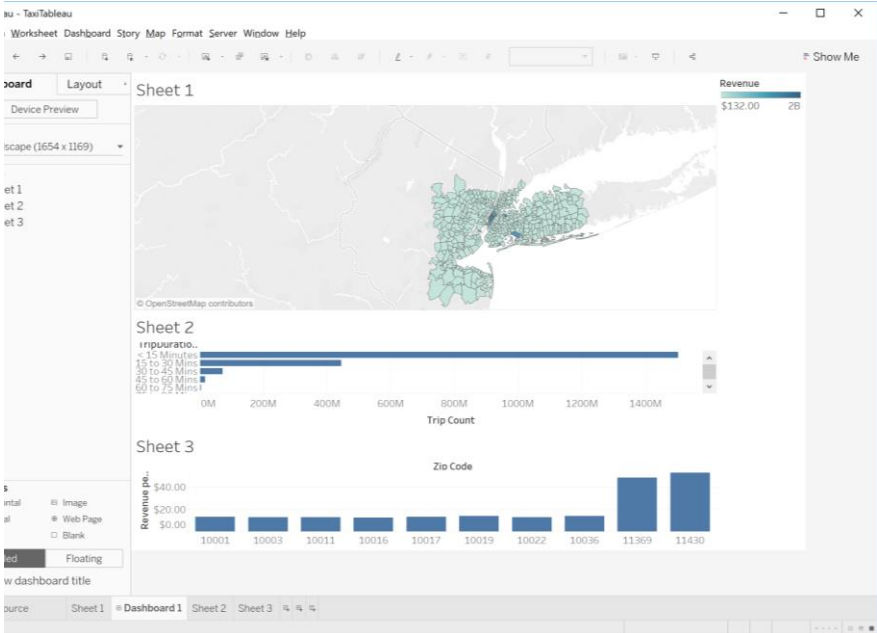
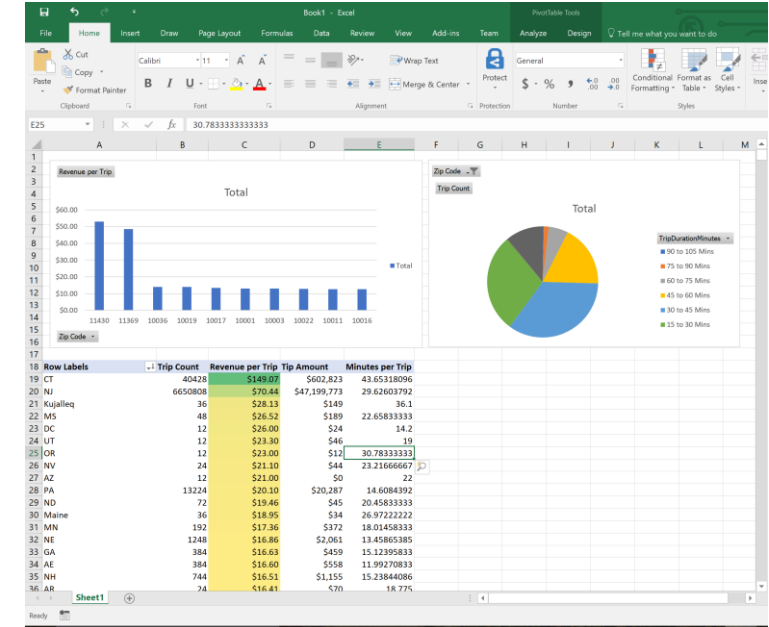
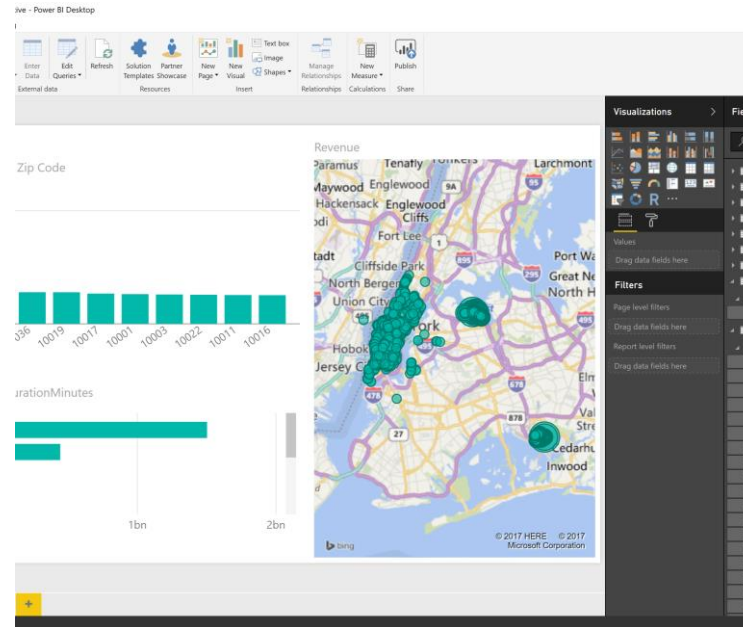
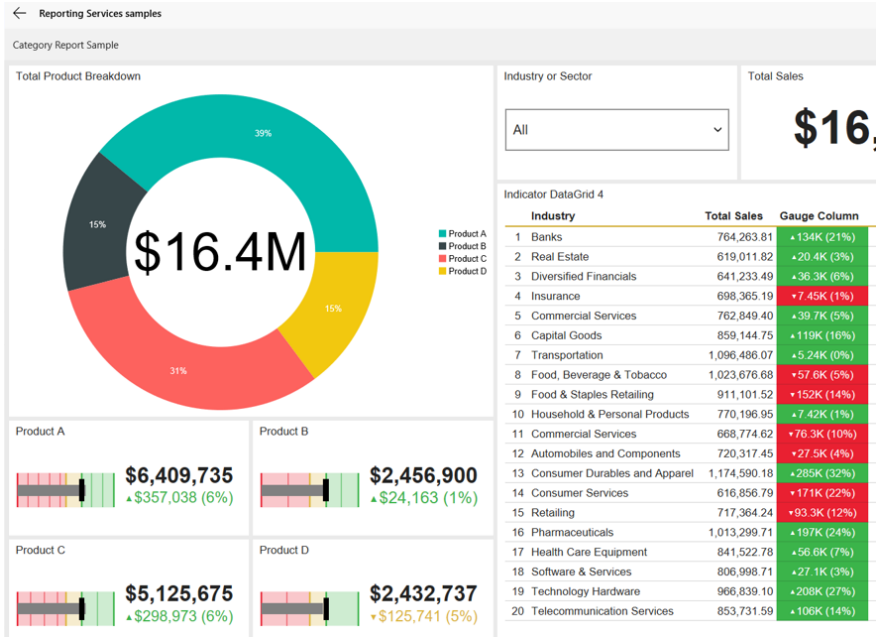




