



.NET Conf HCMC

28 NOV 2020

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.NET Conf 2020 - Building Distributed Cloud-native Application with Dapr

November 28, 2020

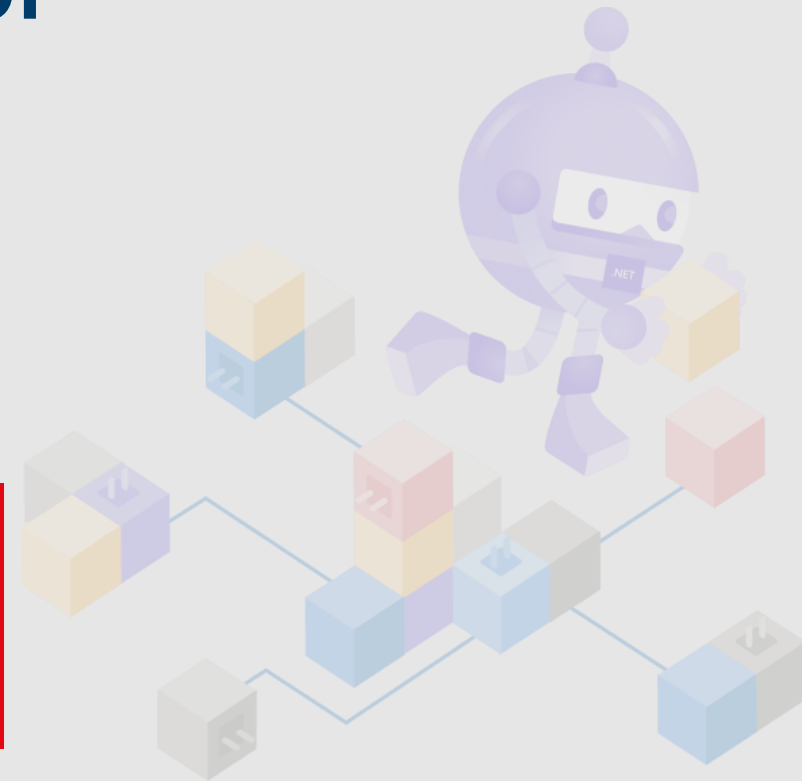
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**Nash
Tech.**



nd for?

Distributed

Hard to build applications on cloud platform:

- Resiliency
- Scalability

Mixed between Developer, Operator and IT

Infrastructure concerns:

- Kubernetes is hard ☹️
- Service Mesh is confused 😊
- Vnet, subnet mask... ☹️
- etc...

Application

Hard to build enterprise applications:

- Event-driven Application
- Actor model
- Long running, short-live function like

Hard to migrate the old application to modern application:

- Lack of programming model for the inter-communication, state management, pub/sub, event bindings, observability and security
- etc...

Runtime

Vendor lock-in

- A lot of client SDKs ☹️
- Only target specific programming language framework, platform and infrastructure 😊

Portability problem

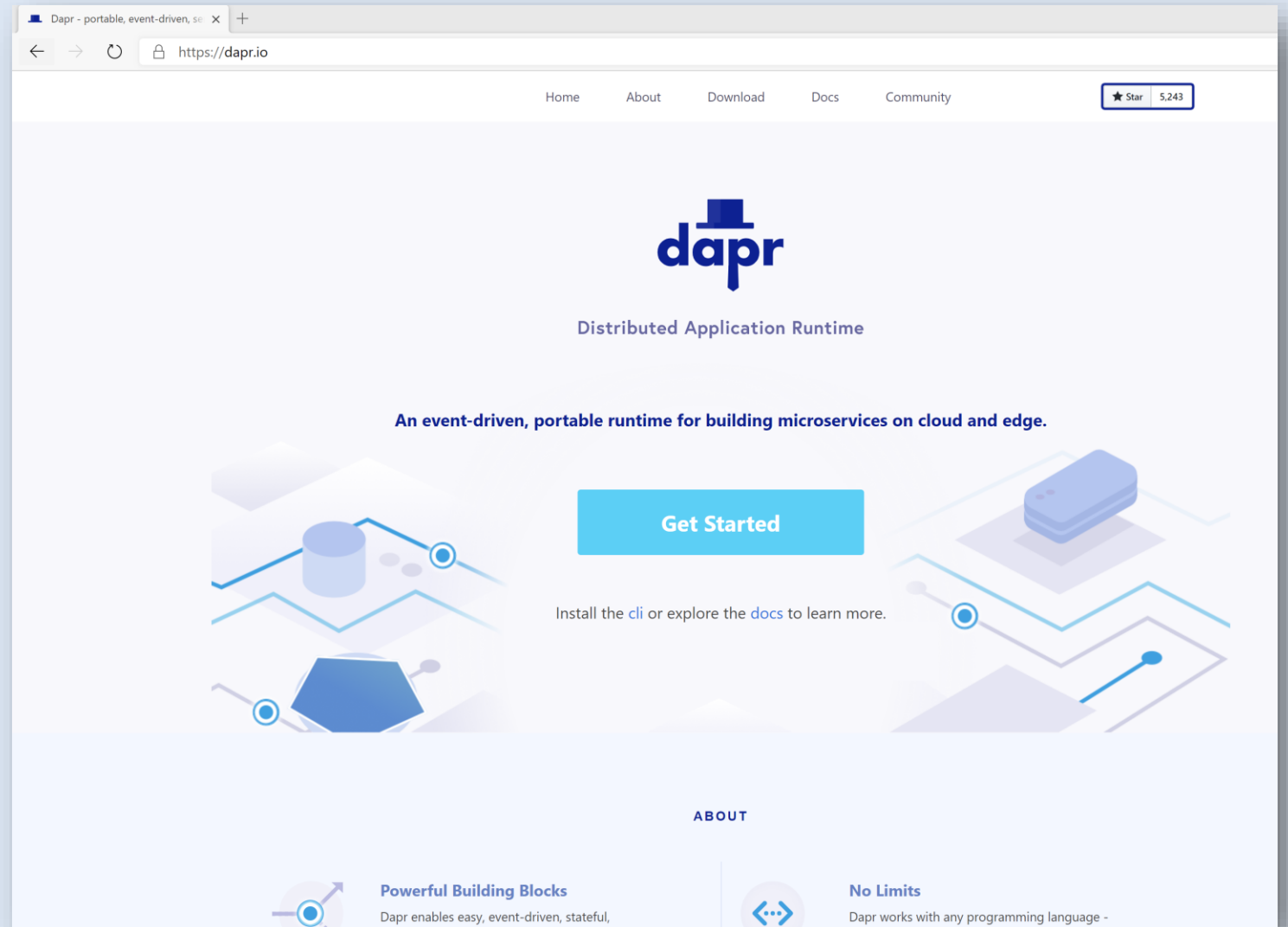
- Run only on local env with or without Docker, not on both
- Run only on Kubernetes or on the edge, not on both



Distributed Application Runtime

Portable, event-driven, runtime for building distributed applications across cloud and edge

<https://dapr.io>



Dapr Goals



Best-Practices
Building Blocks



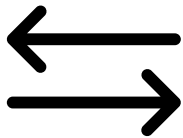
Any Language
or Framework



Community Driven
Vendor Neutral



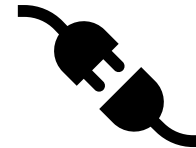
Adopt Standards



Consistent, Portable,
Open APIs



Platform Agnostic
Cloud + Edge



Extensible and
Pluggable Components

Microservice building blocks

- ✓ Standard APIs accessed over http/gRPC protocols from user service code
<http://localhost:<daprPort>/v1.0/state/shoppingcartapp/cart-88421113>
<http://localhost:<daprPort>/v1.0/invoke/productcatalogapp/method/get-product-by-id/100>
- ✓ Runs as local “side car library” dynamically loaded at runtime for each service

Application code

Microservices written in

Any code or framework...



