Red Hat Summit

Connect

La velocità e semplicità di introdurre nuovi servizi cloud attraverso le soluzioni managed Red Hat

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Solution Architect

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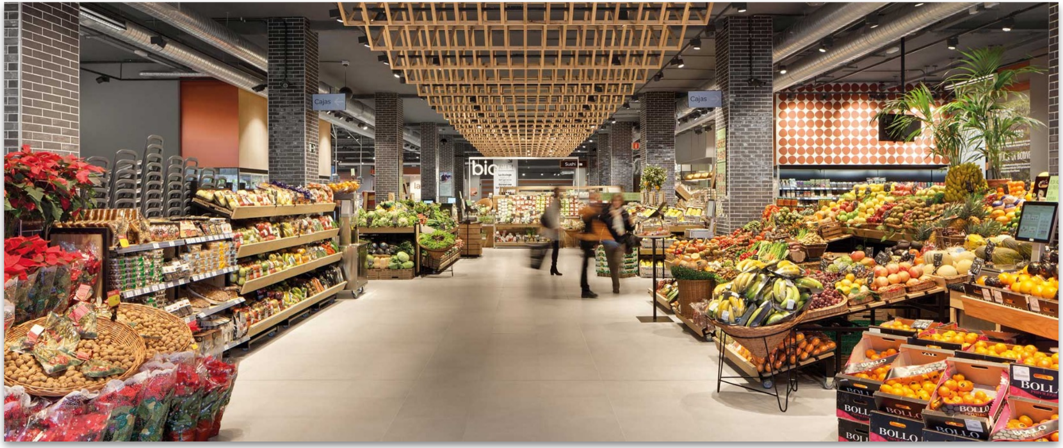
Solution Architect

Red Hat | intel.

Evolving Tree of Taste Business



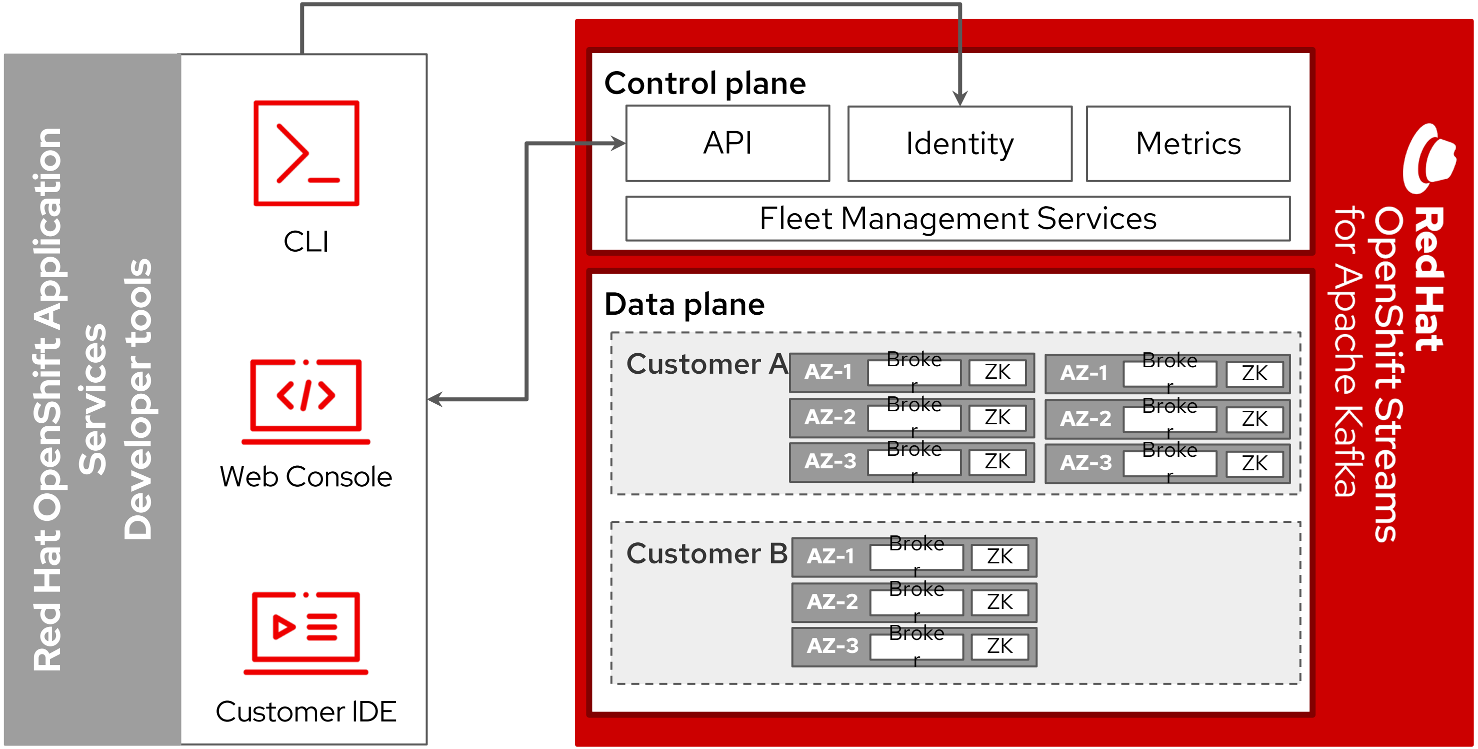
Red Hat can help the Tree of Taste company in its growth process by offering the managed platform dedicated to partner workloads and a managed event streaming solution to deliver a real time order notification for shipments

