DATA() {
EXPOSED;

DATA EXPOSED SPECIAL

Around the Clock with Azure SQL and Azure Data Factory

Americas
February 3, 2021
09:00 - 17:00 PT

Asia
February 4, 2021
09:00 - 17:00 SGT

HOSTED BY
Wee Hyong Tok & Anna Hoffman

16 Sessions | 2 Ask the Expert Panels | 1 Hackathon

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Basic KQL for troubleshooting Azure SQL DB

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Kusto Query Language

- Optimized **query language** with **visualization** options
- For **fast read-only** data retrieval
- **Troubleshooting** & deep diagnostics
- Real-time stream / big data **analytics**

Use KQL to connect and query these Azure Services:

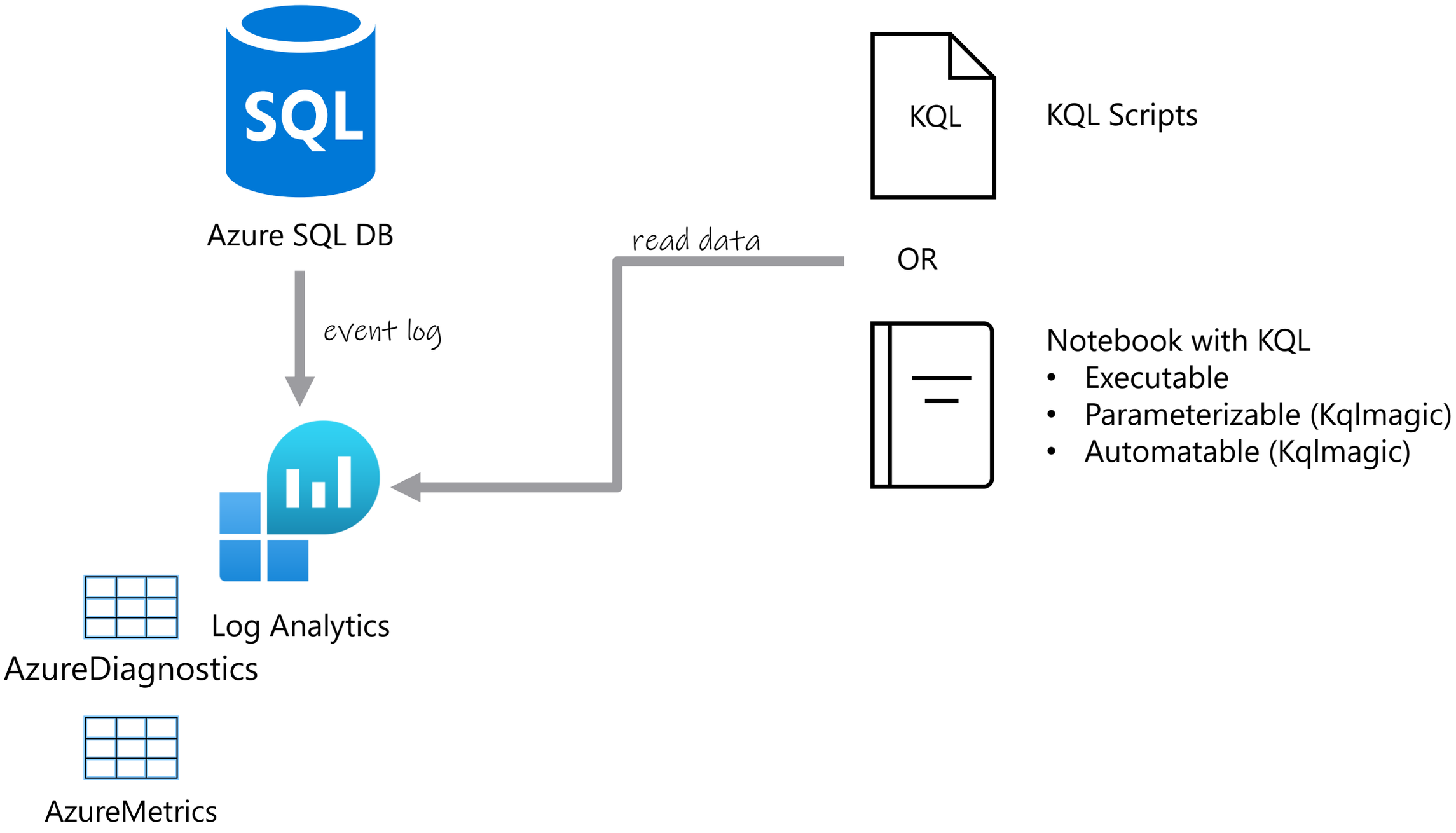
Azure Data Explorer

Log Analytics

App Insights

Resource Graph

...