HTTP API

gRPC API



Service-to-
service
invocation



State
management



Publish
and
subscribe



Resource
bindings
and triggers



Actors



Distributed
tracing

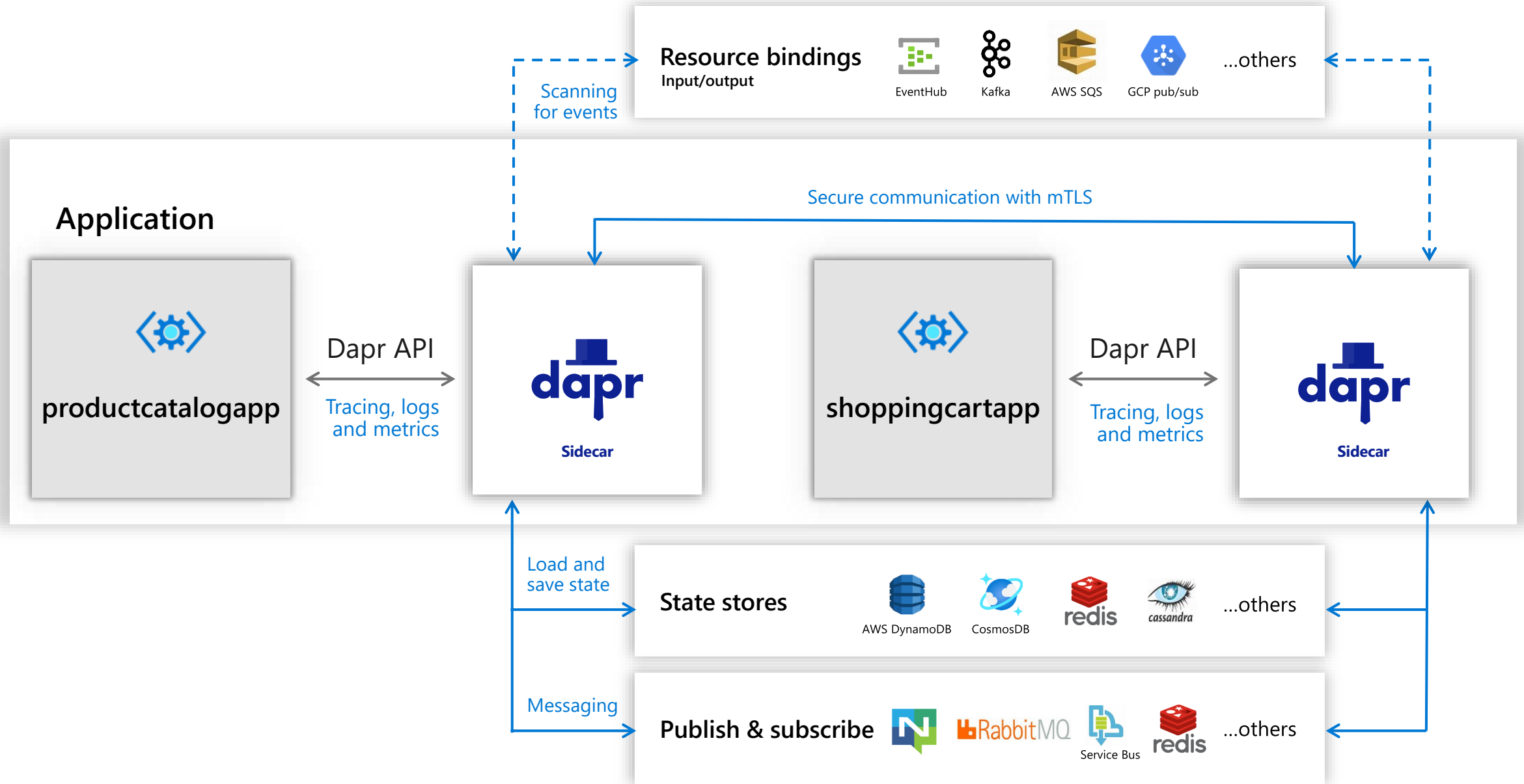


Secrets



Extensible

Sidecar and component architecture



Dapr: Distributed Application Runtime

Build apps using any language with any framework

Application code

Microservices written in

Any code or framework...



