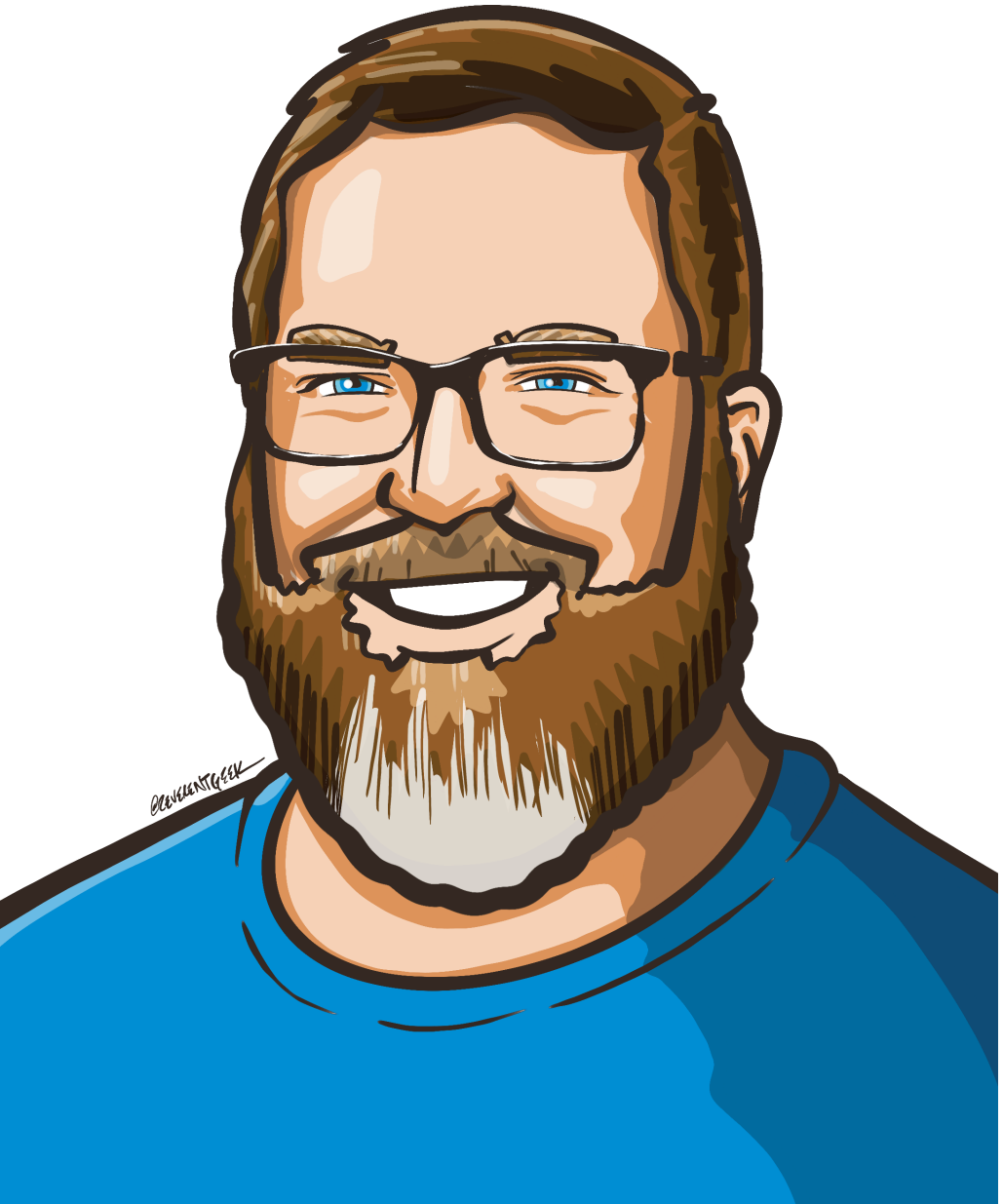
Enhanced Monitoring and Troubleshooting with Azure Application Insights and .NET Aspire's Open Telemetry Dashboard

