XMLA endpoint
Power BI open-platform connectivity

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▸ Founder of Power BI UG Denmark

▸ Host on the Power BI Quiz show

▸ Consultant in justB

▸ Trainer at Orange Man

▸ 10+ years of experience with Microsoft BI

▸ Strong focus on the front-end tools

  ◦ Analysis Services

  ◦ Reporting Services

  ◦ PerformancePoint Services

  ◦ Excel and Power Pivot

  ◦ Power BI

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Microsoft CERTIFIED Trainer
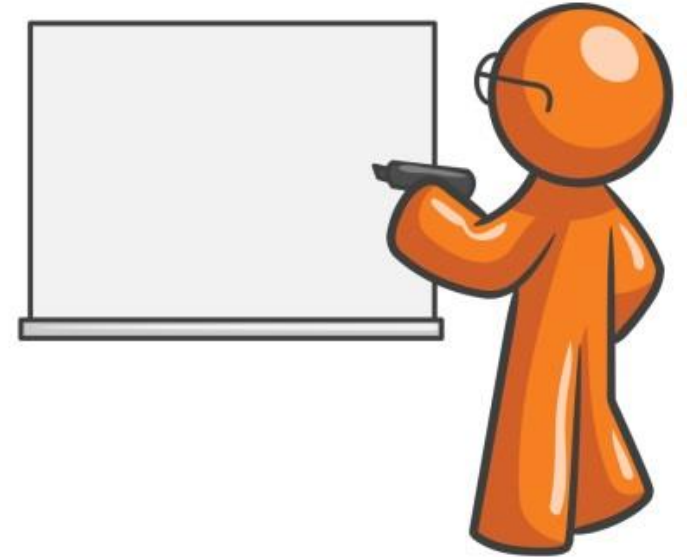
Microsoft CERTIFIED IT Professional

SSAS MAESTRO by Microsoft

MVP **Microsoft** Most Valuable Professional

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Agenda

▸ Power BI merging with Azure Analysis Services

▸ What is the XMLA read/write endpoint?

▸ What is "Dedicated Capacity" ?

▸ Client tools connectivity

▸ Use cases
  ◦ Single source architecture
  ◦ Fine-grain data refresh
  ◦ Deployment with Tabular Editor
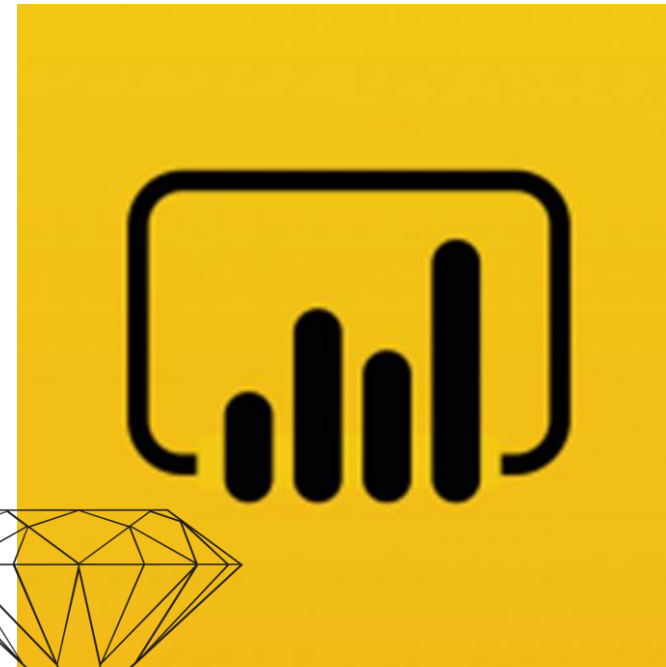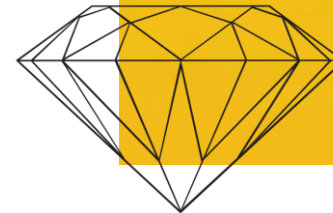 ◦ Incremental deployment with ALM Toolkit

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Power BI merging with Azure Analysis Services