HTTP API

gRPC API



Service-to- service invocation



State management



Publish and subscribe



Resource bindings and triggers



Actors



Distributed tracing



Secrets

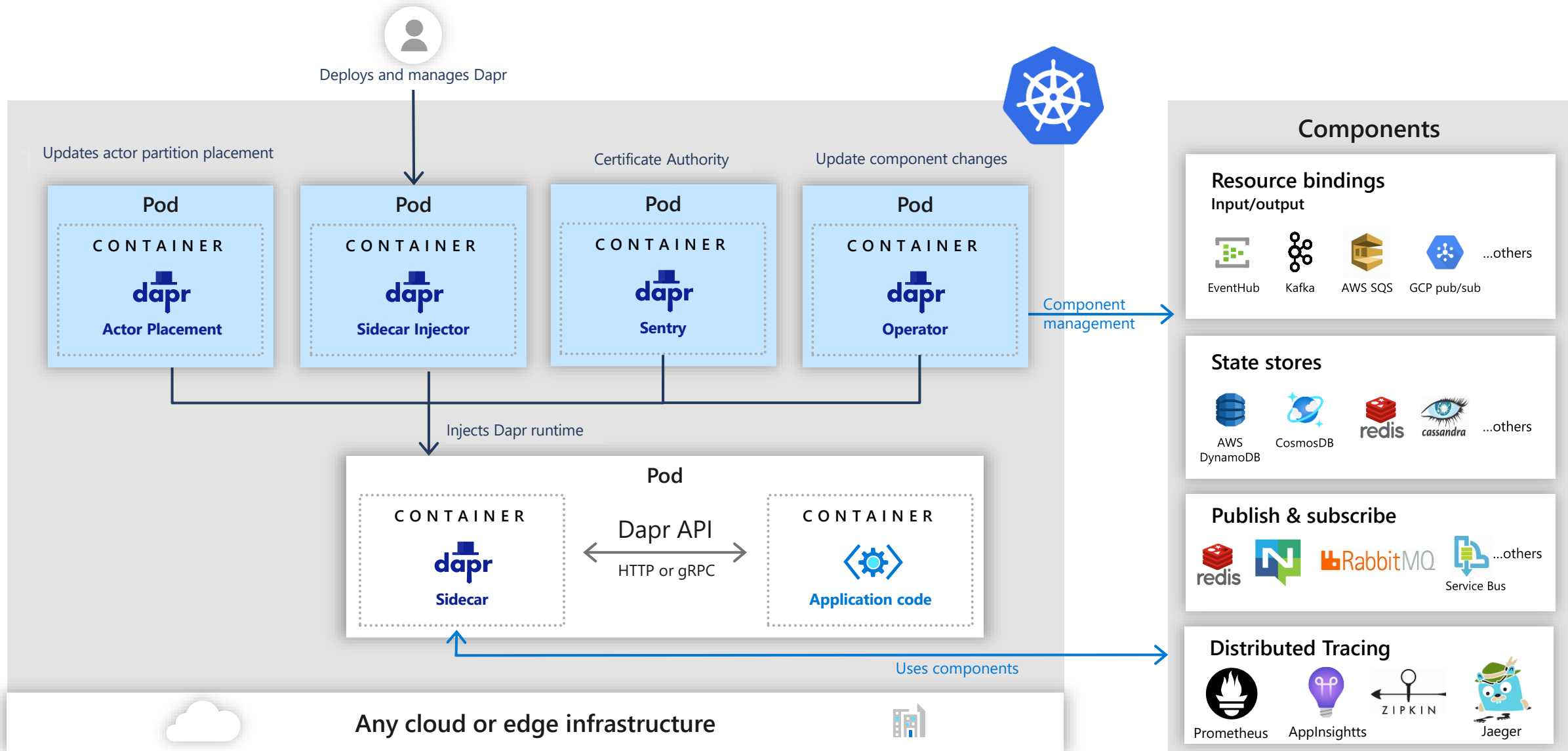


Extensible

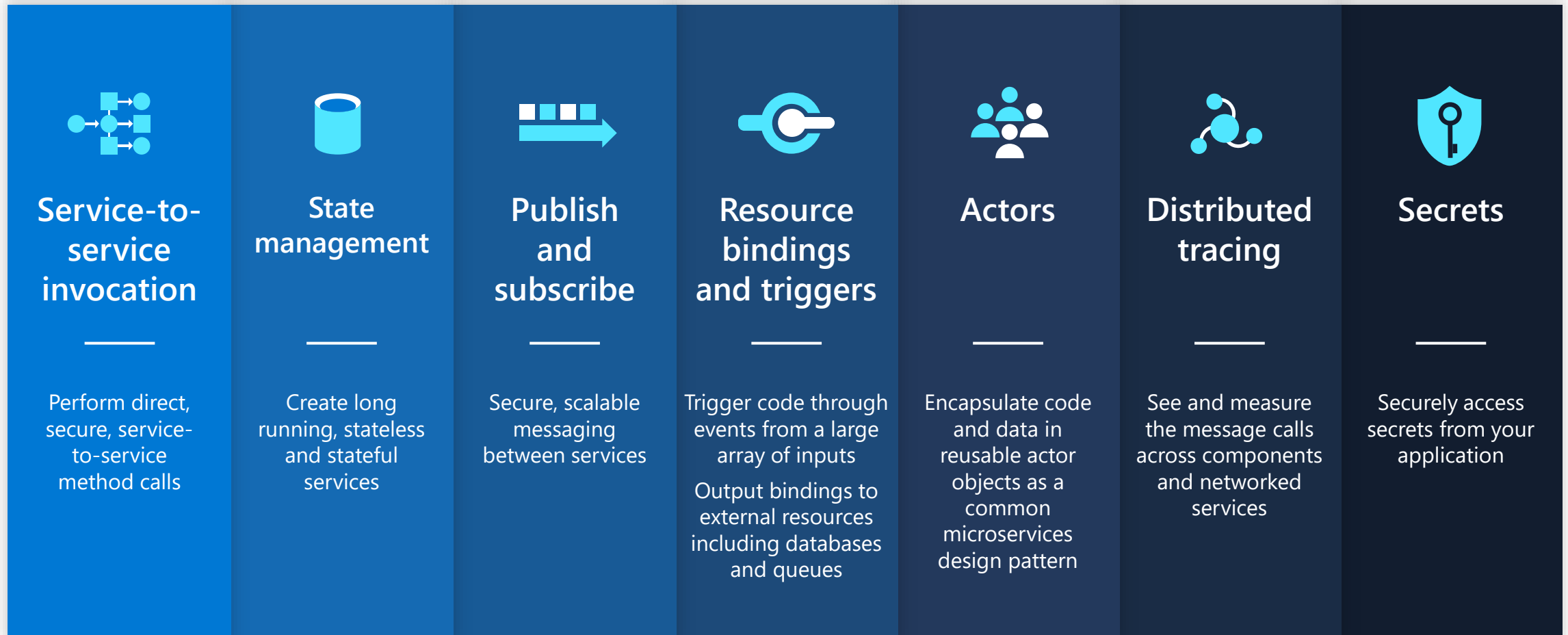
Any cloud or edge infrastructure



Dapr Kubernetes hosted



Microservice building blocks



Use Dapr components

