

# Dapr



Dapr and .NET Aspire –  
A New Era for Observability

Harry Kimpel  
[@harrykimpel](#)



whoami



# Harry Kimpel

Principal Developer Relations Engineer

New Relic

@harrykimpel

- Passionate software craftsman
- Microsoft developer ecosystem
- With New Relic since 2017
- Hiker, climber, biker, runner, swimmer
- Chief Repair Officer at home



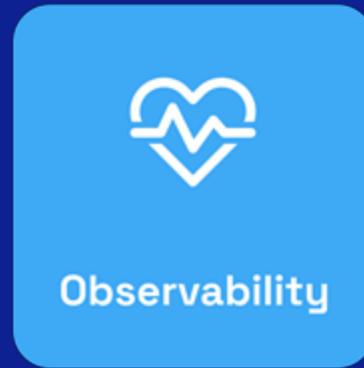


# Dapr Day



Oct 16th, 2024

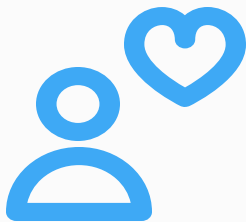
5 years of **dapr**



# Observability

<https://docs.dapr.io/concepts/observability-concept/>

# Open Standards

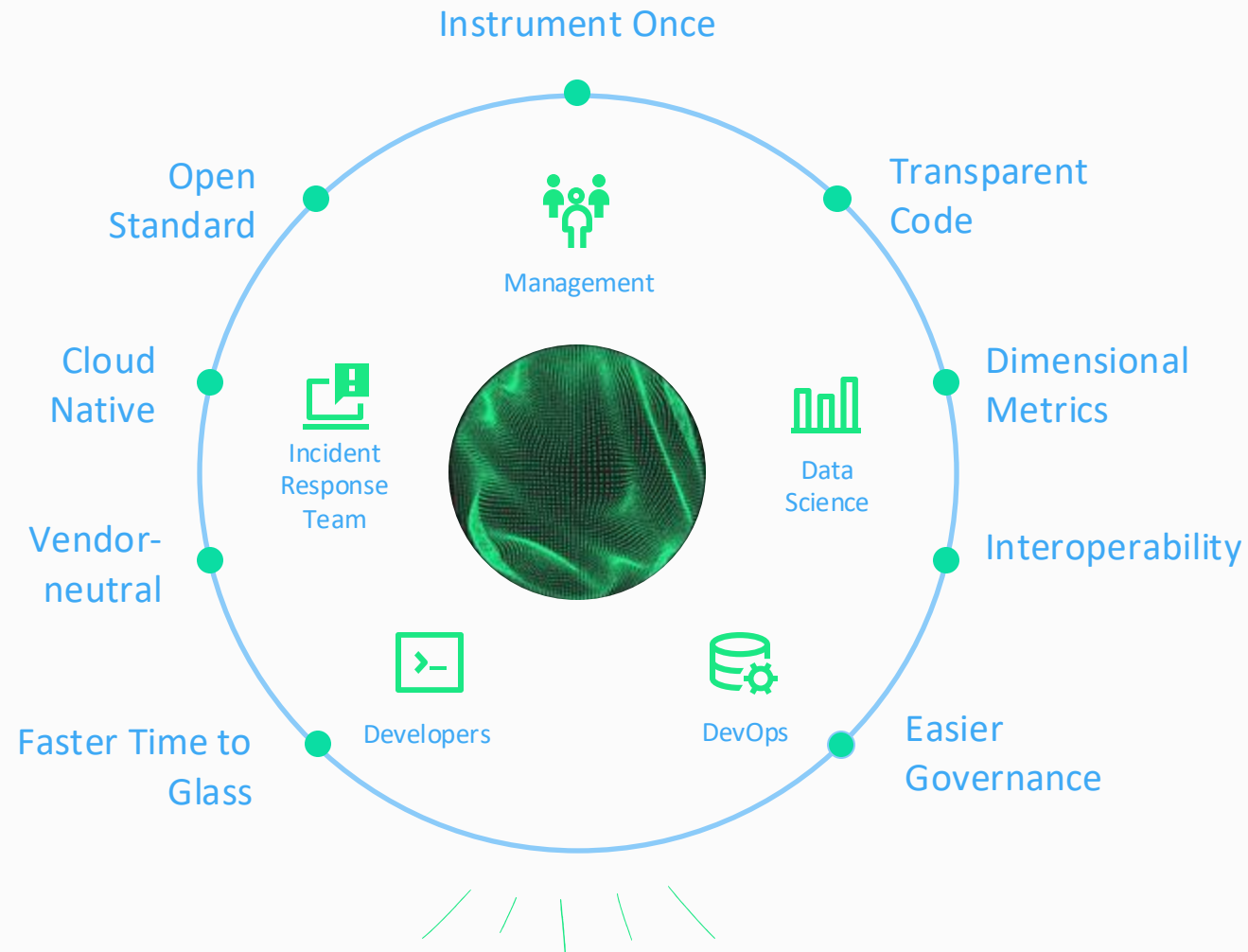


# The Rise of OpenTelemetry

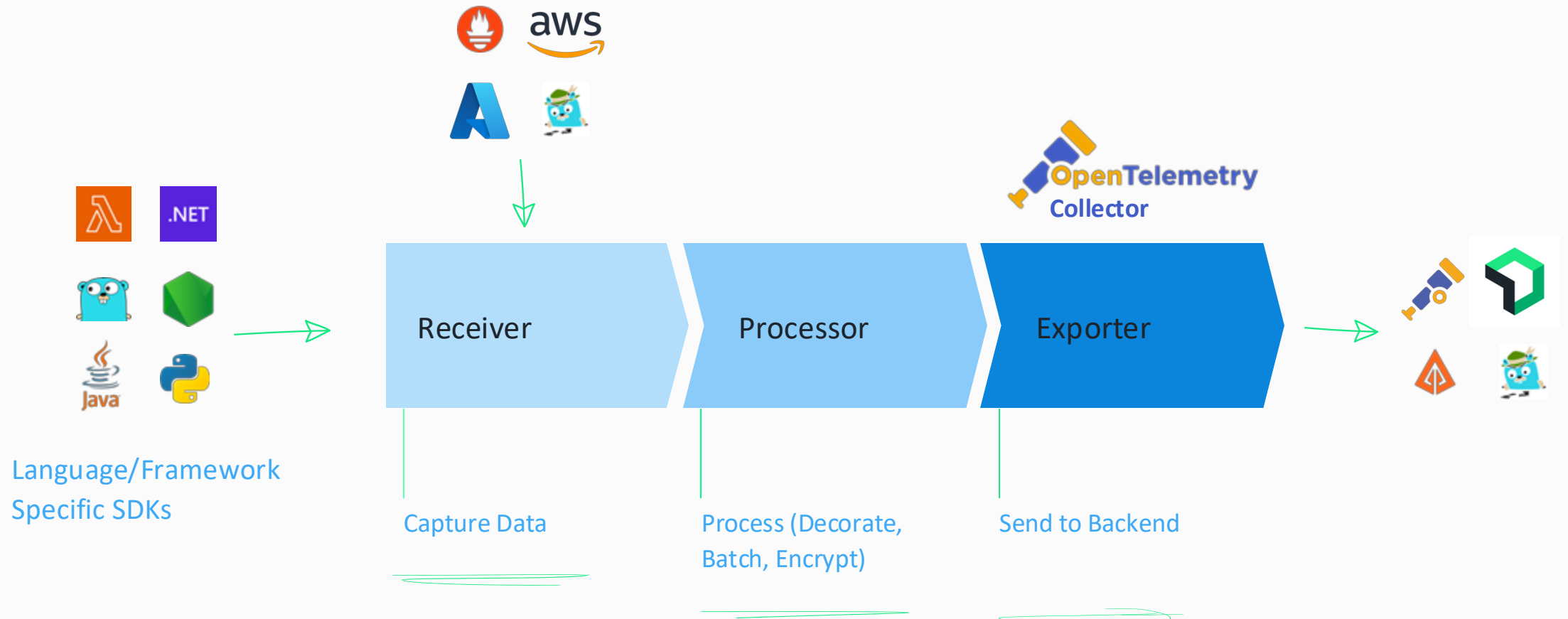
- **OpenTelemetry** is a CNCF project
- Formed through a merger of the **OpenTracing** and **OpenCensus** projects in 2019
- Vendor-agnostic - set of APIs, libraries, integrations, and a collector service for telemetry
- **Standardizes** how you collect telemetry data from your applications and services
- Send it to an observability platform of your choice



