

# Finding The Root Cause

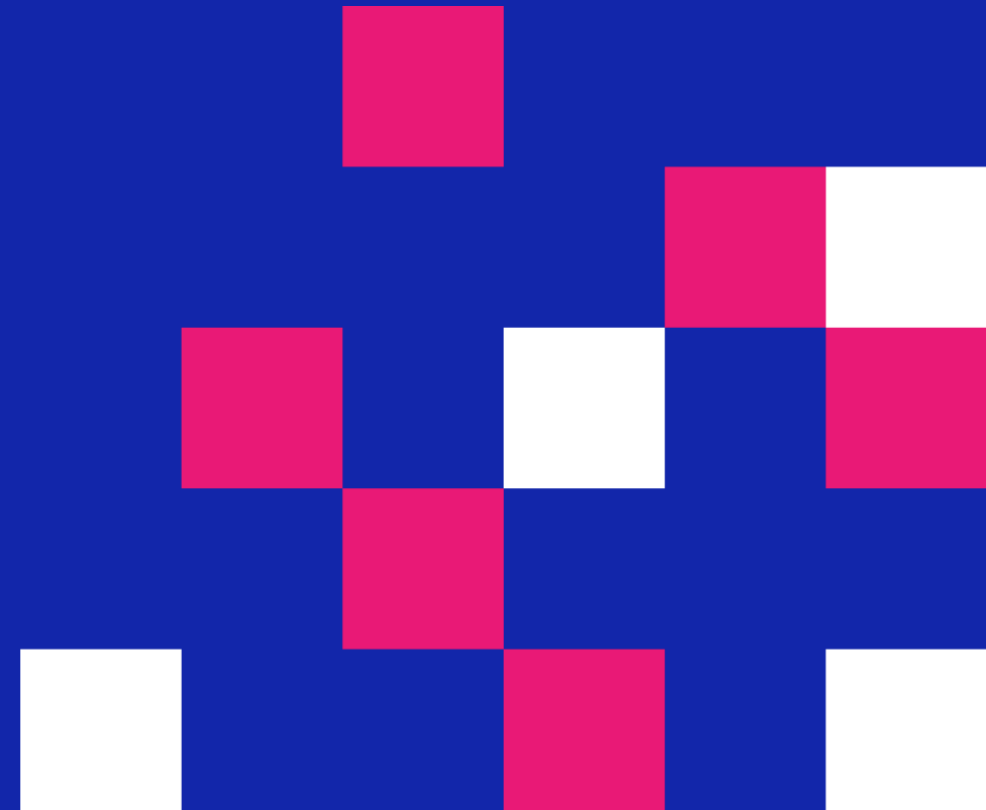
## Distributed Tracing in .NET and Azure