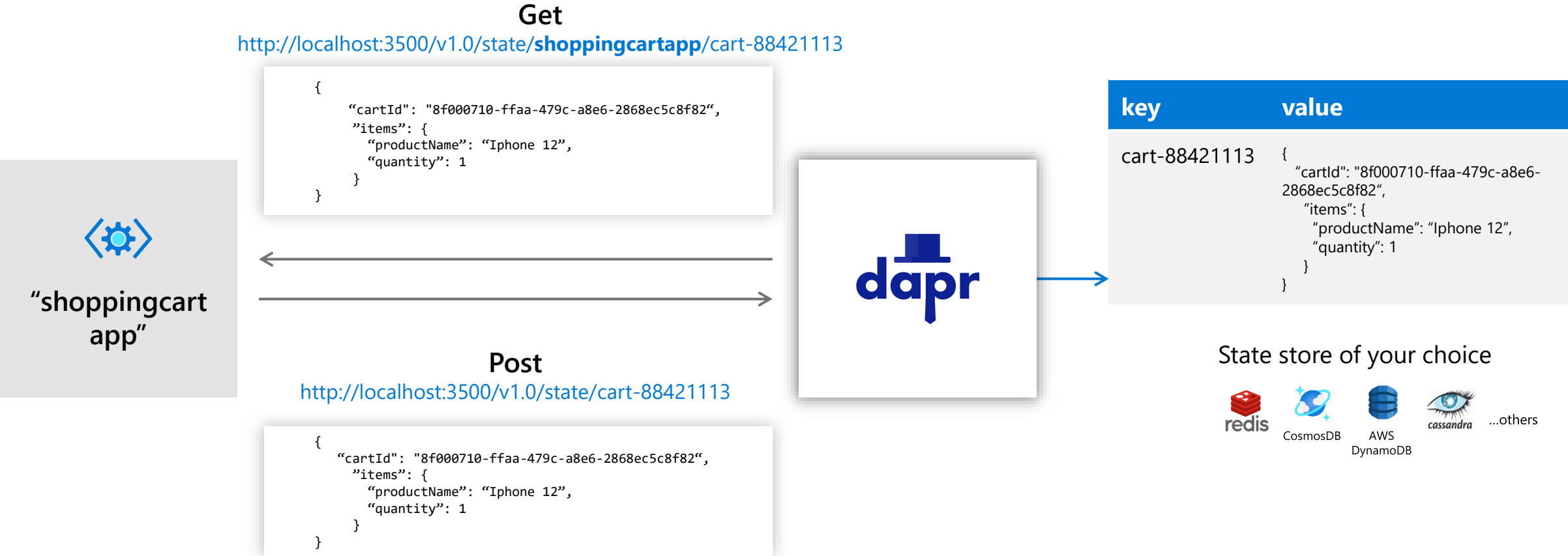
Microservice building blocks

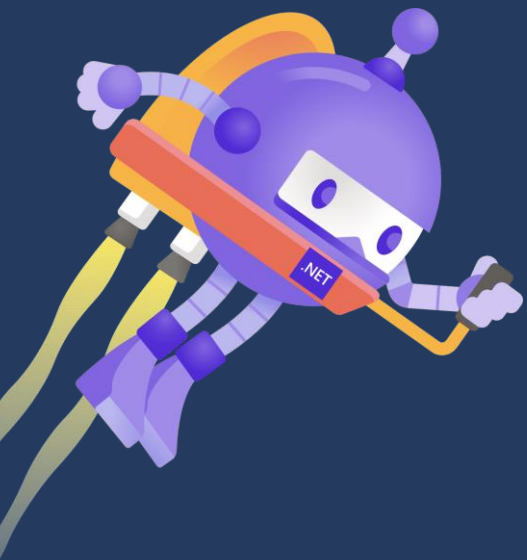
Service invocation



Microservice building blocks

State management: key/value





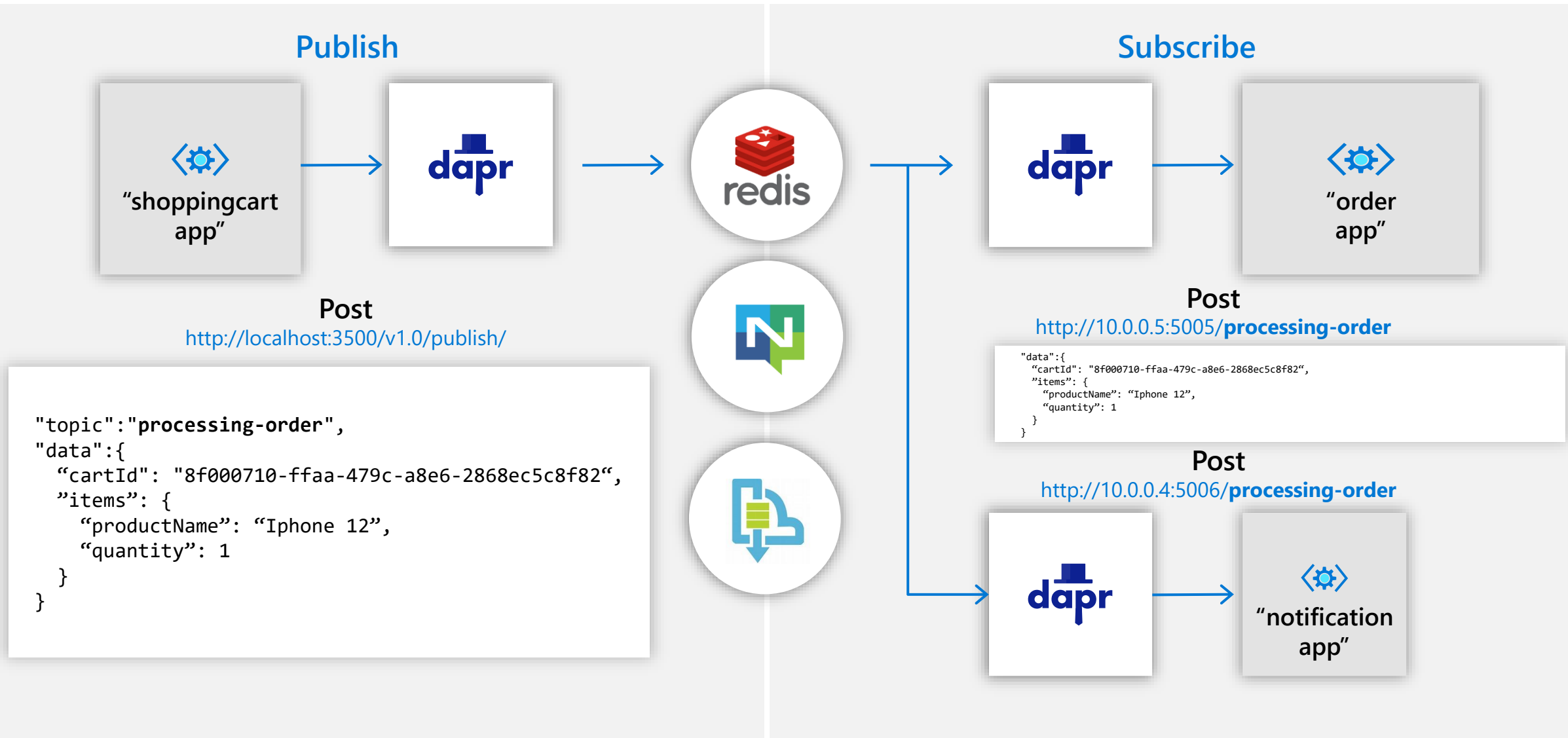
DEMO

Dapr method invoke and state management

<https://github.com/vietnam-devs/coolstore-microservices>

Microservice building blocks

Publish and subscribe