# Why OpenTelemetry?



# Snapshot of OpenTelemetry





# OpenTelemetry in Dapr and .NET Aspire

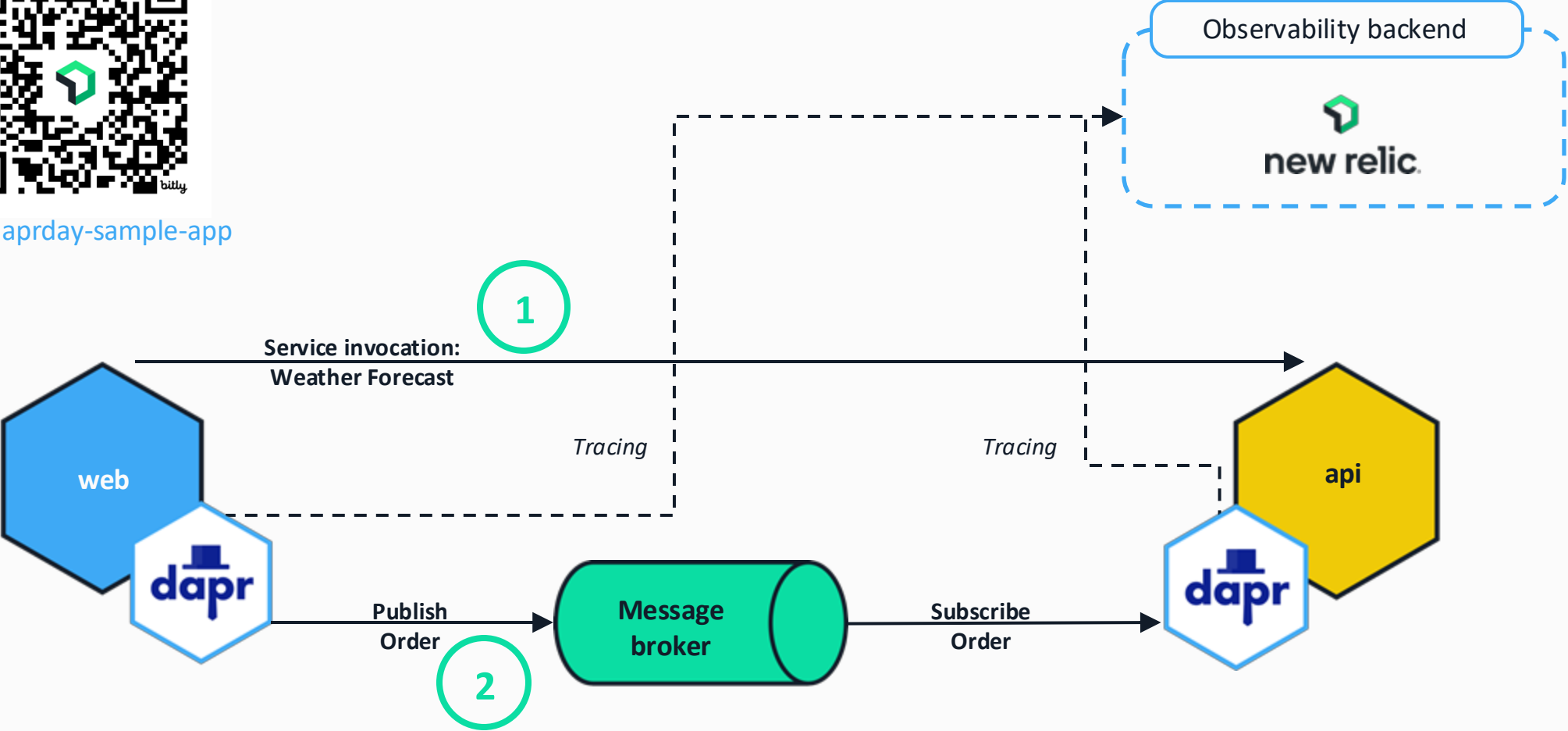


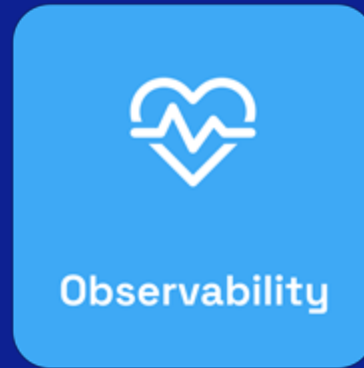
- Both embrace observability as a 1st class citizen
- Dapr <= v1.14
  - Tracing = OpenTelemetry
  - Metrics = OpenCensus
- Dapr v1.15+
  - Tracing = OpenTelemetry
  - Metrics = OpenTelemetry
- .NET Aspire
  - Full support for OpenTelemetry

# Sample application



<https://bit.ly/daprdaysampleapp>





# Observability demo

<https://bit.ly/daprdaysampleapp>

# Tracing for service invocation



Observability

## GET /weather

unknown\_service:AspireWithDapr.Web | October 15 at 11:53am | Trace ID: ac95da5dad267faecda8d084afd8e1ba | Spans: 5

Trace details | Logs (2)

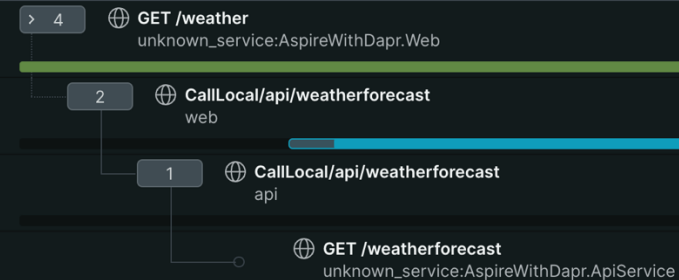
0 anomalous spans 0 errors 4 entities Find spans by name or ID

### Entity map

There are 4 sampled entities in this trace



Expand all | Collapse all | Standard | Manual | | Reset



## GET /weather

unknown\_service:AspireWithDapr.Web | October 15 at 11:53am | Trace ID: ac95da5dad267faecda8d084afd8e1ba | Spans: 5

Trace details | Logs (2)

0 anomalous spans 0 errors 4 entities Find spans by name or ID

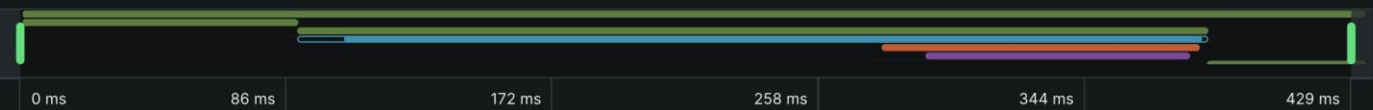
Trace duration 429.41 ms | Back-end duration 429.41 ms