Chris Ayers

https://github.com/codebytes/app-insights



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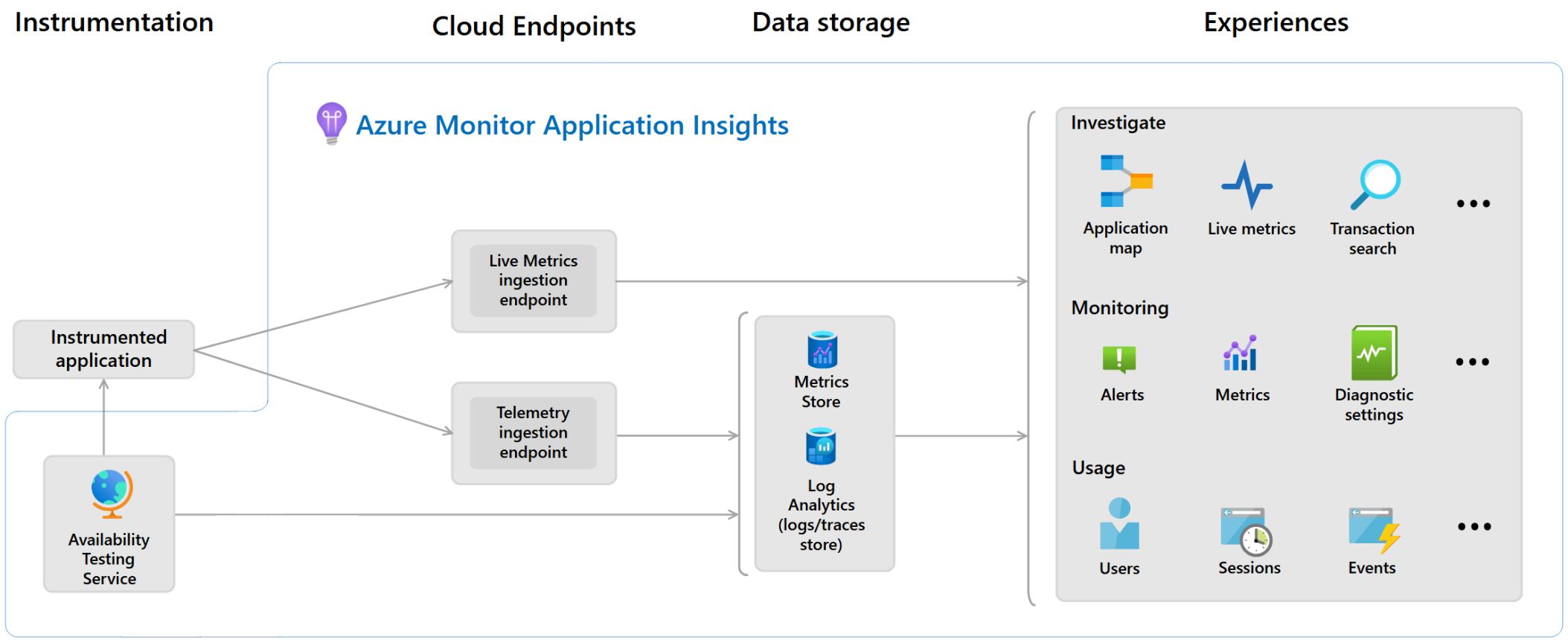
Agenda

- Azure Application Insights
- Application Insights SDK
- OpenTelemetry
- .NET Aspire
- DEMO
- Questions

What is Application Insights?



Application Insights

Application Performance Monitoring (APM)

- Traces
- Metrics
- End user Experience
- Errors
- Performance

Features

- Application Map
- Live Metrics
- Smart Detection
- Transaction Search
- Usage
- Sessions

Auto Instrumentation Support

Environment / Provider	.NETFramework	.NET	Java	Node.js	Python
Azure App Service on Windows	✅	✅	✅	✅	❌
Azure App Service on Linux	❌	✅	✅	✅	✅
Azure Functions - basic	✅	✅	✅	✅	✅
Azure Functions - dependencies	❌	❌	✅	❌	❌
Azure Kubernetes Service (AKS)	❌	❌	✅	❌	❌
VMs Windows	✅	✅	✅	❌	❌
Standalone agent	❌	❌	✅	❌	❌