SQL
Azure SQL DB
event log
read data
KQL
KQL Scripts
OR
Notebook with KQL
• Executable
• Parameterizable (Kqlmagic)
• Automatable (Kqlmagic)
Log Analytics
AzureDiagnostics
AzureMetrics

Enabling Diagnostic Settings for Azure SQL databases

Microsoft Azure (Preview) | Search resources, services, and docs (G+/) | MICROSOFT

Home > AdventureWorks (jukoesmasqldb/AdventureWorks)

AdventureWorks (jukoesmasqldb/AdventureWorks) | Diagnostic settings

SQL database

Search (Ctrl+/)

- Query Performance Insight
- Automatic tuning

Monitoring

- Alerts
- Metrics
- Diagnostic settings
- Logs

Automation

- Tasks (preview)
- Export template

Support + troubleshooting

- Resource health
- New support request

Refresh | Feedback

Diagnostic settings are used to configure streaming export of platform logs and metrics for a resource to the destination of your choice. You may create up to five different diagnostic settings to send different logs and metrics to independent destinations. Learn more about diagnostic settings

Diagnostic settings

Name	Storage account	Event hub	Log Analytics workspace	Edit setting
jukoesmala_AdventureWorks_...	-	-	jukoesmala	Edit setting
SQLSecurityAuditEvents_3d22...	-	-	jukoesmala	Edit setting

+ Add diagnostic setting

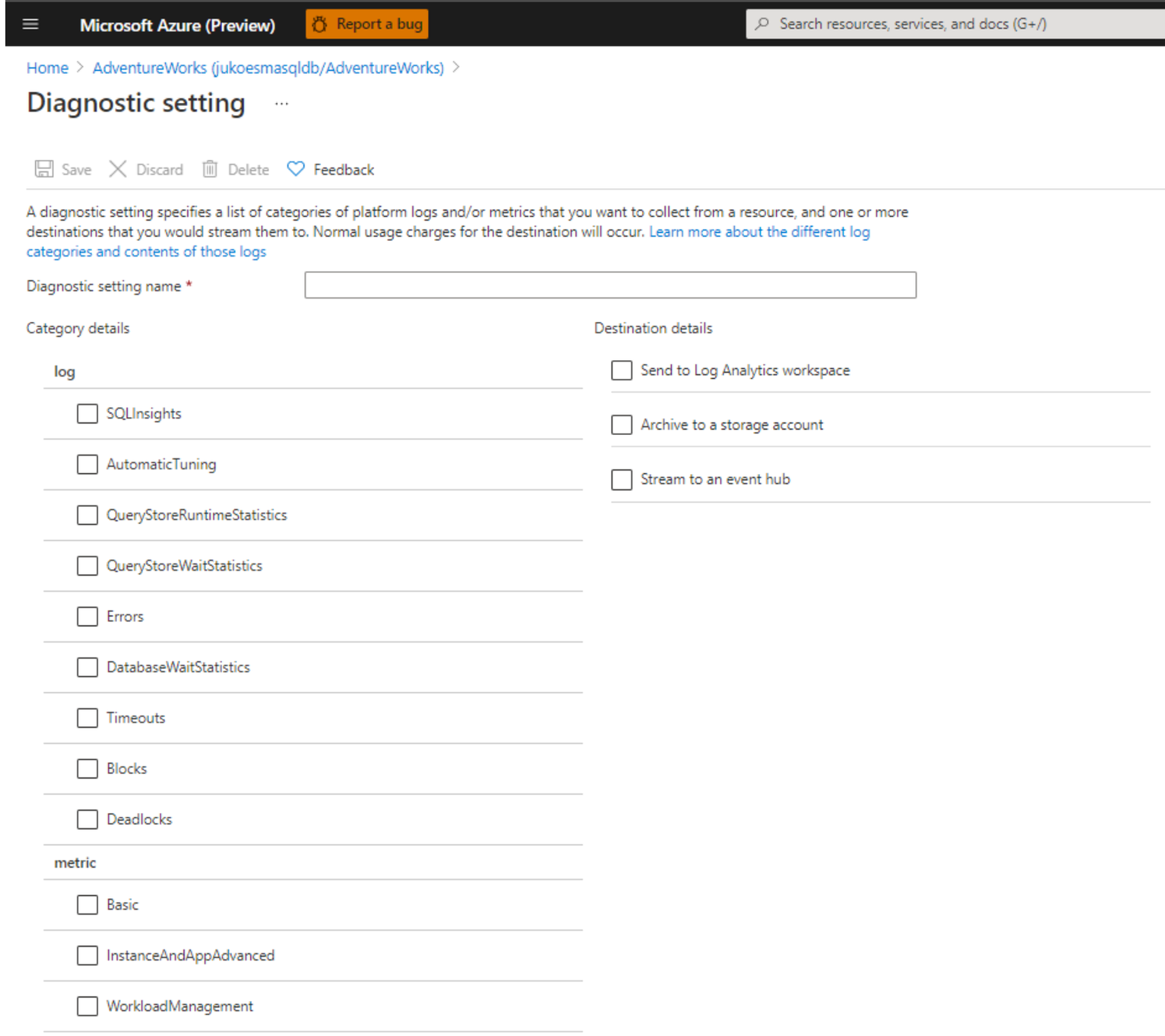
Click 'Add Diagnostic setting' above to configure the collection of the following data:

- SQLInsights
- AutomaticTuning
- QueryStoreRuntimeStatistics
- QueryStoreWaitStatistics
- Errors
- DatabaseWaitStatistics
- Timeouts
- Blocks
- Deadlocks
- Basic
- InstanceAndAppAdvanced

Details you can capture

Category:
- Log
- Metric

Destination Details:
- **Send to Log Analytics workspace**
  Log → AzureDiagnostics
  Metric → AzureMetric
- Archive to storage account
- Stream to an event hub



How to access the logs?

Microsoft Azure (Preview)

Search resources, services, and docs (G+/)

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AdventureWorks (jukoesmasqldb/AdventureWorks) | Logs

SQL database

Search (Ctrl+/)

Intelligent Performance

- Performance overview
- Performance recommendations
- Query Performance Insight
- Automatic tuning

Monitoring

- Alerts
- Metrics
- Diagnostic settings
- Logs

Automation

- Tasks (preview)
- Export template

Support + troubleshooting

- Resource health
- New support request

New Query 1

Feedback | Queries | Query explorer

Queries

Always show Queries | Community Git repo | Documentation

Topic

Search

Resource Type : SQL Databases

Add filter

- ★ Favorites
- All Queries
- Diagnostics
- Performance

DIAGNOSTICS

Loading Data

Monitor data loading in the last hour.

Run

Example query

Wait stats

Wait stats over the last hour, by Logical Server and Database.

Run

Example query

PERFORMANCE

Avg CPU usage

Avg CPU usage in the last hour by resource name.

Run

Example query

Performance troubleshooting

Potentially query or deadlock on the system that could lead to poor performance.