### Trace timeline

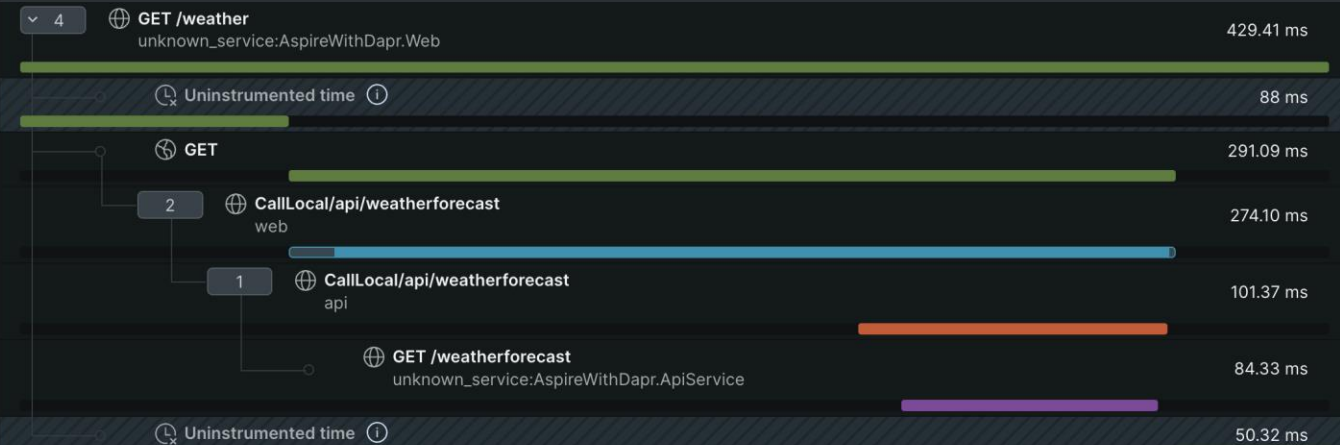
Investigate the entire trace or select an area to focus on that segment of spans

Map Timeline Latency

Maximize



Expand all | Collapse all | Standard | Manual | | Reset



# Traces for service invocation



Observability

**GET /weatherforecast**  
unknown\_service:AspireWithDapr.ApiService

Performance **Attributes** Details **84.33 ms**  
DURATION

Q

amountWeatherForecasts  
5

avgTemperatureC  
13.3999999618530273

avgTemperatureF  
56.20000076293945

category  
http

duration.ms  
84.3313

entity.guid  
NDc4MjU5N3xFWFR8U0VSVkIDRXwtNDU5MDgxMzYyM  
TkzNDA1OTgxNA

entity.name  
unknown\_service:AspireWithDapr.ApiService

entity.type  
SERVICE

amountWeatherForecasts  
5

avgTemperatureC  
13.3999999618530273

avgTemperatureF  
56.20000076293945

# Traces for service invocation




Observability


GET /weather

unknown\_service:AspireWithDapr.Web | October 15 at 11:53am | Trace ID:  ac95da5dad267faecda8d084afd8e1ba | Spans: 5 

Trace details **Logs (2)**

Partition (1) ▾

 Query logs in the selected entity

Trace ID:  ac95da5dad267faecda8d084afd8e1ba

2 Logs

	timestamp	hostname	message
1			
0			
0			
	11:53:19.349		Receiving request for weather forecast.
E	11:53:19.370		The average temperature in the next 5 days is 13,4 C or 56,2 F.

level	timestamp	hostname	message
	11:53:19.349		Receiving request for weather forecast.
	11:53:19.370		The average temperature in the next 5 days is 13,4 C or 56,2 F.

# Tracing for service invocation



Observability

samples > AspireWithDapr > AspireWithDapr.ApiService > C# Program.cs > ...

```
23
24 app.MapGet("/weatherforecast", () =>
25 {
26     ...try
27     ...{
28         ...app.Logger.LogInformation("Receiving request for weather forecast.");
29
30         ...//Generate weather forecast for the next 5 days
31         ...int maxRange = 5;
32         ...var forecast = Enumerable.Range(1, maxRange).Select(index =>
33         ...new WeatherForecast
34         ...{
35             ...DateOnly.FromDateTime(DateTime.Now.AddDays(index)),
36             ...Random.Shared.Next(-20, 55),
37             ...summaries[Random.Shared.Next(summaries.Length)]
38         ...});
39         ...ToArray();
40
41         ...//Add the forecast window as a custom attribute to the current activity
42         ...var activity = Activity.Current;
43         ...activity?.SetTag("amountWeatherForecasts", forecast.Length);
44
45         ...//Calculate the average temperature for the forecast
46         ...int totalTempC = 0;
47         ...int totalTempF = 0;
48         ...foreach (WeatherForecast fc in forecast)
49         ...{
50             ...totalTempC += fc.TemperatureC;
51             ...totalTempF += fc.TemperatureF;
52         ...}
53         ...float avgTempC = (float)totalTempC / (float)maxRange;
54         ...float avgTempF = (float)totalTempF / (float)maxRange;
55
56         ...//Add the average temperature as custom attributes to the current activity and log it
57         ...activity?.SetTag("avgTemperatureC", avgTempC);
58         ...activity?.SetTag("avgTemperatureF", avgTempF);
59         ...app.Logger.LogInformation($"The average temperature in the next {maxRange} days is {avgTempC} C or {avgTempF} F.");
60
61         ...return Results.Ok(forecast);
```