Enterprise BI   **All BI usersSelf-service BI users**

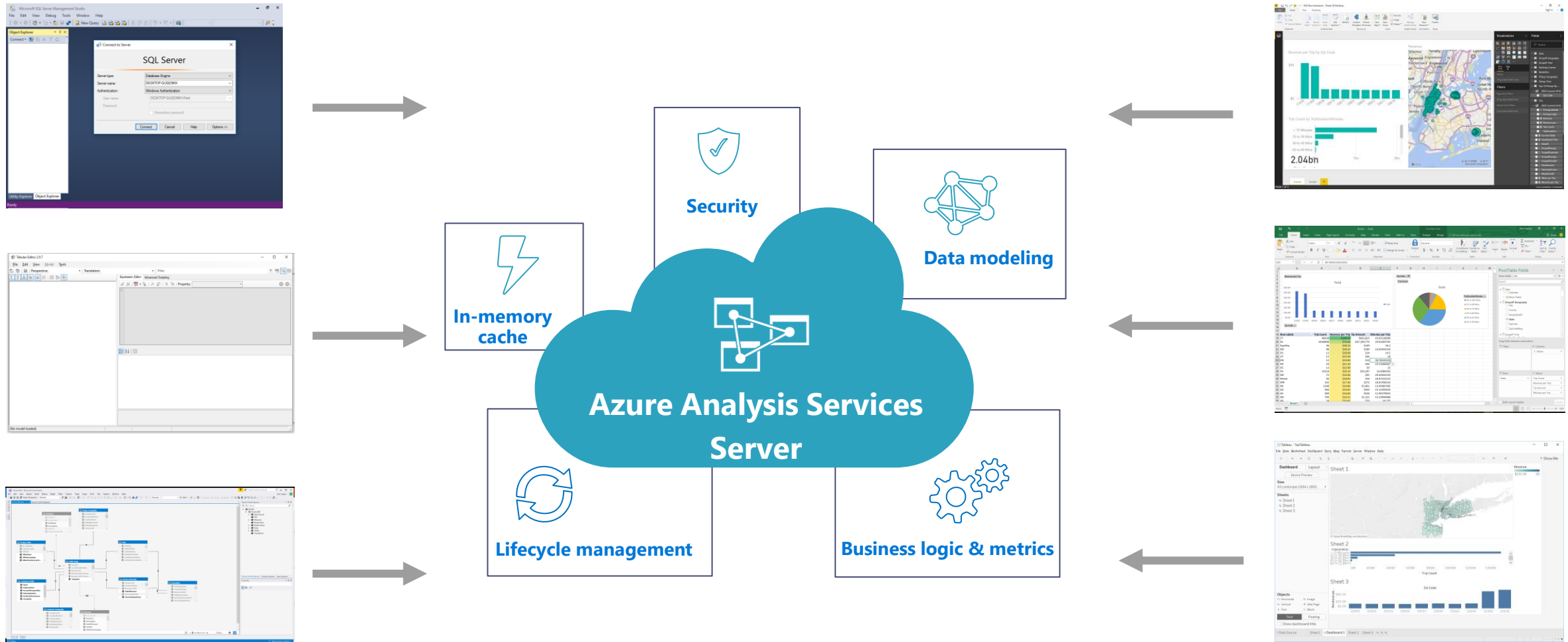Azure Analysis Services   Power BI Premium   Power BI

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What is the XMLA read/write endpoint?

▸ XMLA is the same protocol used for managing SQL Server Analysis Services and Azure Analysis Services models, a variety of Microsoft and third-party tools can be used with Power BI datasets

▸ Additional scenarios for dataset management, advanced semantic modeling, debugging and monitoring

▸ Power BI to support self-service and IT-managed enterprise data models on a single, all-inclusive platform

▸ General availability from September 2020.

▸ Requires dedicated capacity!

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Connectivity: Analysis Services

Azure Analysis Services Server

- Security
- Data modeling
- In-memory cache
- Lifecycle management
- Business logic & metrics

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Connectivity: Power BI Premium

Security

Data modeling

In-memory cache

Workspace

Lifecycle management

Business logic & metrics

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What is "Dedicated Capacity" ?