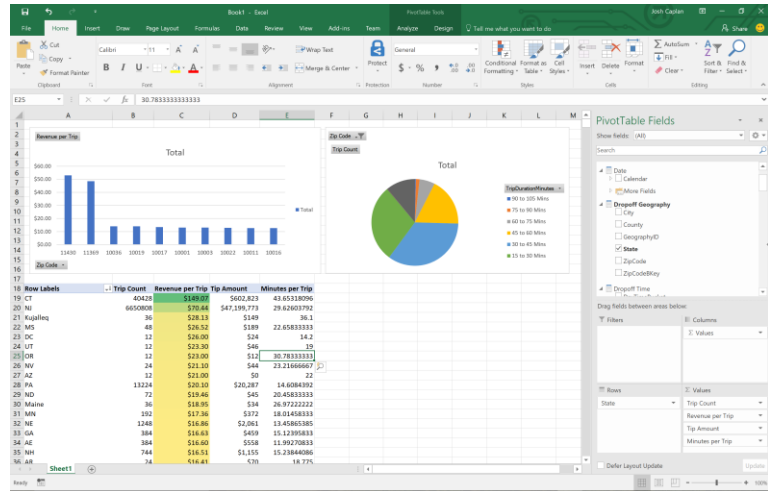
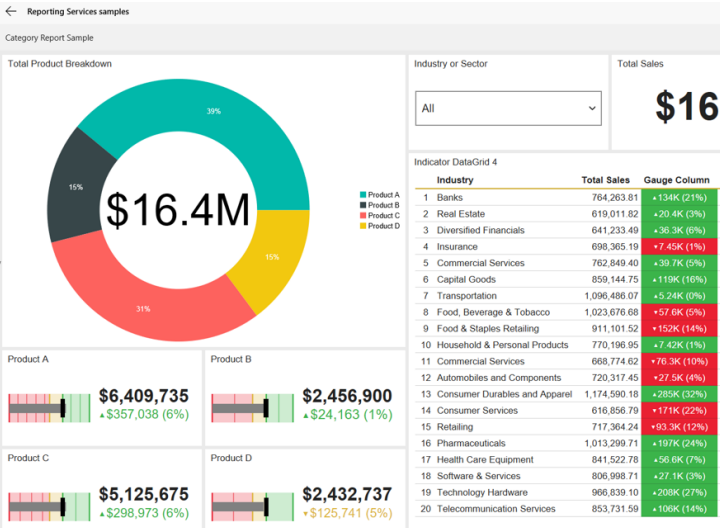
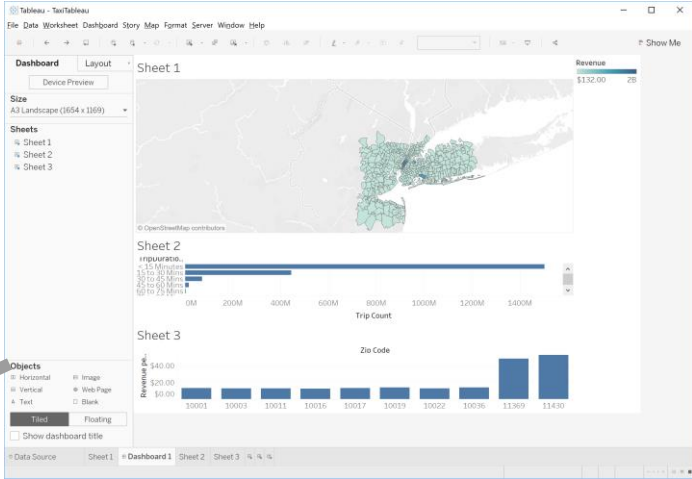
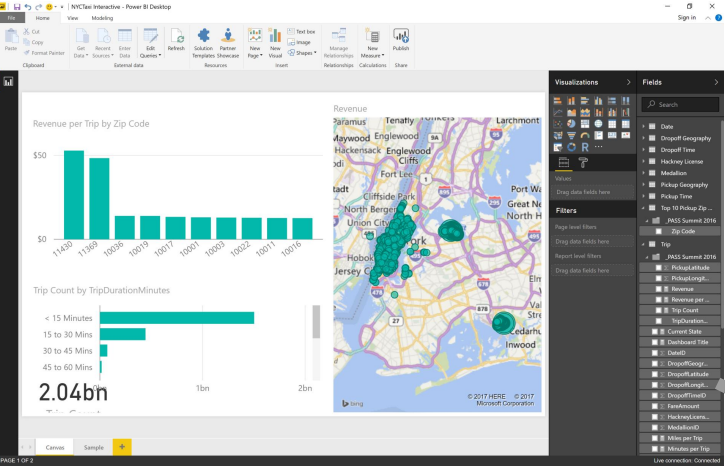
Super Charge Power BI and What is new with Analysis Services

Sivakumar Harinath
Principal Program Manager
Email:sivah@Microsoft.com



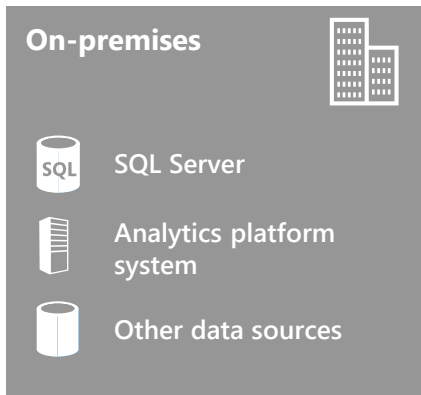
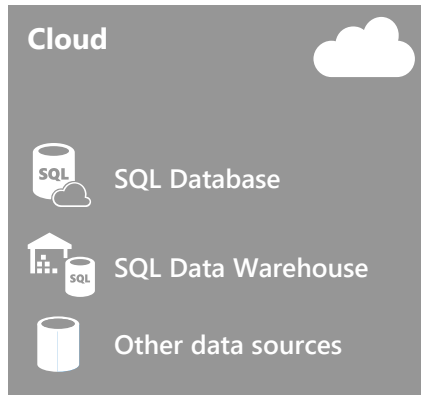
What do all of these have in common?