Run

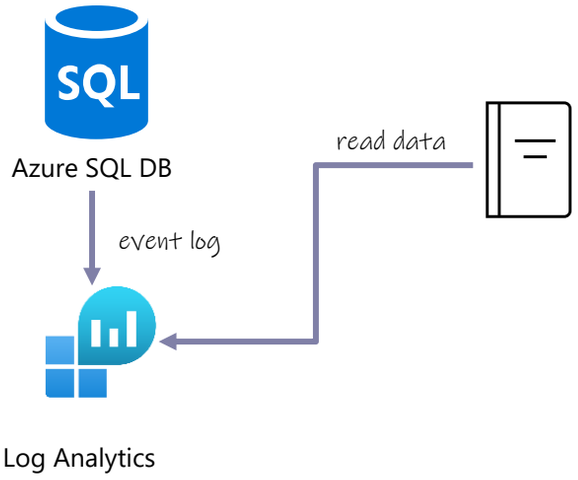
Example query

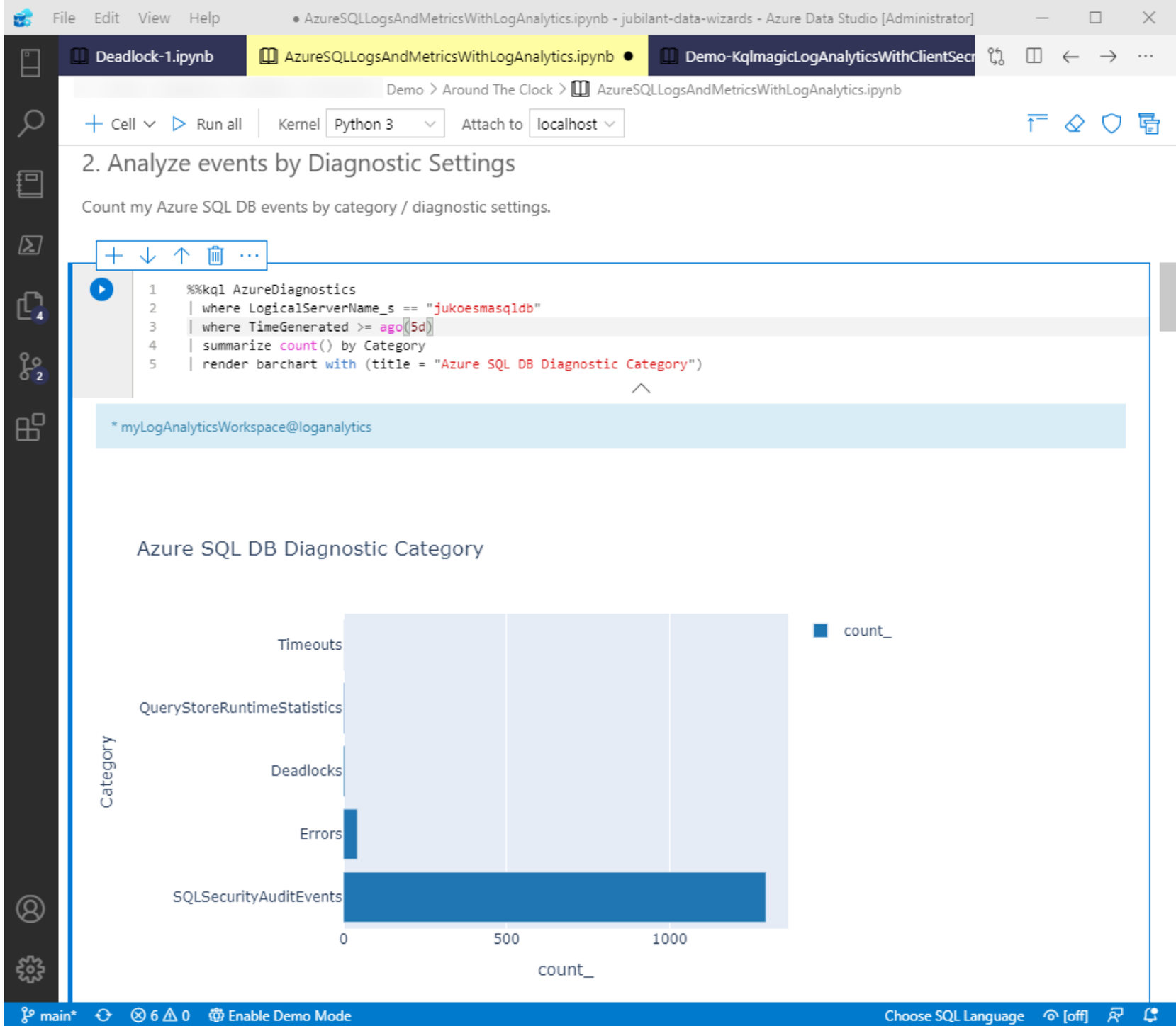
Notebooks

Kernel = Python
Extension = Kqlmagic

Use Case:

- Reproducible Analysis
- Source control
- Troubleshooting guide





Learning basic KQL part 1

KQL	SQL
AzureDiagnostics | where OperationName == "DeadlockEvent" | project TimeGenerated, Category, Resource, OperationName, Type, deadlock_xml_s | sort by TimeGenerated desc | take 50	SELECT TOP 50 TimeGenerated, Category, Resource, OperationName, Type, deadlock_xml_s FROM AzureDiagnostics WHERE OperationName = ‘DeadlockEvent’ ORDER BY TimeGenerated DESC
AzureDiagnostics | where action_name_s == ('BATCH COMPLETED') | project TimeGenerated, action_name_s, stateme nt_s | where statement_s contains "DROP TABLE" | take 10	SELECT TOP 10 TimeGenerated, action_name_s statement_s FROM AzureDiagnostics WHERE OperationName like ‘%DROP TABLE%’

Learning basic KQL part 2

Keywords	Examples

ago	`// ago(5d) = DATEADD(DAY, -5, GETDATE())`
	`AzureDiagnotics`
	`| where TimeGenerated > ago(5d)`

summarize	`// Aggregate (GROUP BY)`
	`AzureDiagnostics`
	`| summarize event_count = count() by OperationName`

