Red Hat Integration

Develop and Connect Cloud Native Applications

Red Hat Integration Technical Overview

Presenter's Name

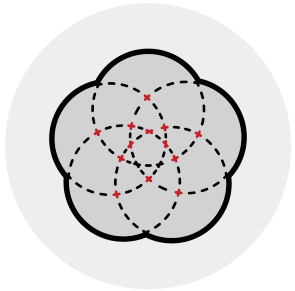
Title

Red Hat

What we'll discuss today

How do you drive innovation to meet business expectations while keeping the lights on?

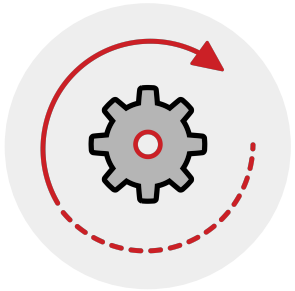
Optimize the IT you have



Integrate apps, data, & processes

Add & manage cloud infrastructure

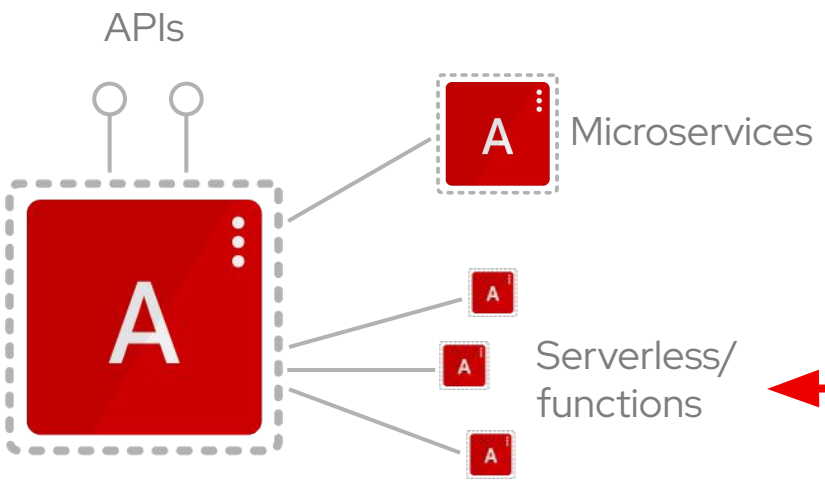
Build more modern applications



Automate & manage IT

Leveraging the cloud becomes a key strategy for success

Common Modernization Patterns



HYBRID APP

Phased approach in migration

Lift and Shift

Leave the architecture alone but modernize the deployment platform. Can be used for performance increases by allowing for deploying to better hardware. Can be used to accelerate deployments and improve processes by leveraging platform automation. **Fast Monoliths**.

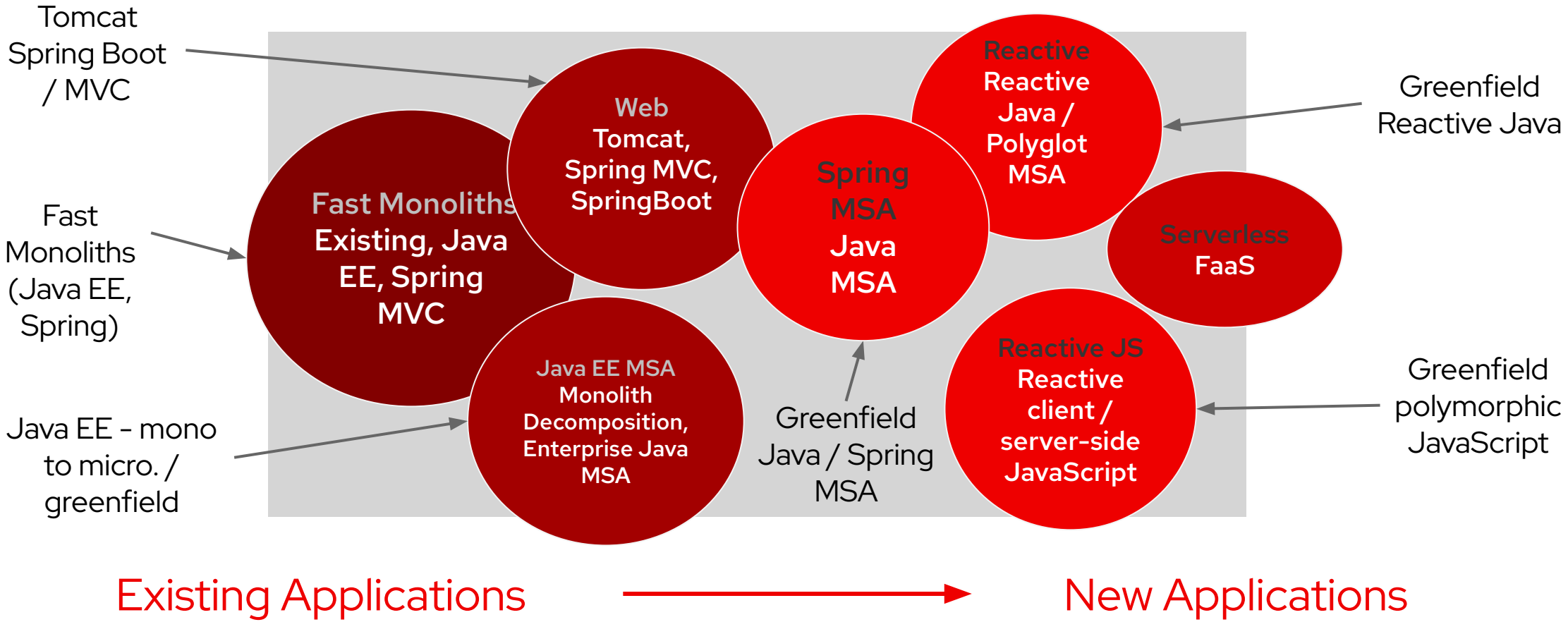
Refactor and Augment/Extend

Find parts of the architecture that are sources of pain - refactor. Build **new capability in microservices** with well-defined APIs. Wrap legacy software too brittle to change with **adapter layers**.

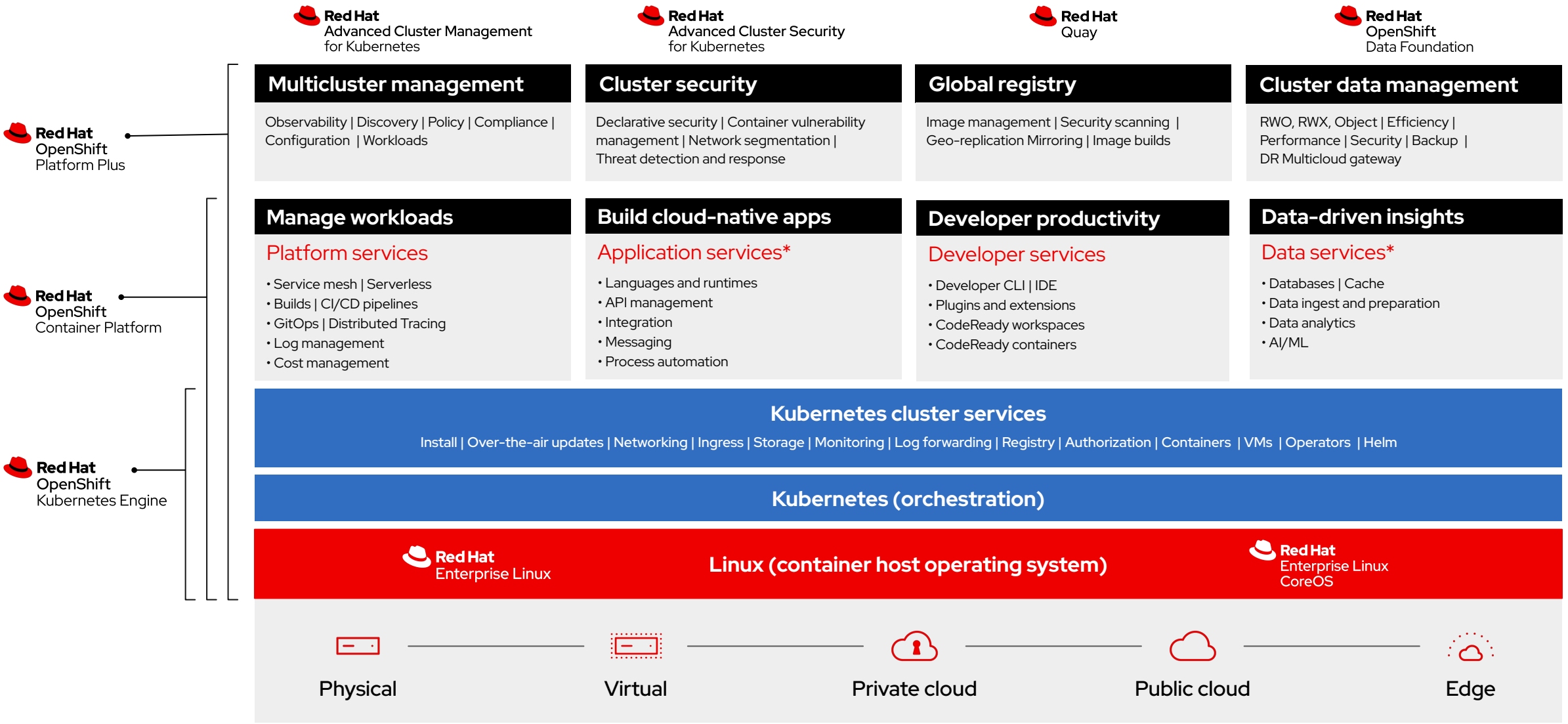
Rewrite/Replace

Create new functionality to **replace existing functionality**. Likely expensive and time-consuming. Typically only recommended when legacy vendors go away or a major skills gap forces it.

The Spectrum Of Enterprise Apps



DEVELOPING CONTAINER & CLOUD-NATIVE APPLICATIONS



* Red Hat OpenShift® includes supported runtimes for popular languages/frameworks/databases. Additional capabilities listed are from the Red Hat Application Services and Red Hat Data Services portfolios.

** Disaster recovery, volume and multicloud encryption, key management service, and support for multiple clusters and off-cluster workloads requires OpenShift Data Foundation Advanced

Red Hat Cloud-Native Application Platform

Our vision is to simplify the creation of cloud-native services and serverless functions with a rich set of components and tools to match the **workloads** of modern cloud native apps.

