Custom Logging within Databricks

Who am I

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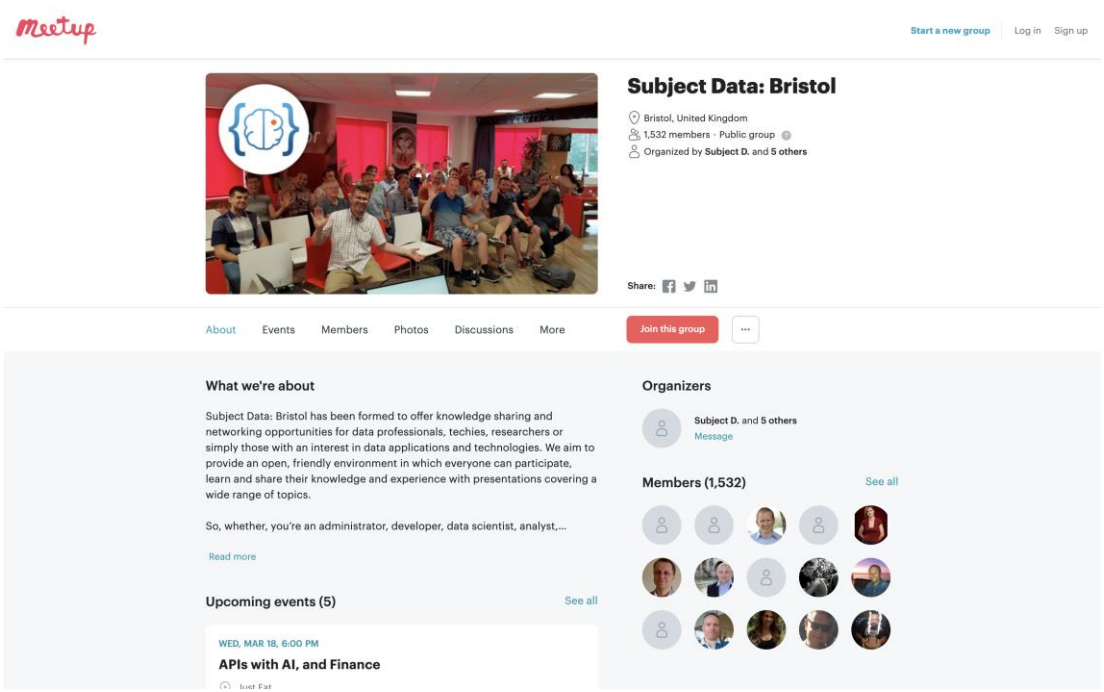
Senior Advancing Analytics Consultant specializing in Data Engineering & Cloud.

Over 15 years' experience, most recently working within the Microsoft Data Platform, Scala, Kafka and various cloud tech

BSc in Multimedia Computing & Business, and a HND in Visual Communication

Meetups and Community Groups



Custom Logging within Databricks

What are we going to do

- Logging, why should you care?
- Structured Logging
- Logging/Metrics in Azure
- Logging/Metrics in Databricks
- (Real World) Demo

Logging, why should you care?

Have you ever got into work at 9am and had to immediately debug an ETL pipeline that failed overnight?

Why should you care

Logging is common place in Software Engineering, why?

Why is Logging often overlooked in Data Engineering?

Logging in Software Engineering

Just capture and react to errors right?

Help capture events in a linear order:

- Helping you trace back when errors occur
- You can see how far you process got to, including triggered events and subsequent paths taken
- Output of processes (results, counts, timings)

Help meet **SLAs (Service Level Agreements)** / **SLOs (Service Level Objectives)**

Structured logging

Structured logging is the practice of implementing a consistent, predetermined message format for application **logs** that allows them to be treated as data sets rather than text

Log.log(“info”, “this is my log message”)

Log.log(“info”, {“message”:“this is my log message”, “logEvent”: “processStarted”, “CreatedAt”: “14/04/2021”})

How have I used this before in Software Engineering?