Annejan Barelds

Software Architect

Move Up with 4Dotnet

March 16<sup>st</sup>, 2023





# Annejan Barelds

## Software Architect - 4Dotnet

Azure – .NET – Architecture – Consultancy



<https://www.linkedin.com/in/barelds/>

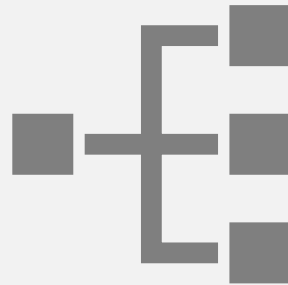


<https://github.com/AnnejanBarelds>

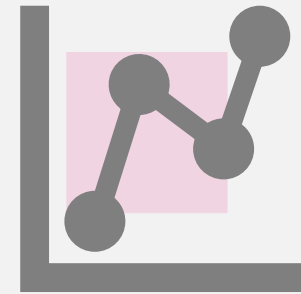
# Observability



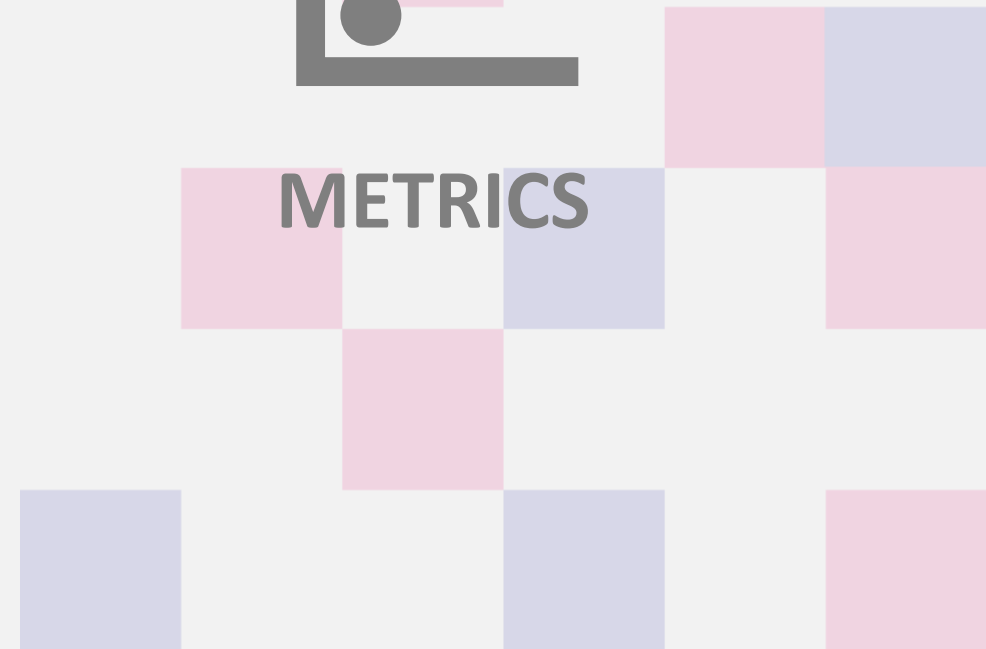
LOGS