Red Hat OpenShift Streams for Apache Kafka

fully hosted and managed Kafka service for stream-based applications

- Running on OpenShift Dedicated and Strimzi. This is **abstracted away** from end-users
- Access to **customer dedicated Kafka instances**. Each instance provides Kafka core capabilities
- Kafka instances are configured based on **opinionated recommendations** made by Red Hat experts
- **Cluster health and metrics services** are also available for the customer dedicated instances

Red Hat OpenShift Streams for Apache Kafka



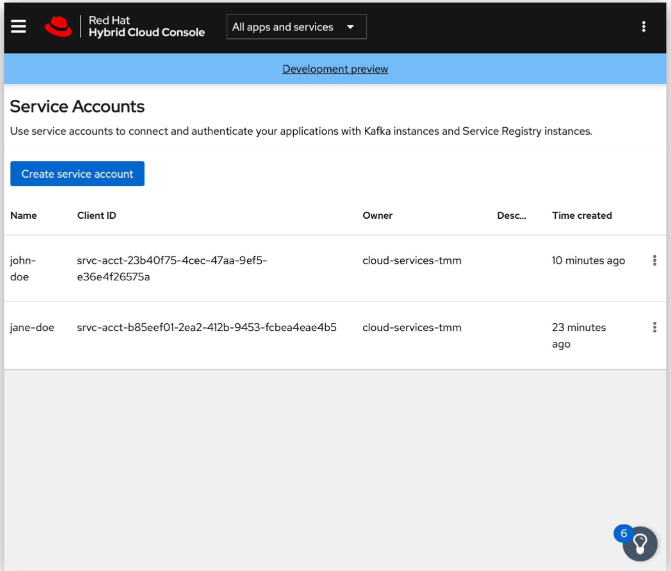
Kafka Connectivity

Producers/consumers connect via SASL (PLAIN or OAUTHBEARER) over SSL

- The Kafka Bootstrap Server URL is public.
- Clients can only connect over SSL.
- Clients must authenticate using SASL PLAIN or SASL OAUTHBEARER mechanisms.
- Clients must provide a Service Account ID and Secret regardless of authentication mechanism.

Service Accounts

Service Accounts are used by client applications to access Kafka instances



Service Accounts

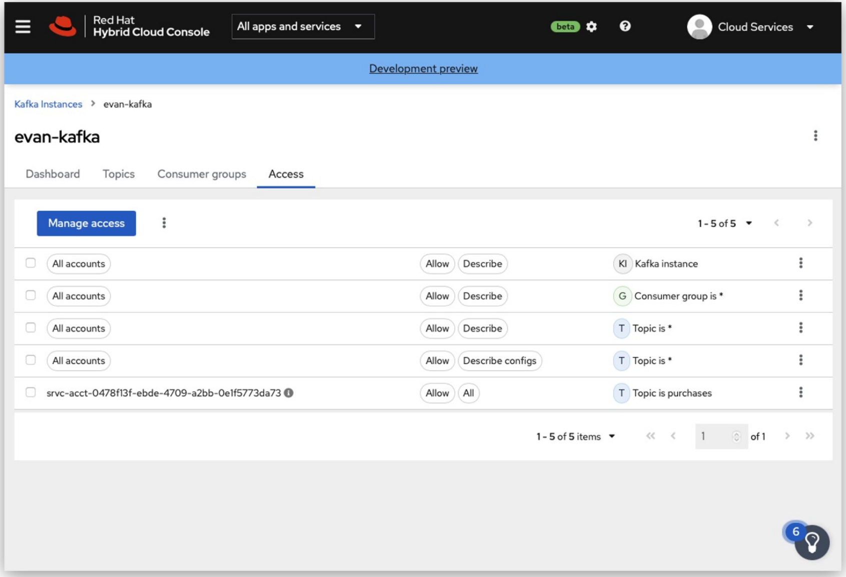
Use service accounts to connect and authenticate your applications with Kafka instances and Service Registry instances.

Name	Client ID	Owner	Desc...	Time created
john-doe	srvc-acct-23b40f75-4cec-47aa-9ef5-e36e4f26575a	cloud-services-tmm		10 minutes ago
jane-doe	srvc-acct-b85eef01-2ea2-412b-9453-fcbea4eae4b5	cloud-services-tmm		23 minutes ago

- Service Accounts are not the same as console.redhat.com User Accounts.
- Create a Service Account to obtain a Client ID and Secret.
- Applications/clients require the Service Account ID and Secret to connect to Kafka.
- Can be managed via console.redhat.com UI or CLI.