# Tracing for publisher/subscriber



Observability

## GET /order

unknown\_service:AspireWithDapr.Web | October 16 at 11:32am | Trace ID: e6145de20fea6b197575d07ebca47532 | Spans: 5

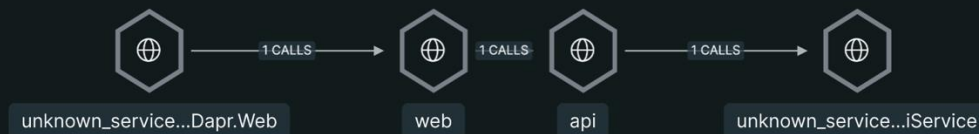
Trace details Logs (1)

0 anomalous spans 0 errors 4 entities Find spans by name or ID Trace duration 45.52 ms Back-end duration 45.52 ms

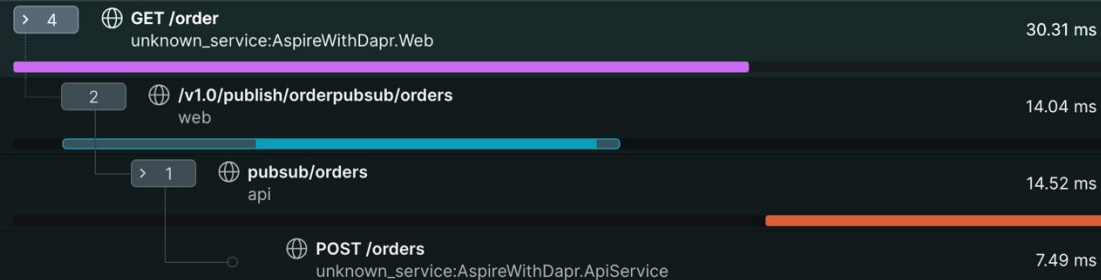
### Entity map

There are 4 sampled entities in this trace

Map Timeline Latency



Expand all Collapse all Standard Manual Reset Maximize



## GET /order

unknown\_service:AspireWithDapr.Web | October 16 at 11:32am | Trace ID: 8a3489645797186b001e83bd6fdc08b | Spans: 8

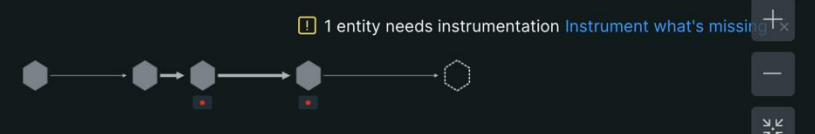
Trace details Logs (5)

0 anomalous spans 2 errors 5 entities Find spans by name or ID Trace duration 315.39 ms Back-end duration 315.39 ms

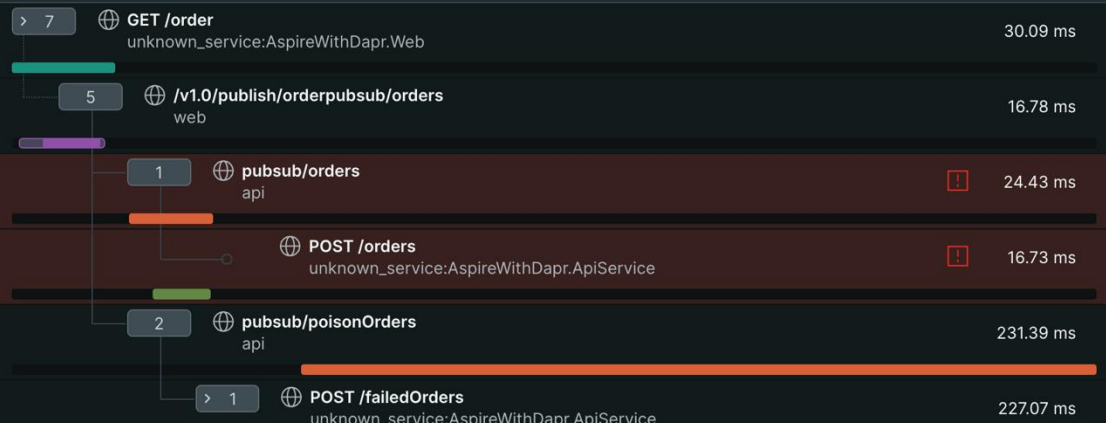
### Entity map

There are 5 sampled entities in this trace

Map Timeline Latency



Expand all Collapse all Standard Manual Focus on: Errors Slow spans Re Maximize





# Tracing for publisher/subscriber



## GET /order

unknown\_service:AspireWithDapr.Web | October 16 at 11:32am | Trace ID: `8a3489645797186b001e83bd6fd6c08b` | Spans: 8 ⓘ

Trace details **Logs (5)**

Partition (1) ▾

Query logs

NRQL

### 5 Logs

6  
4  
2  
0

11:10am 11:15am 11:20am 11:25am 11:30am 11:35am

Errors Warnings Debug Info No Status

Expand logs ☒

Expand table

Add column

Add to dashboard

Export

Open in logs

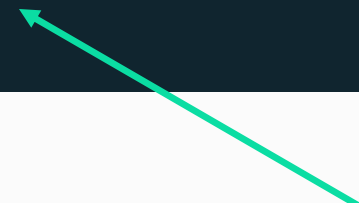
level	timestamp	hostname	message
	11:32:46.683		Subscriber received Order Id: 90
	11:32:46.683		Simulated <b>error</b> for order id: 90
	11:32:46.696		An unhandled exception has occurred while executing the request.
	11:32:46.728		Subscriber received failed Order Id: 90
	11:32:46.953		Failed order received (order id: 90) and sent to custom New Relic event for investigation.