They can all use Analysis Services

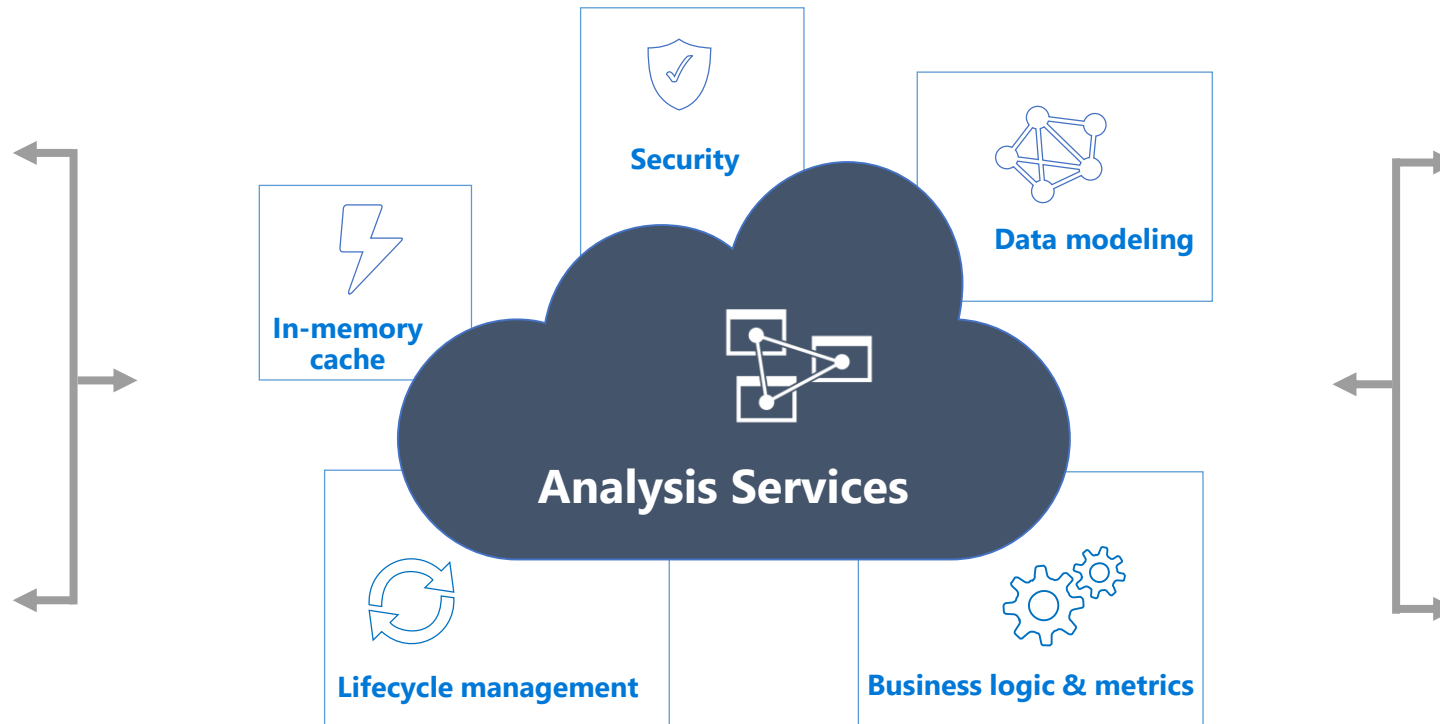


Azure Analysis Services & SQL Server Analysis Services

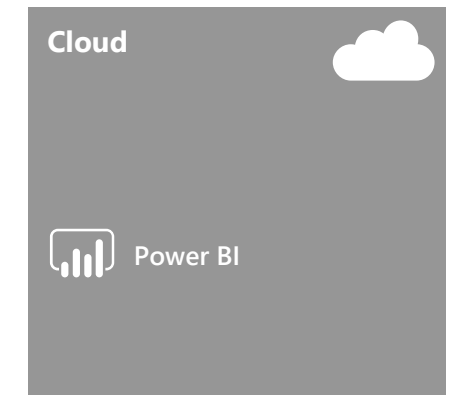
Data sources



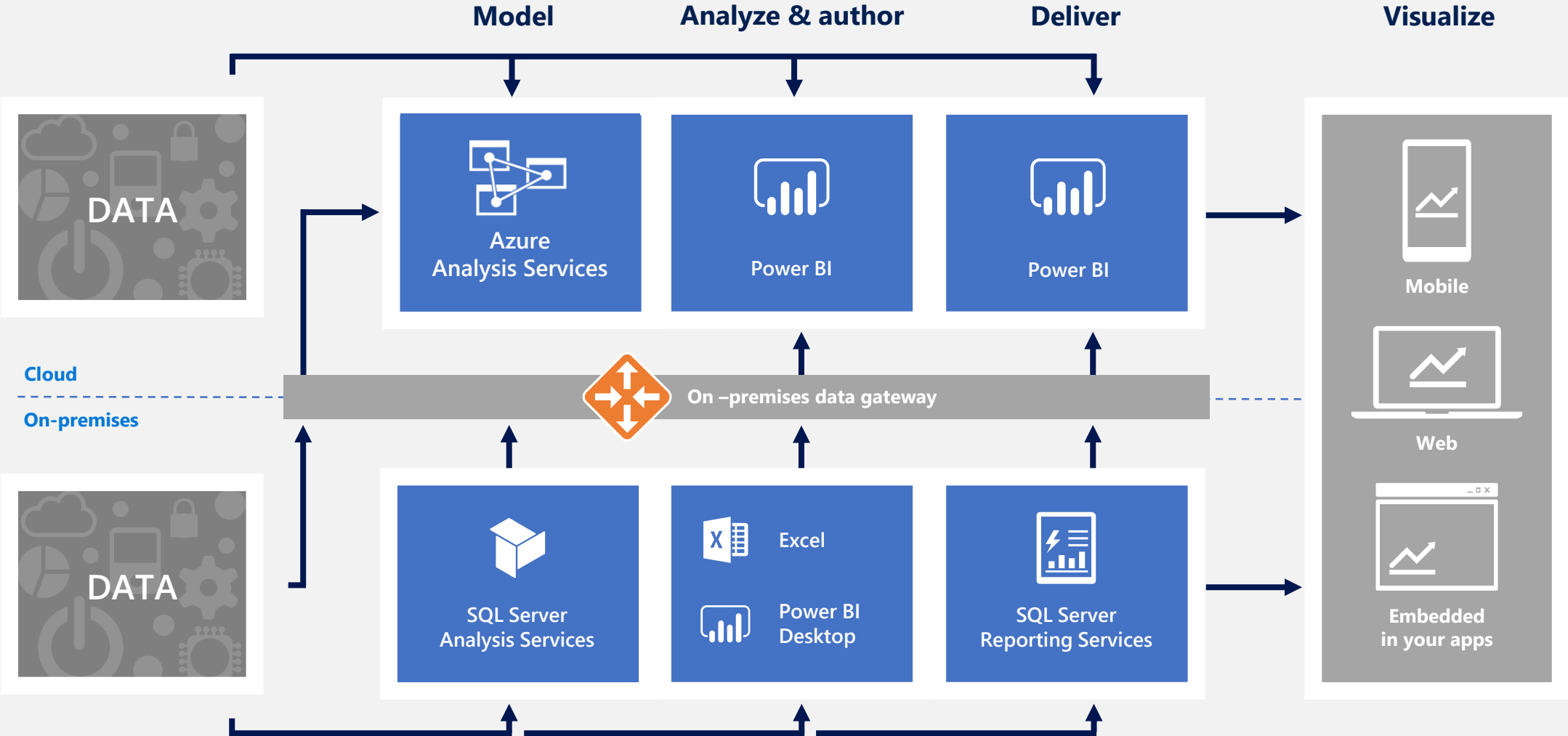
BI semantic model



Client tools

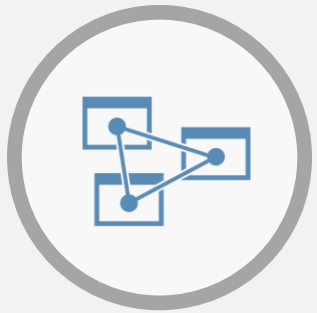


Microsoft BI Platform



Azure Analysis Services

Enterprise grade analytics engine as a service



Build rich semantic models

Transform complex data into business user friendly semantic models



Gain insights at the speed of thought

Gain instant insights with in-memory cache using your preferred visualization tools