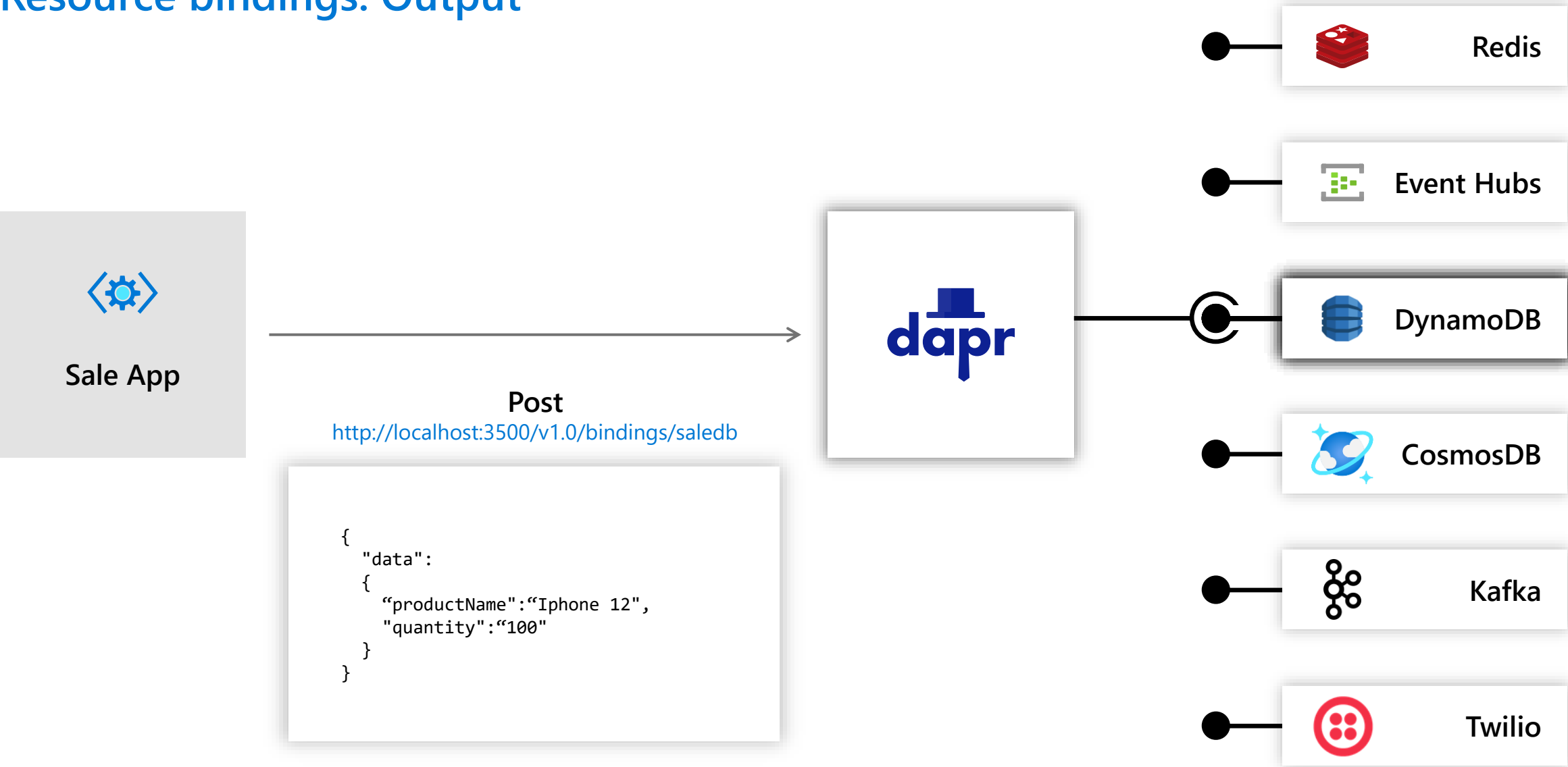
Microservice building blocks

Resource triggers: Input



Microservice building blocks

Resource bindings: Output





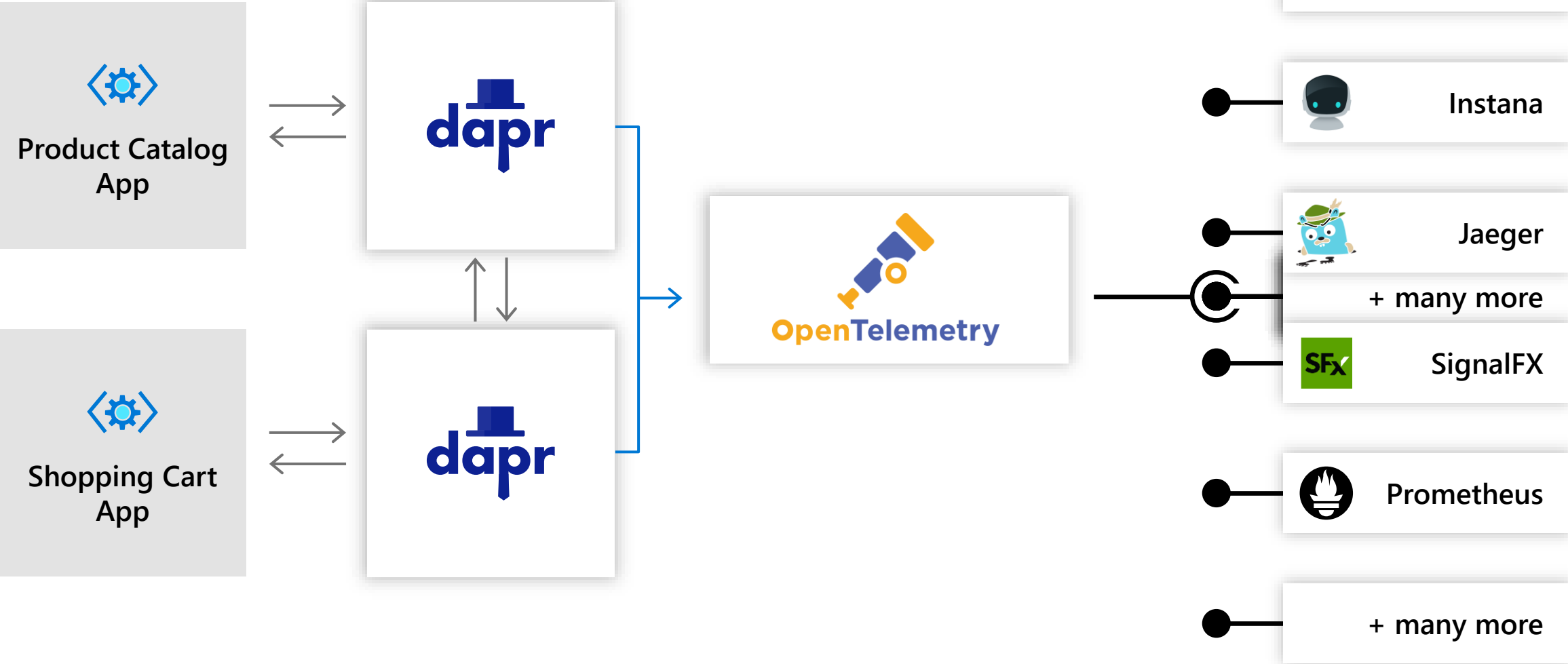
DEMO

Dapr Publish / subscriber and Input Binding

<https://github.com/vietnam-devs/coolstore-microservices>

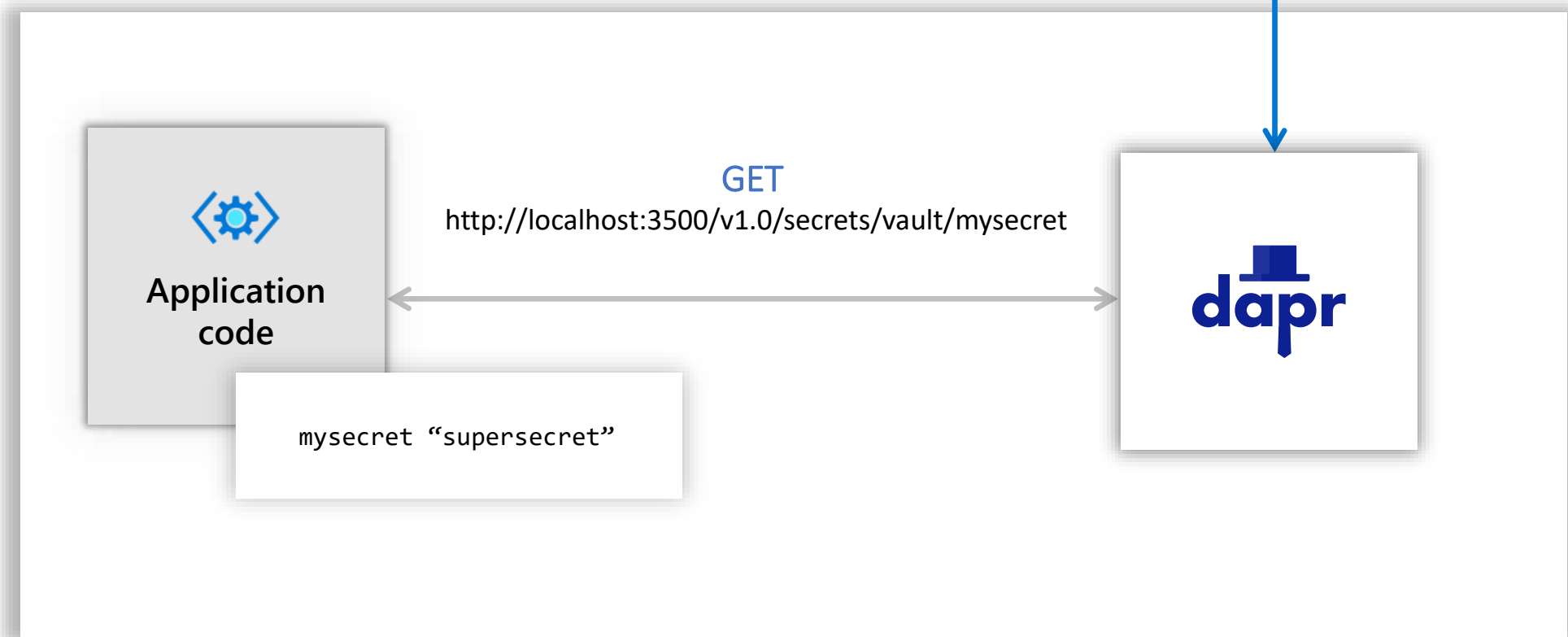
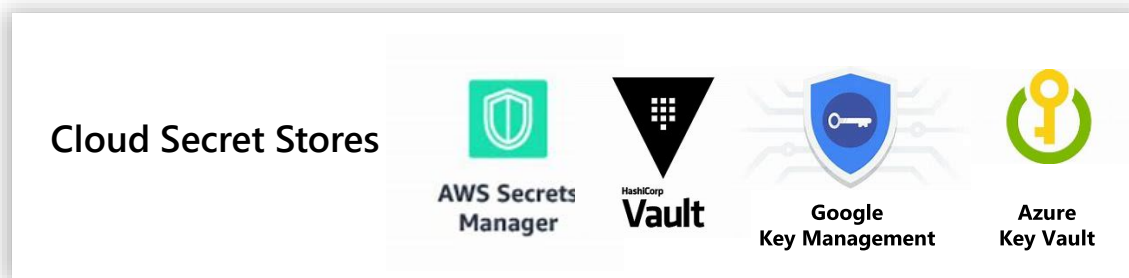
Microservice building blocks