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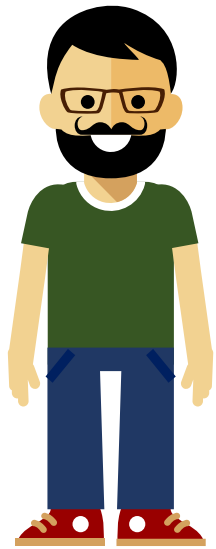
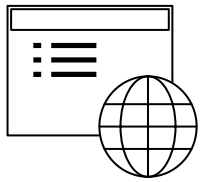
Logging in Software Engineering



User



Website

Backend

Payment Service

Bills & Statement Service

Customer Service

Notification Service

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Payment Service Logging Events

Custom Logging Events

- PaymentReceived
- PaymentRejected
- PaymentApproved
- TimeReceived
- TimeProcessed
- FailedToCommunicate

Custom Logging Events

Bills and Statement Service

- BillRequested
- Bill Amended
- AmendmentApproved
- TimeReceived
- TimeProcessed
- FailedToCommunicate

Custom Logging Events

Customer Service

- CustomerInfoRequested
- CustomerInfoRetrieved
- CustomerNotFound
- TimeReceived
- TimeProcessed
- FailedToCommunicate

Custom Logging Events

Notification Service

- NotificationEventTrigger
- NotificationSent
- TimeReceived
- TimeProcessed
- FailedToCommunicate

How can we apply this to Data Engineering?