Proven technology

Based on powerful, proven SQL Server Analysis Services



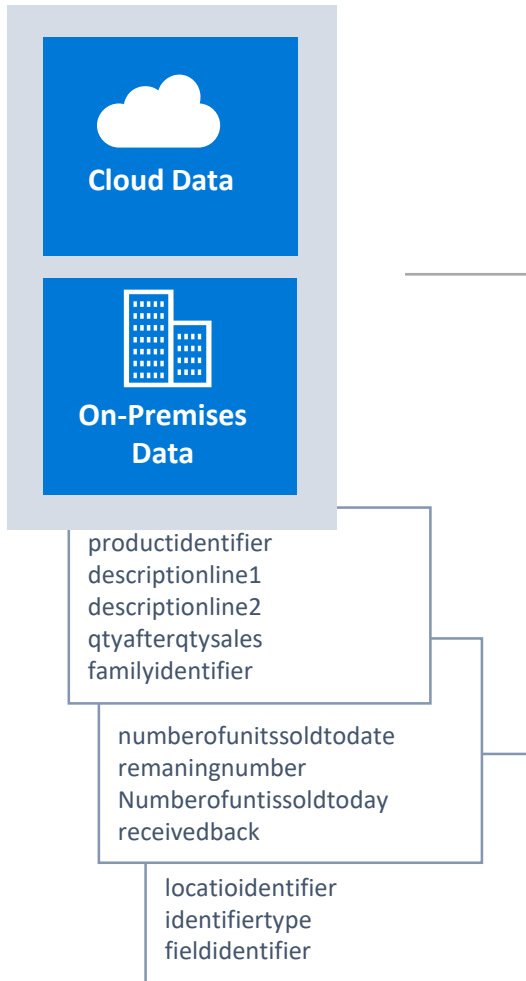
Provision and scale with ease

Easy to deploy, scale, and manage as a platform-as-a-service solution

Rich semantic modelling

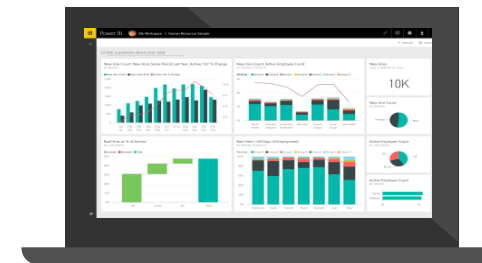
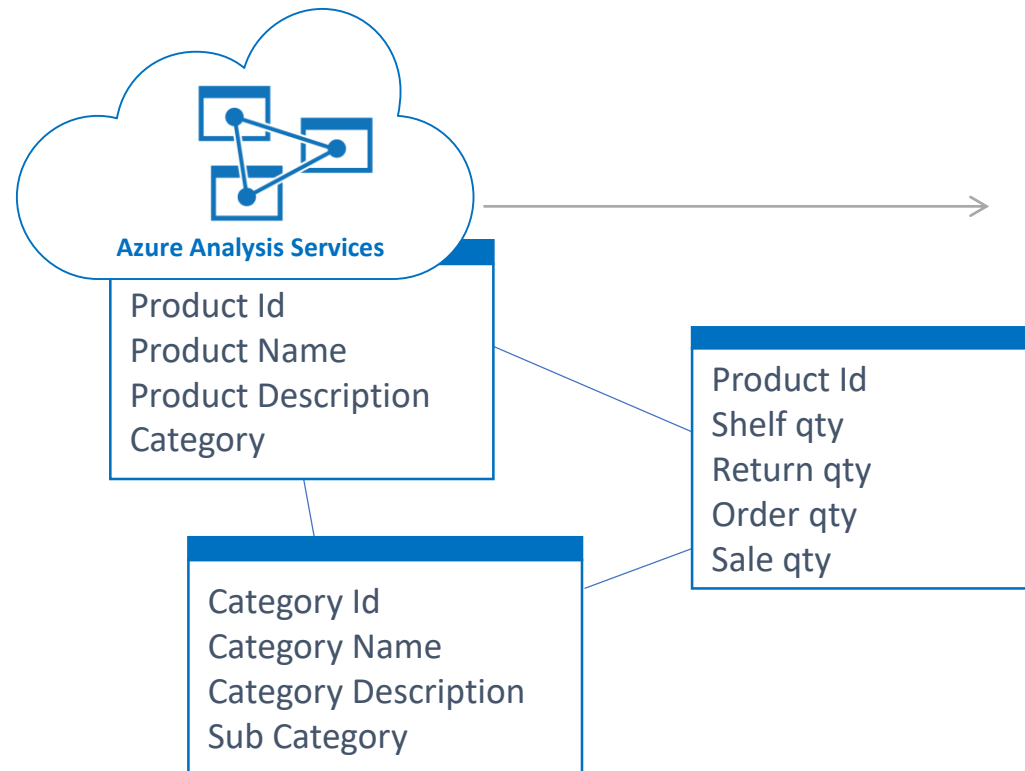
Source Data