Distributed tracing and diagnostics



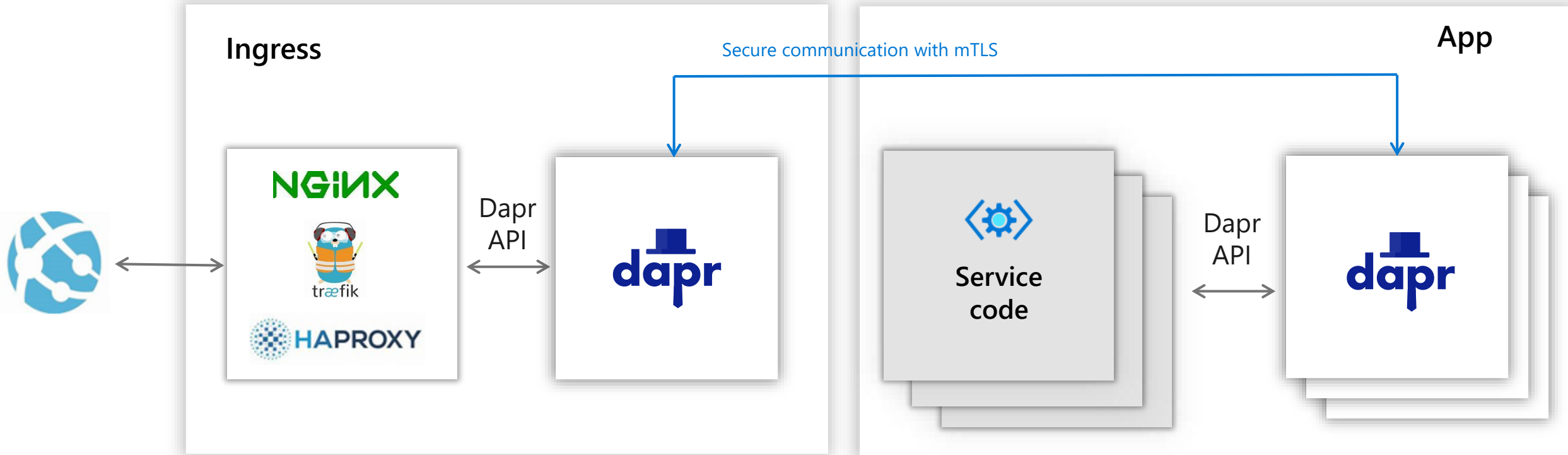
Microservice building blocks

Secrets



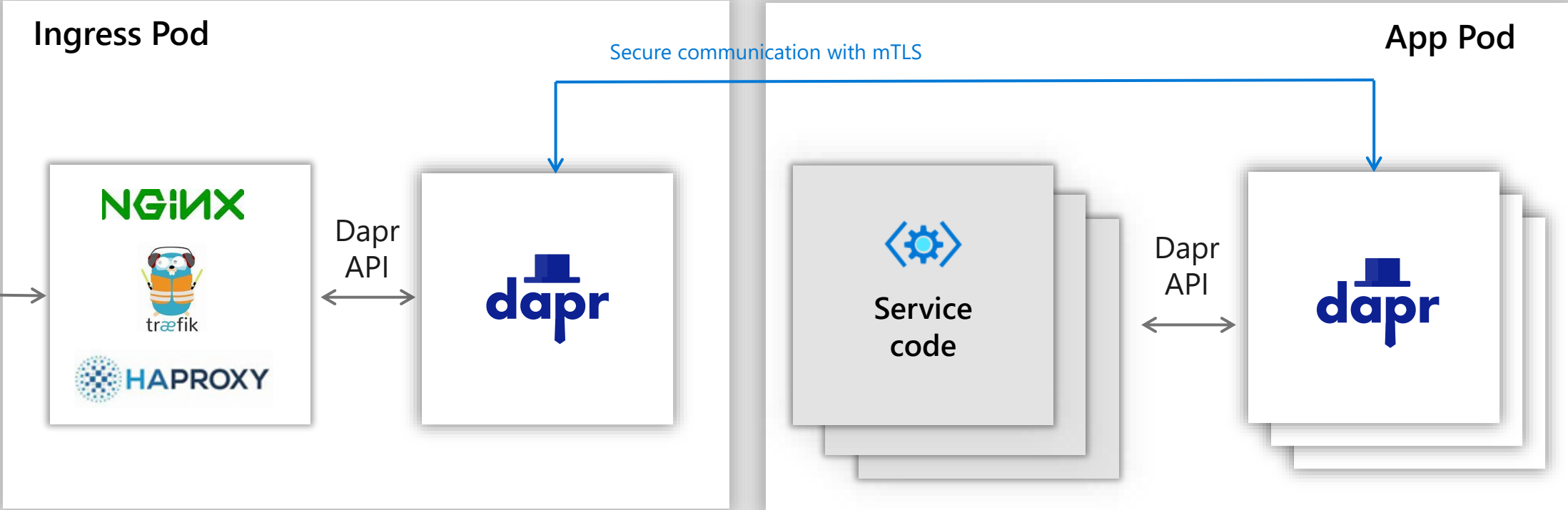
Secure ingress communication

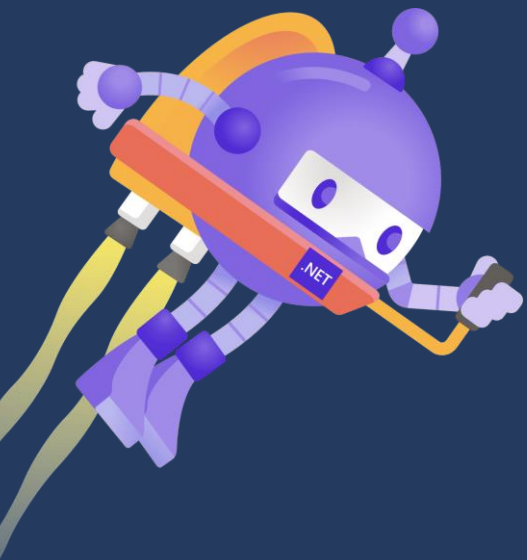
Daprize proxy servers



Secure ingress communication

Daprize proxy servers





DEMO

CoolStore Website on Kubernetes

<http://cool-store.ml>

<https://github.com/vietnam-devs/coolstore-microservices>

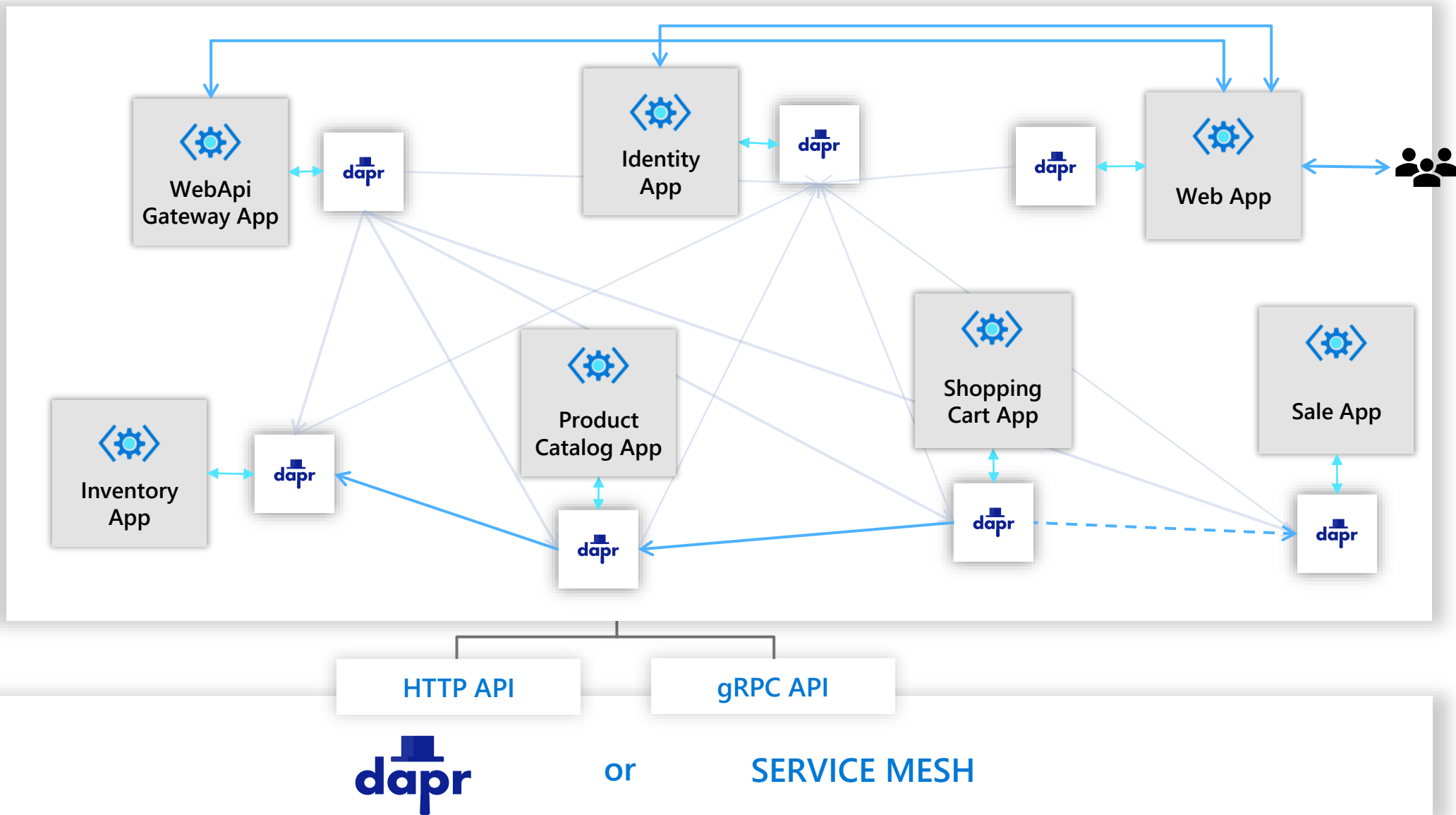
Components

Resource bindings
Cron Job
...others

State stores
redis
...others

Publish & subscribe
redis
...others

Distributed Tracing
ZIPKIN



Any cloud or edge infrastructure



CoolStore Microservices on Dapr

A modern store uses technologies such as .NET Core, Docker, Kubernetes, Dapr, OSM, Tye etc.

Q Search

Filters

Price

Category

Location

Reset Filter

Orders

Cart

Offer

Bag - Regular Kraft 20 Lb

\$2147

★★★★★

Add to Cart

Detail

Offer

Crab - Dungeness, Whole, live

\$1665

★★★★★

Add to Cart

Detail

Offer

Ice Cream Bar - Oreo Cone

\$2236

★★★★★

Add to Cart

Detail

Offer

iPhone 8

\$900

★★★★★

Add to Cart

