

Using Azure EventGrid w/ Fabric Notebooks



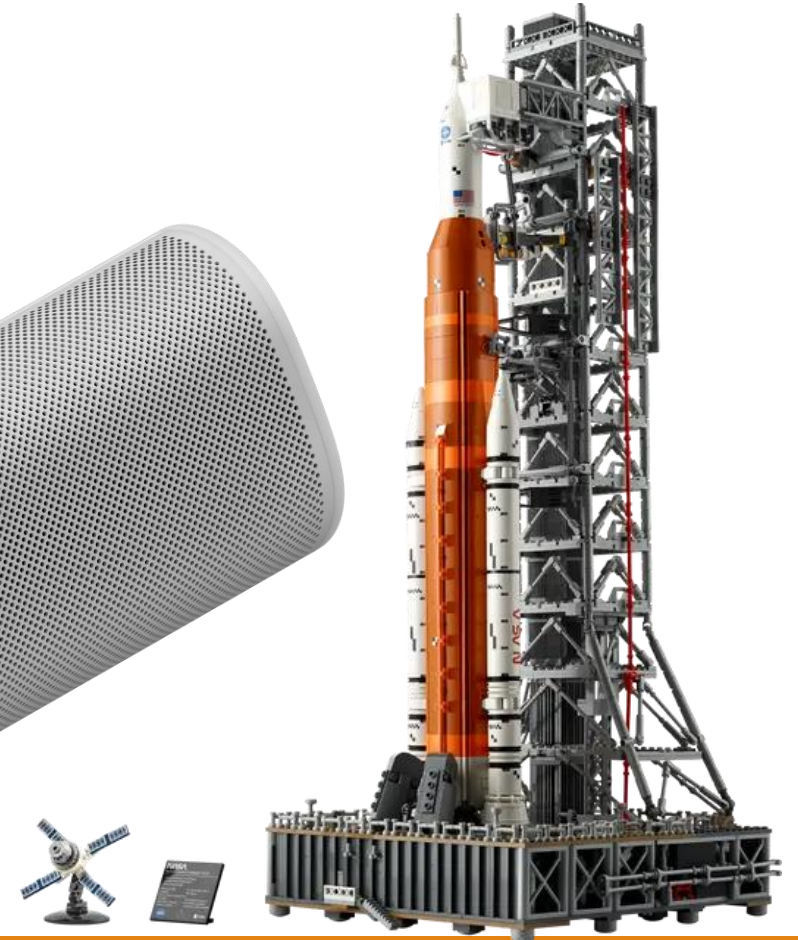
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Standard sponsors



Raffle Prizes



Next 45 minutes

WHY – WHAT - HOW

CAVEAT: MICROSOFT HAS NOT YET RELEASED A FULL FABRIC API, SO SOME FUNCTIONALITY IS STILL PENDING; SOME FUNCTIONALITY IS SWITCHING BACK AND FORTH ON A DAILY BASIS IT SEEMS 🤖

BUT YOU ARE SMART AND CAN ADD THAT WHEN THE FEATURES ARE THERE 💪

Jens Vestergaard

IN BI SPACE SINCE 2003

SQL Server 2000 -> ... -> Azure SQL Database

SQL Server Analysis Services 2000 -> ... -> Analysis Services Tabular Engine

ASP .Net 1.0 -> ... -> .Net Core 8

SQL, C#, Pascal, Python, Basic, Prolog, MDX, Java Script, PowerShell, Visual Basic + more

Microsoft Data Platform MVP since 2017

8 active MS Certifications (Associate & Expert level)