Complex raw data optimized for processing

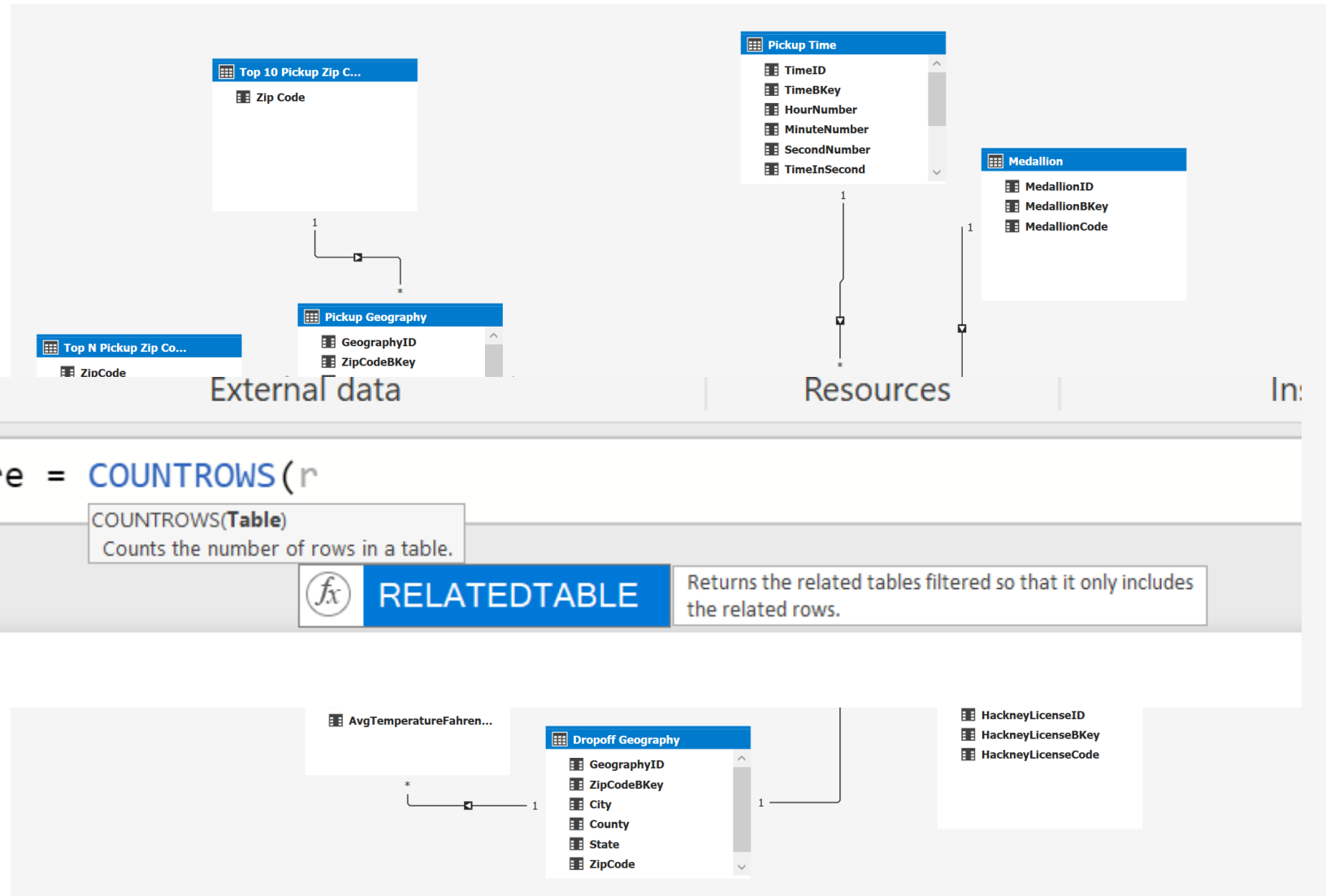
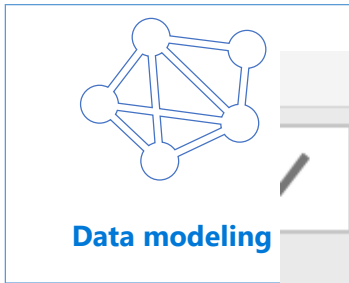


Semantic Model

Rich, business user friendly semantic model



Semantic Model



Connect and go

The screenshot shows the Power BI Desktop interface. The ribbon at the top includes tabs for Home, View, and Modeling. The Visualizations pane on the right displays various chart types like bar, line, and map. The Fields pane shows a list of data fields including Date, Dropoff Geography, Dropoff Time, Hackney License, Medallion, and Pickup Geography.

The screenshot shows the Tableau - Book1 interface. The Data pane on the left lists dimensions such as Date, Dropoff Geography, Dropoff Time, Hackney License, Medallion, Pickup Geography, Pickup Time, Top 10 Pickup Zip Codes, Trip, and Weather. The Marks card is currently set to 'Automatic'. The main workspace is labeled 'Sheet 1' and contains a 'Drop field here' prompt.

The screenshot shows the Excel interface with a PivotTable. The PivotTable Fields task pane on the right lists fields under 'Date' and 'Trip'. The PivotTable area contains a PivotTable with the following structure:

Active Field:	Drill Down	Drill Up	Group	Filter Connections	Refresh	Change Data Source	Actions	Fields, Items, & Sets	OLAP Tools	Relationships	PivotChart	Recommended PivotTables	Show
PivotTable	Field Settings	Active Field	Filter	Data	Calculations	Tools							

The PivotTable area also displays the text: "To build a report, choose fields from the PivotTable Field List" and an illustration of a PivotTable.