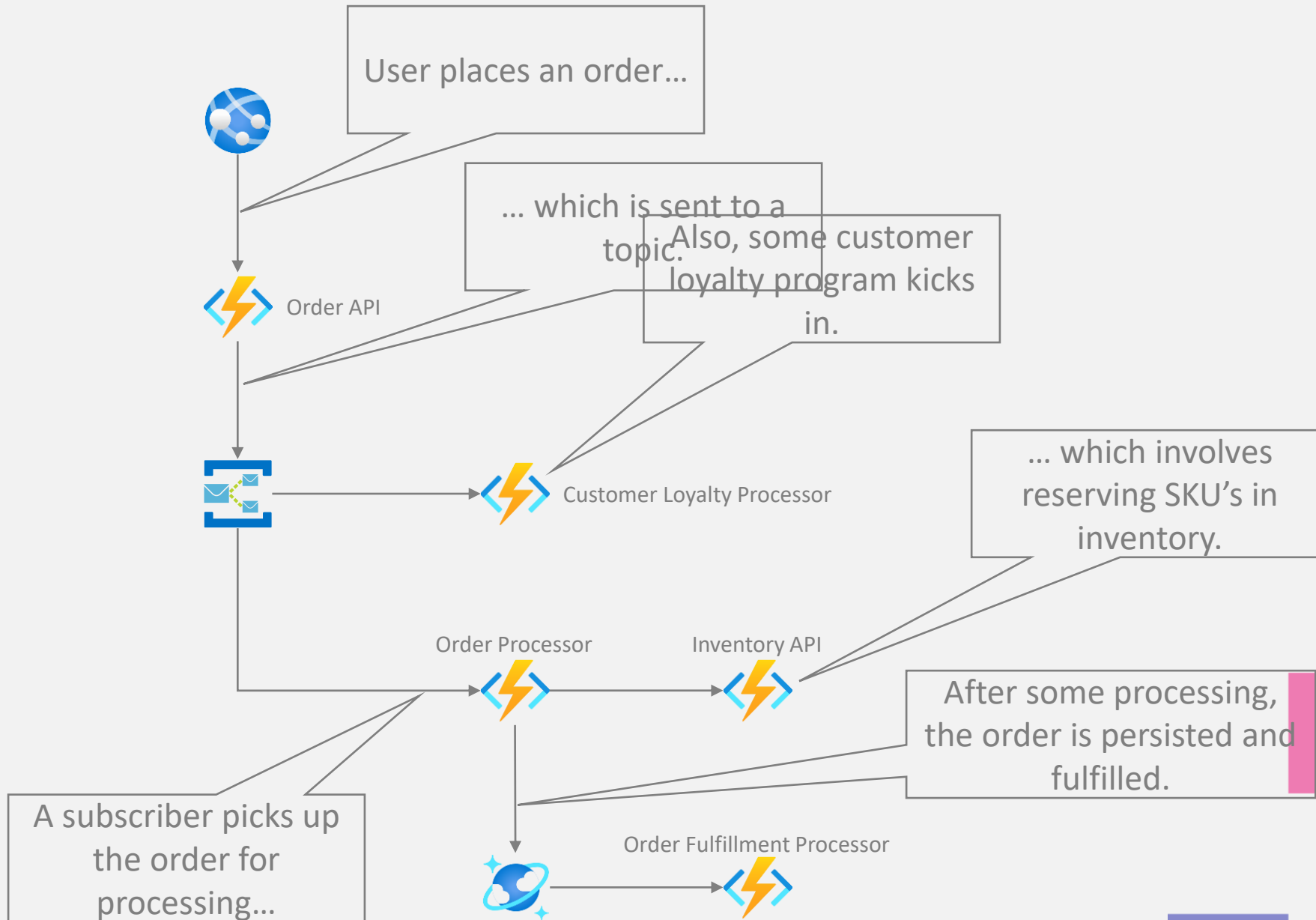


TRACES



METRICS







Order API



Order Processor



Inventory API



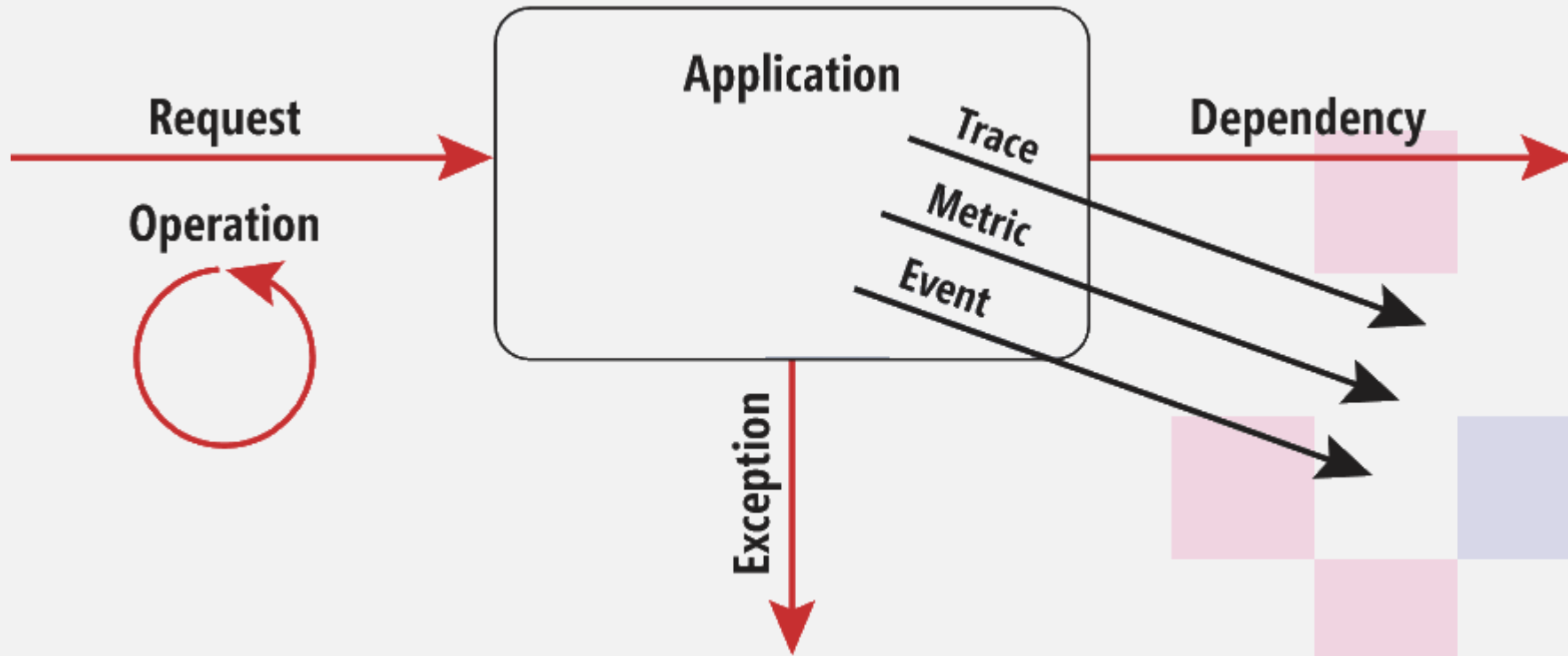
Order Fulfillment Processor



itemType	operation_Id	timestamp [UTC]	message
> request	3045ed1aabe170d9cbefa267017e68c1	2/22/2023, 12:25:42.389 PM	
> trace	3045ed1aabe170d9cbefa267017e68c1	2/22/2023, 12:25:44.235 PM	Executing 'PlaceOrder' (Reason='This