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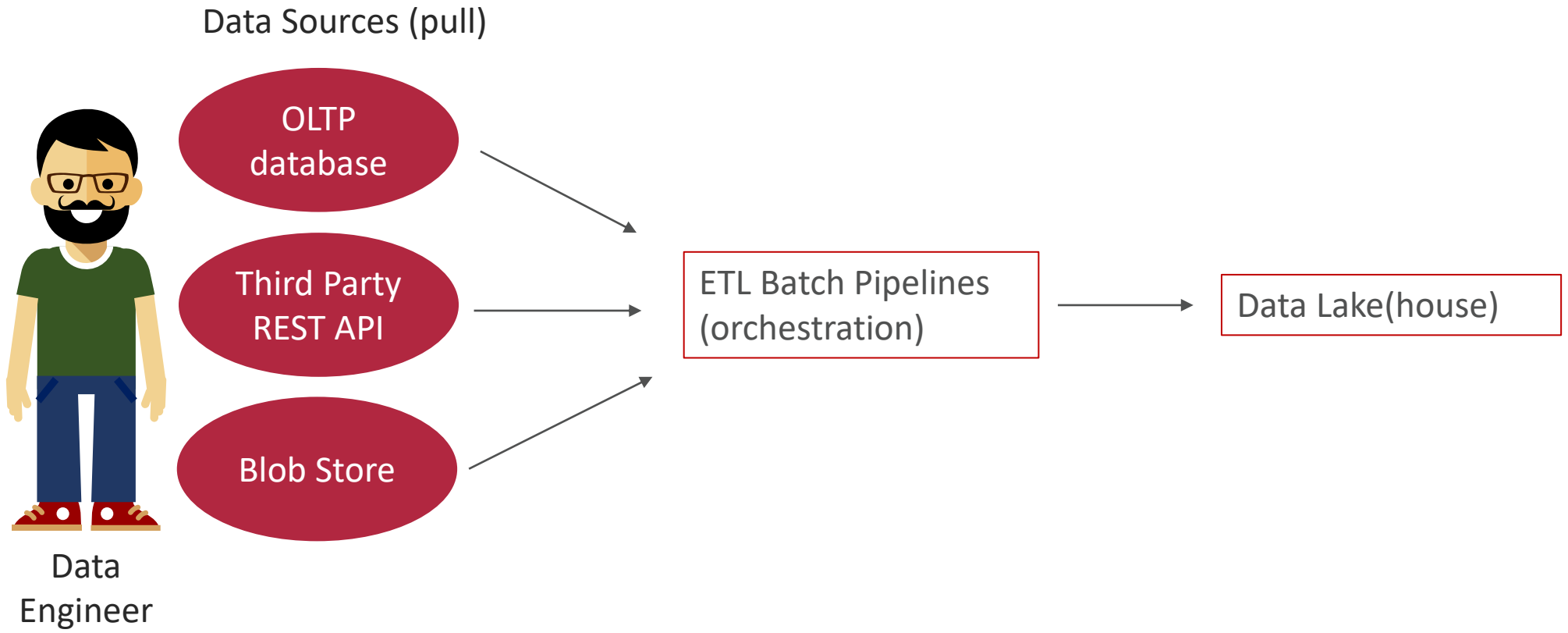
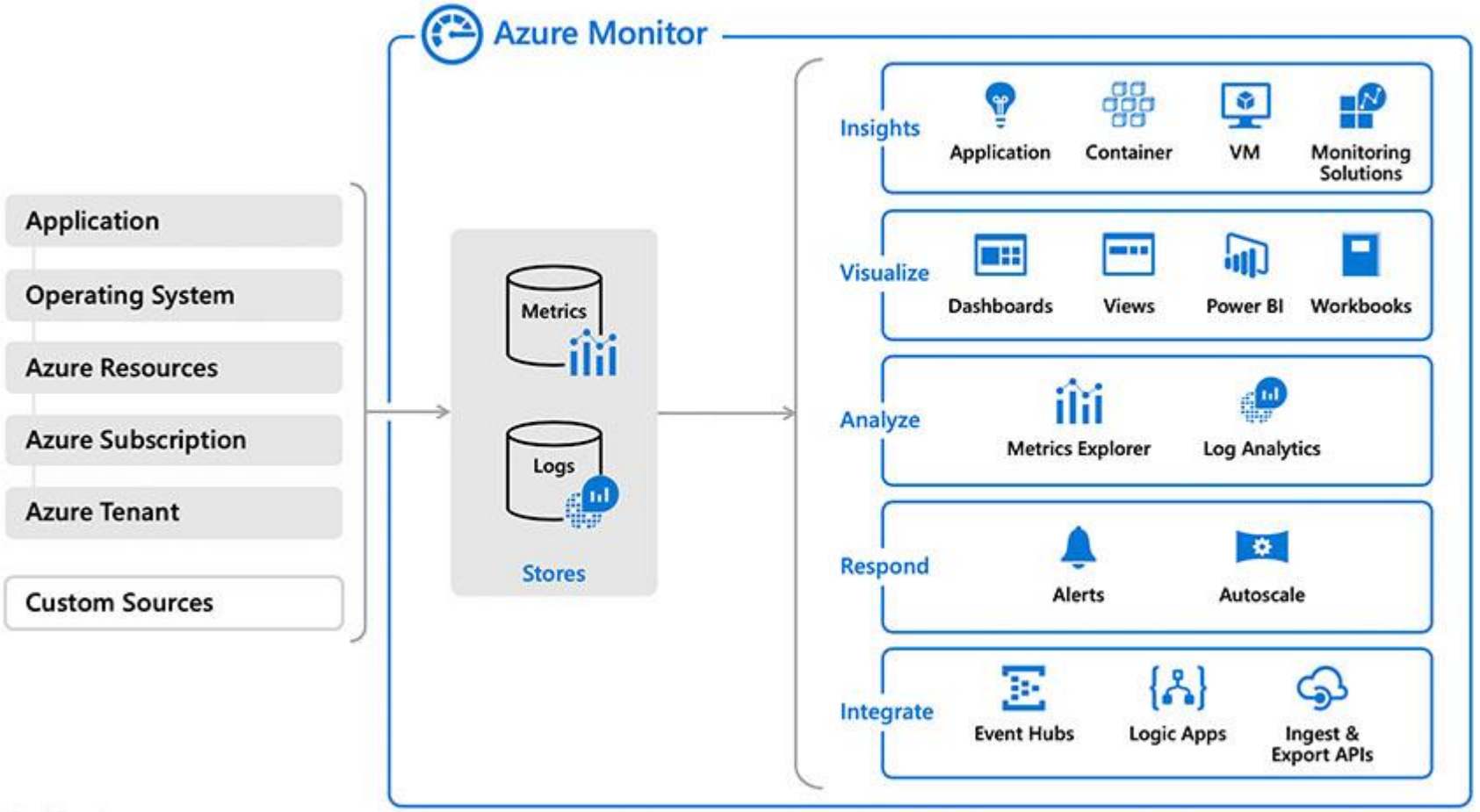
Logging in Data Engineering