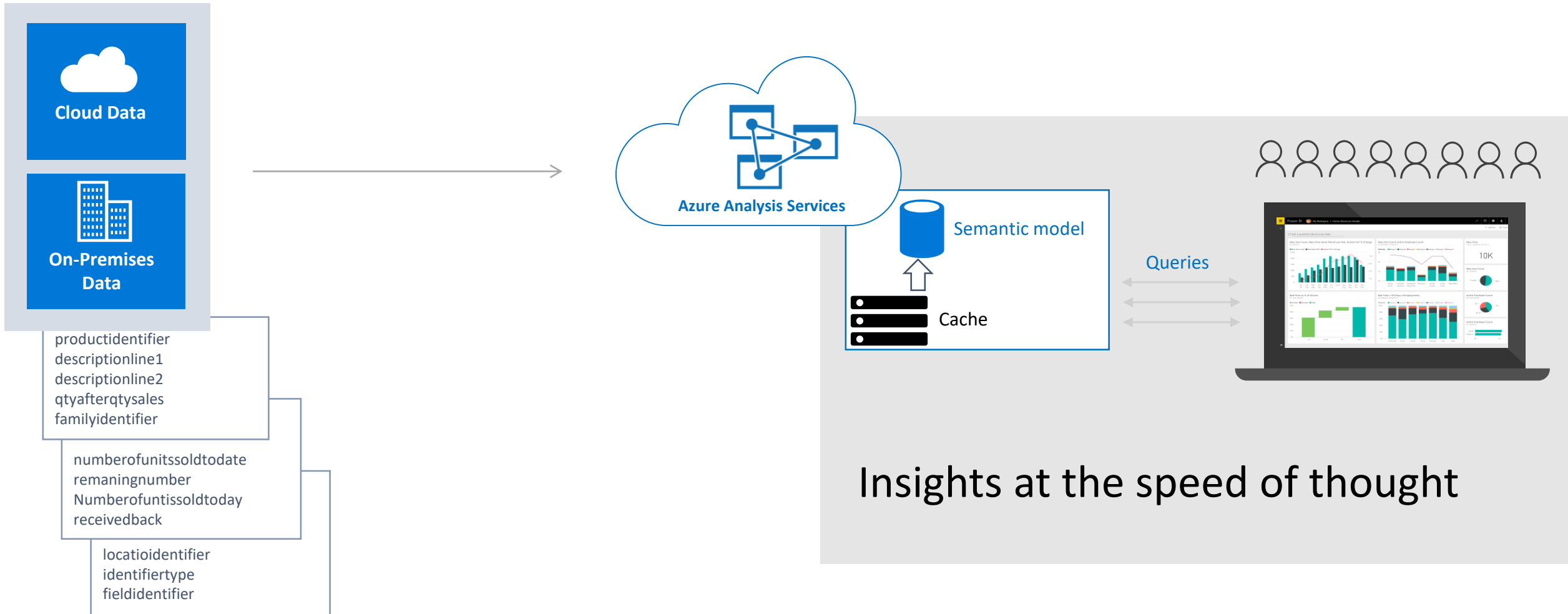
Lightning fast queries

Source Data

Complex raw data optimized for processing

Semantic Model

Rich, business user friendly semantic model



Insights at the speed of thought

Lightning fast queries

The screenshot displays the Power BI Desktop interface for a report titled "NYCTaxi Interactive". The dashboard contains four main visualizations:

- 1. Revenue per Trip by Zip Code:** A vertical bar chart showing revenue for various zip codes. The highest revenue is for zip code 11430, exceeding \$50.
- 2. NYC Map:** A map of New York City with green bubbles of varying sizes representing revenue at different locations. The largest bubbles are concentrated in the Manhattan area.
- 3. Trip Count by TripDurationMinutes:** A horizontal bar chart showing the number of trips for different duration ranges. The "< 15 Minutes" range has the highest count, exceeding 2 billion.
- 4. Fields Pane:** A pane on the right side of the interface showing the data model. It includes sections for Visualizations, Values, Filters, and Report level filters. The "Zip Code" field is currently selected in the Filters section.

The interface also shows the standard Power BI Desktop ribbon with tabs for File, Home, View, and Modeling, and a status bar at the bottom indicating "PAGE 1 OF 2" and "Live connection: Connected".

Analysis Services

Azure Analysis Services with Power BI

Considerations for using Azure AS

- Scenario: Large models with high concurrent usage
- Query latency: Low. All data in Memory
- Data freshness: On demand
- Data partitioning
- Model size: Up to 400 GB of data after compression.
- Programmability: ARM, PowerShell, TOM/AMO, TMSL, MSOLAP and ADOMD.
- Application life cycle: Visual studio and source control integration.

Getting started

Introducing Azure Analysis Services web designer!

- Import Power BI desktop files to Azure AS.
- Get started quickly.
- Tune existing models in the web.
- Integrate with Power BI, Excel, Visual Studio and GitHub.

The screenshot displays the Microsoft Azure Analysis Services web designer interface. The main window shows the 'Internet Sales - Measures' configuration page. A list of measures is visible, with 'Internet Total Freight' selected and highlighted in blue. Below the list, a DAX formula editor shows the formula 'SUM([Freight])'. To the right, there are panels for 'Tables' and 'Functions'. The 'Tables' panel lists various tables like Customer, Date, Geography, Product, etc. The 'Functions' panel lists various functions like Date and Time, Time Intelligence, Filter, etc. The background shows a code editor with JSON configuration for the model.

Azure Analysis Services web
designer

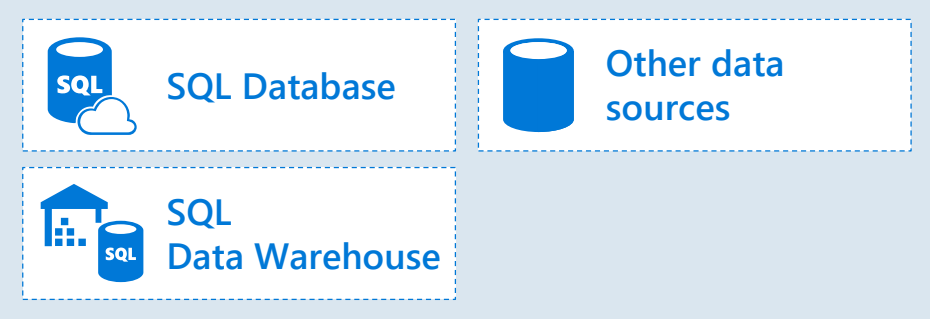
Import Power BI Desktop file

- Supported sources
 - SQL Server, Azure SQL DB, Azure SQL Data Warehouse, Oracle and Teradata.
 - More to come.
- Cache mode only

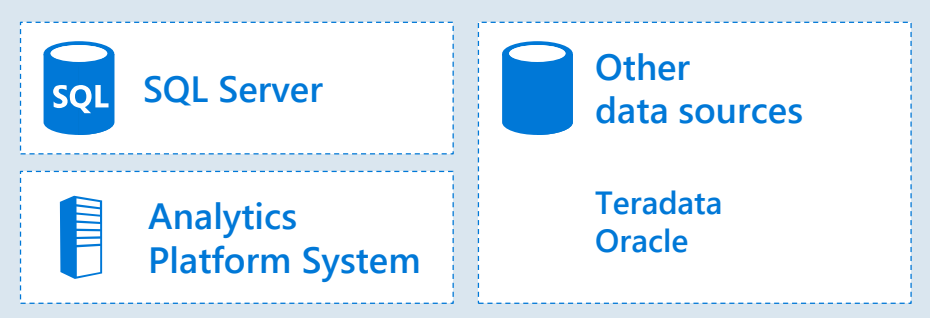
Connecting to on premise data

Azure Analysis Services Architecture

Cloud data sources



On-premises data sources



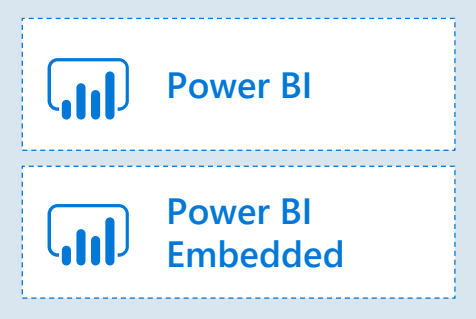
Azure Analysis Services



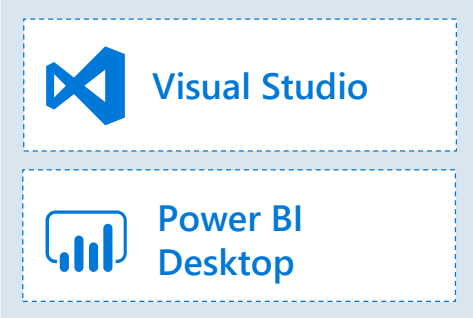
Gateway



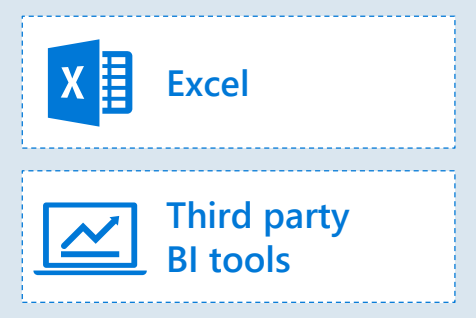
Cloud visualization tools



Authoring and development tools



On-premises visualization tools



Direct Query
Cached Model

Direct Query
Cached Model

Note: not all capabilities available at public preview



You can now use one gateway for
everything!