> trace	3045ed1aabe170d9cbefa267017e68c1	2/22/2023, 12:25:44.287 PM	C# HTTP trigger function processed a
> trace	3045ed1aabe170d9cbefa267017e68c1	2/22/2023, 12:25:44.356 PM	Querying cache for sku for productId
> trace	3045ed1aabe170d9cbefa267017e68c1	2/22/2023, 12:25:44.357 PM	Found sku sku1 for productId 1



# Application Insights







Order API



#### Message Text

☒ Autoindent

```
1 {  
2   "Id": "f6f1a6bb-7fed-442d-9e06-53fe3aaa3d9e",  
3   "Items": [  
4     {  
5       "Sku": "sku4",  
6       "ProductId": 3,  
7       "Amount": 1  
8     }  
9   ]  
10 }
```

#### Message Custom Properties

	Key	Type	Value
▶	\$AzureWebJobsParentId	String	a39f3291-e462-4c8d-bf51-a8bf400e87ef
	Diagnostic-Id	String	00-ba2d0901e3307644378b590b8afd4e51-e041c7499f329733-00
*			

#### End-to-end transaction

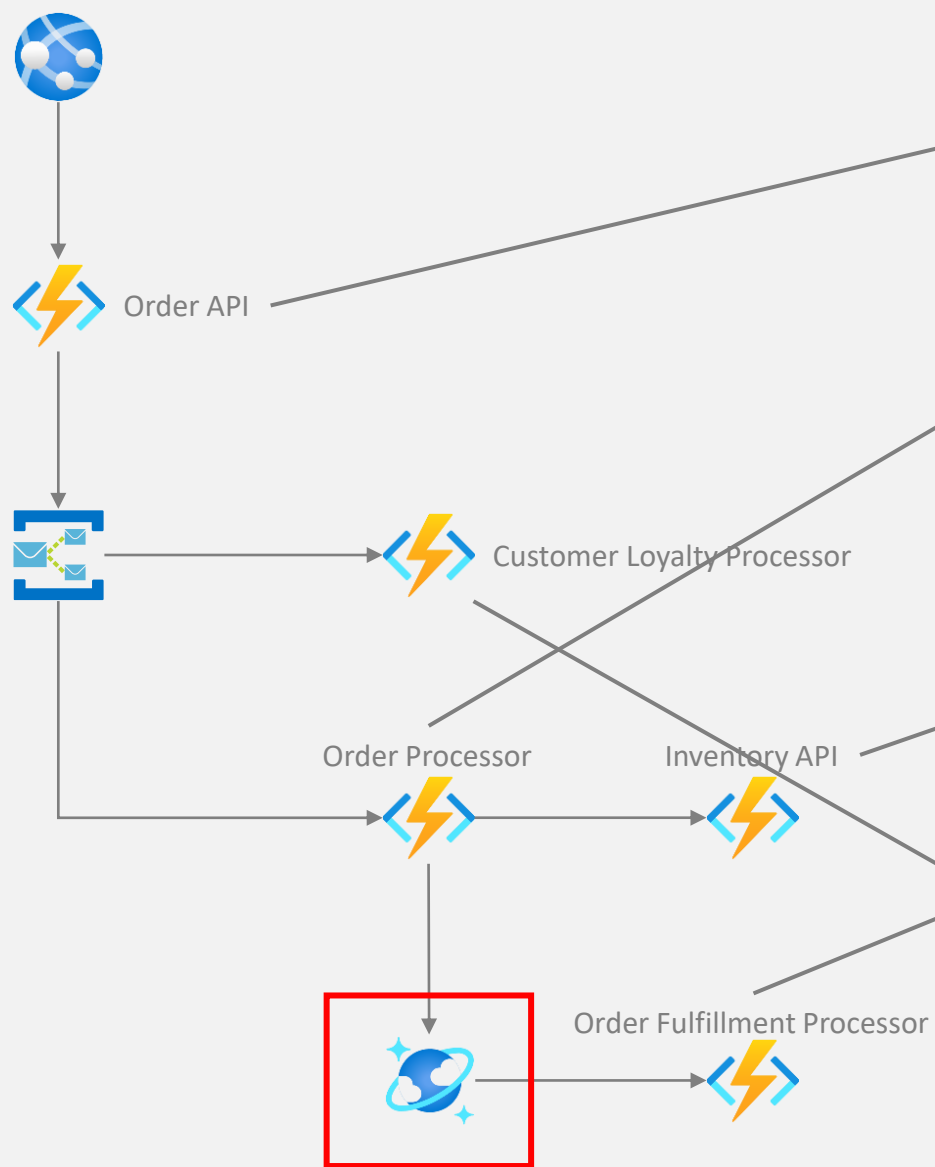
Operation ID: **ba2d0901e3307644378b590b8afd4e51**