Automate Kubernetes application operations with DevOps in mind

Red Hat OpenShift

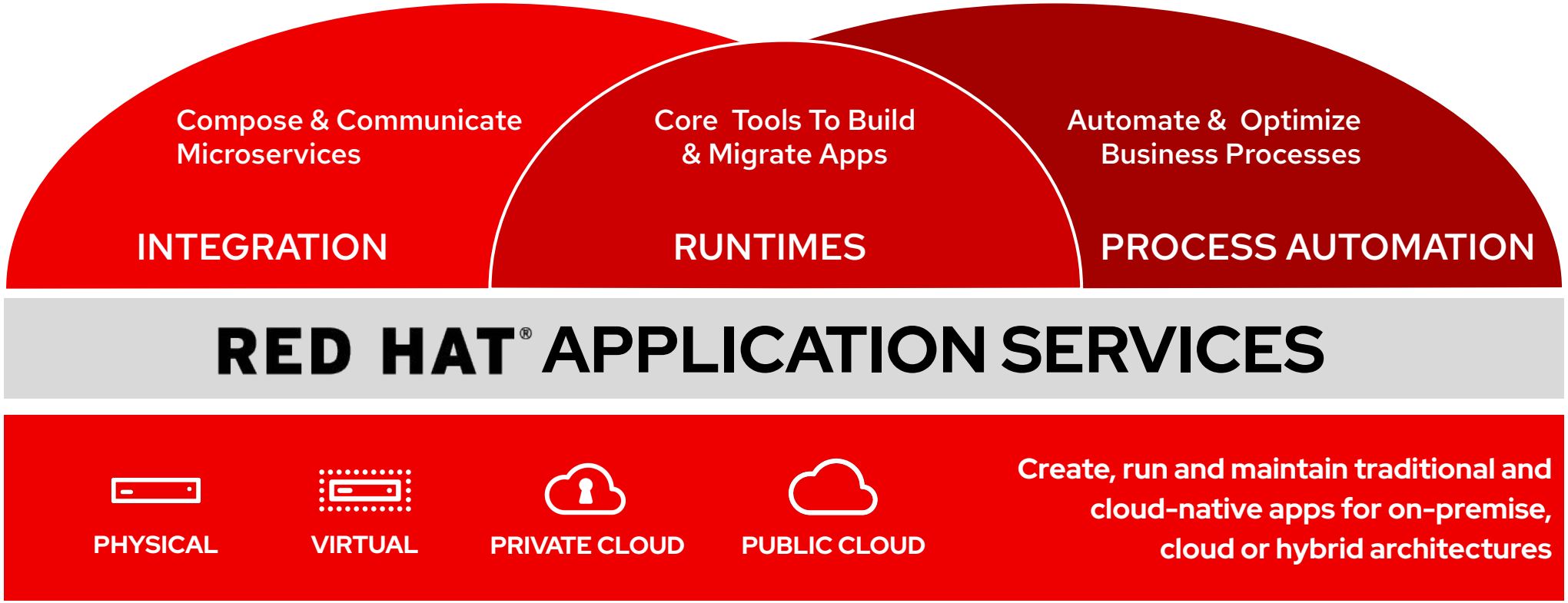
Runtimes, frameworks and services to build applications natively on Kubernetes

Red Hat Application Services

Tools and standard processes to increase developer productivity on Kubernetes

Red Hat CodeReady

Red Hat Cloud-Native Application Platform



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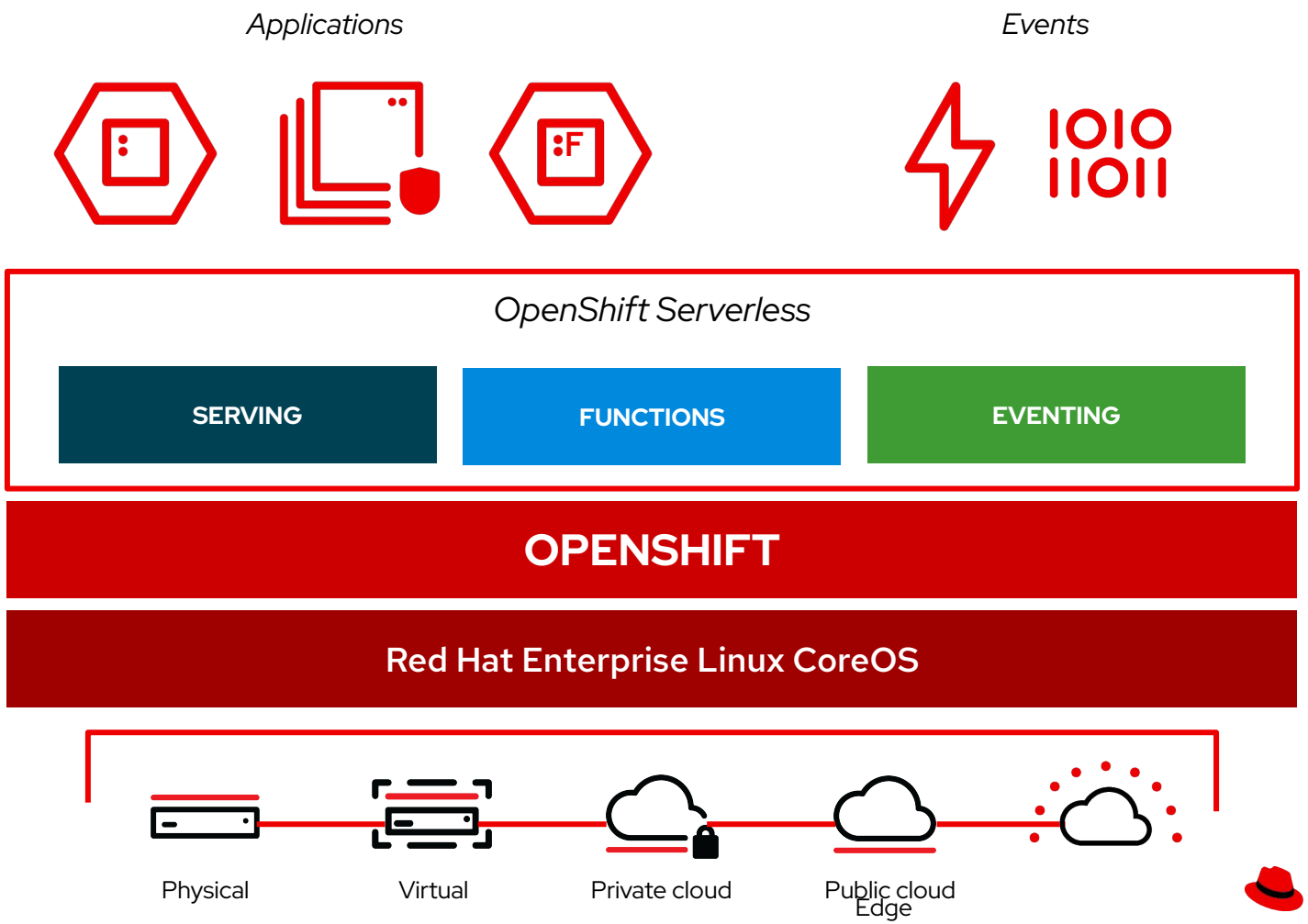
OpenShift Serverless

- ✓ Knative Serving and Eventing
- ✓ Event Connectivity
- ✓ Functions
- ✓ Operator based install
- ✓ Great User Experience



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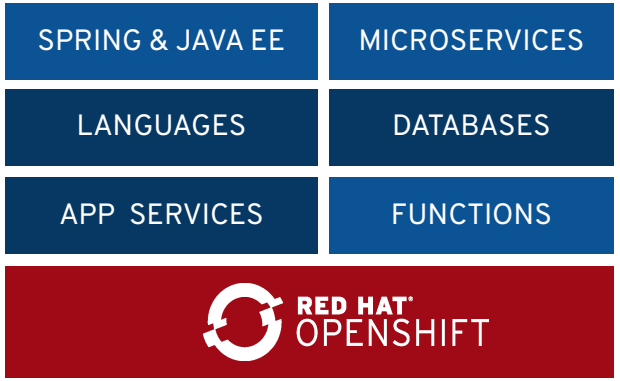
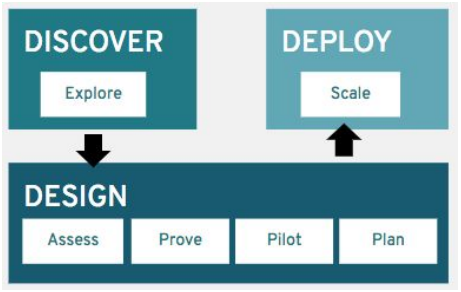
Why is Red Hat the best choice for container and cloud-native applications?

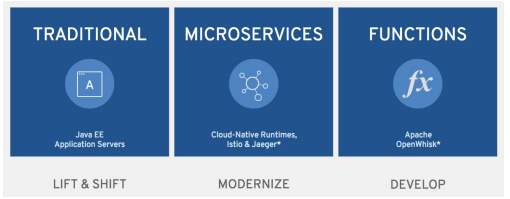
Standardize on a set of best-of-breed open source runtimes and frameworks



Simplify development through native integration with OpenShift and Kubernetes Services



Support modernization initiatives at any speed with lift and shift, replatform and refactor



Match application requirements to polyglot runtime/framework (“right tool for the right job”)

Red Hat

Develop New Applications

Select The "Right Tool For The Right Task" For Your Applications

- Established and emerging runtimes, frameworks, and languages
- Leverage your developers' enterprise Java expertise with minimal to no learning curve to microservices
- Prescriptive/guided development via missions and boosters

Red Hat

Connect and Extend Applications Across the Hybrid Cloud

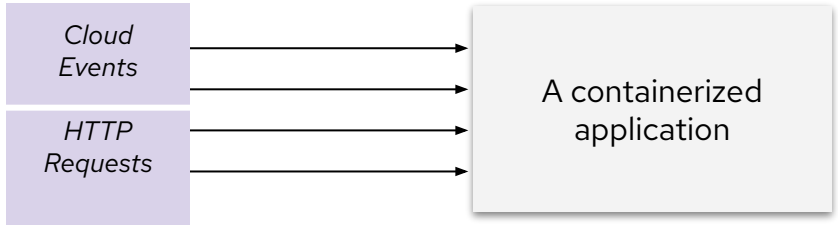
Select The "Right Tool For The Right Task" For Your Applications

- Build applications with an API-first approach
- Build event driven apps leveraging tech like Apache Kafka for data streaming
- Compose and orchestrate microservices and serverless
- Create a multi cloud event mesh to connect the hybrid cloud
- Based on 100% open source community projects