	Analysis Services	A SKU	P SKU	Premium Per User
Product	Azure AS	Power BI Embedded	Power BI Premium	Power BI PPU
Purchase	Azure portal	Azure portal	Office 365	Office 365
Use cases	• Only datasets • No Power BI features	• Embed content in external apps • Capacity testing	• Same as A SKU, plus: • Share content with Power BI free users through the Power BI portal • Embed in other SaaS apps (SharePoint, Teams)	• Capacity testing
Billing	Hourly	Hourly	Monthly	Monthly
Commitment	None	None	Yearly	Monthly
Difference	Full elasticity: scale up, scale down, pause, resume. ARM API with PowerShell.	Full elasticity: scale up, scale down, pause, resume. ARM API with PowerShell.	Combine embedding in apps, and use the Power BI Service in the same capacity. Power BI Report Server included.	

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Dedicated capacity pricing

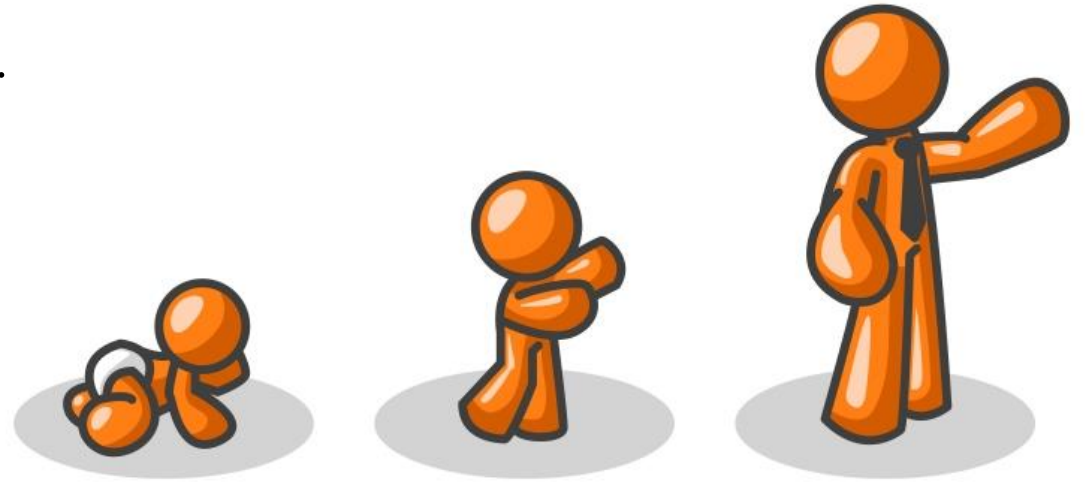| Virtuel cores	Memory (GB)	Analysis Services		A SKU		P SKU	
1	3			A1	~$750		
2	5			A2	~$1.500		
4	10			A3	~$3.000		
8	25	S1	~$1.500	A4	~$6.000	P1	~$5.000
16	50	S2	~$3.000	A5	~$12.000	P2	~$10.000
32	100	S4	~$6.000	A6	~$24.000	P3	~$20.000

Price is per month. Analysis Services and A SKU has full elasticity – only pay per hour!

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Premium Gen2 (Preview)

▸ With Premium Gen2 the amount of memory available on each node size is set to the limit of memory footprint of a single artifact, and not to the cumulative consumption of memory. For example, in Premium Gen2 only a single dataset size is limited to 25 GB, in comparison to the original Premium, where the total memory footprint of the datasets being handled at the same time was limited to 25 GB.

▸ No limits on refresh concurrency so you don't have to track refresh schedule spacing.

▸ Enhanced performance on any capacity size, any time: Analytics operations will run up to 16X faster. Furthermore, operations will always perform at top speed and will not slow down when the load on the capacity approaches the capacity limits.