Supported Languages

OpenTelemetry Distro

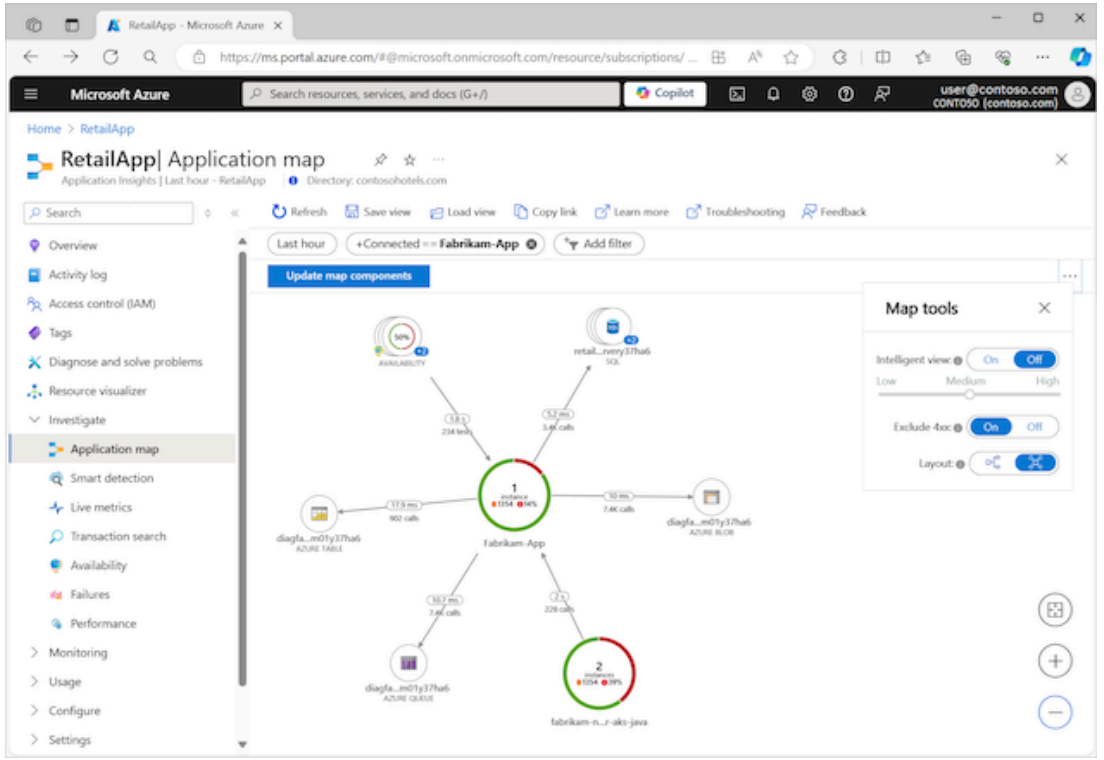
- ASP.NET Core
- .NET
- Java
- Node.js
- Python

SDK (Classic API)

- ASP.NET
- ASP.NET Core
- Java
- Node.js
- Python
- Javascript

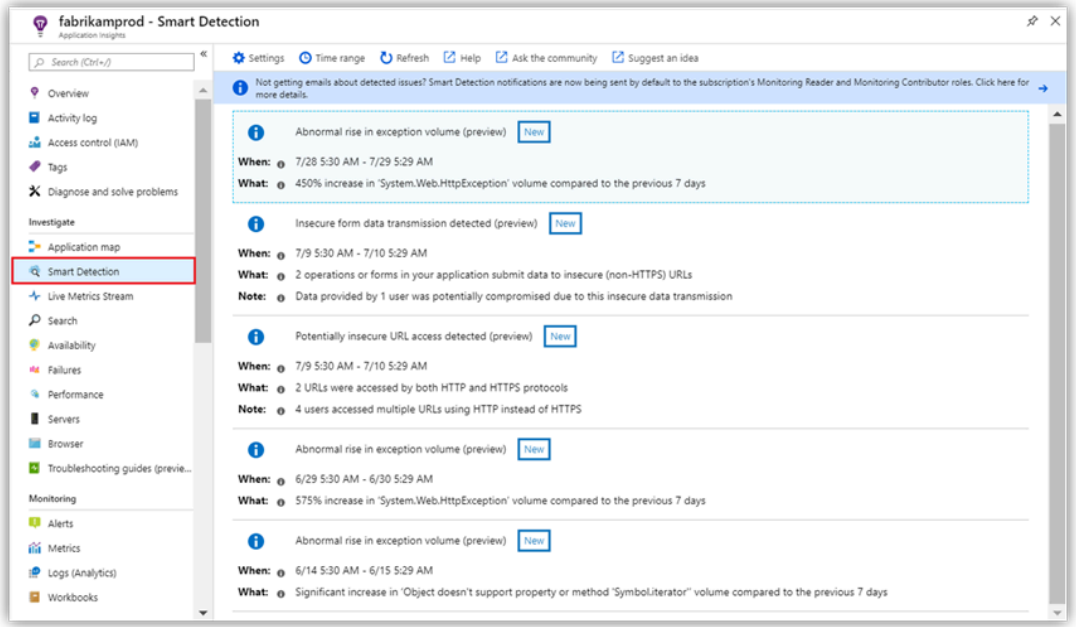
Application map

- Spot performance bottlenecks or failure hotspots across all components of your distributed application.
- Each node on the map represents an application component or its dependencies.