COPENHAGEN, DENMARK BASED

Studied physics/astronomy -> ... -> Applied Computer Science

Married, three kids

Absolutely love coffee; roasting, grinding, brewing ☕

Grew up with computers bigger than your fridge





Real-Time Processing



Scalability



Consistency in
Logging and
Telemetry



Enhanced Data
Processing Pipeline



Framework for
Reporting and
Analysis



Minimization of
Errors



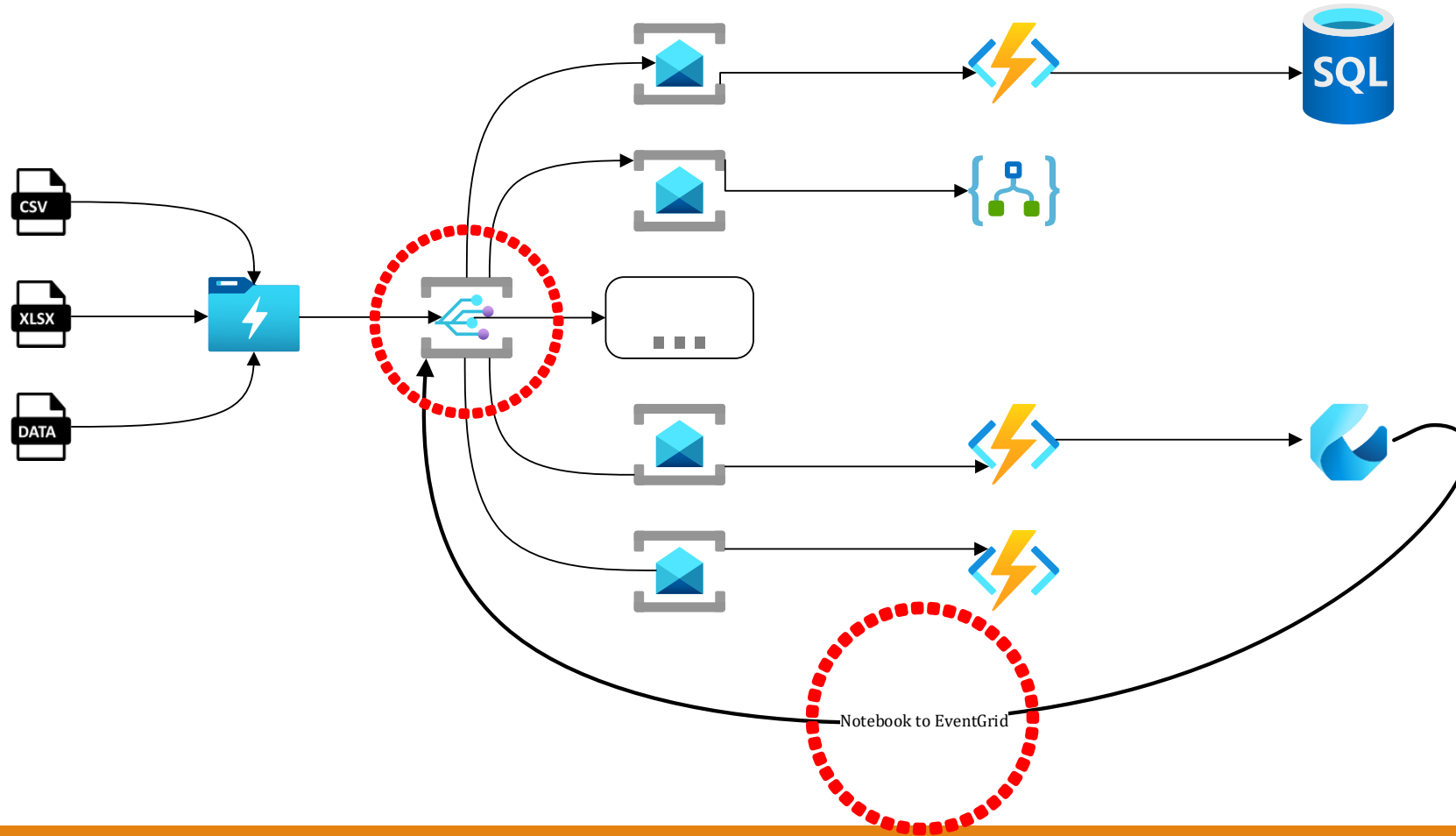
Efficiency and Time
Savings

Why are we doing this?





Framework





Understand Azure
Event Grid



Custom Python
libraries to interact
with Event Grid



Integration of
libraries in our
workspaces



Azure Service Bus as
throttler and
coordinator



Az Functions/Logic
Apps/<Your
invention>



Filtering based on
topic, eventType,
and/or subject

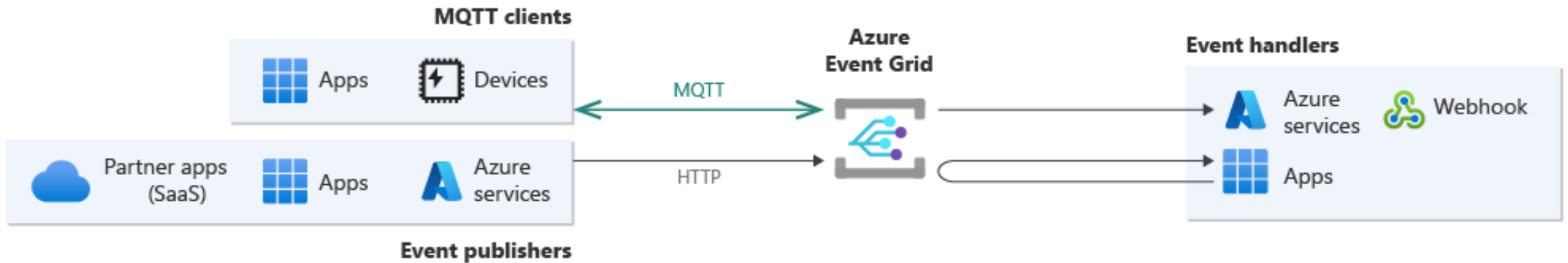


Reap the benefits

What are we doing?

Azure Event Grid

OVERVIEW



Key features: Publishers / Subscribers

```
[
  {
    "topic": string,
    "subject": string,
    "id": string,
    "eventType": string,
    "eventTime": string,
    "data":{
      object-unique-to-each-publisher
    },
    "dataVersion": string,
    "metadataVersion": string
  }
]
```

Key features: event schema

Topic Filtering

- System; All systems related events
- Data; All data related events
- Shipment; All event related to deployment: code, reports etc.

Event Type Filtering

- production/status/notebook/init
- test/telemetry/file/success

Subject Filtering

- /blobServices/default/containers/<container>/blobs/<blob>
- /silver/pos/sales/<customer>

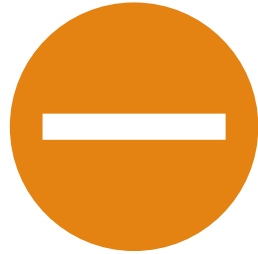
Key features: routing #1

Data Specific Filtering

```
"data": {  
  "fileDetails": {  
    "fileName": "file.txt",  
    "fileExtension": "txt",  
    "changeType": "Modified",  
  },  
  "additionalProperties": "value"  
},
```

`data.fileDetails.fileExtension == "txt"`

Key features: routing #2



Error Handling

Dead lettering; Events that cannot be delivered to any subscribers are sent to a dead-letter endpoint, helping to address and identify issues.



Resilience

Retry policies; Azure Event Grid employs automatic retry mechanisms to handle transient failures, ensuring that events are reliably delivered.

Key features: Dead lettering & Retry



Publisher/Subscriber

eventSchema

Routing

Dead letter

Retry

Summary: Event Grid

Azure Service Bus (queue)

OVERVIEW

Azure Service Bus

Home > pinkywoods

pinkywoods | Queues

Service Bus Namespace

Search

<< + Queue Refresh Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Shared access policies

Geo-Recovery

Encryption

Configuration

Properties

Locks

Entities

Queues

Search to filter items by name...

Queues 9

Name ↑↓	Status ↑↓	Message count ↑↓	Active messages ↑↓	Dead-letter mess... ↑↓	Scheduled messa... ↑↓	Max size ↑↓	Enable partitioning ↑↓
build-completed-queue	Active	47	0	47	0	1024 MB	false
cmnext-build-completed-queue	Active	0	0	0	0	1024 MB	false
data-import-bulk-queue	Active	0	0	0	0	1024 MB	false
data-import-vip-queue	Active	0	0	0	0	1024 MB	false
notebook-job-queue	Active	0	0	0	0	1024 MB	false
tabular-deployment-queue	Active	162	0	162	0	1024 MB	false
tabular-processing-log-queue	Active	62	62	0	0	1024 MB	false
tabular-refresh-queue	Active	0	0	0	0	1024 MB	false
tabular-refreshing-queue	Active	31	0	31	0	1024 MB	false

Configuring a new queue

Create queue



Service Bus

Name * ⓘ

Max queue size

1 GB ▾

Max delivery count * ⓘ

Message time to live ⓘ

Days	Hours	Minutes	Seconds
<input type="text" value="14"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Lock duration ⓘ


Days	Hours	Minutes	Seconds
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="1"/>	<input type="text" value="0"/>

☐ Enable dead lettering on message expiration ⓘ

☐ Enable partitioning ⓘ

What's in the queue?