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Client tools connectivity
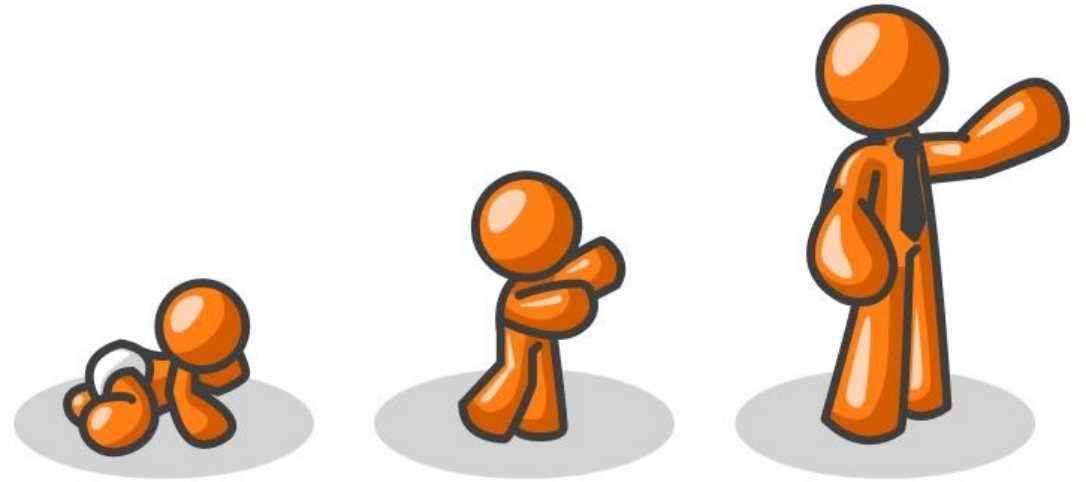
▸ SSMS, DAX Studio, SSRS, Third-Party....

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Client tools connectivity

Tool	Description	Installation/prerequisites
Third party data-visualization tools	Non-Microsoft tools to consume reusable semantic models in Power BI	Install the latest versions of MSOLAP
SQL Server Management Studio	View partitions generated by incremental refresh	Version 18.0 RC1 or above
SQL Server Profiler	Tool for tracing and debugging	SSMS version 18.0 RC1 or above
DAX Studio	Open-source, community tool for executing and analyzing DAX queries against Analysis Services	Version 2.8.2 or above.
Power BI Report Builder	Operational, pixel perfect, paginated reports	Power BI Report Builder
Excel PivotTables	Traditional interactive analysis	Click-to-Run version of Office 16.0.11326.10000

Connectivity
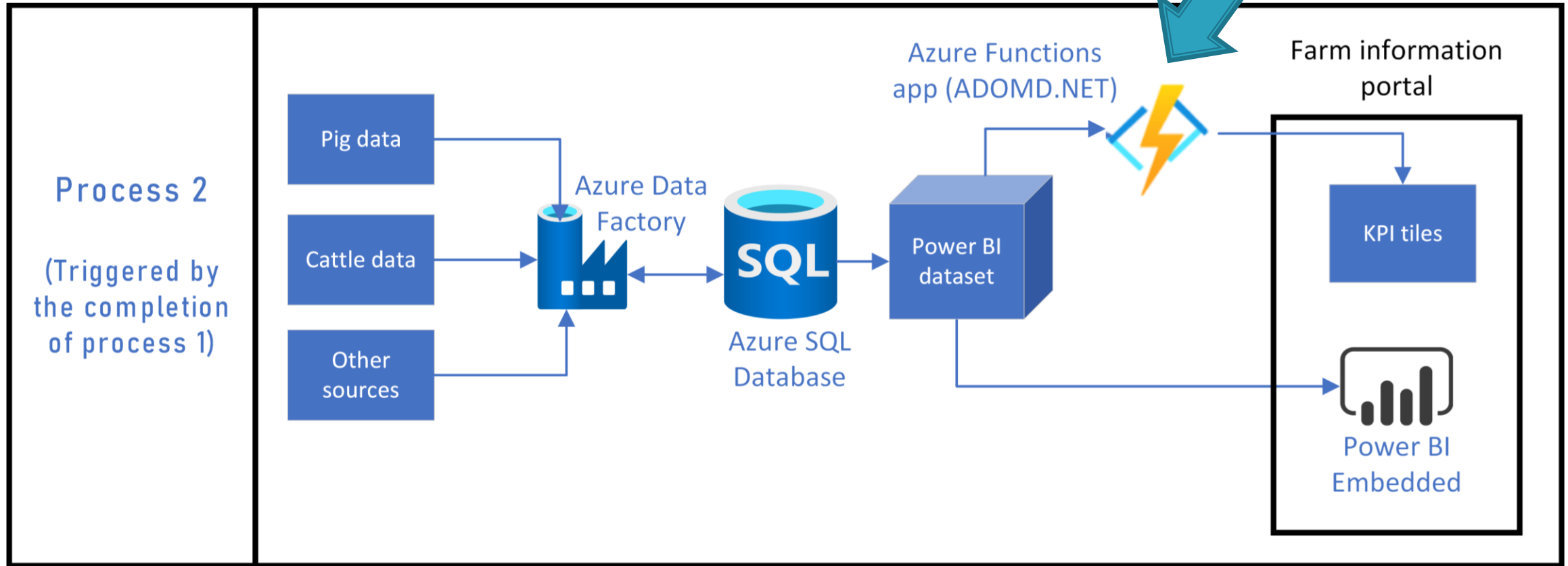
▸ ADOMD.NET client library is required