Detail

Offer

iPhone X

\$1000

★★★★★

Add to Cart

Detail

Offer

Oil - Olive

\$1124

★★★★★

Add to Cart

Detail

Offer

Oranges - Navel, 72

\$1731

★★★★★

Add to Cart

Detail

Offer

Prunes - Pitted

\$1191

★★★★★

Add to Cart

Detail

Offer

Wonton Wrappers

\$2200

★★★★★

Add to Cart

Detail

Previous

1

2

3

Next

CoolStore Microservices on Dapr

A modern store uses technologies such as .NET Core, Docker, Kubernetes, Dapr, OSM, Tye etc.

Q Search

Orders

Cart

#	Product	Price	Quantity	
1	Bag - Regular Kraft 20 Lb Open periph nerve biopsy	\$2147	1	
2	Ice Cream Bar - Oreo Cone Proximal gastrectomy	\$2236	5	
3	Crab - Dungeness, Whole, live Chng hnd mus/ten Ing NEC	\$1665	1	
4	Oranges - Navel, 72 Remove bladder stimulat	\$1731	1	
5	Wonton Wrappers Tibia/fibula inj op NOS	\$2200	1	

Summary

Cart total: \$18923.00

Promotional item saving: \$0.00

Subtotal: \$18923.00

Shipping: \$0.00

Promotional shipping saving: \$0.00

Total order mount: \$37846.00

Checkout

CoolStore Microservices on Dapr

A modern store uses technologies such as .NET Core, Docker, Kubernetes, Dapr, OSM, Tye etc.