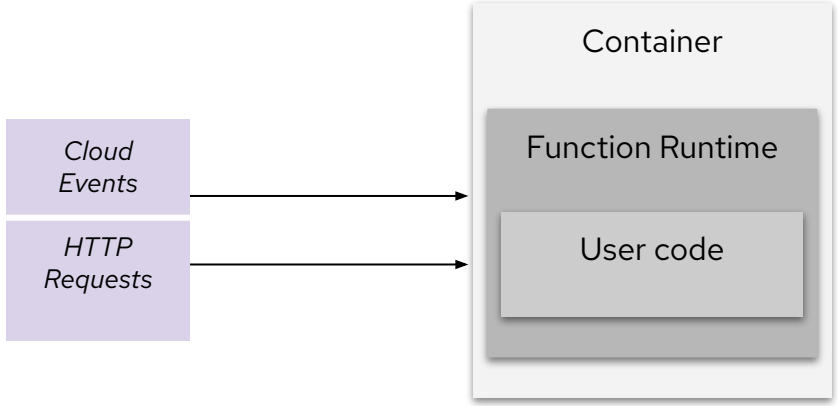
Source

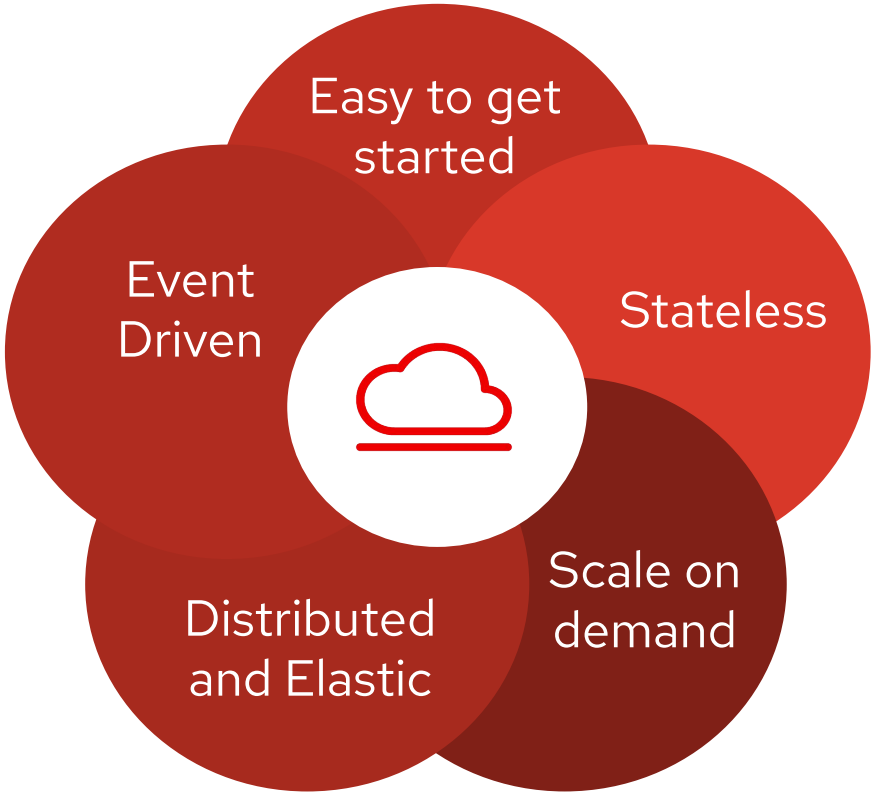
Serverless

Serverless Containers



Serverless Functions





The **Serverless** approach abstracts complexity delivering on the utility premise.

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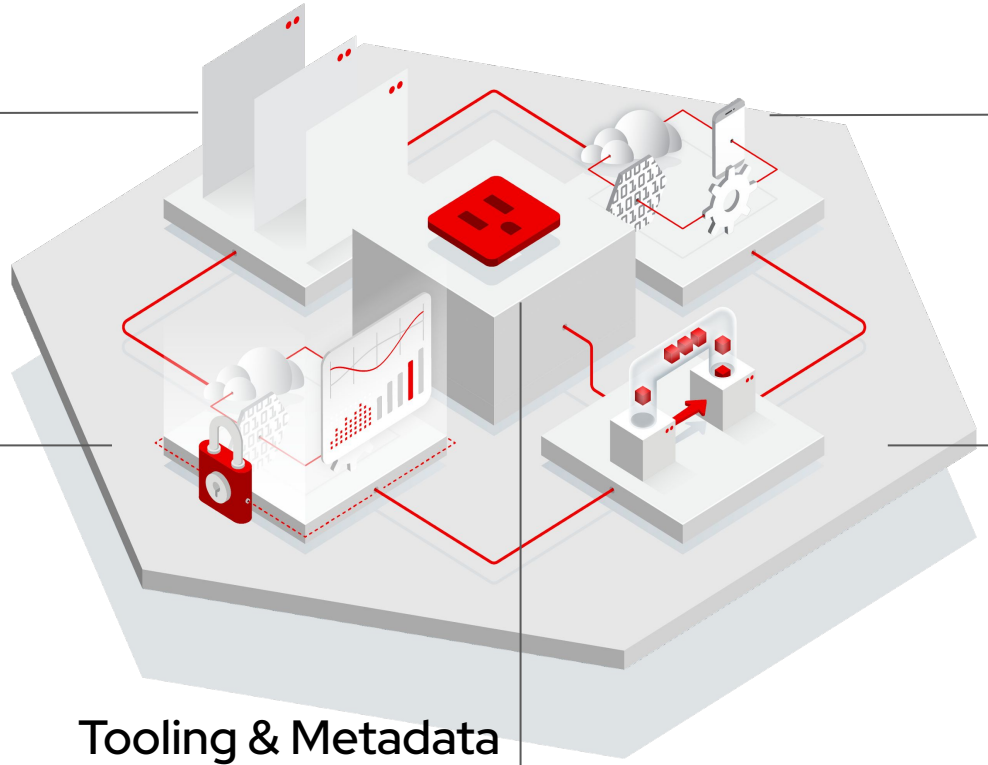
Red Hat Integration

Data Integration

- Change Data Capture with Debezium

API Management

- API Manager
- API Gateway
- Istio Service Mesh Adapter



Tooling & Metadata

- Service Registry
- API Designer
- Integration Operator

Enterprise Integration

- Comprehensive connectors
- Microservices orchestration
- Data Transformation
- Low-code iPaaS
- Kubernetes connectivity with Camel K

Events & Messaging

- JMS Message Broker
- Wide Area Routing
- Data Streaming with Apache Kafka

Source

Interface

Application concerns

Microservices Connectivity

Infrastructure concerns

API

- API Contracts
- Monetisation
- Business strategic policy enforcement
- Partner ecosystem

APPLICATION

- Choice of language/framework
- Self-service / productivity
- Low mem, fast startup
- Integrations framework

SERVICE TO SERVICE

- Network resilience
- Service security
- Policy enforcement
- Metrics/Observability
- Load balancing

DEPLOYMENT PLATFORM

- Reliability
- Instance placement
- Scaling/autoscaling
- Resource usage
- Job scheduling
- Distributed Logging

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Red Hat Application Services

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Red Hat Application Services