▲ = Exception    ▨ = Dependency (outgoing)    ■ = Request (incoming)

#### EVENT

	RES.	DURATION	
▼ <b>api-rootcause</b> PlaceOrder	200	49.7 ms	
▼ <b>annejan</b> Message		136.2 μs	
▼ Time Spent in Queue		34 ms	
▼ <b>orderprocessor-rootcause</b> OrderProcessor	0	130.2 ms	
▼ <b>inventoryapi-rootcause</b> POST /api/reservations	404	99.0 ms	
▼ <b>inventoryapi-rootcause</b> Reservations	404	28.4 ms	
▼ <b>annejan</b> ServiceBusReceiver.DeadLetter		11.1 ms	
▲ <b>EXCEPTION</b> System.Exception			
		34 ms	
	ityProcessor 0	64.3 ms	
		24.0 ms	





### End-to-end transaction

Operation ID: da8868146a4da67c91cbb26821d79088, 9b988e84b05bfc626c68bf1bfa119dd7

= Request (incoming)    = Dependency (outgoing)

EVENT	RES.	DURATION
api-rootcause PlaceOrder	200	2.7 s
annejan Message		2.5 ms
Time Spent in Queue		41.9 s
orderprocessor-rootcause OrderProcessor	0	6.5 s
169.254.169.254 GET /metadata/instance	Fault...	34.7 ms
ManagedIdentityCredential.GetToken		94.6 ms
127.0.0.1:41870 GET /msi/token/	200	91.0 ms
cosmos-rootcause GET	200	82.2 ms
inventoryapi-rootcause POST /api/reservations	204	4.9 s
inventoryapi-rootcause Reservations	204	1.1 s
Store event Store event		190.9 μs
Link to OrderFulfillmentProcessor		95.7 ms
orderfulfillmentprocessor-rootcause OrderFulfillmentProc	0	95.7 ms
cosmos-rootcause-west europe Get collection	200	52.7 ms
cosmos-rootcause-west europe Create document	201	10.9 ms
Time Spent in Queue		6.3 s
customerloyaltyprocessor-rootcause CustomerLoyaltyProcessor	0	320.0 ms
annejan ServiceBusSender.Send		1.1 s
DefaultAzureCredential.GetToken		208.2 ms
ManagedIdentityCredential.GetToken		172.9 ms
127.0.0.1:41779 GET /msi/token/	200	26.8 ms



Order API



itemType

operation\_Id

customDimensions\_MS.links

tim

> request

9b988e84b05bfc626c68bf1bfa119dd7

[{"operation\_Id": "da8868146a4da67c91cbb26821d79088", "id": "36005bd9eafefc0d"}]