Custom Logging Events

- RowCount
- ProcessedRowCount
- FailedRowCount
- InvalidDataType
- TimeReceived
- TimeProcessed
- FailedToCommunicate

Logging in Azure



Custom sources can also include AWS, GCP, Local data Centers

Log Analytics Workspace

Log Analytics Workspace

Like a Data Warehouse of logs
KQL (Kusto Query Language)

Event Hub

Good for event pipelines

Storage

The original one
Long-term retention

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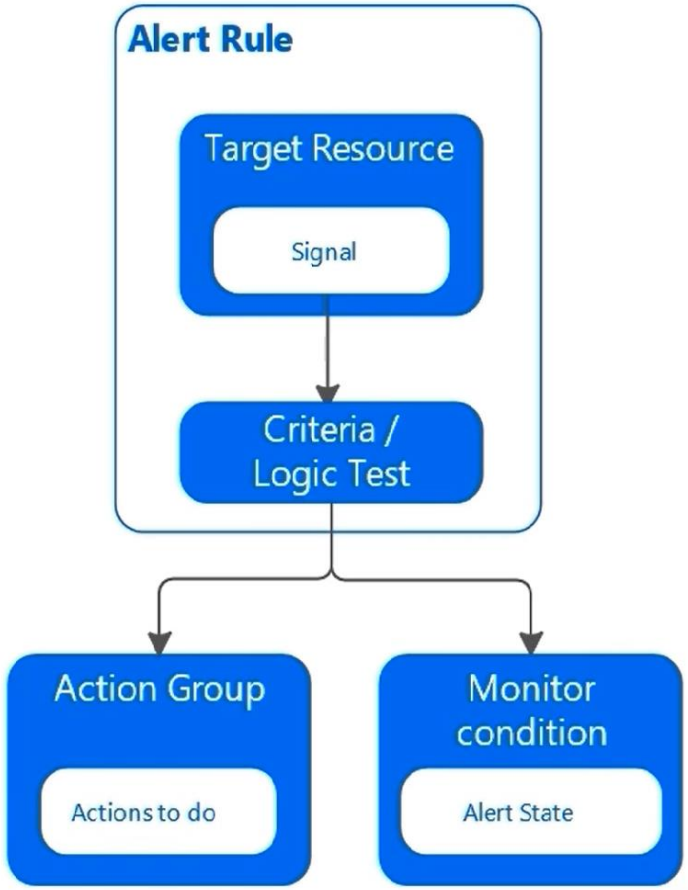
Azure Monitor Alert Workflow



Great for triggering Email/SMS Alerts, and running processes of the back of alerts

Logging in Databricks

What do we already have for Databricks?

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Databricks Logging/Metrics Options

https://docs.microsoft.com/en-us/azure/architecture/databricks-monitoring/dashboards

Databricks Logging/Metrics Options

Spark UI

▾ Active Jobs (1)

Page: 1 — 1 Pages. Jump to 1 . Show 100 items in a page. Go

Job Id ▼	Description	Submitted	Duration	Stages: Succeeded/Total	Tasks (for all stages): Succeeded/Total
7	count at <console>:26 count at <console>:26 (kill)	2019/08/10 17:50:13	17 s	0/2	0/5 (4 running)

Page: 1 — 1 Pages. Jump to 1 . Show 100 items in a page. Go

▾ Completed Jobs (7)