▸ Addressing a workspace
  ◦ powerbi://api.powerbi.com/v1.0/myorg/[your workspace name]
  ◦ myorg can be replaced with your tenant name (e.g. "mycompany.com")
  ◦ [your workspace name] is case sensitive and can include spaces
  ◦ May need to specify Initial Catalog

▸ XMLA endpoints will honor the security group membership set at the workspace/app level
  ◦ Workspace contributors and above have write access to the dataset and are therefore equivalent to Analysis Services database admins
  ◦ App viewers are equivalent to Analysis Services database readers

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Demo of use cases

Single-source architecture

Process 2

(Triggered by the completion of process 1)

Pig data

Cattle data

Other sources

Azure Data Factory

SQL

Azure SQL Database

Power BI dataset

Azure Functions app (ADOMD.NET)

Farm information portal

KPI tiles

Power BI Embedded

https://customers.microsoft.com/en-us/story/852447-seges-professional-services-power-bi

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Demo: Query from DAX Studio

▸ Enable Read Only or Read Write for the capacity

▸ Tenant-level Export data setting in the Power BI Admin Portal

▸ Connecting to a Premium workspace

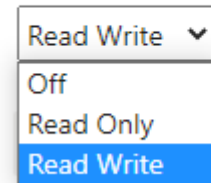◢ Allow XMLA endpoints and Analyze in Excel with on-premises datasets
Enabled for the entire organization

Users in the organization can use Excel to view and interact with on-premises Power BI datasets. This also allows connections to XMLA endpoints.