2/2

> trace

9b988e84b05bfc626c68bf1bfa119dd7

2/2

> trace

9b988e84b05bfc626c68bf1bfa119dd7

> trace

9b988e84b05bfc626c68bf1bfa119dd7

> trace

9b988e84b05bfc626c68bf1bfa119dd7

> trace

9b988e84b05bfc626c68bf1bfa119dd7

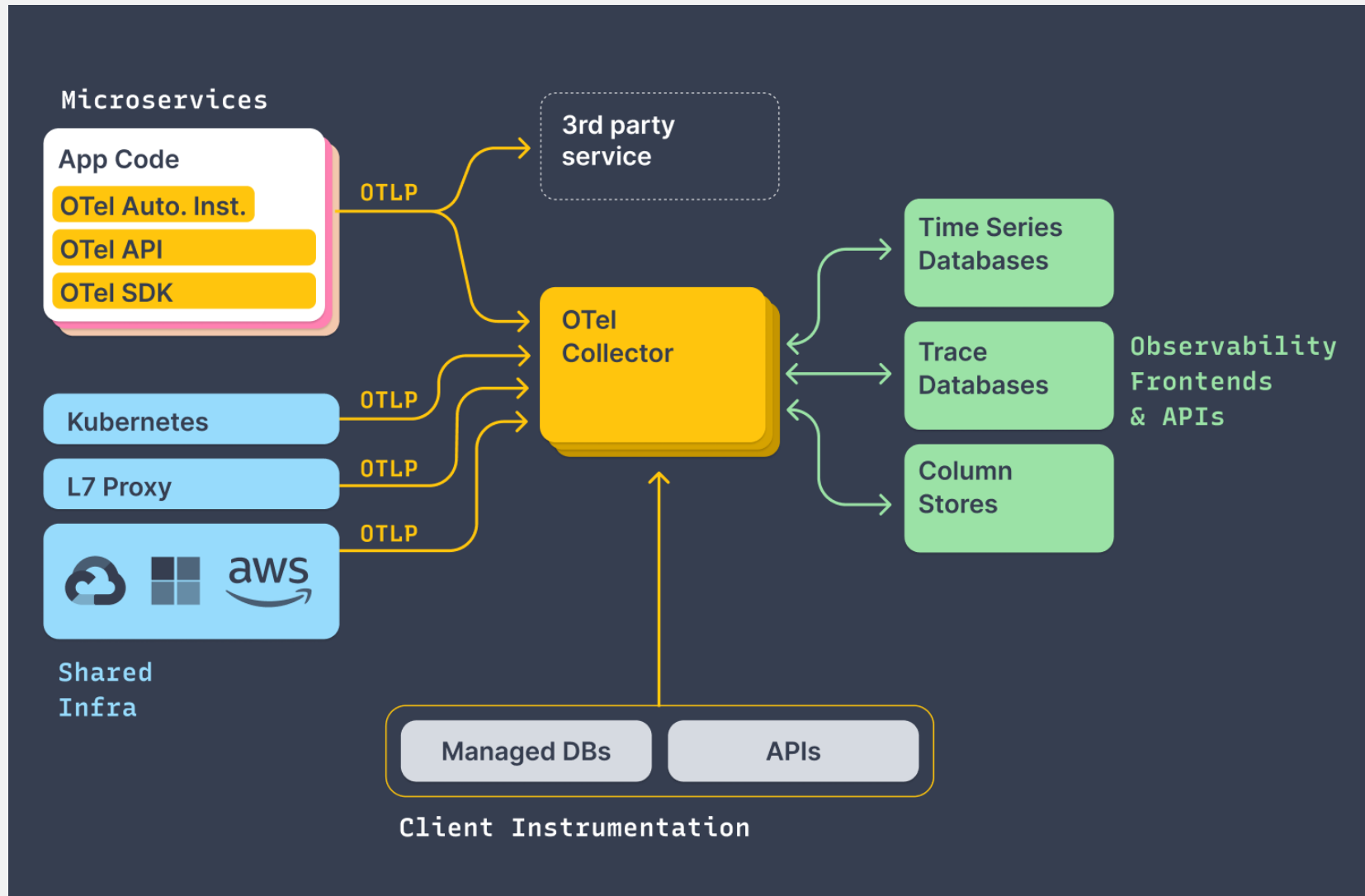


Order Fulfillment



```
{
  "id": "97040ac9-4db6-479b-b4d7-412069d43b59",
  "OrderItems": [
    {
      "sku": "sku5",
      "ProductId": 5,
      "Amount": 1
    }
  ],
  "OrderId": "e1d37086-3cbb-4443-9300-a44574b97ca5",
  "DiagnosticId": "00-da8868146a4da67c91cbb26821d79088-36005bd9eafefc0d",
  "_rid": "JakQAPDEiK8aAAAAAAAAA==",
  "_self": "dbs/JakQAA=/colls/JakQAPDEiK8=/docs/JakQAPDEiK8aAAAAAAAAA=",
  "_etag": "\"5b01cc46-0000-0d00-0000-63f61adf0000\"",
  "..."
}
```

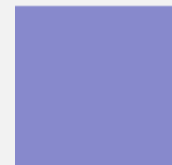
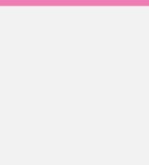
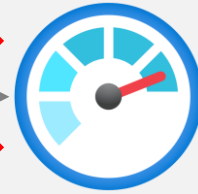
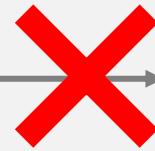
# OpenTelemetry