Home > [redacted] | Queues > tabular-deployment-queue [redacted] /tabular-deployment-queue)

 **tabular-deployment-queue ([redacted] /tabular-deployment-queue) | Service Bus Explorer** ☆ ...

Search

Overview

Access control (IAM)

Diagnose and solve problems

Service Bus Explorer

Settings

Shared access policies

Properties

Locks

Automation

CLI / PS

Tasks (preview)

Export template

Help

Support + Troubleshooting

Peek Mode

Send messages

Refresh

Show message body

Settings

Learn more

Give feedback

Queue (0) **Dead-letter (162)**

Peek from start

Peek next messages

Peek with options

Re-send selected messages

Download selected message body

Showing 100 of 162 messages

	Sequence Number	Message ID	Enqueued Time	Delivery Count	State	Body ...	Label/Subject	Message Text	Dead
<input checked="" type="checkbox"/>	1	1b058875-f367-412c-8044-1fbec...	Tue, 10 Oct 23, 08.31.01 pm CEST	0	Active	350 B		{"id":"test-id","eventType":"cms/d...	TTLEx
<input type="checkbox"/>	2	4cdd188f-6045-46c8-9d48-626d...	Tue, 10 Oct 23, 08.31.35 pm CEST	0	Active	1.6 KB		{"id":"test-id","eventType":"cms/d...	TTLEx
<input type="checkbox"/>	3	391e7745-3c71-4f2f-ae6e-27504...	Tue, 10 Oct 23, 08.31.50 pm CEST	0	Active	1.6 KB		{"id":"test-id","eventType":"cms/d...	TTLEx
<input type="checkbox"/>	4	a5744699-9d02-45e2-989a-3f5c...	Tue, 10 Oct 23, 08.31.51 pm CEST	0	Active	1.6 KB		{"id":"test-id","eventType":"cms/d...	TTLEx
<input type="checkbox"/>	5	1103a5b0-b90b-4304-9a9c-0868...	Tue, 10 Oct 23, 08.31.52 pm CEST	0	Active	1.6 KB		{"id":"test-id","eventType":"cms/d...	TTLEx
<input type="checkbox"/>	6	17a23bcd-5e24-47c8-a35d-3e86...	Tue, 10 Oct 23, 08.31.53 pm CEST	0	Active	1.6 KB		{"id":"test-id","eventType":"cms/d...	TTLEx
<input type="checkbox"/>	7	1ad5bae1-6cee-4314-8b98-0791...	Tue, 10 Oct 23, 08.32.09 pm CEST	0	Active	1.6 KB		{"id":"test-id","eventType":"cms/d...	TTLEx
<input type="checkbox"/>	8	48b624637d44-5eb38e-d6d004...	Wed, 11 Oct 23, 11.34.40 am CEST	0	Active	674 B		@DataGrid=http://schemas.m...	TTLEx

Message Body Message Properties

Fit message body ☐ Off

```
{"id":"test-id","eventType":"cms/deployment/tabular/init","subject":"diamond/tabular/deploy/essity.dk","data":[],"dataVersion":"test","metadataVersion":"1","eventTime":"2023-10-10T17:02:32","topic":"/subscriptions/9791f3b3-9dd9-48ff-b220-b31f06473809/resourceGroups/[redacted]/providers/Microsoft.EventGrid/domains/[redacted]/topics/process"}
```



Create Queue(s)

Keep track of message(s) and
re-run

Send message(s)

Summary: Azure Service Bus

Custom Python

OVERVIEW

Custom Python function/method

```
import os
from azure.core.credentials import AzureKeyCredential
from azure.eventgrid import EventGridPublisherClient, EventGridEvent

def sendMessage(subject, eventType, topic, data):
    event = EventGridEvent(
        data=data,
        subject=subject,
        topic=topic,
        event_type=eventType,
        data_version="1.0"
    )
    key = "2z[REDACTED]:"
    endpoint = "https://[REDACTED].westeurope-1.eventgrid.azure.net/api/events"
    credential = AzureKeyCredential(key)
    client = EventGridPublisherClient(endpoint, credential)
    client.send(event)
```

Microsoft Azure

Search resources, services, and docs (G+)

Home >

Event Grid Domain

Search

Event Subscription + Domain Topic Delete Refresh

Overview

Activity log

Access control (IAM)

Tags

Settings

Access keys

Networking

Identity

Configuration

Locks

Essentials

Resource group (move) : [REDACTED]

Status : Active

Location : West Europe

Subscription (move) : [REDACTED]

Subscription ID : [REDACTED]

Tags (edit) : State : Investigation Proctor : jve@catmansolution.com Owner : jve@catmansolution.com Enviroment : Development

Domain Endpoint : https://[REDACTED].westeurope-1.eventgrid.azure.net/api/events

Local Authentication : Enabled

Pricing tier : Basic

Availability zones : Enabled

Show metrics: General Errors Latency Dead-Letter

For the last: 1 hour 6 hours 12 hours

Getting Keys and Endpoint via Portal

Getting Keys and Endpoint via CLI

```
Azure Cloud Shell

Requesting a Cloud Shell.Succeeded.
Connecting terminal...

jens [ ~ ]$ az eventgrid domain key list --name p id --resource-group p d
{
  "key1": "2",
  "key2": "A"
}
```

```
Azure Cloud Shell

jens [ ~ ]$ az eventgrid domain list -g p d
Command group 'az eventgrid' is in preview and under development. Reference and support
levels: https://aka.ms/CLI_refstatus
The behavior of this command has been altered by the following extension: eventgrid
[
  {
    "endpoint": "https://.westeurope-1.eventgrid.azure.net/api/event
S",
    "id": "..."
  }
]
```




Create function (VS Code)