Gateway

Unified Gateway

On-premises data gateway

One gateway for multiple cloud services and experiences

Cloud services



Gateway Cloud Service

- Encrypts and stores data source credentials and on-premises data gateway details
- Routes queries and results between cloud services, on-premises data gateway, and data source



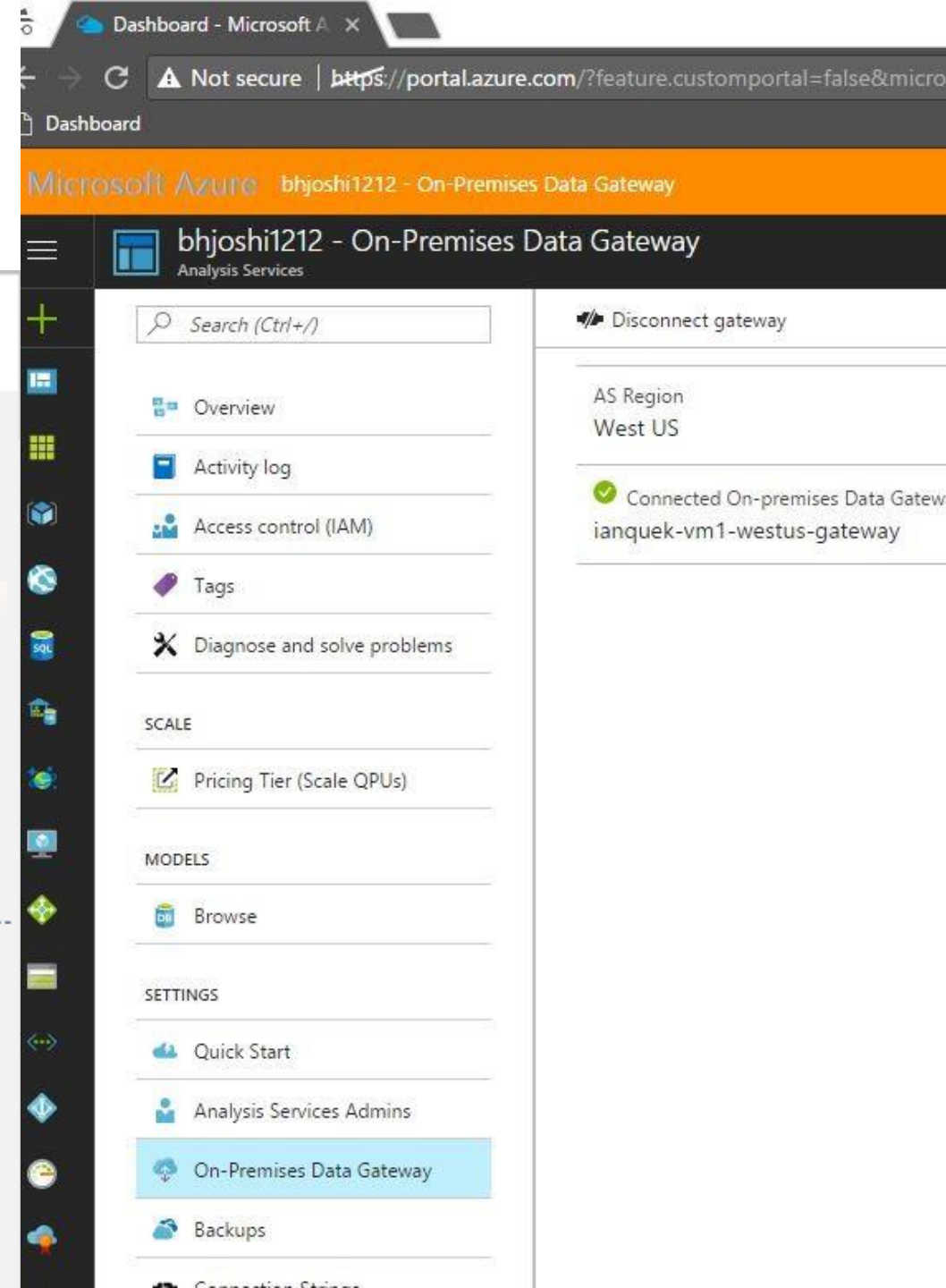
Azure Service Bus



On-premises data gateway

- Decrypts data source credentials and connects to data source
- Sends queries to data source and returns the results to gateway cloud service

On-premises data sources



Customer example

Why Azure Analysis Services at Expedia?

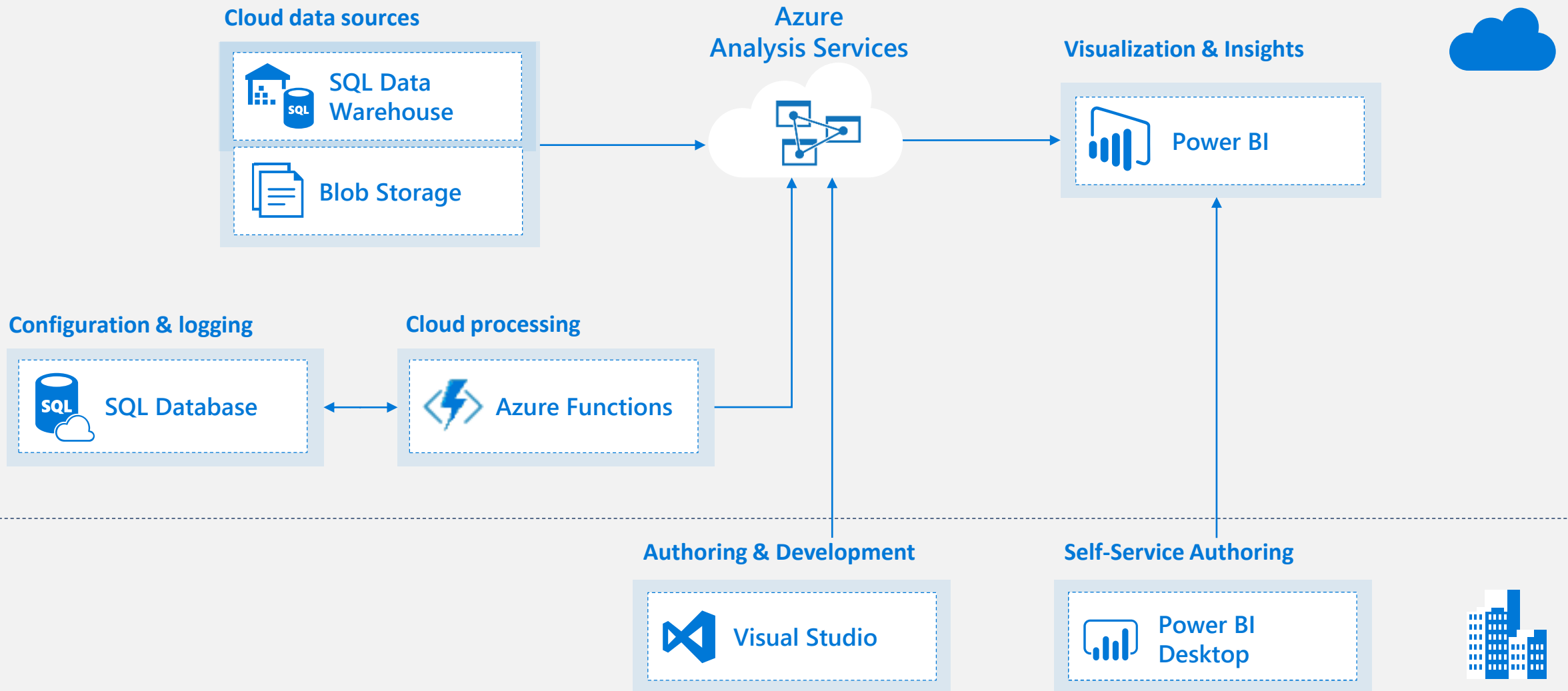
- Scale and performance
- PaaS service fast setup
- Tabular is quick and easy
- Great integration with Power BI
- Data consistency / corporate BI