# Tracing for publisher/subscriber



Observability

```
84 // Dapr subscription in /dapr/subscribe sets up this route when configuring it programmatically
85 app.MapPost("/orders", (DaprData<Order> requestData) =>
86 {
87     ...int customerId = requestData.Data.CustomerId;
88     ...int orderId = requestData.Data.OrderId;
89     ...Console.WriteLine($"Subscriber received Order Id: {orderId}");
90     ...app.Logger.LogInformation($"Subscriber received Order Id: {orderId}");
91     ...var activity = Activity.Current;
92     ...activity?.SetTag("enduser.id", customerId);
93     ...activity?.SetTag("orderId", orderId);
94 }
```

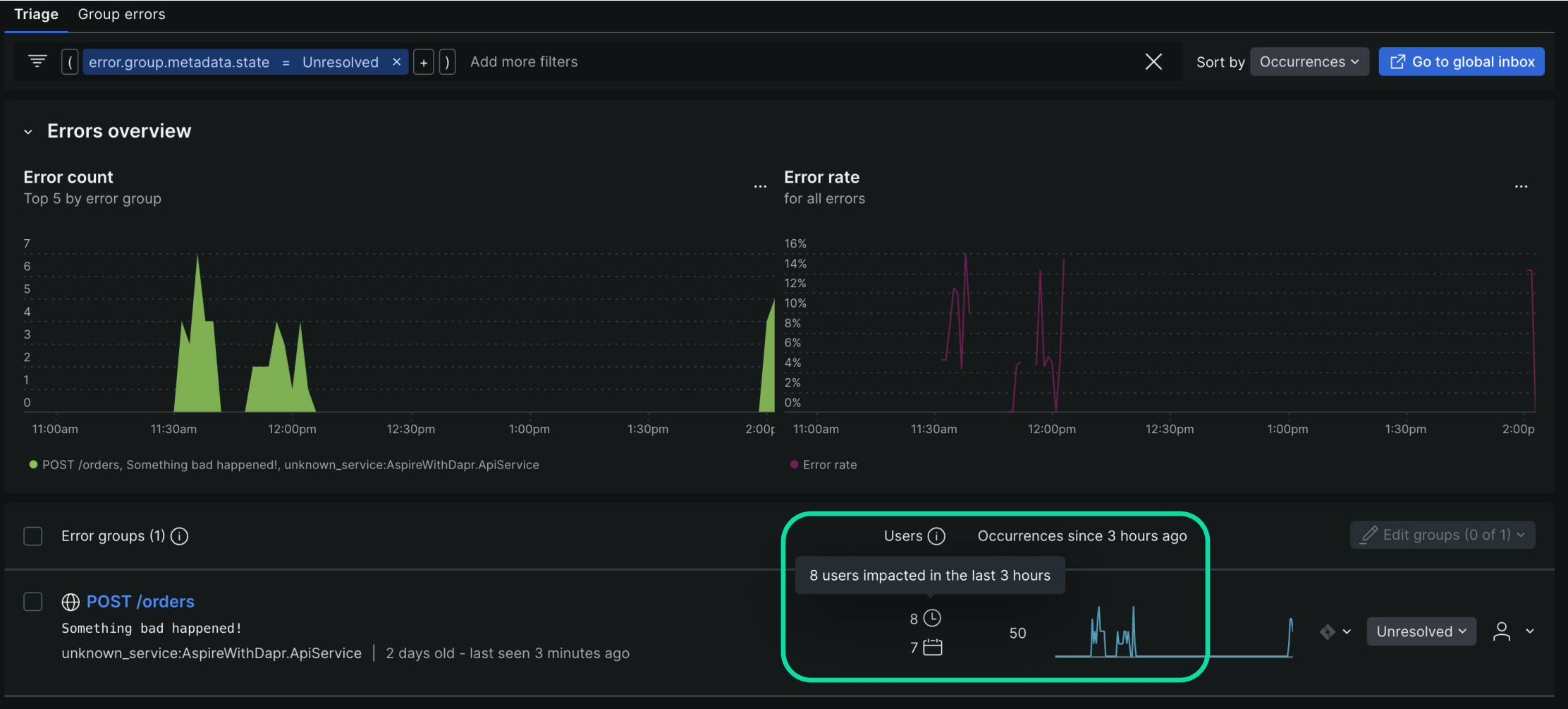




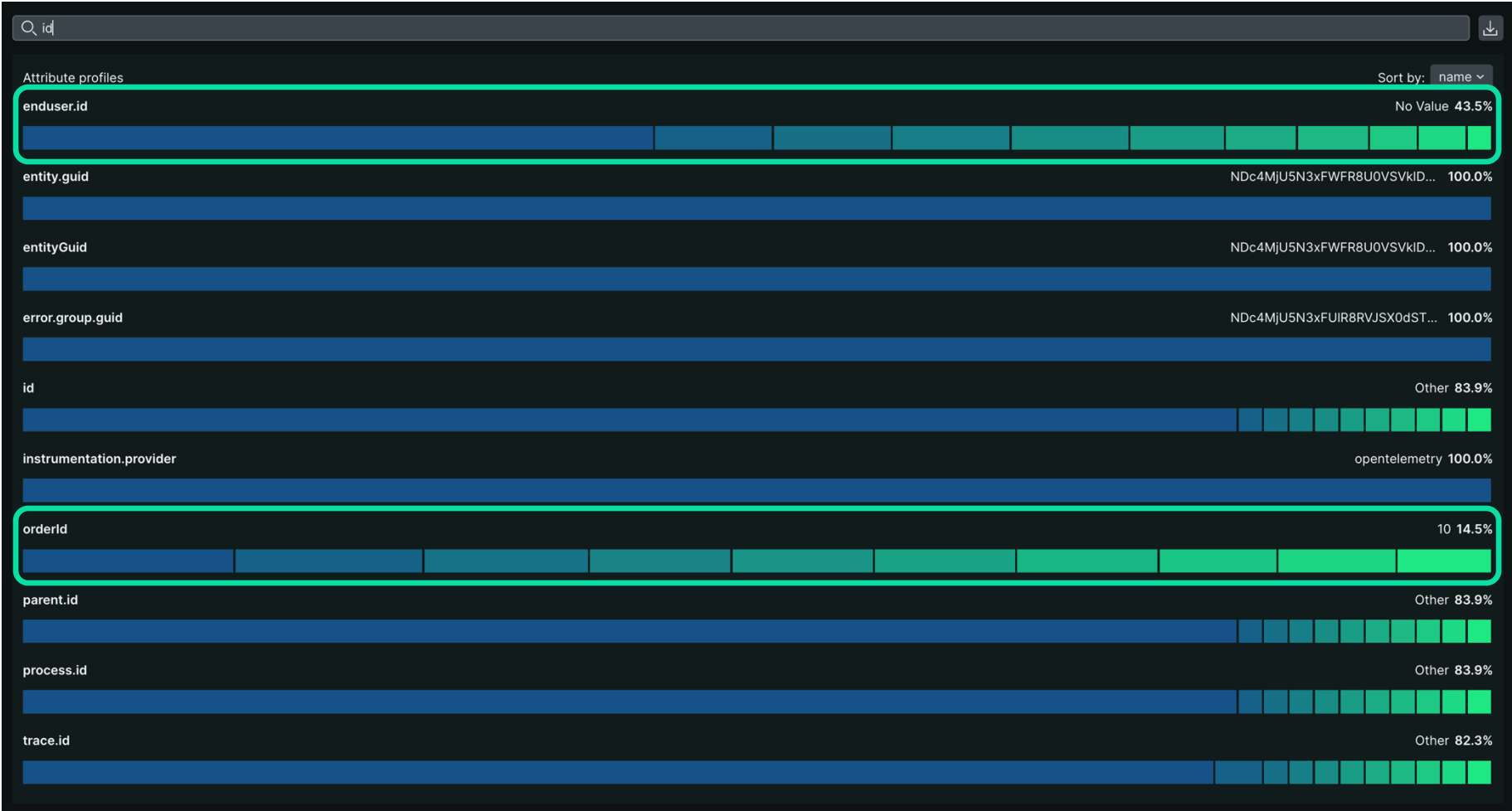
Observability

Why are custom attributes  
and tags important?