Red Hat OpenShift

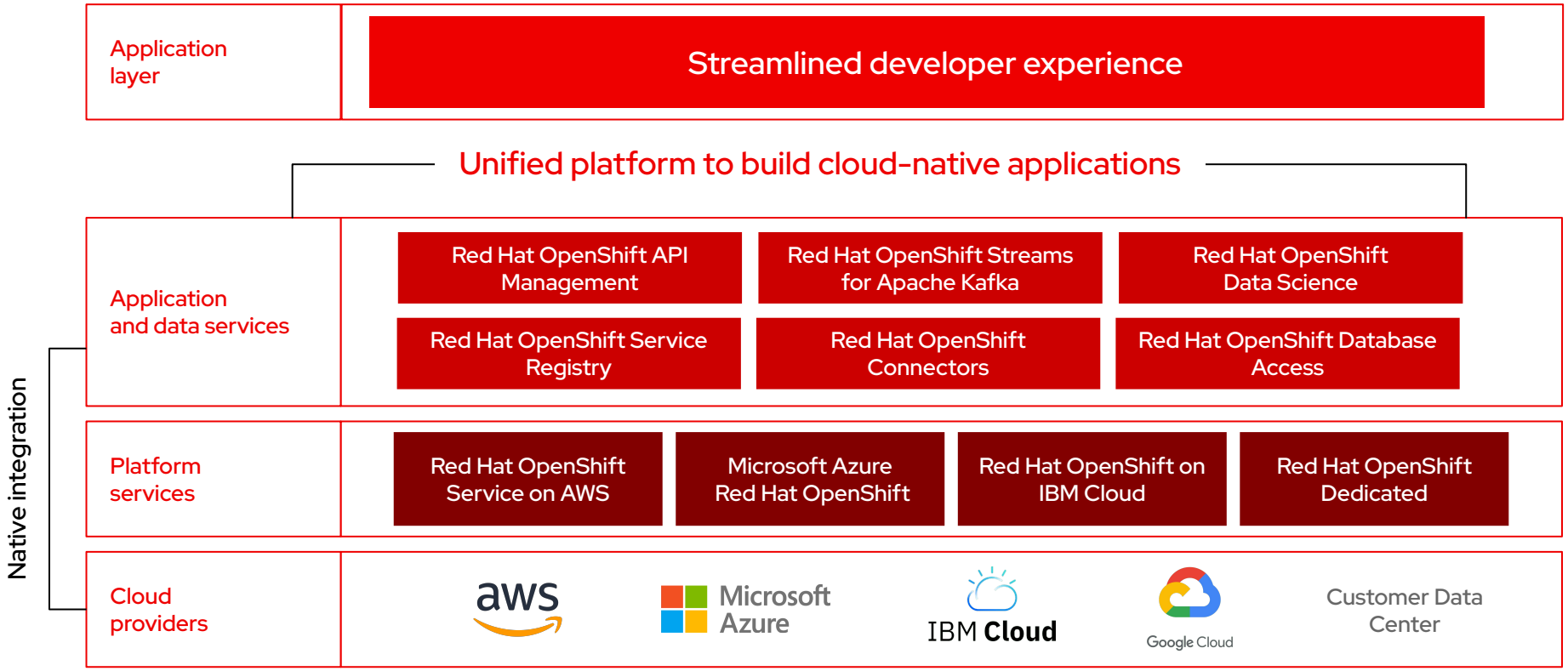
Cloud Services Managed by Red Hat

Managed OpenShift + Application Services + Data Services

Full stack management and unified experience

Maximize full value of Red Hat OpenShift

Hybrid cloud flexibility



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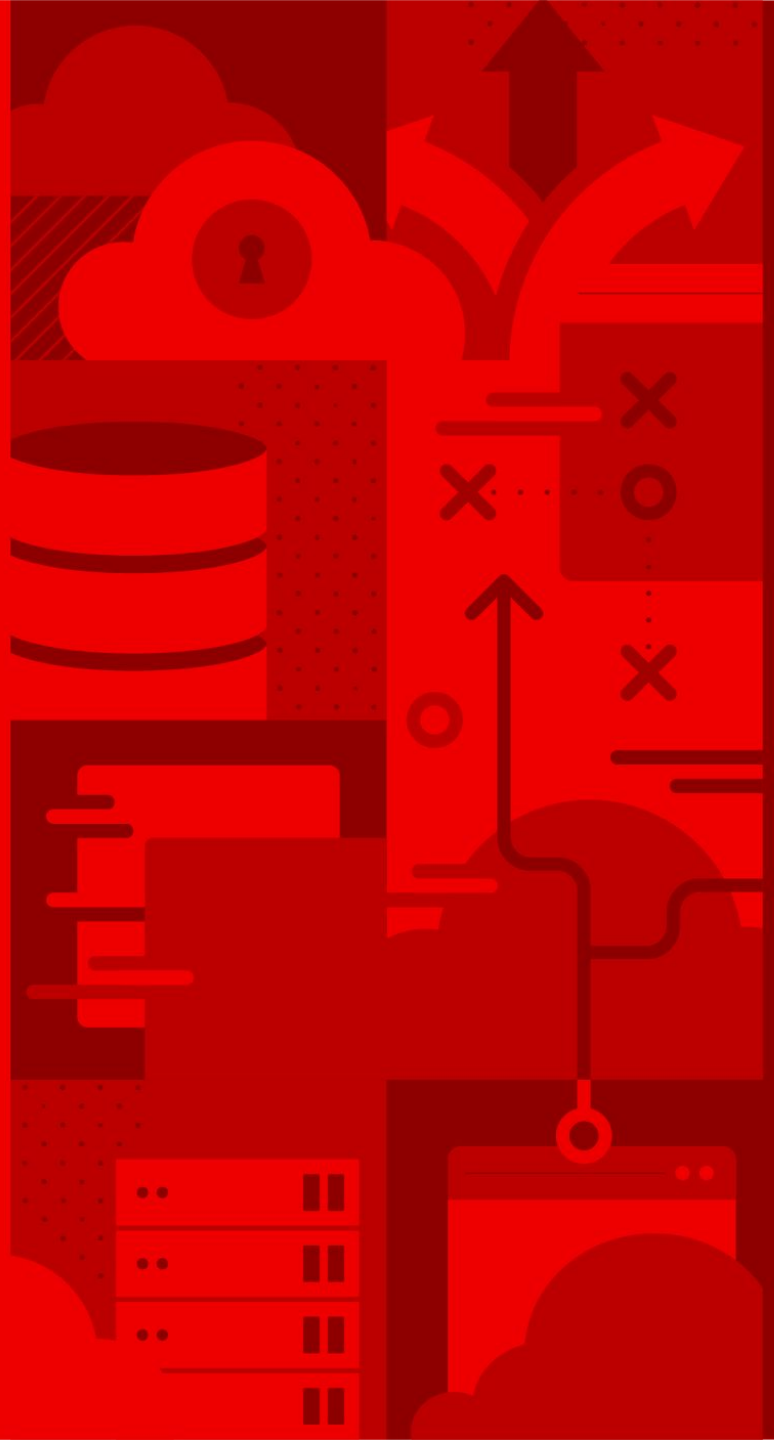

Event Driven Architecture

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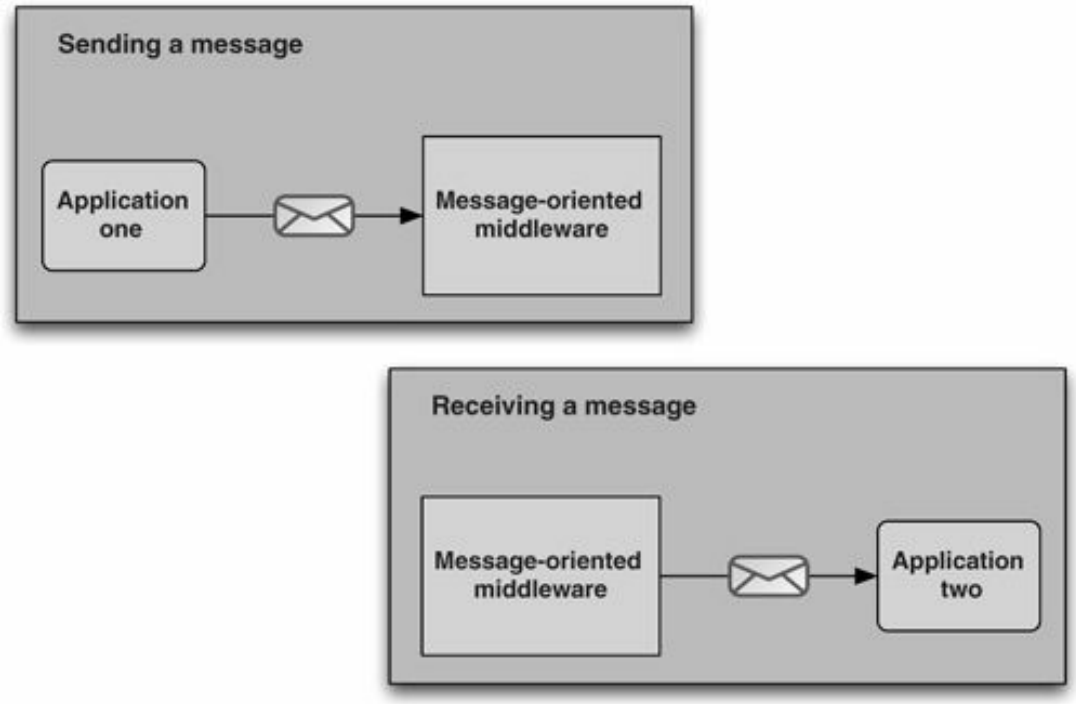
Introduction: Events

What is Event-Driven Architecture?

Event-Driven Architecture (EDA) is a way of designing applications and services to respond to real-time information based on the sending and receiving of event notifications



Source: https://www.gartner.com/en/information-technology/glossary/eda-event-driven-architecture :
Image: ActiveMQ in Action https://www.manning.com/books/activemq-in-action

What is an event?

Event an action or occurrence recognized by software, often originating asynchronously from the external environment, that may be handled by the software

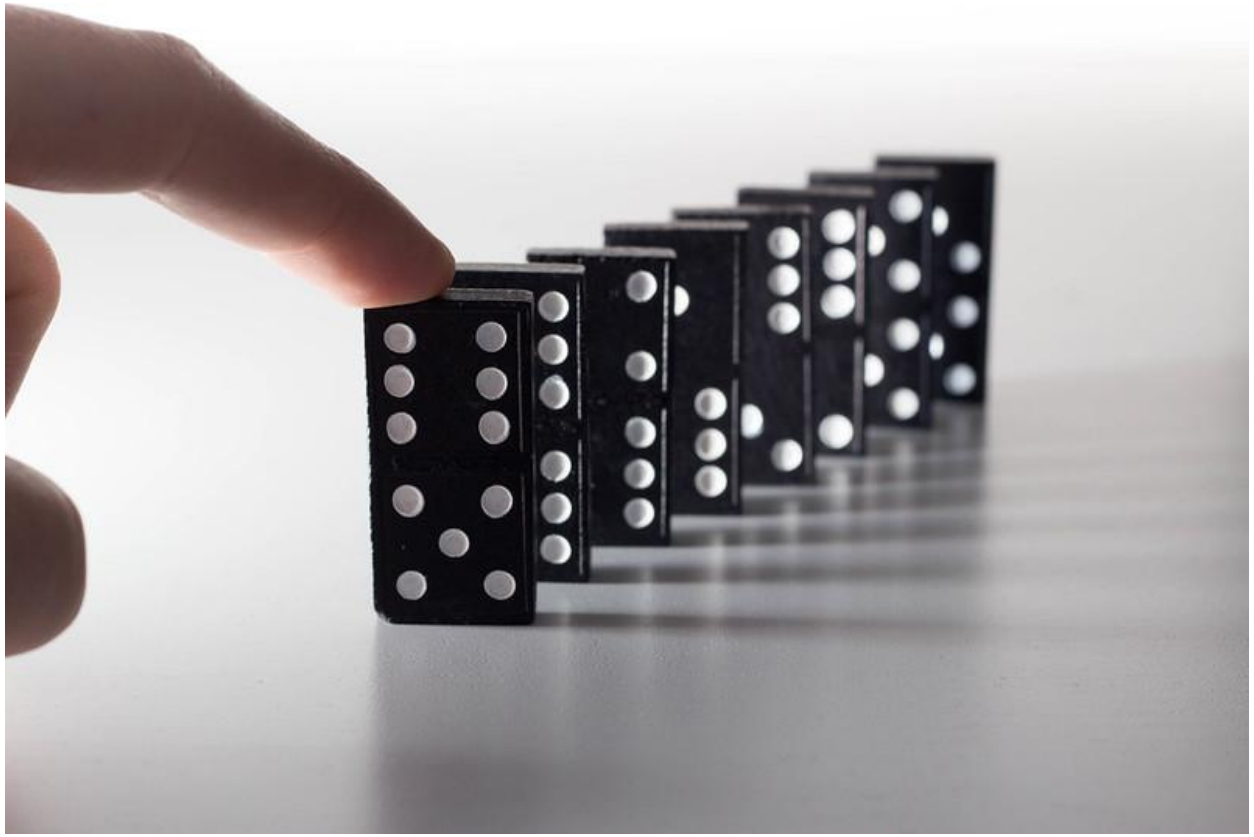
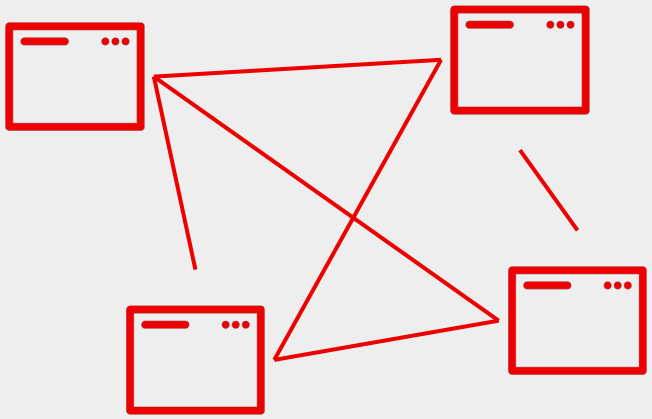


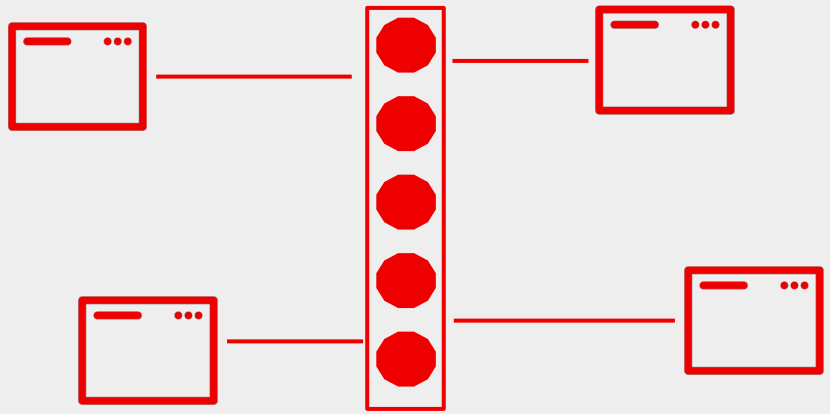
Image: https://foto.wuestenigel.com/hand-ready-to-push-domino-pieces/