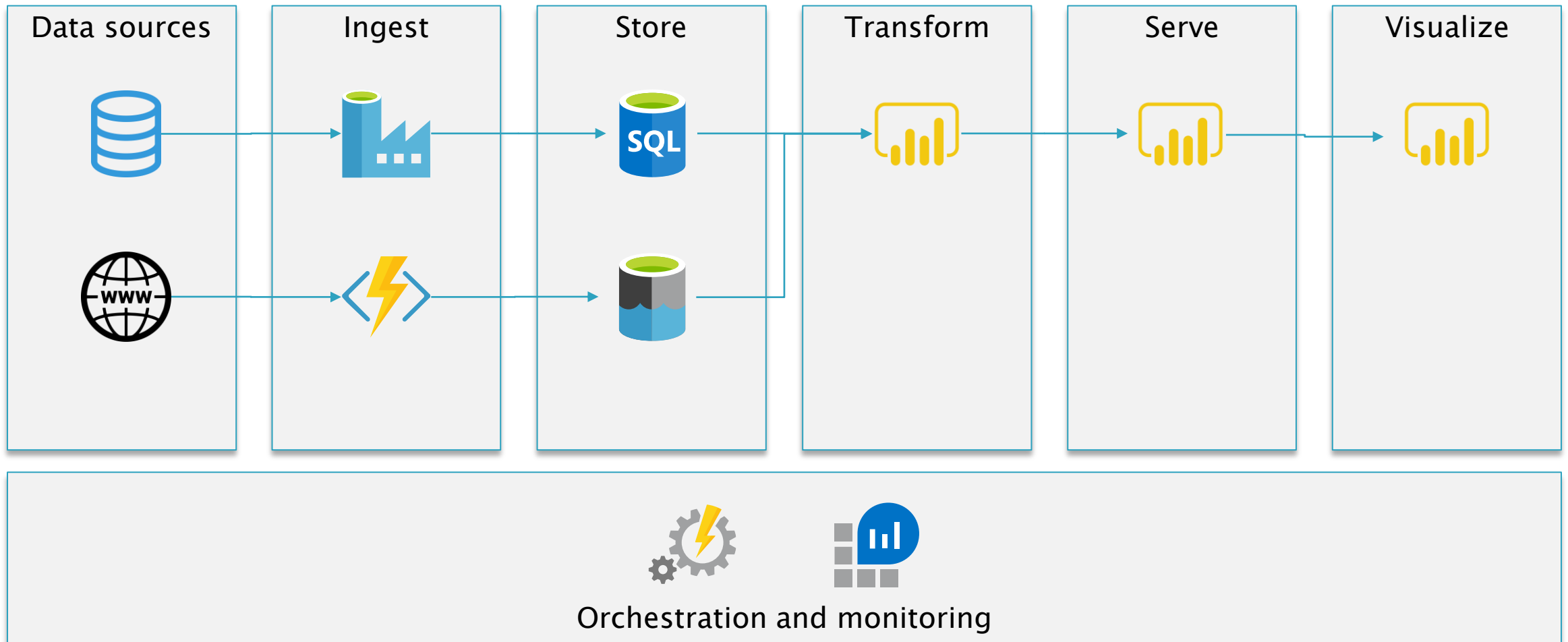Enabled

◢ Dataset workload settings

XMLA Endpoint

Read Write ⌄

Off
Read Only
Read Write   iscard

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Tools leveraging the read/write connectivity

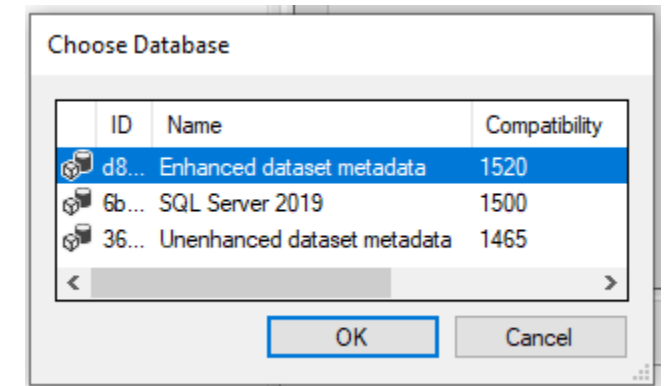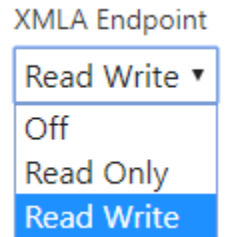| Tool	Description
SQL Server Data Tools (SSDT)	Model authoring with a range of enterprise features, integration with source control, and application-lifecycle management processes.
Analysis Services Deployment Wizard	Deployment of Visual Studio authored tabular model projects. It can be run interactively or from the command line for automation.
Tabular Editor	Open-source, community tool with extensive set of enterprise modelling features, and easy-to-use experience
SQL Server Management Studio	Perform fine-grain data refresh, scripting and management.
ALM Toolkit and BISM Normalizer	Application-lifecycle management, incremental deployments and model merging
PowerShell cmdlets	Analysis Services cmdlets can be used to automate dataset management tasks like refresh operations.
Other third-party tools	