Get Endpoint via Portal/CLI

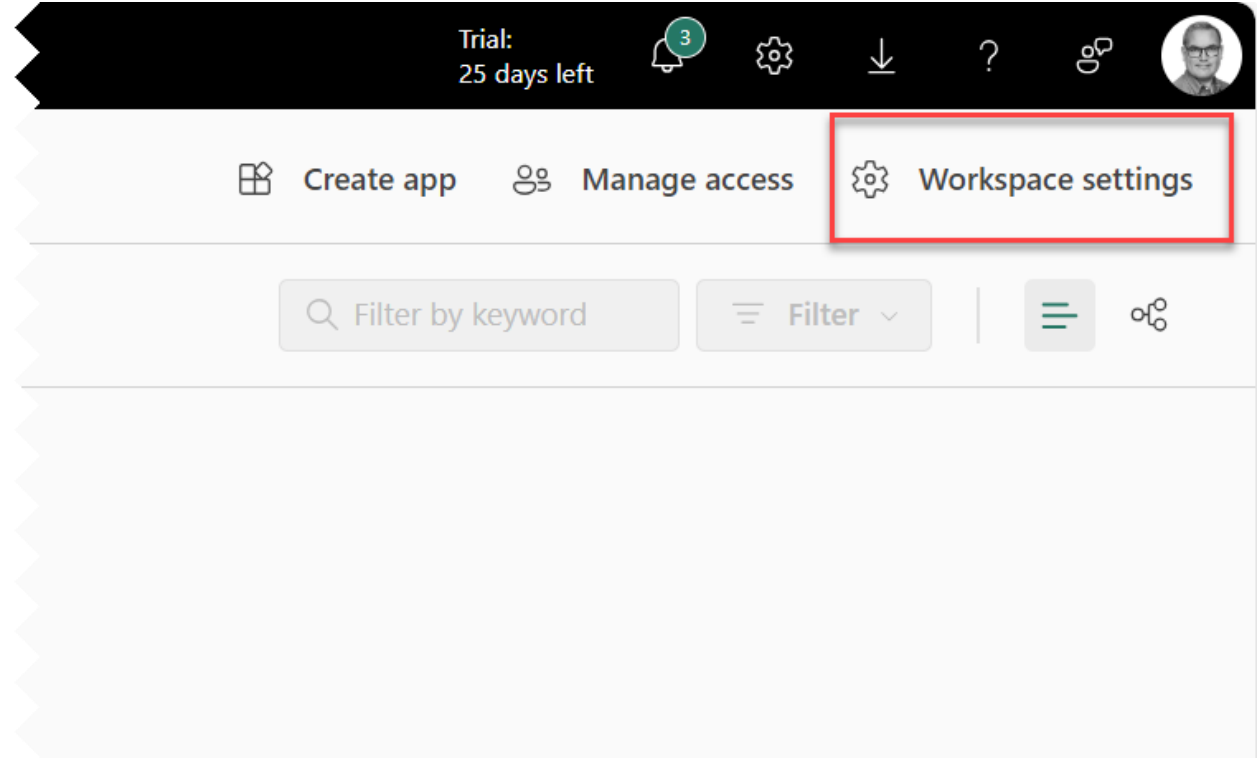
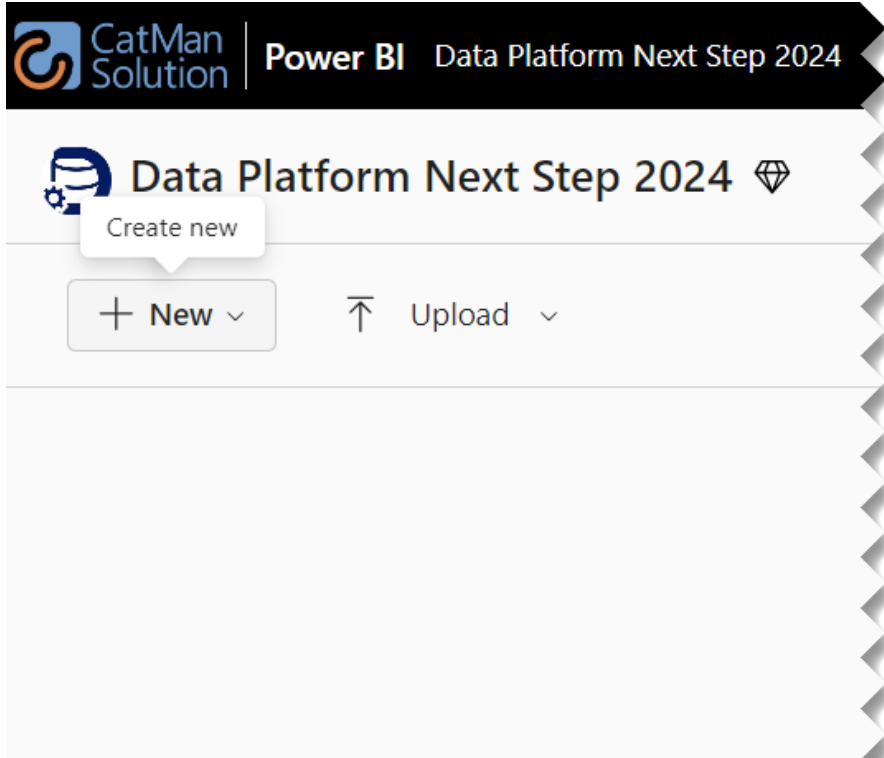
Get Key via Portal/CLI