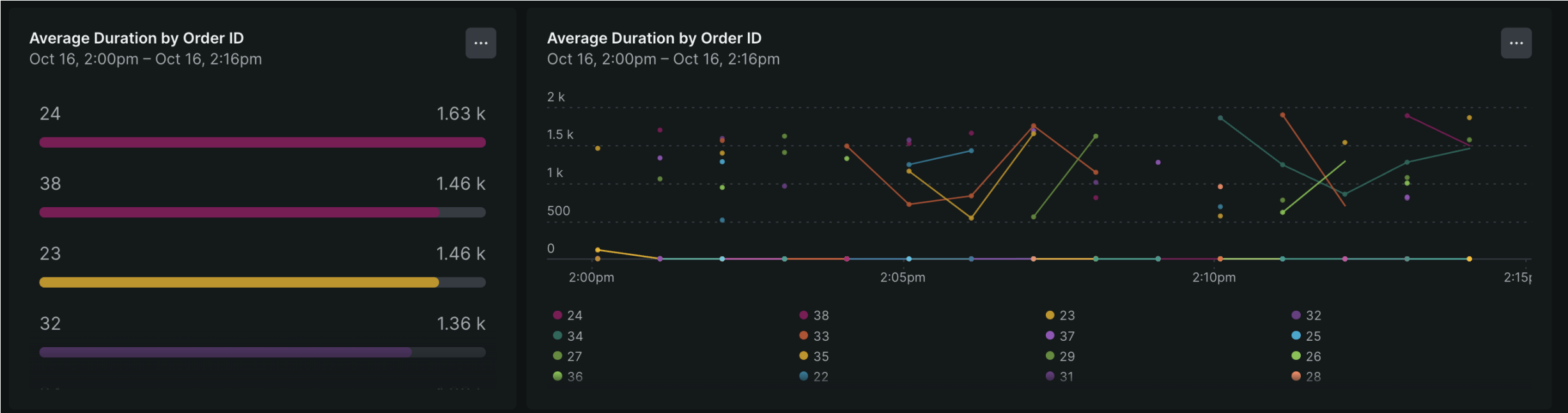
# Helps diagnose the impact of errors



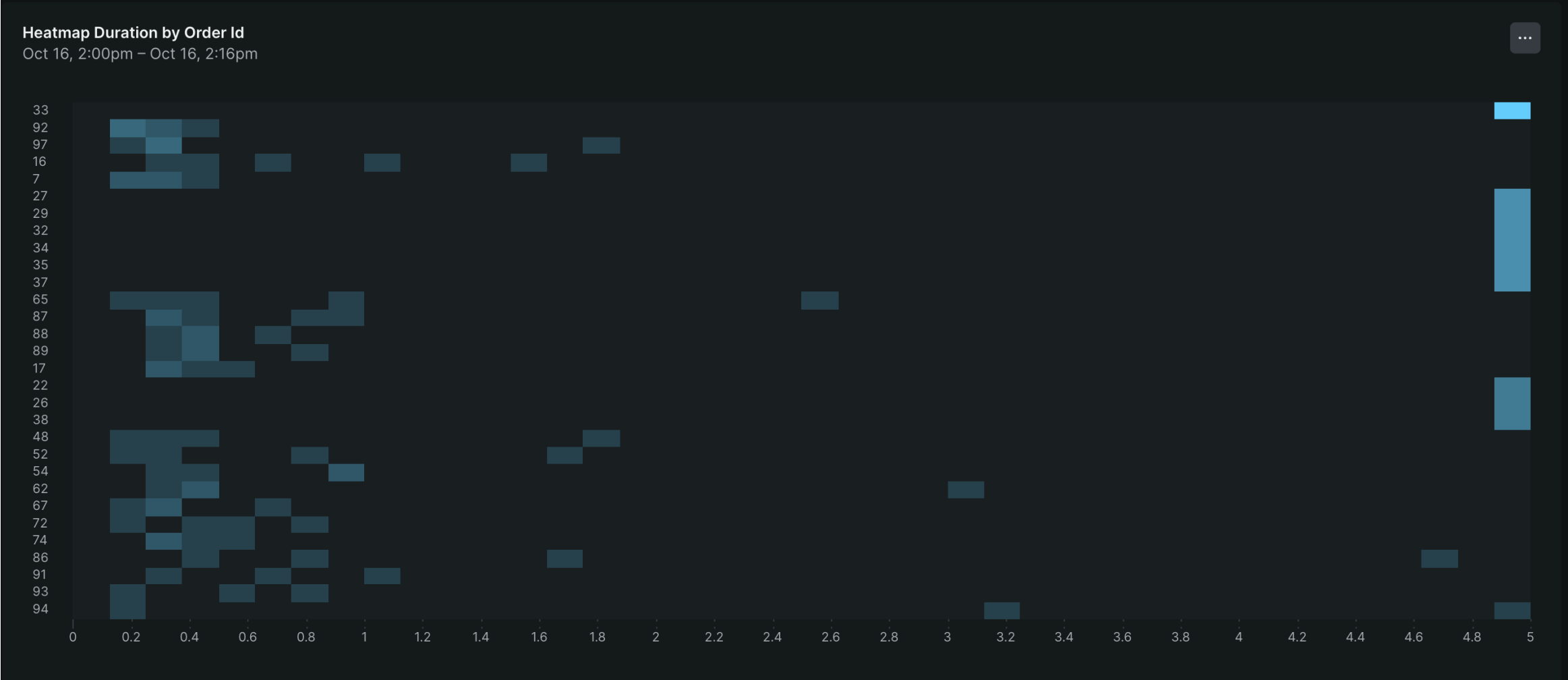
# Create error profiles



# Create Actionable Insights



# Create Actionable Insights



# Summary



- OpenTelemetry is here to stay
- Power of an open standard
  - Inter-service communication
  - Capture of data
  - Export of data / OTLP
- Broad industry support
- Community contributions



# Dapr Resources



[dapr.io](https://dapr.io)



[bit.ly/dapr-youtube](https://bit.ly/dapr-youtube)



[bit.ly/dapr-quickstarts](https://bit.ly/dapr-quickstarts)



[bit.ly/dapr-discord](https://bit.ly/dapr-discord)



[@daprdev](https://twitter.com/daprdev)



[dapr.io](https://dapr.io)

Claim the Dapr Community Supporter badge!



[bit.ly/dapr-supporter](https://bit.ly/dapr-supporter)