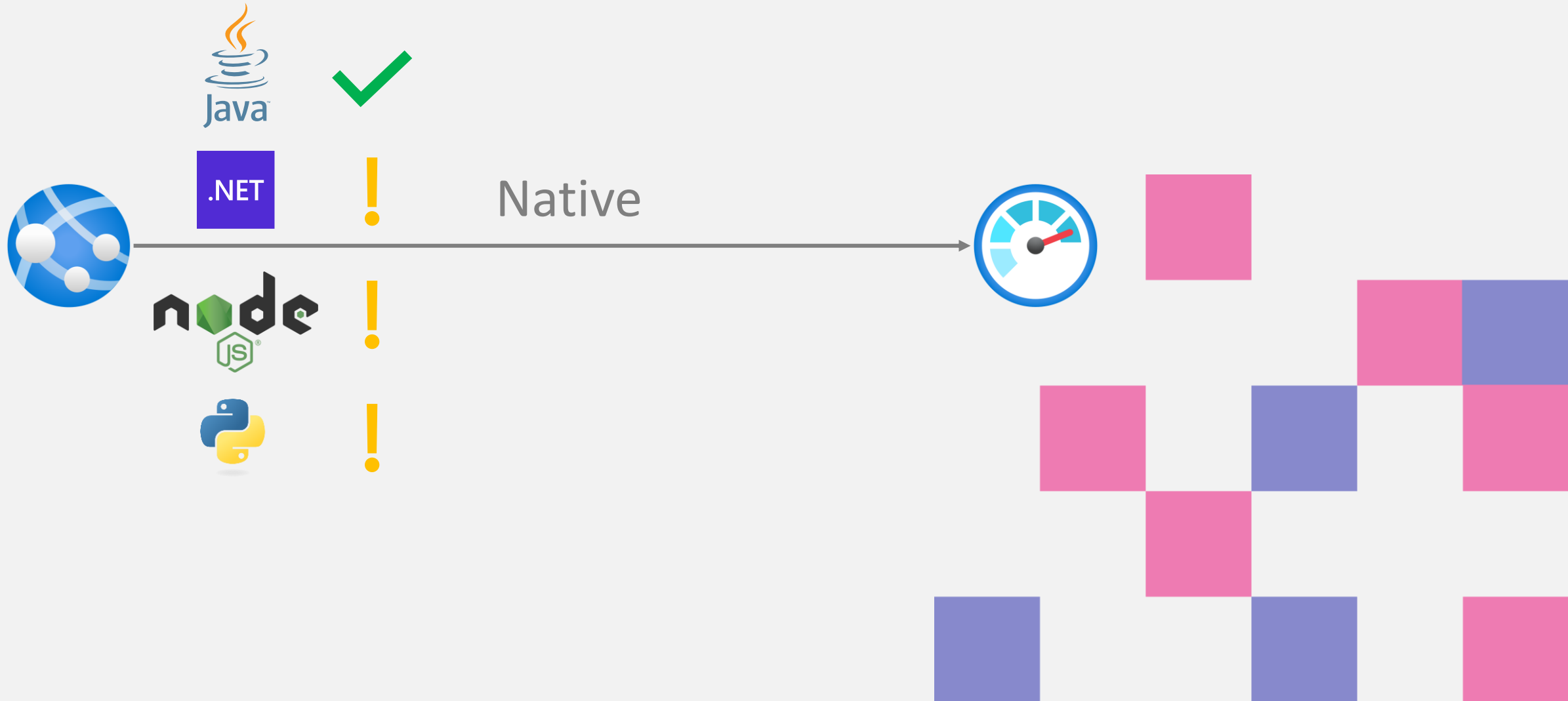
# OTel In The Microsoft Ecosystem



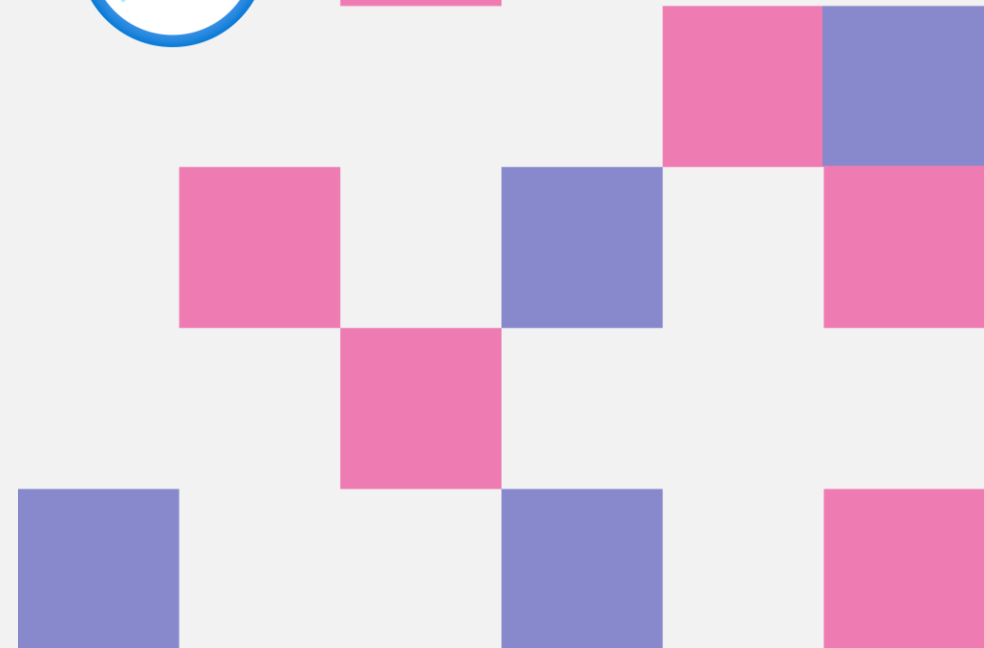
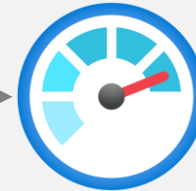
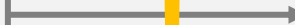
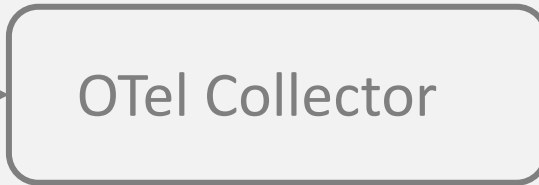
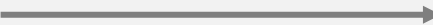
OLTP



# OTel In The Microsoft Ecosystem



# OTel In The Microsoft Ecosystem



Distributed tracing comes out of the box

Increasingly based on open standards

Can be extended

OpenTelemetry looks promising and is gaining momentum



# Thanks!

<https://github.com/AnnejanBarelds/FindingTheRootCause>

A decorative pattern of pink and white squares arranged in a grid-like fashion, located in the bottom right corner of the slide.