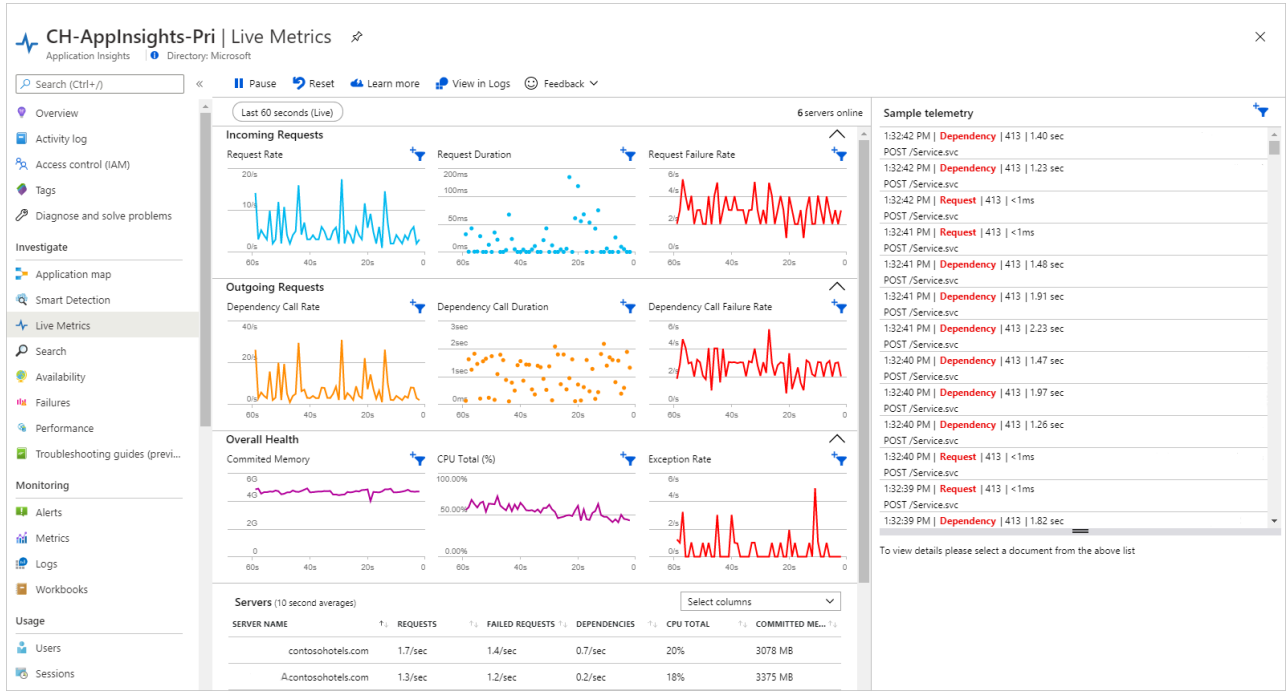
Smart Detection

- Automatic alerts based on your app
- Triggers when outside the usual pattern.
- Alerts on custom or standard metrics.