Event-driven Microservices

Microservices Async Communication

Foundation for event-driven microservices

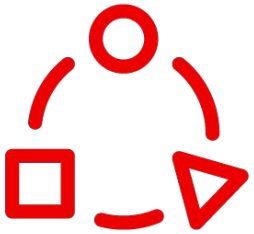




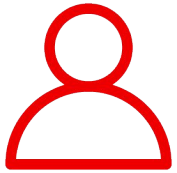
- High availability: No dependency on other services
- Autonomy in services with independent evolution

Source:

Event-driven architecture use cases

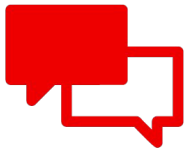


Reactive notification



Behavior capture

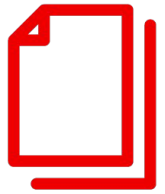
Cache store



Complex event processing

Command query responsibility segregation (CQRS)

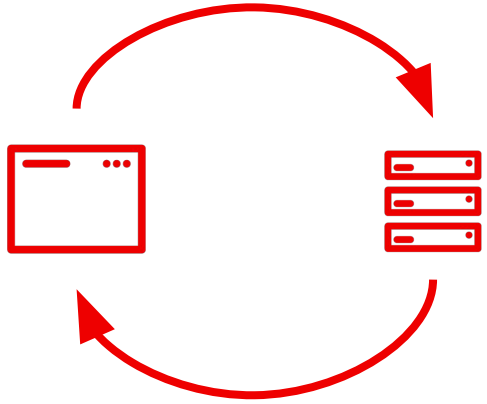
Streaming between data centers



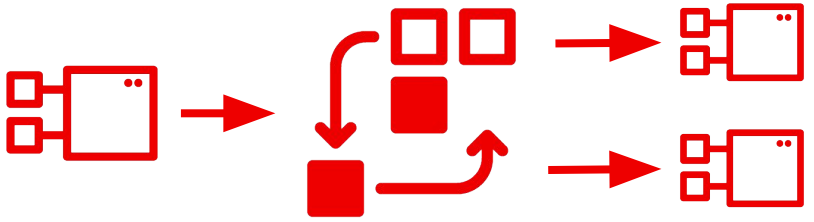
Auditing

Source:

Request-reply & Event-driven



Synchronous & ephemeral
Low composability
Simplified model
Low tolerance to failure
Best practices evolved as REST

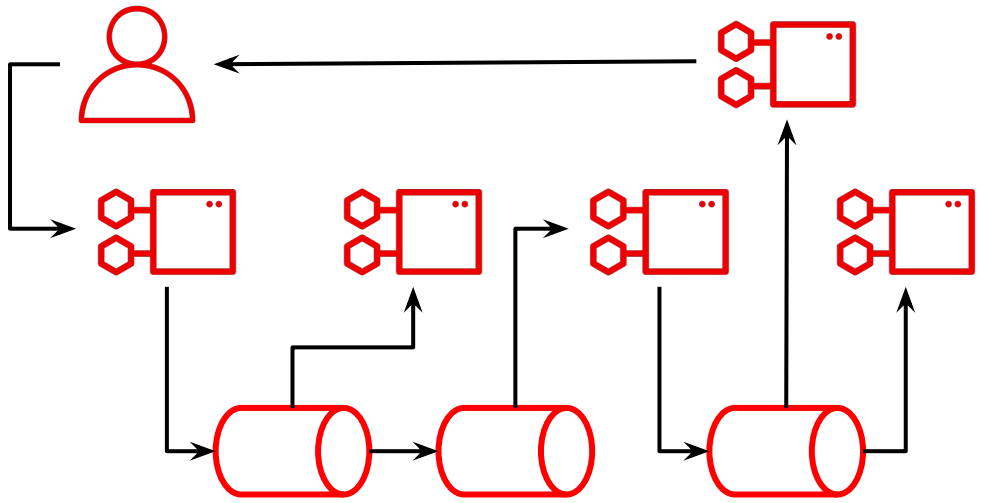


Asynchronous and persistent
Decoupled
Highly composable
Complex model
High tolerance to failure
Best practices are still evolving

Source:

Connect loosely-coupled microservices

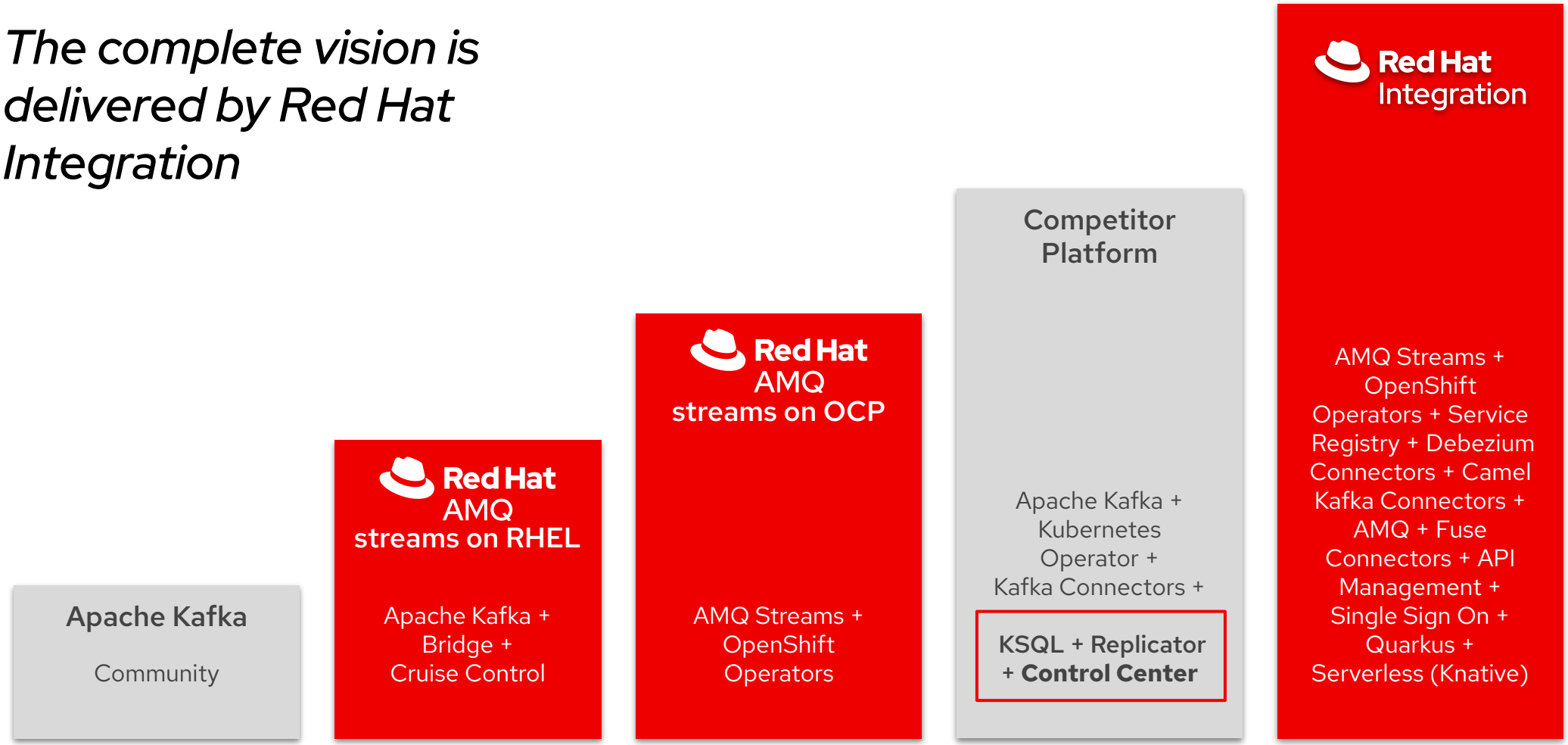
Remain agile with event-centric microservice architecture



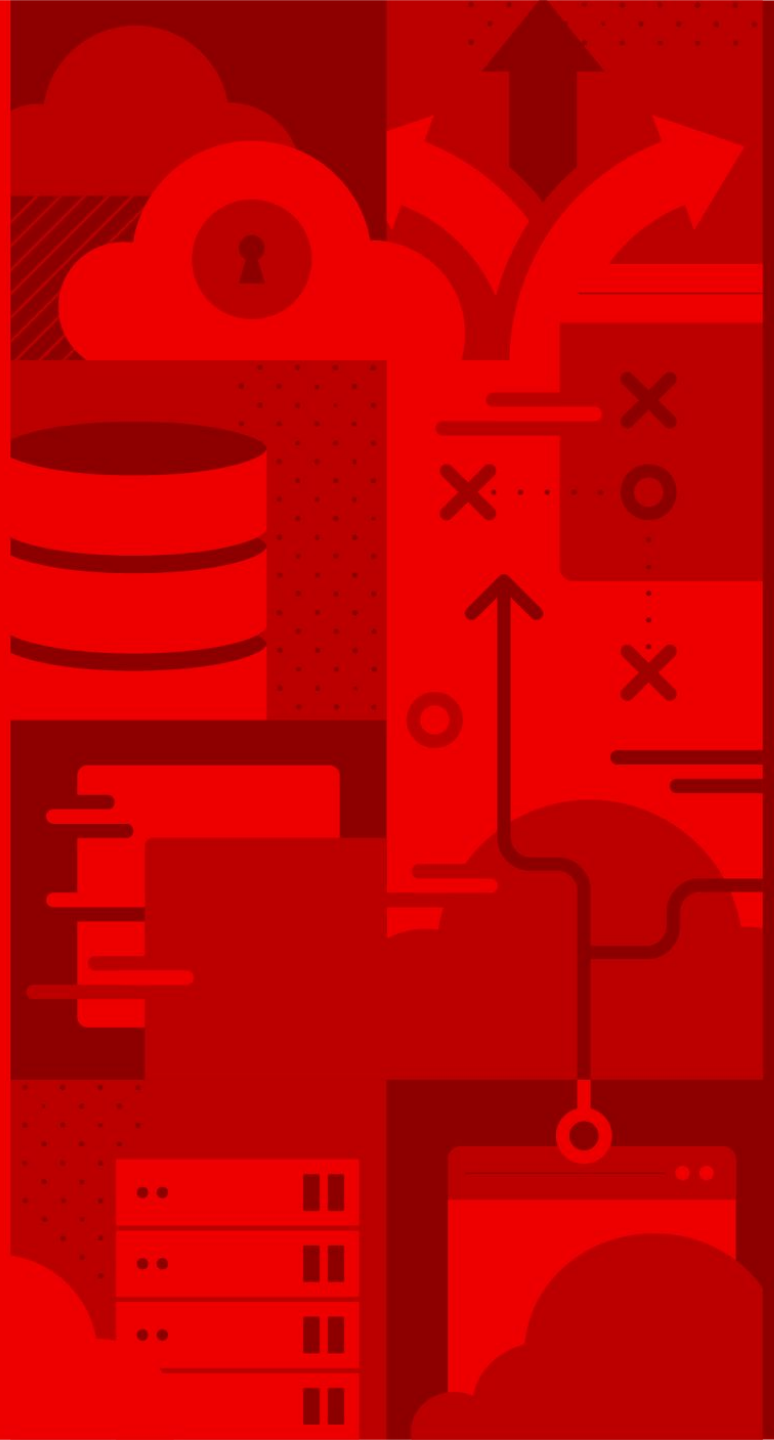
Connect microservices and stay agile

- Publish events to Kafka brokers and decouple the data from the event-consuming services
- Meet event volumes by independently scaling up and down your microservices
- Avoid hard-coding integrations and connections between microservices applications