Summary: Custom Python

Fabric Functions to the rescue

Workspace integration

OVERVIEW



Setting up an Environment

Trial:
25 days left

3

Workspace settings

i

About

Premium

Azure connections

System storage

Git integration

Workspace image

Upload

Reset

Name

Data Platform Next Step 2024

Description

Power BI

▼

Data Engineering/Science

1 ^

Spark settings

2

Data Factory

▼

Contact list

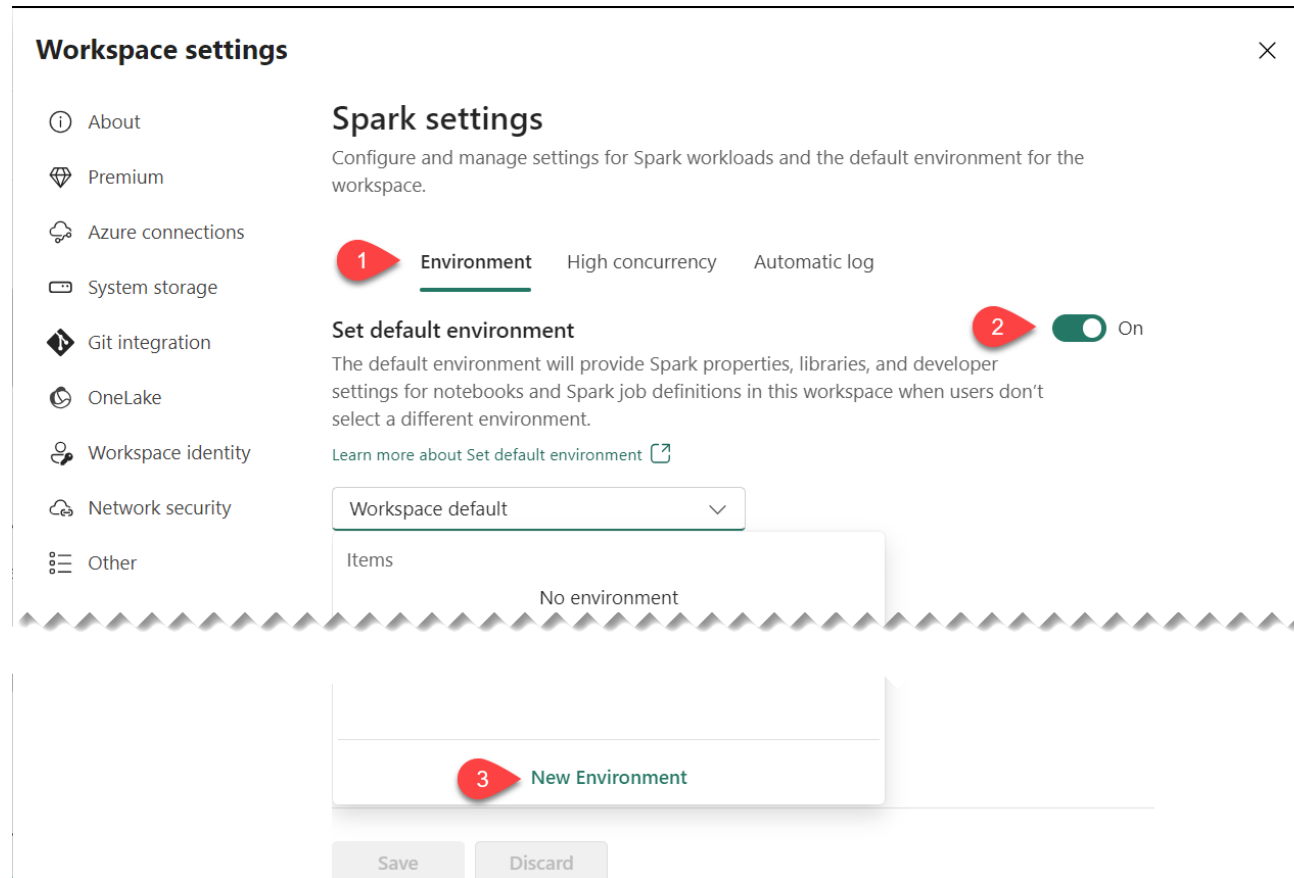
Jens Vestergaard

×

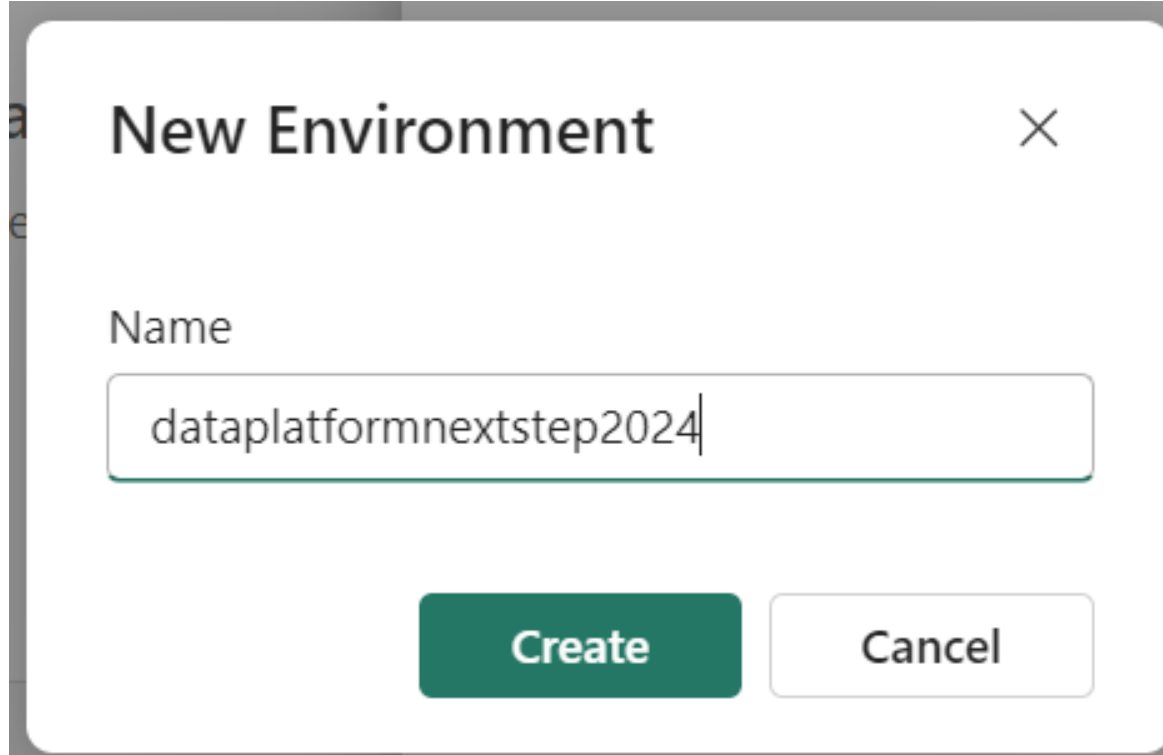
Workspace OneDrive

(Optional)

Setting up an Environment



Setting up an Environment

A screenshot of a 'New Environment' dialog box. The dialog has a title bar with the text 'New Environment' and a close button (X) in the top right corner. Below the title, there is a label 'Name' followed by a text input field. The input field contains the text 'dataplatfromnextstep2024'. At the bottom of the dialog, there are two buttons: a green 'Create' button and a white 'Cancel' button with a grey border.