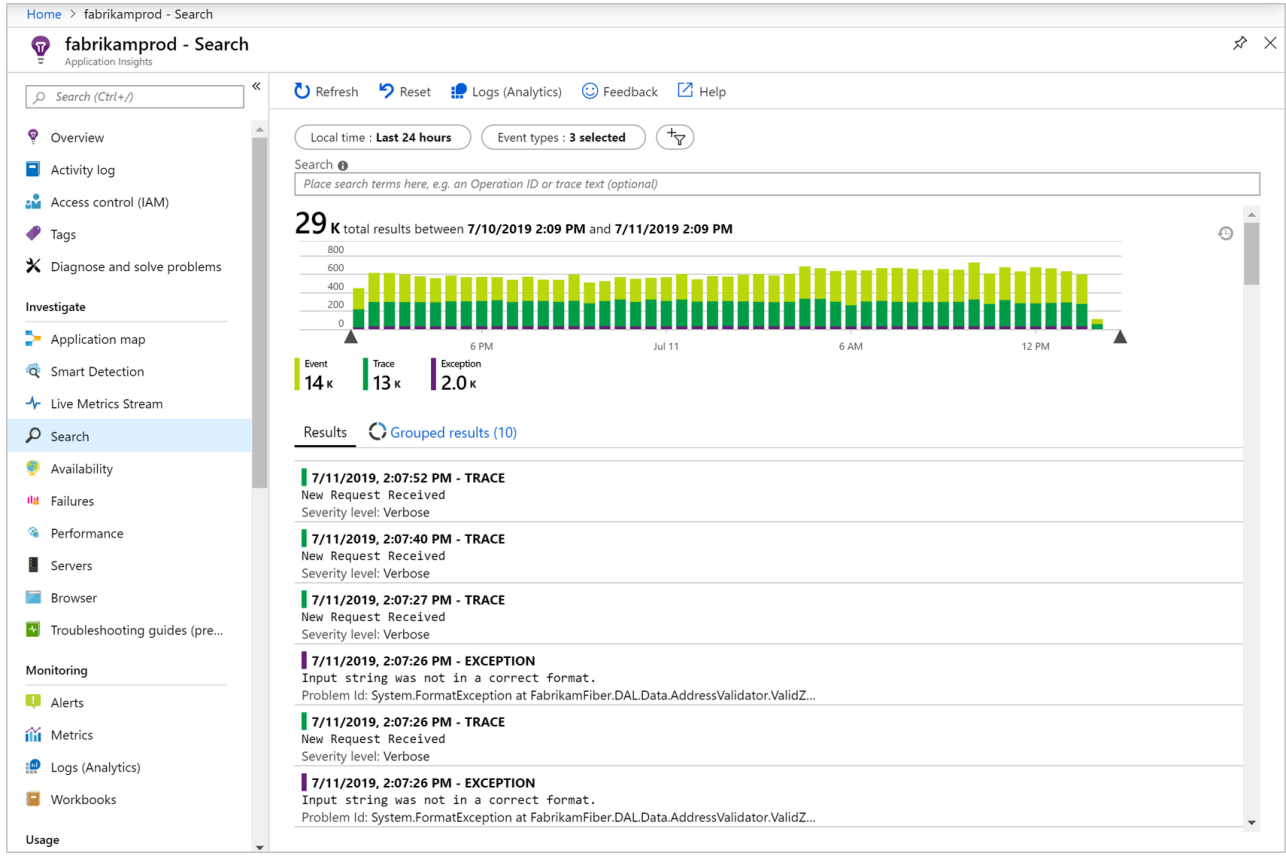
Live Metrics

- Validate a fix while it's released by watching performance and failure counts.
- Watch the effect of test loads and diagnose issues live.
- Get exception traces as they happen.