The complete vision is delivered by Red Hat Integration



Reference: https://www.confluent.io/confluent-community-license-faq/

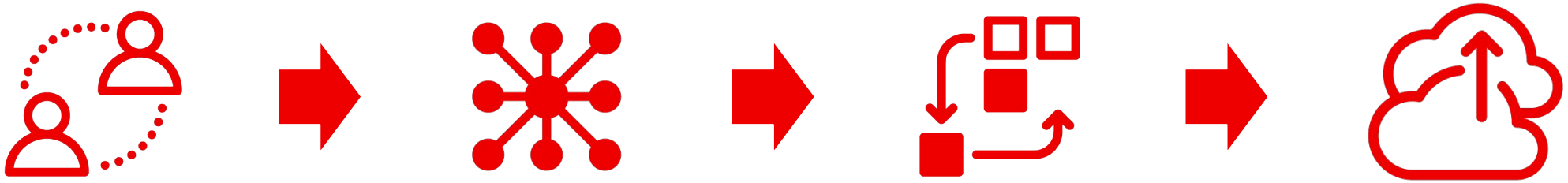


Enterprise Integration

Red Hat

Evolution of Integration

Architecture



Point to Point

Direct connection between systems, application both internally and with external services

Enterprise Service Bus

Placing a centralized bus that integrate between loosely coupled services.

Microservices

Fine grained distributed services, allowing faster turnover rate, more agile and flexible deployment model.

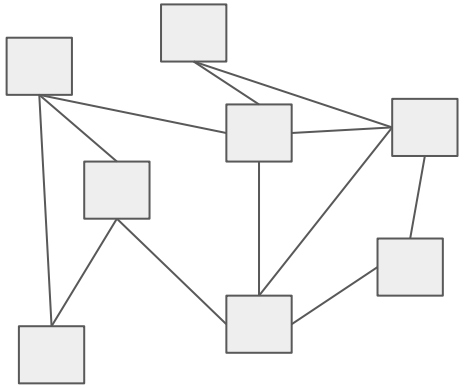
Serverless

Scale down to zero. Optimize Resource Usage. Avoid random, arbitrary workload prediction

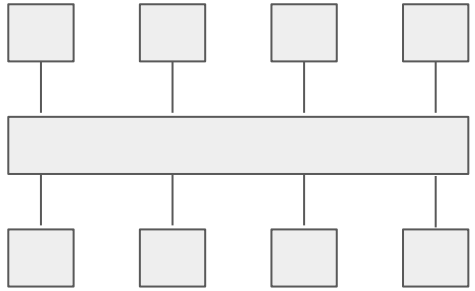
Evolution of Integration

Application Delivery

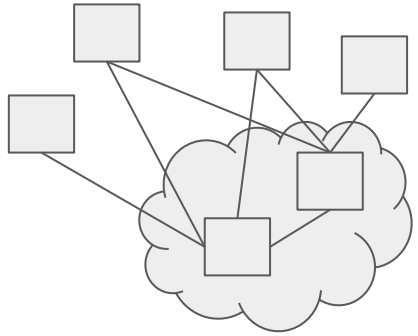
SMALL CLIENT LIBRARIES



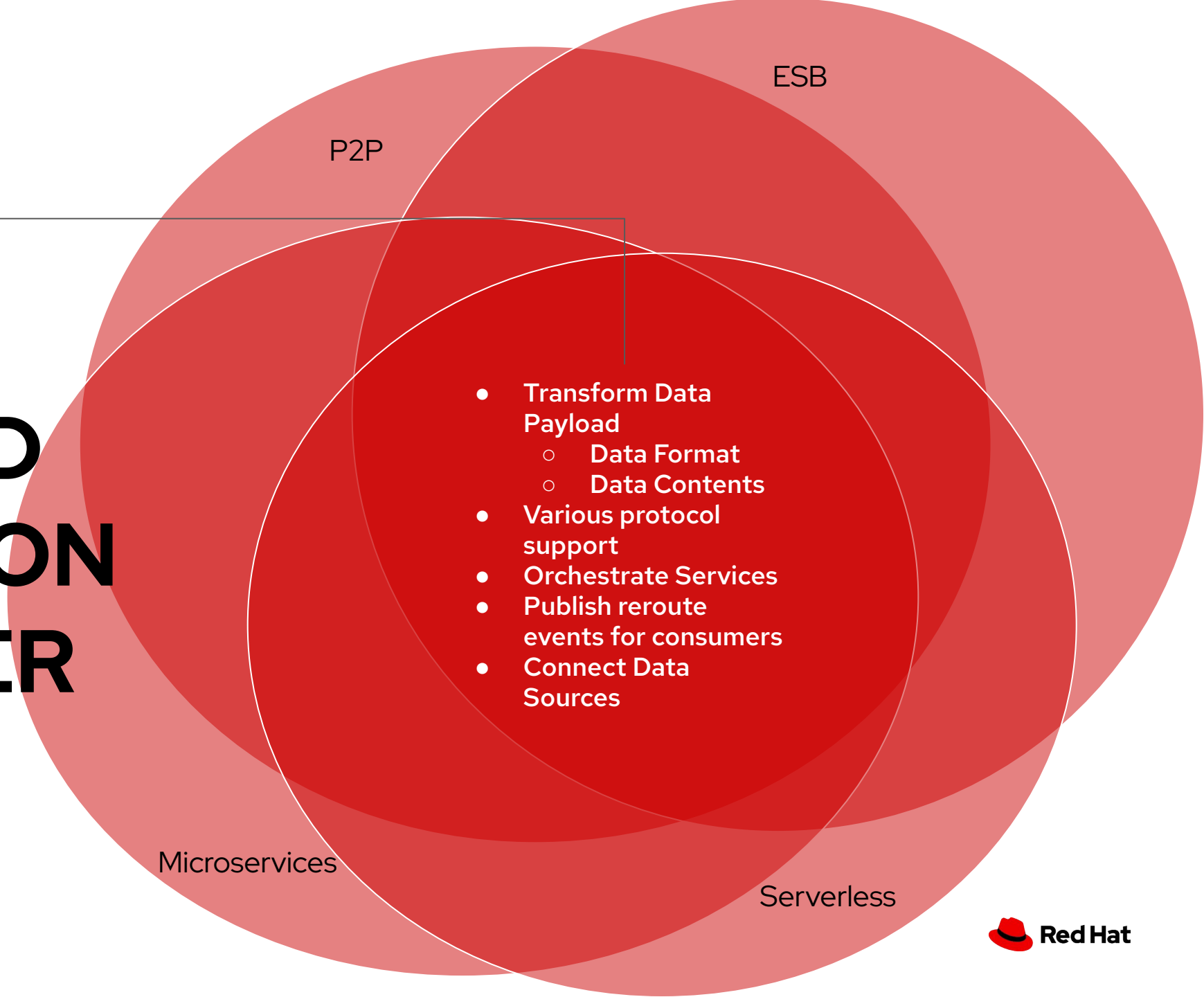
ENTERPRISE PACKAGE ON PREM SERVER



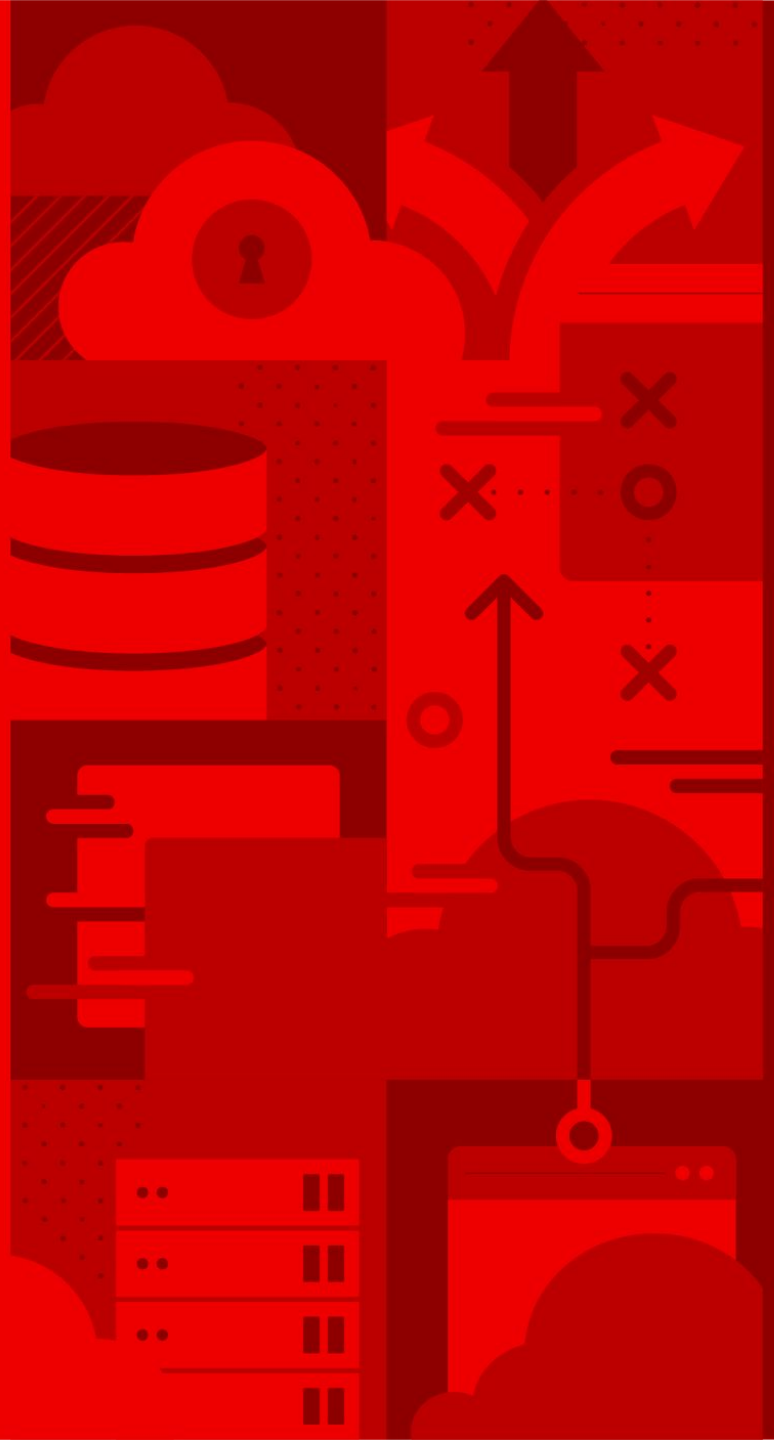
CLOUD



YOU NEED INTEGRATION NO MATTER WHAT!