New Environment

Name

dataplatfromnextstep2024

Create Cancel

Name environment

CatMan Solution | dataplatformnextstep2024

Search

HomePublic libraries

+ Add from PyPIAdd from .yamlDeleteExport to .yaml

Libraries

Public libraries

Custom libraries

Spark compute

Compute

Spark properties

Storage

Resources

Public libraries

Search and add libraries from public repositories or via a .yaml file. They'll be available if you run your notebook or Spark job definition in this environment. [Learn more](#)


There's nothing here yet

Add libraries from public repositories or via a .yaml file.

1

Add from PyPI

Add library: Azure Event Grid

 CatMan Solution | dataplatformnextstep2024 ▼

[Home](#) [Public libraries](#)

Add from PyPI

Add from .yaml

Delete

Export to .yaml

You have unpublished changes. To apply these changes to notebooks and Spark job definition run in this environment, select Publish. To save your changes without updating the environment, select

Libraries

Public libraries 1

Custom libraries

Spark compute

Compute

Spark properties

Public libraries

Search and add libraries from public repositories or via a .yaml file. They'll be available if you run your notebook or Spark job de

<input type="checkbox"/>	Library ↑	Version	Source	SI
<input type="checkbox"/>	<div><div>azure-eventgrid</div><div><div>1</div><div>azure-eventgrid</div><div>Add from PyPI</div></div></div>	4.20.0 ▼	PyPI	N

Add library: Azure Event Grid

CatMan Solution | dataplatformnextstep2024

Search

HomeCustom libraries

UploadDownload allDelete

You have unpublished changes. To apply these changes to notebooks and Spark job definition run in this environment, select Publish. To save your changes without updating the environment, select Save.

Libraries

Public libraries1

Custom libraries

Spark compute

Compute


Spark properties

Storage

Resources

Custom libraries

Upload .jar, .whl or .tar.gz files to install custom libraries. They'll be available if you run your notebook or Spark job definition in this environment. [Learn more](#)



There's nothing here yet

Upload .jar, .whl or .tar.gz files to see your custom libraries here.

Upload

Setting up an Environment

```

1 pip install azure-eventgrid
2 import catman
3 catman.function_init()
4
5 import uuid
6 message = "{ 'package id': '' + str(uuid.uuid4()) + ''}"
7
8 from catman import eventGridHandler as egh
9 egh.sendMessage( 'bronze/product/master/conaxess.trade.dk', 'cms/data/file/init', 'data', message )

```

Send a message



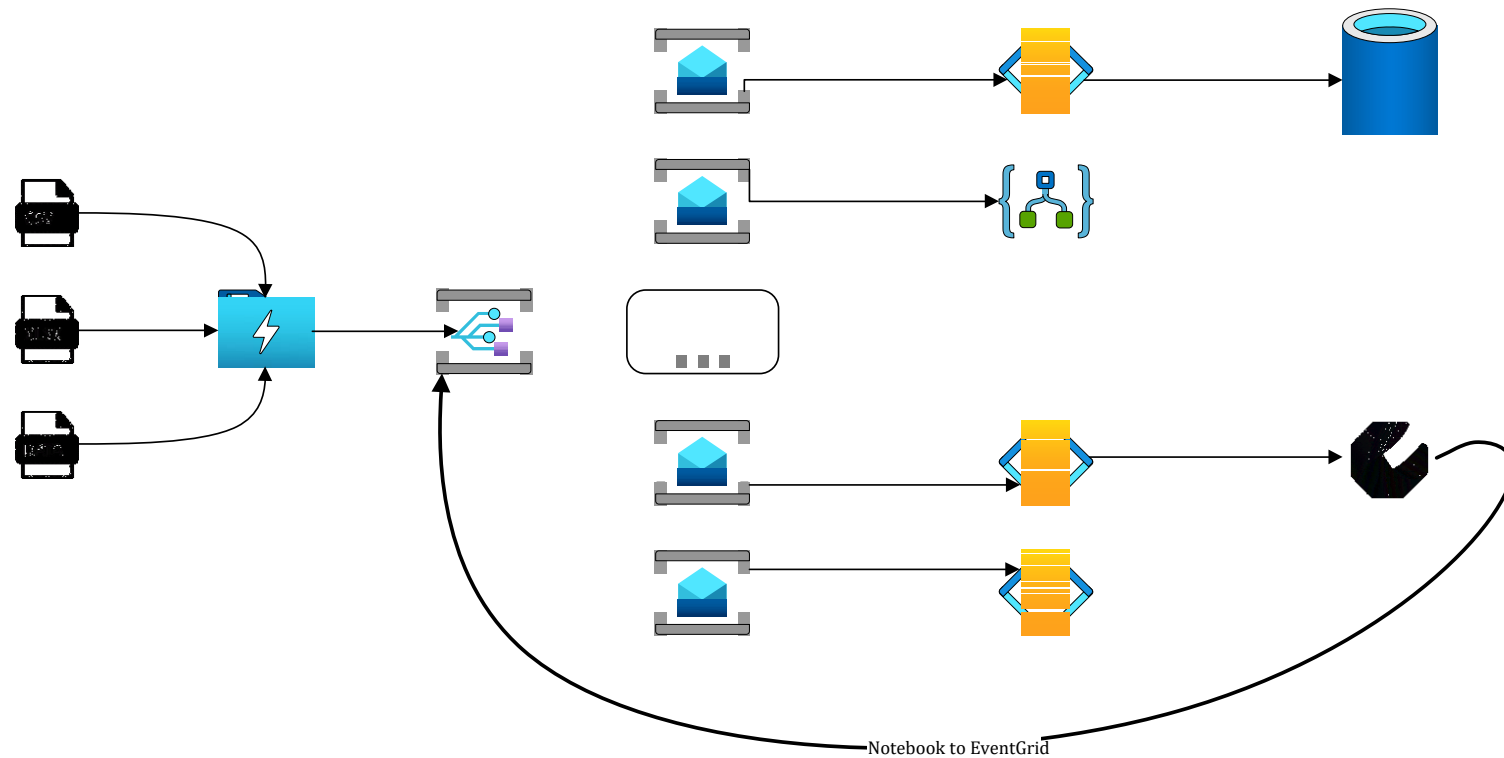
Create New Environment

Upload code (.whl)

Import code into notebook

Send message

Summary: Workspace integration






How are we doing so far?

Subscribing


OVERVIEW



Home > [redacted] | Domain Topics >

 **system**  ...
Event Grid Domain Topic

 Event Subscription  Delete  Refresh

Event Subscriptions

 Search to find event subscription by name...