Self-Service & Corporate BI > “Bimodal” BI

- Self-service BI is characterized by having a large number of small models.
- Corporate BI is characterized by having a small number of large models.

- Kurt Schlegel et al. (2016) observes the following. *Create a Centralized and Decentralized Organizational Model for Business Intelligence, Page 6*. Retrieved from Gartner database; “Gartner Foundational”.
 - ... a centralized team in overall charge **that finds and then promotes interesting analysis across the entire organization.**
 - Local teams are being empowered to create and innovate. **The centralized team identifies the most successful work being done at a local level, and provides a platform to share and promote this work globally.**

Architecture



1200 Compatibility Level

Azure Analysis Services / SQL Server Analysis Services 2016

- Modeling and analytics
 - Bi-directional cross filters
 - Calculated tables
 - Display folders
 - Translations
 - Over 50 new DAX functions
- DirectQuery enhancements
- Manageability
 - Tabular Object Model (TOM)
 - Tabular Model Scripting Language (TMSL)
- Performance and scalability
 - Parallel partition processing
 - NUMA awareness and memory allocator (SP1)
 - Super DAX
- Developer Tools
 - Tabular Model Explorer
 - Integrated workspace server
 - DAX formula editing

1400 Compatibility Level

Azure Analysis Services / SQL Server Analysis Services 2017

- **Data connectivity**

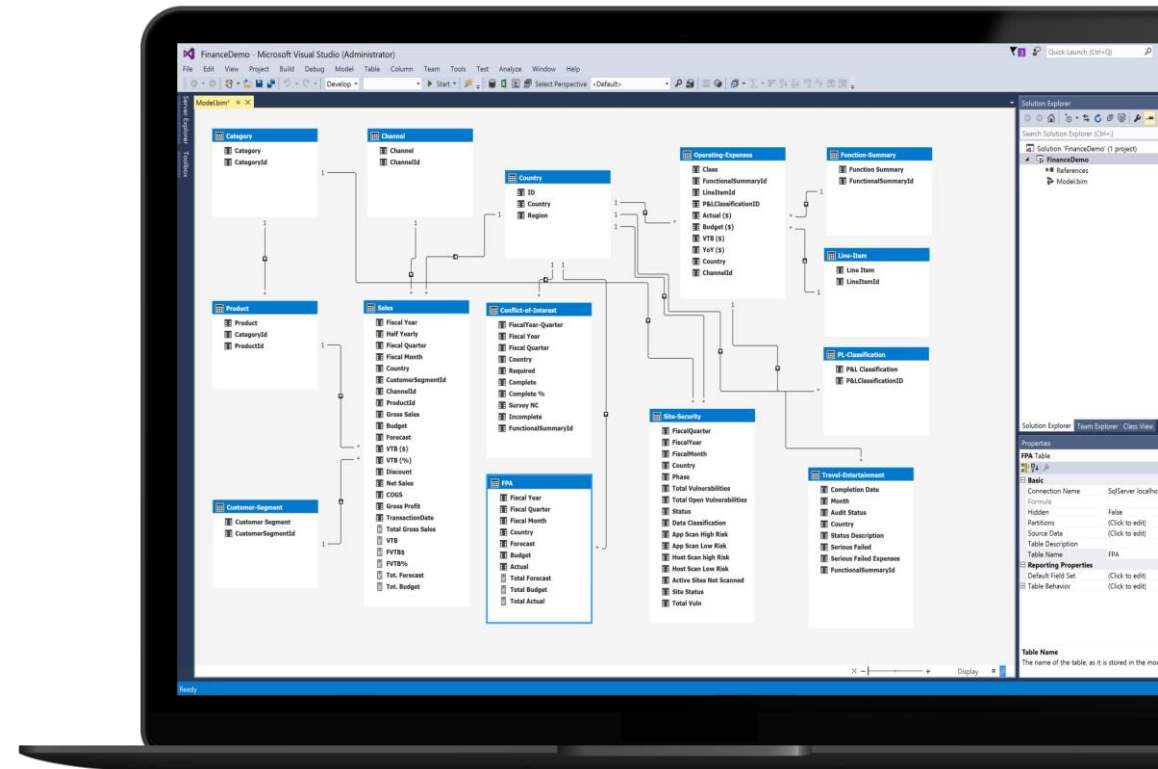
- Rich set of data sources
- Data transformations and mashups with Power Query Formula Language

- **Modeling and analytics**

- Detail Rows
- Object level security
- Enhanced support for ragged hierarchies

- **Developer tools**

- SSDT for VS 2017
- DAX Editor for SSDT and SSMS



Further Info

- Power BI Governance & Deployment Approaches: <https://powerbi.microsoft.com/documentation/powerbi-admin-governance/>
- Gartner Research Paper by Kurt Schlegel et al. (2016): [Create a Centralized and Decentralized Organizational Model for Business Intelligence](#)
- Gartner IT Glossary: <http://www.gartner.com/it-glossary/bimodal>
- Analysis Services Team Blog: <https://blogs.msdn.microsoft.com/analysisservices/>
- Analysis Services Git Repo: <https://github.com/Microsoft/Analysis-Services/>
- BISM Normalizer: <http://bism-normalizer.com/>

Questions