Red Hat



Serverless Integration

Red Hat

Serverless Market Trends

"Use Serverless To optimize The Benefits of The cloud" [2]

40%

of enterprises adopted Serverless technologies or practices with expected growth coming in the next 12 to 18 months.[1]

Vendor lock-in is the second biggest concern when adopting Serverless technologies.[1]

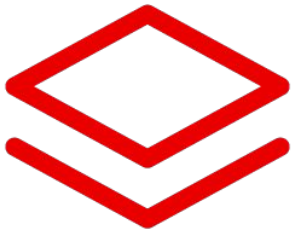
60%

of the serverless practitioners reported *"reduction of operational costs"* with the second biggest benefit being *"scale with demand automatically"*

Source:
1. https://www.oreilly.com/radar/oreilly-serverless-survey-2019-concerns-what-works-and-what-to-expect/
2. Forrester - Now Tech: Serverless, Q4 2019

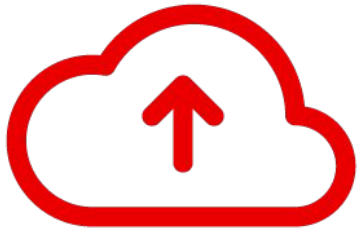
Serverless

"The future of cloud computing"



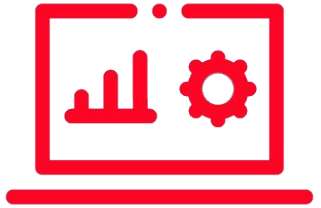
Beyond PaaS

Focus on Code



Scale by Demand

Scale to Zero



Optimize Resource Usage

Balancing workload

Event Driven

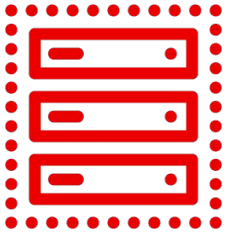
Near real-time latency

Serverless Benefits

Avoid random, arbitrary prediction

Lower operational cost

Faster time to market



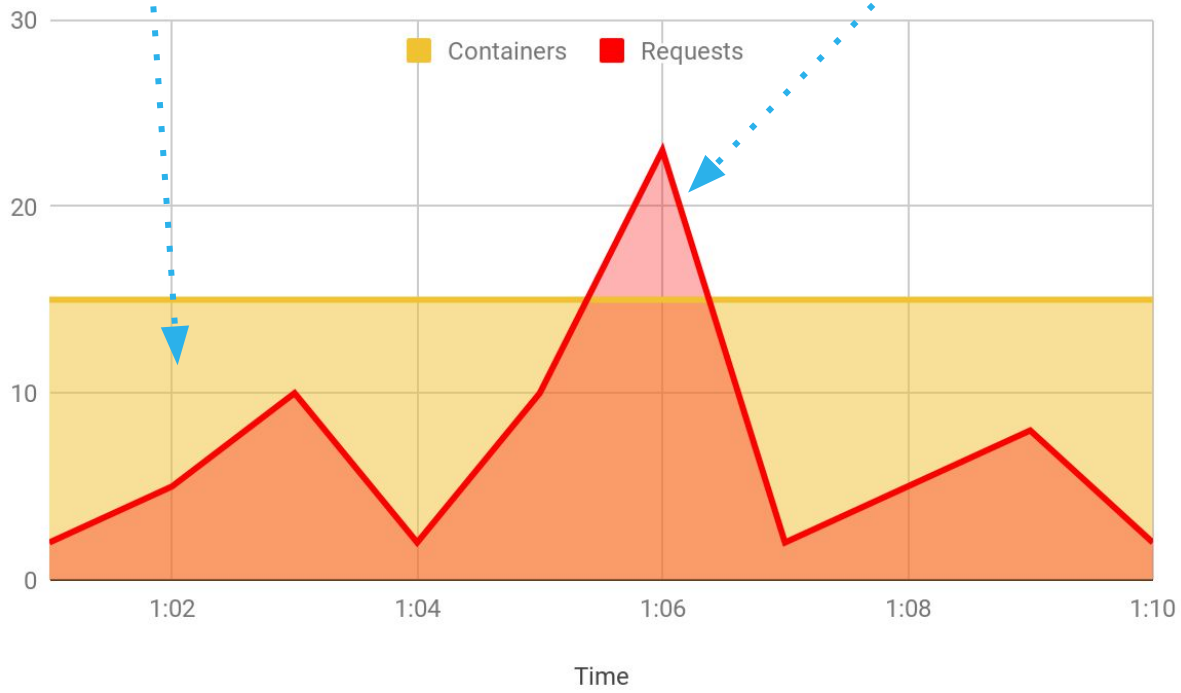
Reduced packaging and deployment complexity

Flexible Scalability on-demand

Serverless Operational Benefits

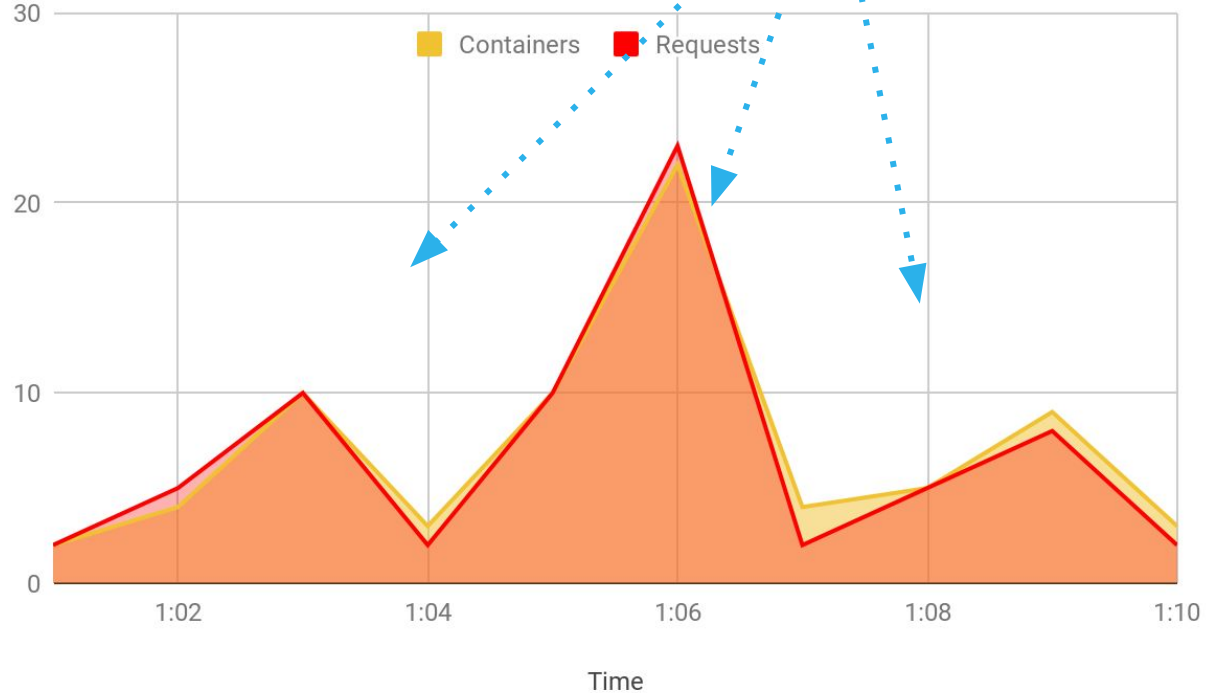
Over provisioning
Time in capacity planning
IT cost of idle resources