Name	Endpoint
 Tabular-Refresh-Queue	ServiceBusQueue
 Tabular-Refreshes-Queue	ServiceBusQueue
 EventViewer	WebHook




Event Types	Provisioning state
cms/refresh/tabular/init	Succeeded
cms/refresh/tabular/status	Succeeded
	Succeeded

Subscribing to events

```
[FunctionName("ServiceBusQueueTriggerCSharp")]
public static void Run(
    [ServiceBusTrigger("myqueue", Connection = "ServiceBusConnection")]
    string myQueueItem,
    Int32 deliveryCount,
    DateTime enqueuedTimeUtc,
    string messageId,
    ILogger log)
{
    log.LogInformation($"C# ServiceBus queue trigger function processed message: {myQueueItem}");
    log.LogInformation($"EnqueuedTimeUtc={enqueuedTimeUtc}");
    log.LogInformation($"DeliveryCount={deliveryCount}");
    log.LogInformation($"MessageId={messageId}");
}
```


Binding Az Function

 When a resource event occurs ① ...

*Subscription ▼

*Resource Type ▼

*Resource Name ▼

Event Type Item - 1 ... 

×

Event Type Item - 2 ...

×

Event Type Item - 3 ...

×

Event Type Item - 4 ...

×

Logic Apps to the rescue

Publish Log Event

* Item - 1

```
{
  "data": {x} Data x ,
  "eventTime": {x} Event Time x ,
  "eventType": "cms/log/file/init",
  "id": {x} Id x ,
  "subject": {x} Subject x ,
  "topic": {x} Topic x
}
```

+ Add new item

Publish Telemetry Event

* Item - 1

```
{
  "data": {x} Data x ,
  "eventTime": {x} Event Time x ,
  "eventType": "cms/telemetry/file/init",
  "id": {x} Id x ,
  "subject": {x} Subject x ,
  "topic": {x} Topic x
}
```

+ Add new item

Logic App – Splitting Events

https://core-component-events.azurewebsites.net

Summary - Overview Current Sprint Backlogs (DevOps) TODO (DevOps) Microsoft Fabric Home Appliances Zendesk - CatMan... Broadband Router cmdf2 - Azure Data...

Azure Event Grid Viewer

Event Type	Subject
cms/status/bronze/stop	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFR (Characteristics)
cms/status/bronze/success	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFR (Characteristics)
cms/status/bronze/start	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFR (Characteristics)
cms/status/bronze/stop	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFR (Products)
cms/status/bronze/success	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFR (Products)
cms/status/bronze/start	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFR (Products)
cms/status/bronze/stop	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFI (Products)
cms/status/bronze/success	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFI (Products)
cms/status/bronze/stop	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFI (Characteristics)
cms/status/bronze/success	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFI (Characteristics)
cms/status/bronze/stop	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFI (Facts)
cms/status/bronze/success	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFI (Facts)
cms/status/bronze/start	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFI (Products)
cms/status/bronze/stop	bronze/nielseniq/Findus NO/CPN_CM_FN01DYFR (Aggregated Data)

Azure Event Grid Viewer


https://core-component-events.azurewebsites.net

Summary - OverviewCurrent SprintBacklogs (DevOps)TODO (DevOps)Microsoft FabricHome AppliancesZendesk - CatMan...Broadband Routercmdf2 - Azure Data...

cms/status/bronze/success	bronze/nielsenq/Findus NO/CPN_CM_FN01DYFR (Products)
cms/status/bronze/start	bronze/nielsenq/Findus NO/CPN_CM_FN01DYFR (Products)
cms/status/bronze/stop	bronze/nielsenq/Findus NO/CPN_CM_FN01DYFI (Products)
cms/status/bronze/success	bronze/nielsenq/Findus NO/CPN_CM_FN01DYFI (Products)
cms/status/bronze/stop	bronze/nielsenq/Findus NO/CPN_CM_FN01DYFI (Characteristics)
cms/status/bronze/success	bronze/nielsenq/Findus NO/CPN_CM_FN01DYFI (Characteristics)

```
{
  "id": "06311f23-7e08-48ab-9af6-47b584f3758d",
  "subject": "bronze/nielsenq/Findus NO/CPN_CM_FN01DYFI (Characteristics)",
  "data": {
    "StartEventId": "286545f4-e01e-0052-1830-b32b0306af23",
    "ParentStartEventId": null,
    "RunId": "176a97db-c224-4c13-af7e-b6423b593076",
    "PreviousId": "a3d7110c-f847-4194-9d8e-666d6b5ea4b1",
    "Creator": "blobtrigger",
    "Component": "classifier",
    "FileId": "287dbf67-9ffc-4161-a17e-c40ff0a45561",
    "FileName": "20240531_0758060992_CPN_CM_FN01DYFI_Findus_NO_characteristics_ref_744535.txt",
    "FilePath": "landing/20240531_0758060992_CPN_CM_FN01DYFI_Findus_NO_characteristics_ref_744535.txt",
    "ReceivedTime": "2024-05-31T07:58:05.2759761+00:00",
    "FileExtension": "txt",
    "FileSize": 423,
    "From": null,
    "To": null,
    "Subject": "raw/pos/characteristics/findusno",
    "MessageId": null,
    "BlobPath": "https://cmscorestorage.blob.core.windows.net/s-ftp/Findus NO/NielsenIQ/CPN_CM_FN01DYFI_Findus_NO_characteristics_ref_744535.txt.gz",
    "BatchId": "e3636aea-c006-004e-0030-b3f314000000",
    "Customer": "Findus NO",
    "Provider": "NielsenIQ",
    "DataCategory": "Characteristics",
    "Dependency": true,
    "ClassificationId": "bb4a308e-4e96-4fa7-89e4-5d9f3757c763",
    "Error": null,
    "WorkspaceId": "a22d0f68-9215-4f23-965d-7db0be48a2eb",
    "NotebookId": "2f90387a-c8b8-4b76-ba67-9da1c8dd3eb1",
    "NotebookParam": "{
      \"workspaceName\": {
        \"value\": \"Plywood\",
        \"type\": \"string\"
      },
      \"lakehouseName\": {
        \"value\": \"Lakehouse_Bronze\",
        \"type\": \"string\"
      },
      \"deltaTableName\": {
        \"value\": \"Nielsen_DDM_Characteristics\",
        \"type\": \"string\"
      },
      \"customer\": {
        \"value\": \"Findus NO\",
        \"type\": \"string\"
      },
      \"provider\": {
        \"value\": \"NielsenIQ\",
        \"type\": \"string\"
      }
    }"
  }
}
```

