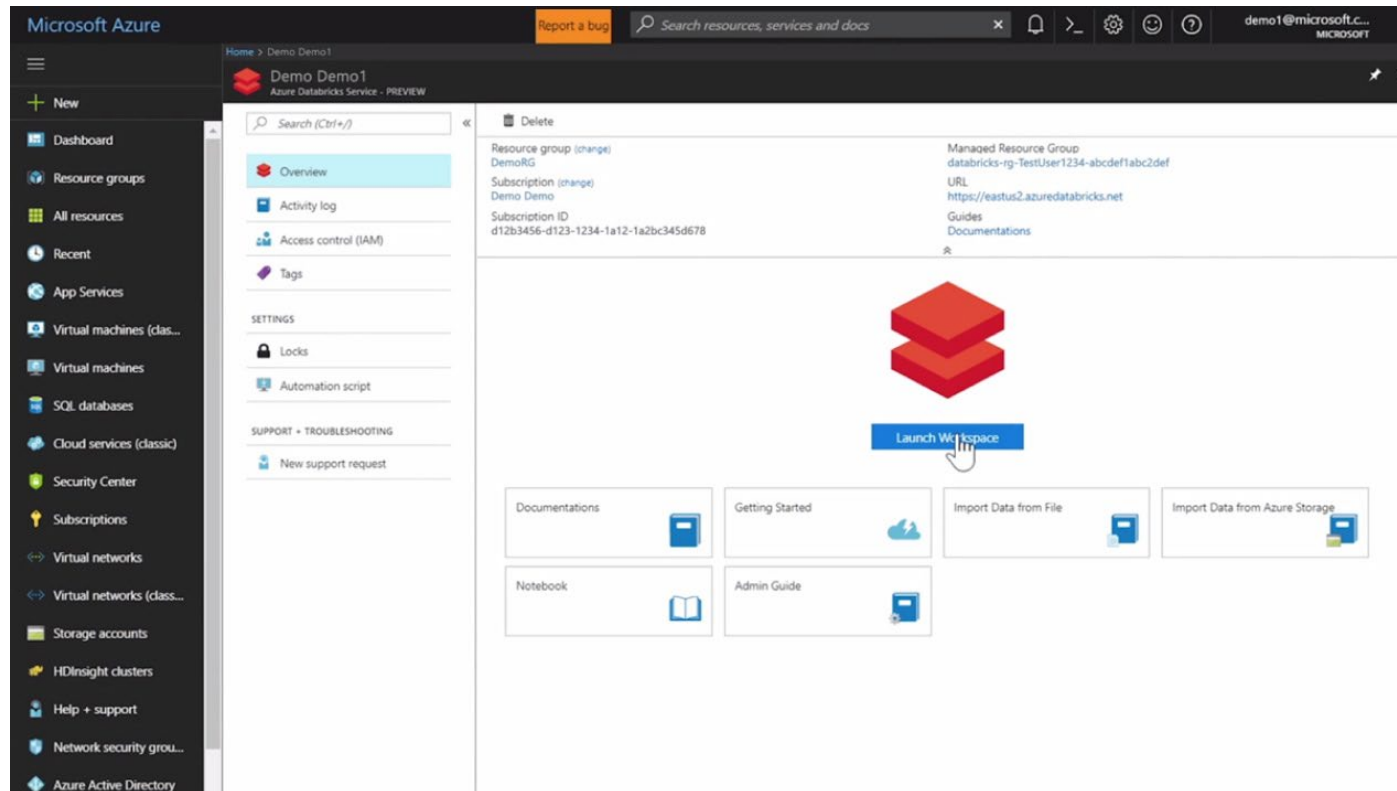
Last Modified

Thu, 15 Dec 2016 23:29:56 GMT

# AZURE STORAGE EXPLORER



<https://azure.microsoft.com/en-us/features/storage-explorer/>



<https://azure.microsoft.com/en-us/services/databricks/>

<https://docs.databricks.com/spark/latest/data-sources/azure/azure-datalake-gen2.html>

## Azure Modern Data Warehouse

- <https://azure.microsoft.com/en-us/solutions/architecture/modern-data-warehouse/>

## Power BI Docs & Blog

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

## Guy in a Cube YouTube Channel

- <https://guyinacube.com/>
- <https://www.youtube.com/channel/UCFplvaKzpfvoGai0vESVJ0w>

## Power BI YouTube Channel

- <https://www.youtube.com/user/mspowerbi>

## RADACAD

- <http://radacad.com/>

## SQL BI

- <https://www.sqlbi.com/>

# RESOURCES