Page: 1 — 1 Pages. Jump to 1 . Show 100 items in a page. Go

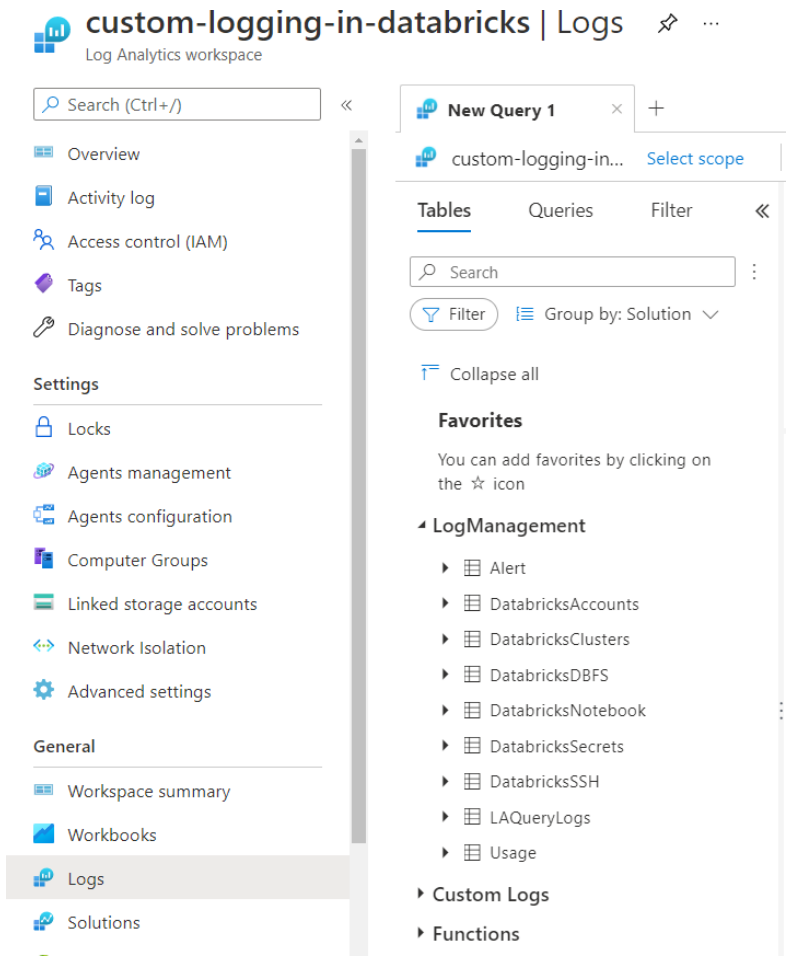
Job Id ▼	Description	Submitted	Duration	Stages: Succeeded/Total	Tasks (for all stages): Succeeded/Total
6	show at <console>:26 show at <console>:26	2019/08/10 17:49:30	0.4 s	1/1	1/1
5	show at <console>:28 show at <console>:28	2019/08/10 17:48:32	0.8 s	3/3	9/9
4	show at <console>:28 show at <console>:28	2019/08/10 17:47:40	2 s	3/3	9/9

Databricks Logging/Metrics Options

Azure Log Analytics

Log Analytics for Databricks: What do we get out the box?

Azure Log Analytics



Log Analytics REST API

https://docs.microsoft.com/en-us/rest/api/loganalytics/

Manage Log Analytics Resources

Send Custom Log Data to Log Analytics

Access Log Analytics Data

(Real World) Demo

What will we do?

- Go through set-up of Log Analytics for Databricks
- Create a Python Wheel containing Log Analytics REST API logic to create our logs
- Write some Custom Logs via a Databricks Notebook
- Explore our Custom logs, in Log Analytics
- Create Azure Monitor Alerts from our Custom Logs
- Create Azure Monitor Dashboard from our Custom Logs

Useful links

Code Repository :
https://github.com/AnnaWykes/custom-logging-in-databricks

Log Analytics Getting Started
https://docs.microsoft.com/en-us/azure/azure-monitor/logs/log-analytics-tutorial

Log Analytics REST API
https://docs.microsoft.com/en-us/rest/api/loganalytics/

Grafana Databrick Metrics Monitoring with Log Analytics
https://docs.microsoft.com/en-us/azure/architecture/databricks-monitoring/dashboards

THANK YOU

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