Azure Event Grid Viewer



Each topic can subscribe to +
down stream services

Binding Azure Function Apps

Native support in Azure Logic
Apps

Summary: Subscribing

Filtering

OVERVIEW

Home > [redacted] > [redacted] > system >

Tabular-Refresh-Queue

Event Subscription

Save Delete Give feedback

Metrics **Filters** Additional Features Delivery Properties

EVENT TYPES

Filter to Event Types

Event Schema

cms/refresh/tabular/init X Add Event Type

SUBJECT FILTERS

Apply filters to the subject of each event. Only events with matching subjects get delivered. [Learn more](#)

☐ Enable subject filtering

ADVANCED FILTERS

Filter on attributes of each event. Only events that match all filters get delivered. Up to 25 filters can be specified. All string comparisons are case-insensitive. [Learn more](#)

Valid keys for currently selected event schema:

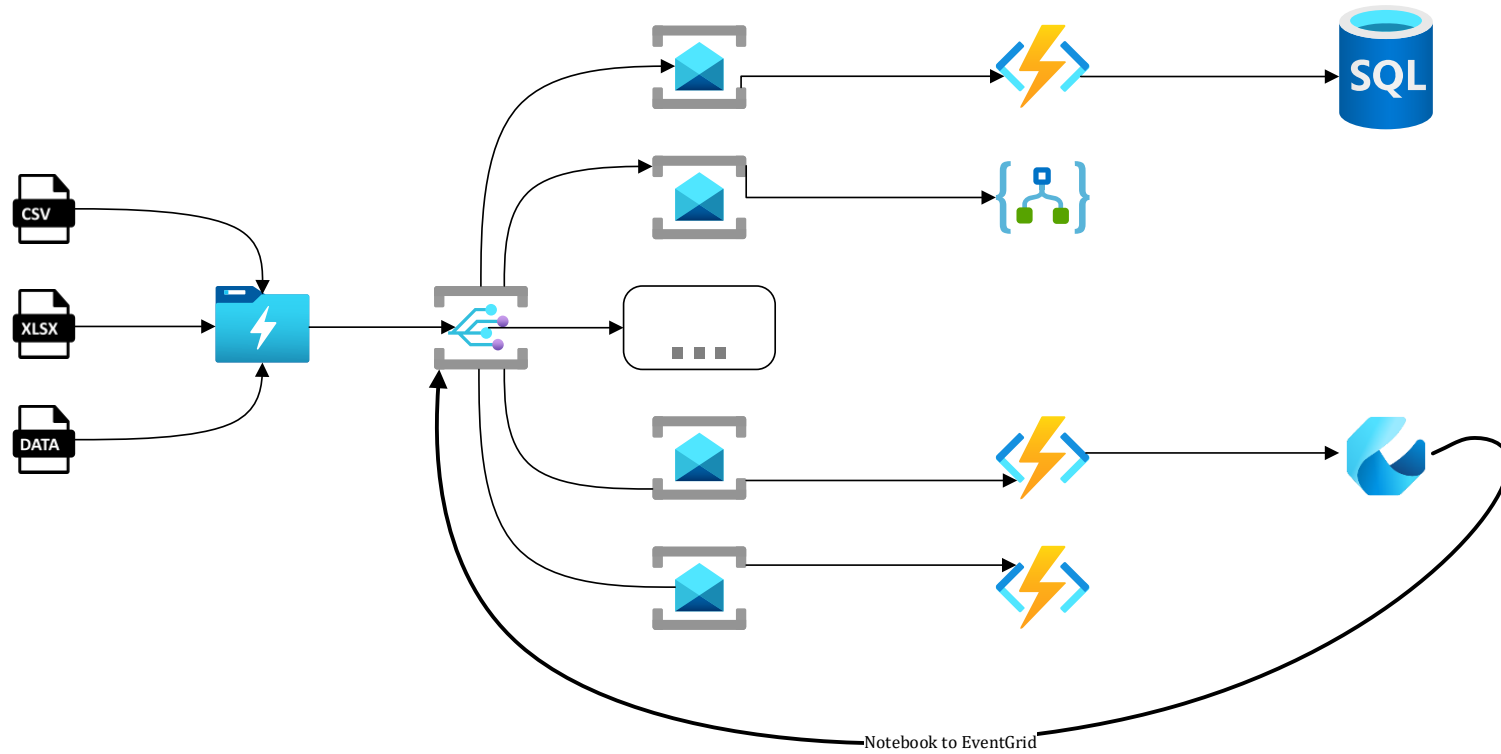
- id, topic, subject, eventtype, dataversion
- Custom properties inside the data payload, using "." as the nesting separator. (e.g. data, data.key, data.key1.key2)

Key	Operator	Value
No results		

[Add new filter](#)

☒ Enable advanced filtering on arrays ⓘ

Filtering events



How are we doing so far?

Thank you

- CONNECT TO ME AT:
 - jv@t-sql.dk
 - @vestergaardj (X/Mastodon/Bluesky)
-



Resources to study more

- [OVERVIEW - AZURE EVENT GRID | MICROSOFT LEARN](#)
 - <https://learn.microsoft.com/en-us/azure/event-grid/overview>
[GitHub - Azure-Samples/azure-event-grid-viewer: Live view of events from Azure Event Grid with ASP.NET Core and SignalR](#)
- [AZURE SERVICE BUS MESSAGING DOCUMENTATION | MICROSOFT LEARN](#)
 - <https://learn.microsoft.com/en-us/azure/service-bus-messaging/>
- [HOW TO USE NOTEBOOKS - MICROSOFT FABRIC | MICROSOFT LEARN](#)
 - <https://learn.microsoft.com/en-us/fabric/data-engineering/how-to-use-notebook>
- [OVERVIEW - AZURE LOGIC APPS | MICROSOFT LEARN](#)
 - <https://learn.microsoft.com/en-us/azure/logic-apps/logic-apps-overview>
- [AZURE FUNCTIONS OVERVIEW | MICROSOFT LEARN](#)
 - <https://learn.microsoft.com/en-us/azure/azure-functions/functions-overview?pivots=programming-language-csharp>

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