Near real-time refresh architecture

Demo: Fine-grain data refresh

▸ Refresh only one table or partition in a dataset

▸ Scenario: Near real-time refresh

▸ PowerShell cmdlet: Invoke-ProcessTable

▸ Automation with Azure Runbook

```
ProcessTable.ps1 ✕
1   ##  Parameters
2   $Server = 'powerbi://api.powerbi.com/v1.0/myorg/IT-managed datasets'
3   $Database = 'TraditionalDW'
4   $TableName = 'Metadata'
5   $RefreshType = 'Full'
6
7   Invoke-ProcessTable -Server $Server -Database $Database -TableName $TableName -RefreshType $RefreshType
8
```
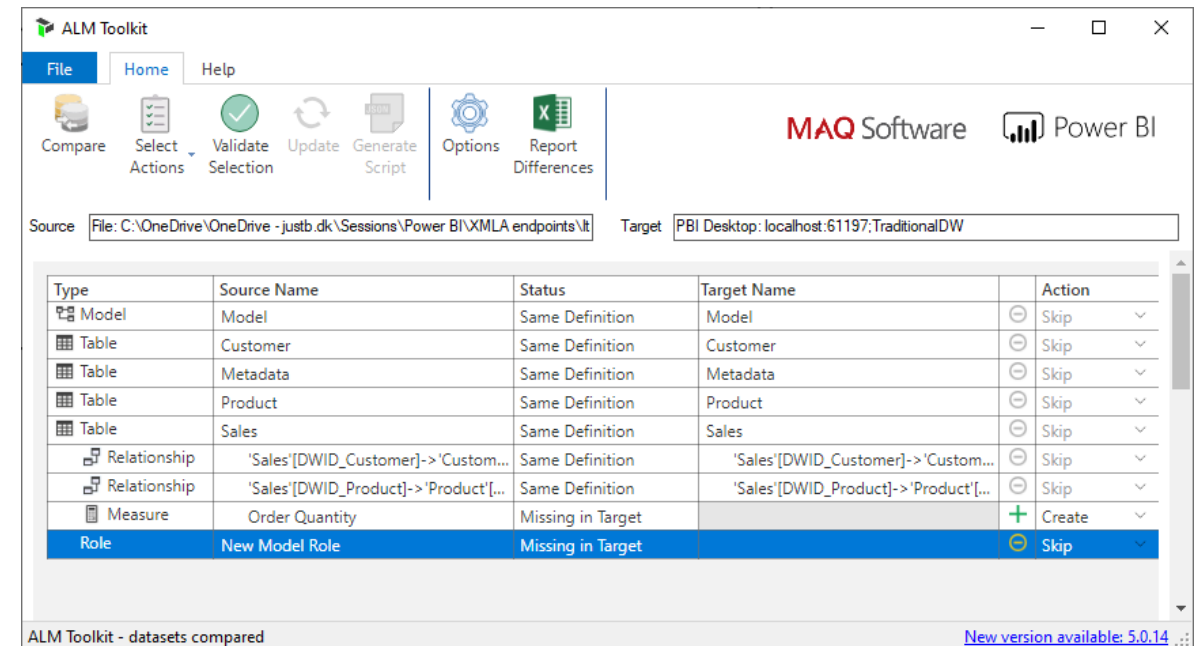
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Demo: Deployment with Tabular Editor

▸ Live connect to dataset with Tabular Editor
▸ Deploy a saved model to the Power BI Service
▸ Automating the deployment process

▸ Download dataset from the Power BI Service?

XMLA Endpoint

Read Write ▾

Off
Read Only
Read Write

Choose Database

	ID	Name	Compatibility
	d8...	Enhanced dataset metadata	1520
	6b...	SQL Server 2019	1500
	36...	Unenhanced dataset metadata	1465

OK   Cancel

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Demo: Incremental deployment with ALM Toolkit

▸ Compare models
  ◦ Power BI Desktop to Dataset in Workspace
  ◦ .BIM file to Dataset in Workspace

▸ Incremental deploy changes

Questions?

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Ressources

- https://powerbi.microsoft.com/en-us/blog/announcing-read-write-xmla-endpoints-in-power-bi-premium-public-preview/
- https://aka.ms/XmlaEndpoint
- https://radacad.com/what-is-the-xmla-endpoint-for-power-bi-and-why-should-i-care
- https://justb.dk/blog/2020/04/use-cases-for-the-xmla-endpoint/
- https://justb.dk/blog/2020/04/using-the-xmla-endpoint-without-premium/