Under provisioning
Lost business revenue
Poor quality of service



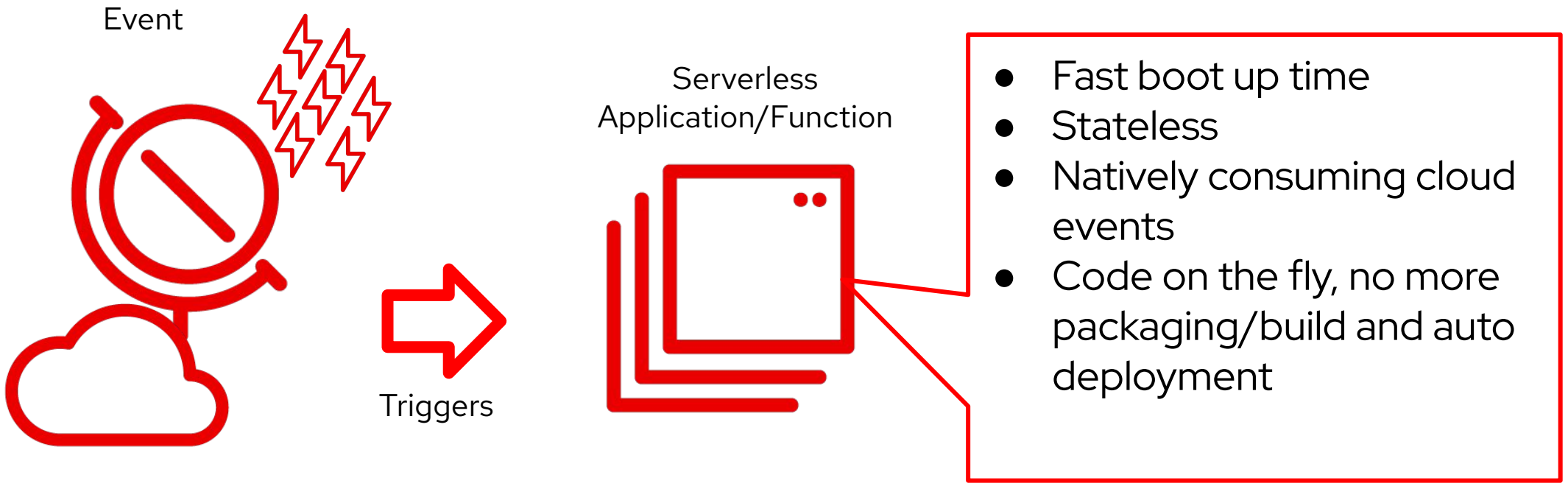
NOT Serverless

More applications
Direct line between IT
costs & business revenue



with Serverless

Serverless Function/Application Behaviour



Types of Serverless functions

Collectors

Source to Sink, header filtering

ie: Camel Source

Connectors

Data format, aggregate, split, orchestrate events, content filters

ie: Sequence, Trigger, Camel Source

Task

Work load, and process that you will normally do

ie: knative service

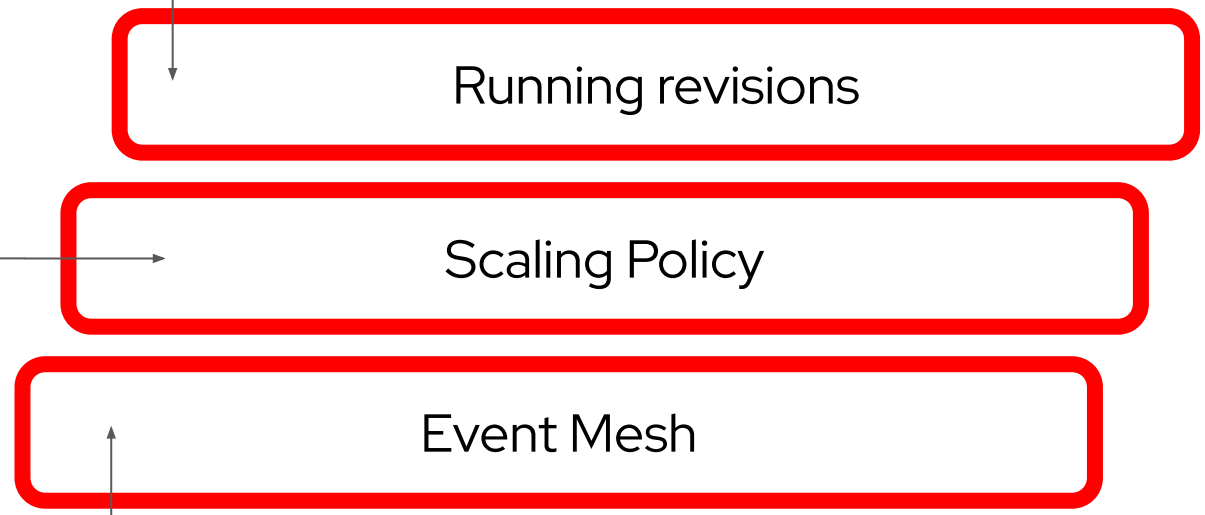
DevOps and Serverless

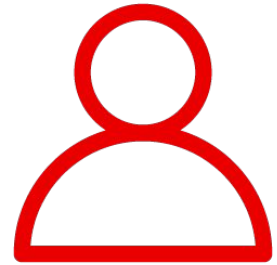
"DevOps Made Easy"

Quick turnaround time for deployment and switch between versions

Centralize place to manage and apply scaling policy for serverless in platform

Setup event mesh with ease with various implementations

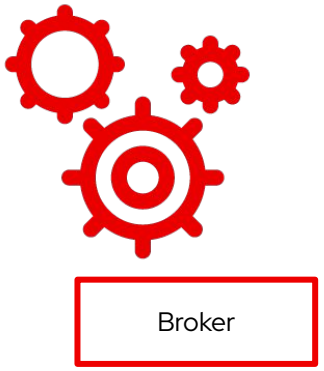




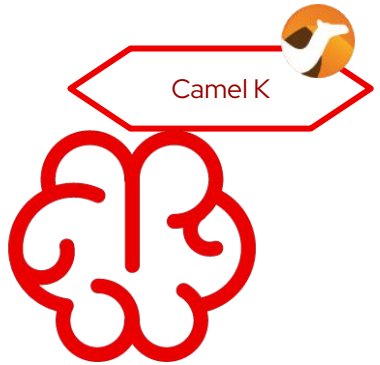
DEVOPS

Serverless Event Mesh

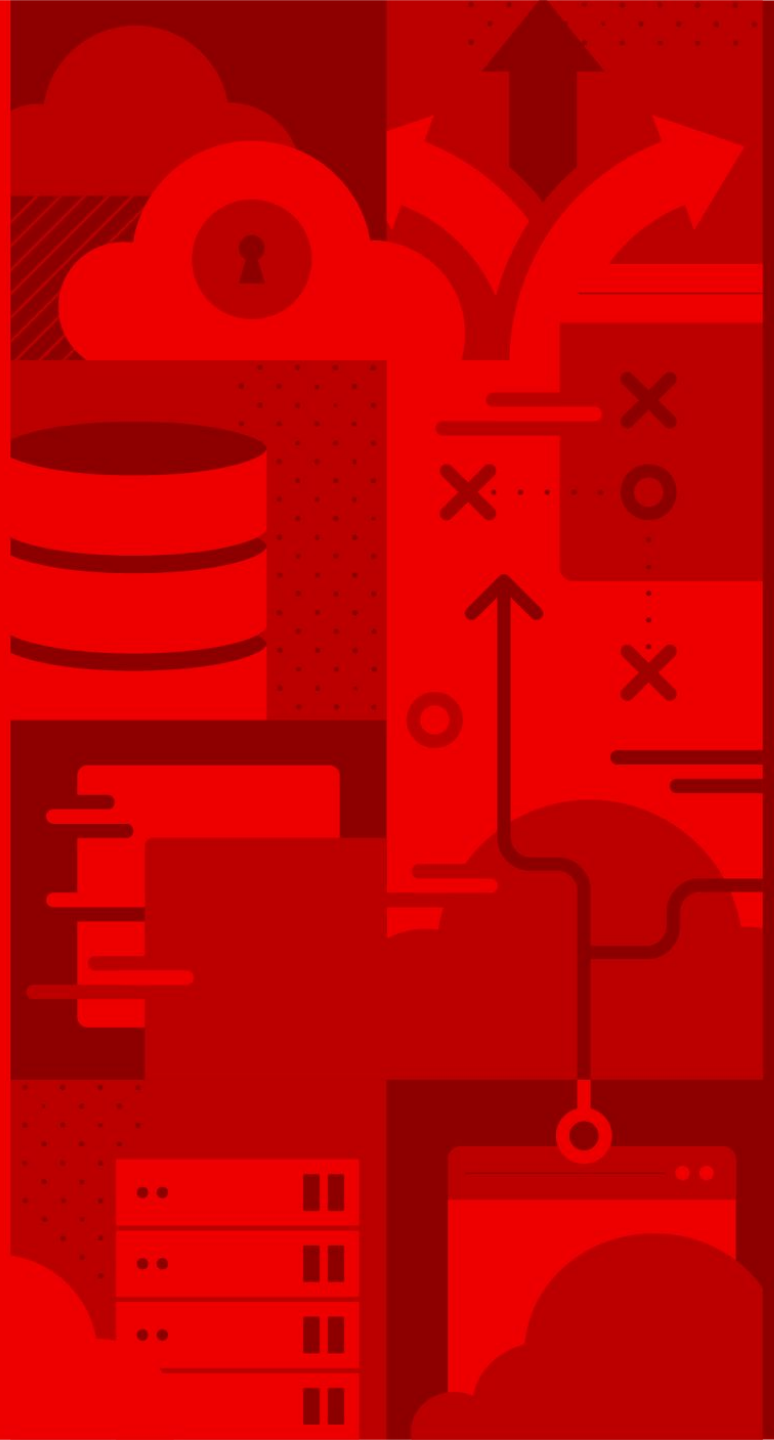
Receive or Polling events
Wraps payload to Cloud Events



Event Mesh channels



Wraps payload to Cloud Events
Data format
Payload aggregate and spilt
Orchestrate events
EIP
Push event to external

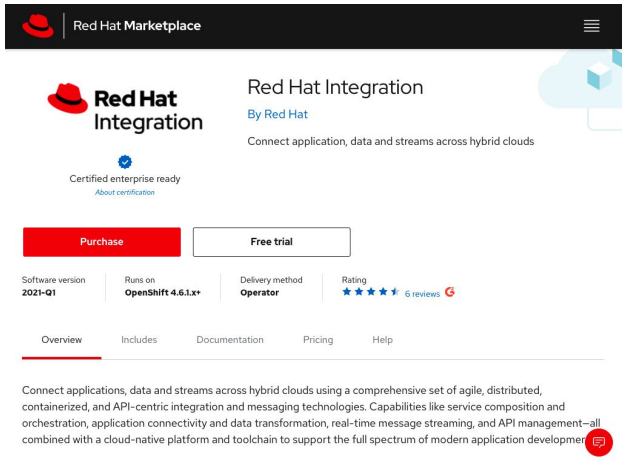


Red Hat Integration Operator

Red Hat

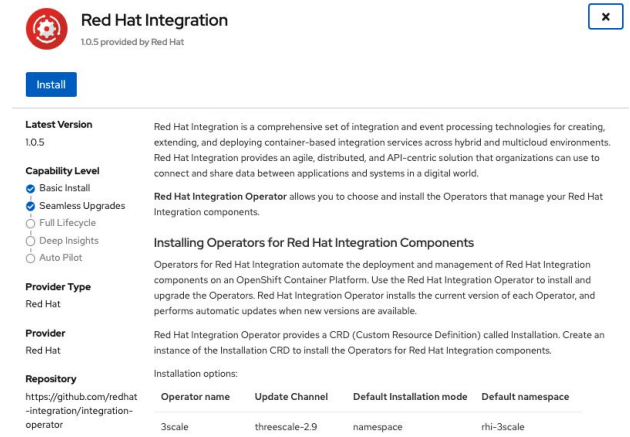
Red Hat Integration Operator allows you to choose and install the Operators that manage your Red Hat Integration components.

Red Hat Integration Operator availability



Red Hat Marketplace

Go to the Red Hat Marketplace website, search for the RH Integration Operator, and install it in on-premise OCP cluster.



OperatorHub

Go to the OperatorHub page in my on-premise OCP or OSD console, search for the RH Integration Operator, and install it.

Source:

Operators available for installation

- 3scale
- 3scale APIcast
- AMQ Broker
- AMQ Interconnect
- AMQ Streams
- API Designer
- Camel K
- Fuse Console
- Fuse Online
- Service Registry

Source:
https://access.redhat.com/documentation/en-us/red_hat_integration/2021.q2/html/installing_the_red_hat_integration_operator_on_openshift/installing-rhi-operators#installing-integration-operator-components

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.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