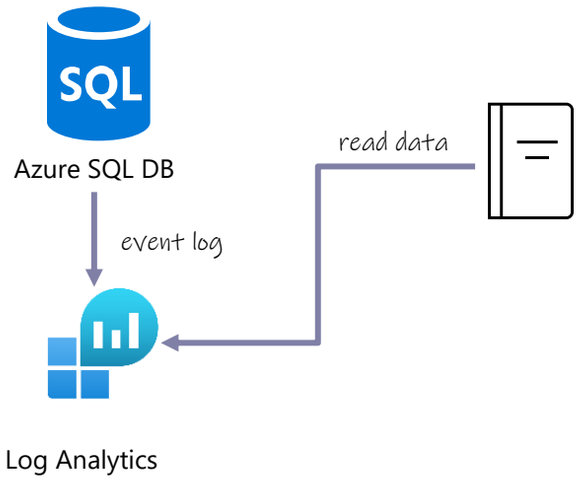
parse_xml	`// Read XML data`
	`AzureDiagnostics`
	`| where OperationName == "DeadlockEvent"`
	`| extend d = parse_xml(deadlock_xml_s)`

bin,
render
	`// Bin date/time column, which is handy for timechart viz`
	`AzureDiagnostics`
	`| where OperationName == "ErrorEvent"`
	`| extend ErrorNumber =  tostring(error_number_d)`
	`| summarize event_count=count() by EventTime = bin(TimeGenerated, 10m), ErrorN`
	`umber`
	`| render timechart`

Learn more

All resources including demo notebook is here:
https://bit.ly/3tgNdMl

Get Azure Data Studio:
http://aka.ms/getAzureDataStudio



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Learn with us!

View our on-demand playlist:
aka.ms/azuresqlandadf

@AzureSQL
@AzDataFactory

Microsoft Azure

Appendix

Modern data experiences, multi data-platforms
SQL: SQL Server, PostgreSQL, Azure SQL Edge, Azure SQL*
KQL: Azure Data Explorer
Environment: On-premises, poly-cloud

Client tool on multi-platforms: Windows, Linux, macOS
Extensible tool
Git support
Jupyter Notebook experiences
... and more ...

Kqlmagic in notebooks

Install Kqlmagic package in Python first via Azure Data Studio "Manage Packages", or:

```
!pip install Kqlmagic --no-cache-dir –upgrade
```

Quick Usage tips:

- `%reload_ext Kqlmagic` is needed on every notebook session
- `%kql <connection string>` is needed at least once on every notebook session. Also use this to add a connection in the session.
- `%kql` or `%%kql` is needed to be prefixed before any KQL queries

https://docs.microsoft.com/azure/data-explorer/kqlmagic

Connection Tips

The most asked question!

Log Analytics

```
%kql loganalytics://code;workspace='<WorkspaceID>’
```

- **Working with multiple tenants?**
  You can provide Tenant ID in the connection string instead of “code”. For example:
  ```
  %kql loganalytics://tenant=<TenantID>;workspace='<WorkspaceID>'
  ```

- **Fluent in Python?**
  Try out Azure CLI in Python, and use `-try-azcli_login` **option at the end.**
  ```
  %kql loganalytics://code;workspace='<WorkspaceID>' -try-azcli_login
  ```

Log Analytics Workspace

Microsoft Azure (Preview)

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Home >

jukoesmala

Log Analytics workspace

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings

- Locks
- Agents management
- Agents configuration
- Linked storage accounts
- Network Isolation
- Advanced settings

General

Delete

Essentials

View Cost | JSON View

Resource group (change)

Status
Active

Location

Subscription (change)

Subscription ID

Tags (change)
Click here to add tags

Workspace Name
jukoesmala

Workspace ID

Pricing tier
Pay-as-you-go

Access control mode
Use resource or workspace permissions

Get started with Log Analytics

Log Analytics collects data from a variety of sources and uses a powerful query language to give you insights into the operation of your applications and resources. Use Azure Monitor to access the complete set of tools for monitoring all of your Azure resources.

Useful commands

- **Get version**
  `%kql --version`

- **Get help on a topic, e.g. connection**
  `%kql --help "conn"`

- **Update configuration**
  `%env KQLMAGIC_CONFIGURATION="<settings>"`

```
# Set environment variables using %env magic
%env KQLMAGIC_CONFIGURATION="show_query_time=True;plot_package='plotly';display_limit=100"

# use the following to suppress the Kqlmagic banner:
%env KQLMAGIC_CONFIGURATION="show_init_banner=False"
```