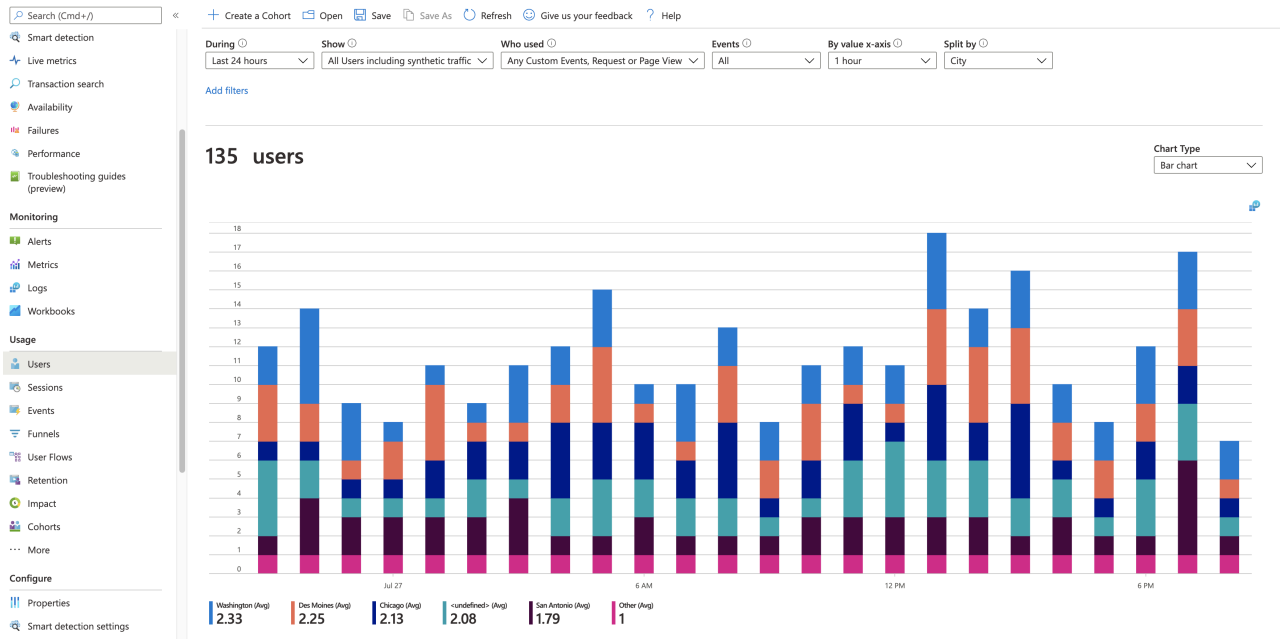
Transaction Search

- Search in the Portal or Visual Studio
- Filter by Events
- Filter by custom properties
- Filter by exceptions
- Filter by performance
- Filter by dependencies



Usage

- Sessions
- Users
- Page views
- Events
- Cohorts
- Funnels



OpenTelemetry

- **OpenTelemetry** is an open-source observability framework.
- It provides:
  - **Metrics** (Quantitative data on performance)
  - **Logs** (Records of events)
  - **Traces** (Insights into request flows)
- Supports a wide range of programming languages and frameworks.
- Part of the **CNCF** (Cloud Native Computing Foundation).

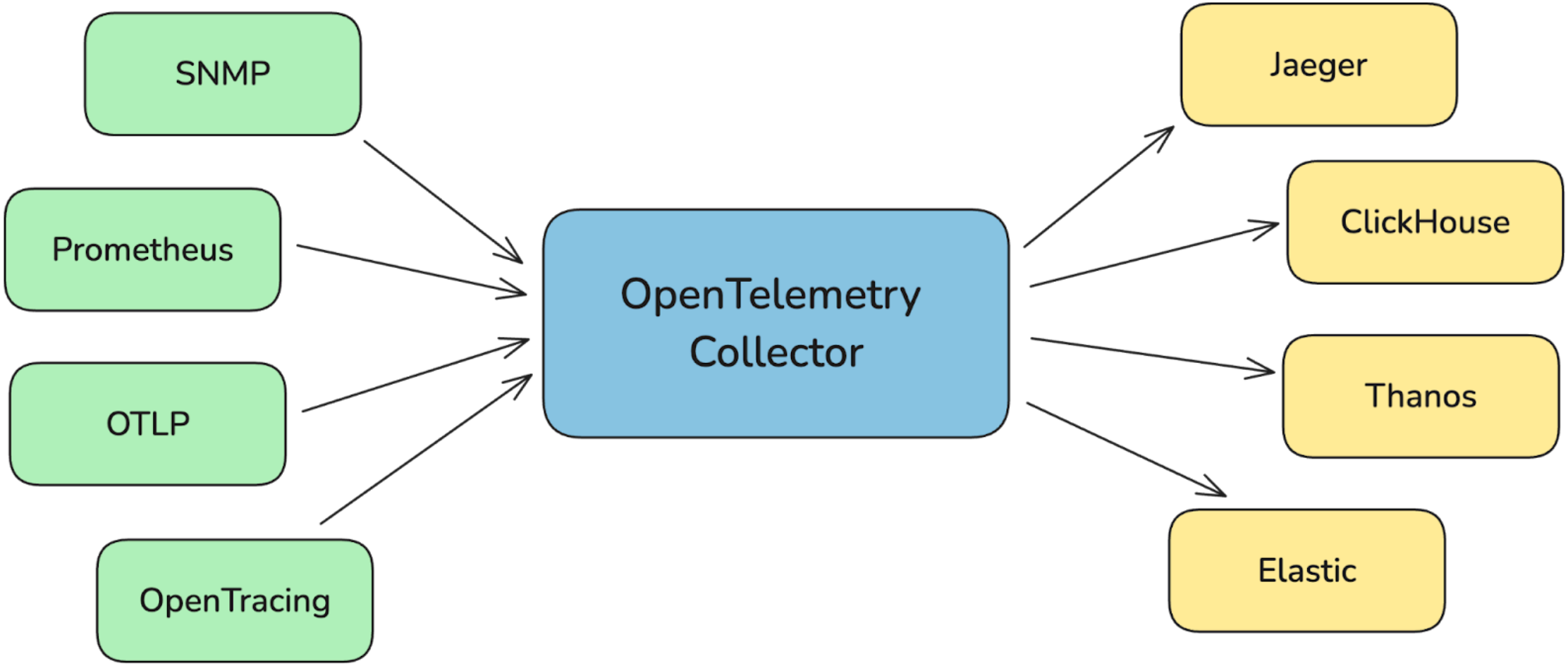
Why Use OpenTelemetry?