Q Search

Orders

Cart

Customer name	Order date	Complete date	Number of products	Order status
Bob Smith	2020-11-13T11:18:40.08536		3	Processing
Bob Smith	2020-11-13T11:18:23.777262	2020-11-13T11:19:27.010272	5	Completed
Bob Smith	2020-11-13T11:19:30.360911		2	Received
Bob Smith	2020-11-13T11:18:30.785155		3	Processing



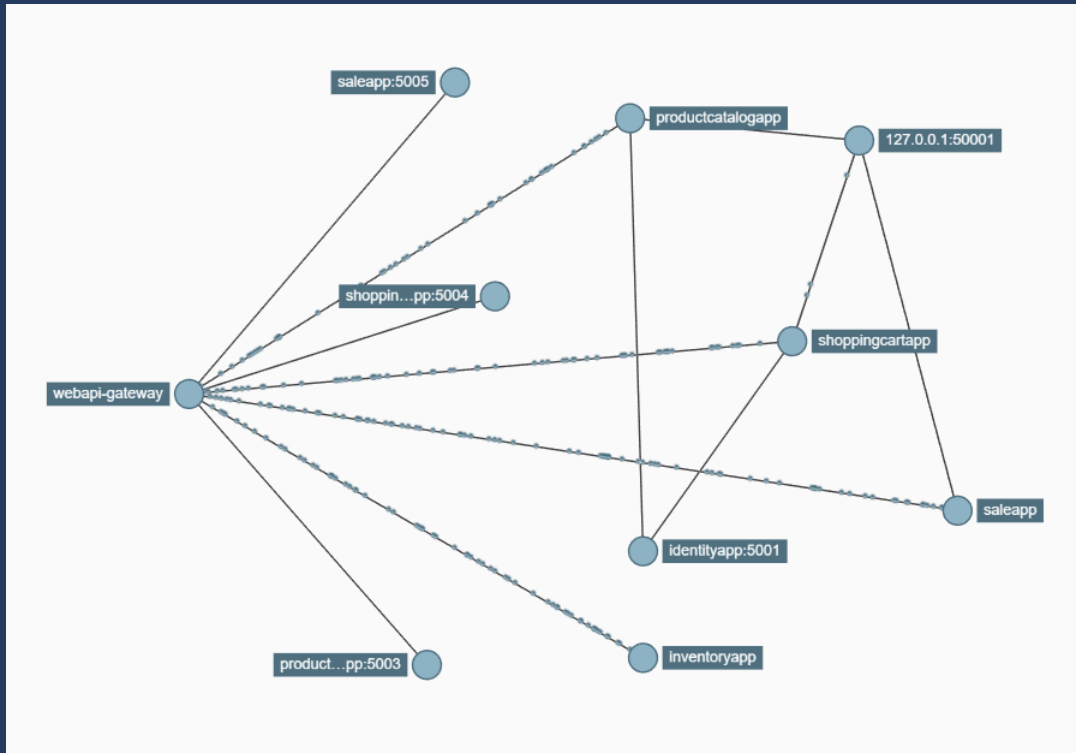
DEMO

Logs, Metrics and Distributed Tracing

<https://github.com/vietnam-devs/coolstore-microservices>

DEMO

Observability Tracing



WEBAPI-GATEWAY

/cart/api/carts

Span ID: b4266df1bf0aa47 Parent ID: None

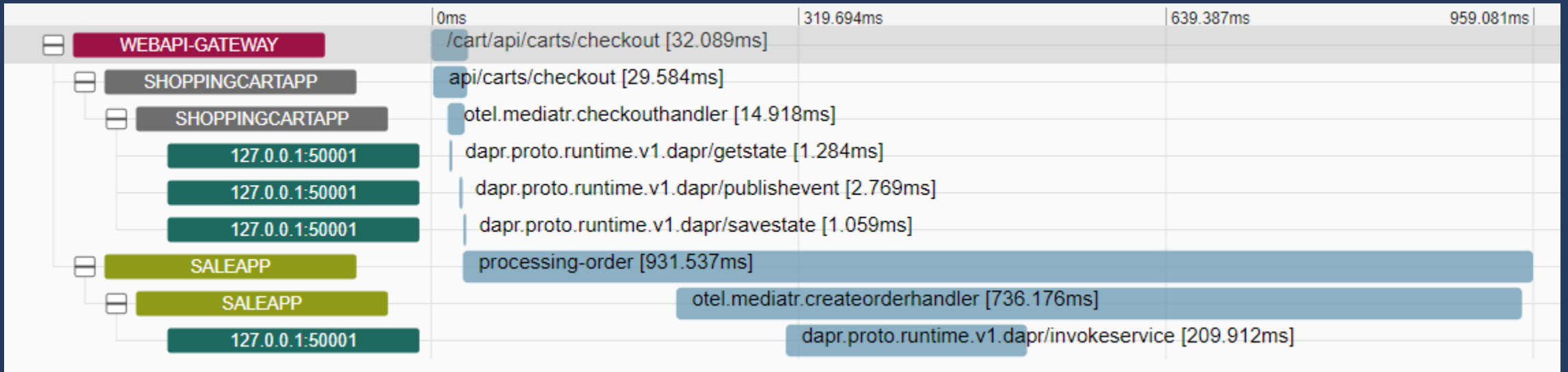
Annotations



SHOW ALL ANNOTATIONS

Tags

http.host	api.cool-store.ml
http.method	GET
http.path	/cart/api/carts
http.status_code	200
http.url	http://api.cool-store.ml/cart/api/carts
http.user_agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/86.0.4240.198 Safari/537.36 Edg/86.0.622.69
otel.status_code	0



DEMO

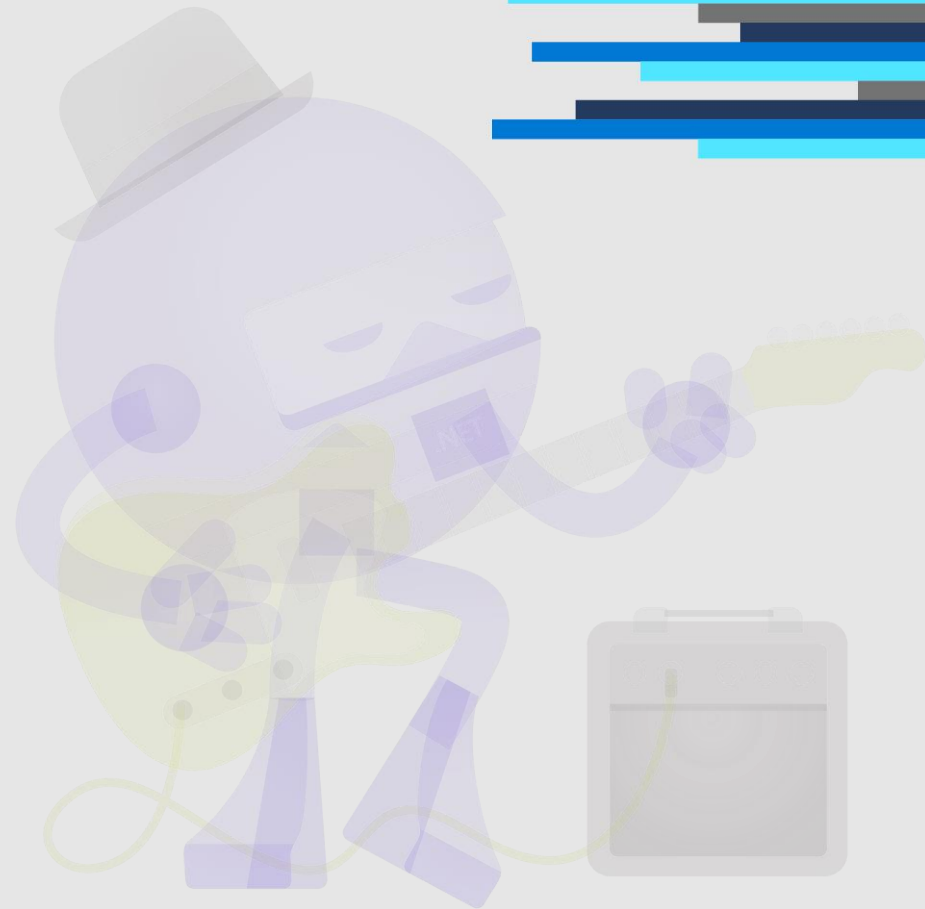
Observability Metrics





Thanks for joining!

Dapr, power up the cloud-native apps



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