- **Vendor-Neutral**: Collect once, export to any observability platform (e.g., Prometheus, Grafana).
- **Unified Standard**: No need to integrate multiple tools for metrics, logs, and traces.
- **Full Stack Coverage**: From backend services to frontend apps.
- **Improved Monitoring**: Provides deeper insights into distributed systems.
- **Better Root Cause Analysis**: Visualizes the path of a request across services.

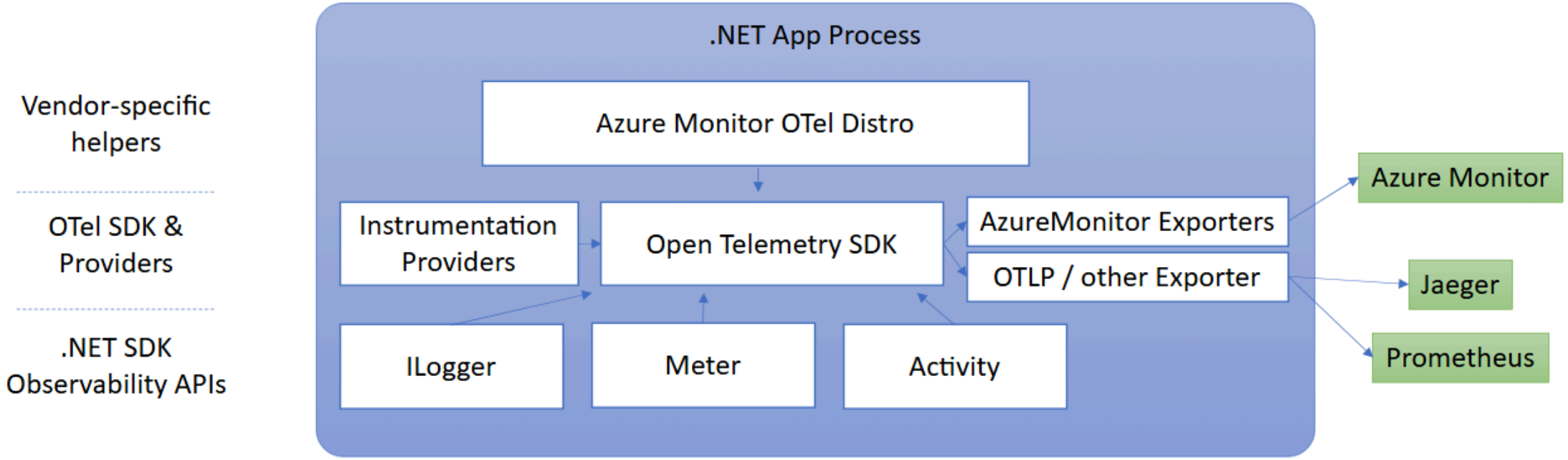
Components of OpenTelemetry

- **API**: Defines how applications create and interact with telemetry data.
- **SDK**: Implements the API for different languages.
- **Instrumentation**: Automatically or manually collect data from code.
- **Collectors**: Agent or service that processes and exports telemetry data.
- **Exporters**: Sends data to a monitoring backend like Jaeger, Zipkin, or Prometheus.

OpenTelemetry Collector



Azure Monitor OpenTelemetry Distro



DEMO TIME

Resources

Links

- Application Insights overview
- Enable Azure Monitor OpenTelemetry for .NET, Node.js, Python, and Java applications

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