Access Controls (ACLs)

Comprehensive ACLs can be configured to manage Service Account access



evan-kafka

□	All accounts	Allow Describe	KI Kafka instance
□	All accounts	Allow Describe	G Consumer group is *
□	All accounts	Allow Describe	T Topic is *
□	All accounts	Allow Describe configs	T Topic is *
□	srvc-acct-0478f13f-ebde-4709-a2bb-0e1f5773da73	Allow All	T Topic is purchases

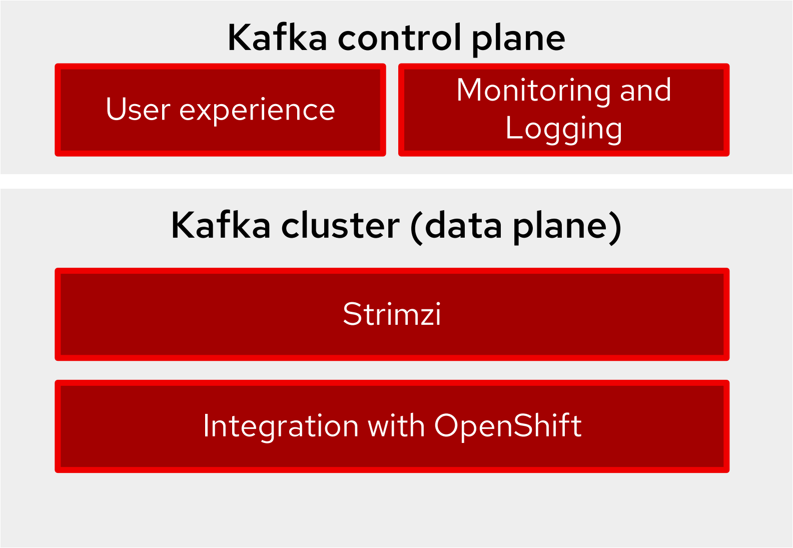
- Secure by default. Topic access explicitly granted.
- Granular control of CRUD on Topics, Brokers, etc.
- Allow/Deny based on Service or User Account.
- Can target specific resources, or use wildcards.

Benefits of Red Hat Management

We deliver premium support and 99.95% uptime

Red Hat manages:

- Core components of the Apache Kafka cluster
- User experience for developers and admins
- Identity Management and cluster security
- Cluster Management
- Cloud infrastructure
- Monitoring and operation of the entire stack
- Upgrade and version management



Kafka control plane

User experience

Monitoring and Logging

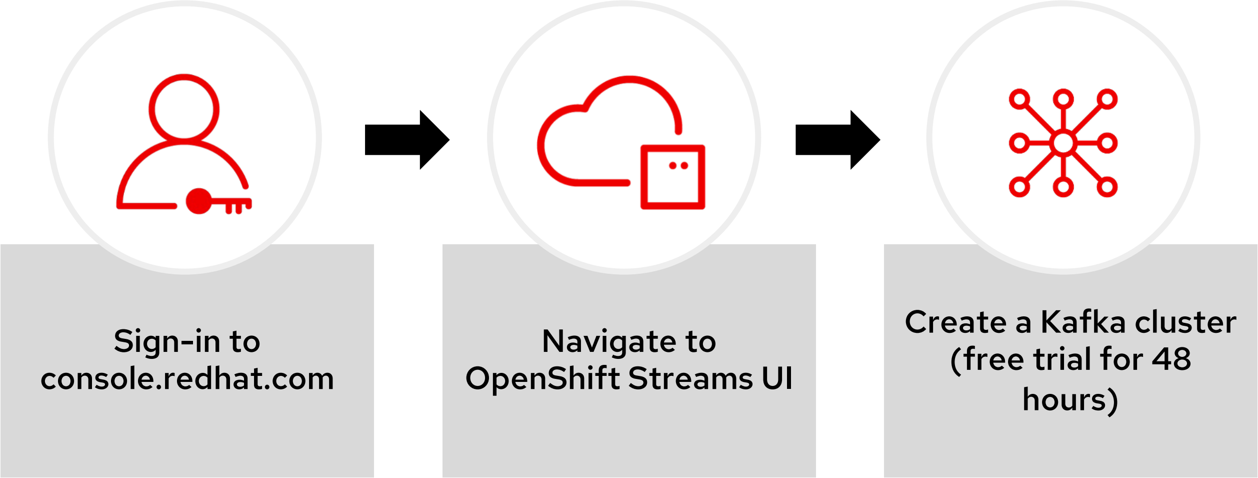
Kafka cluster (data plane)

Strimzi

Integration with OpenShift

Try **Red Hat OpenShift** Streams for Apache Kafka

No OpenShift cluster is necessary. Sign-in. Create a Kafka cluster. Connect.

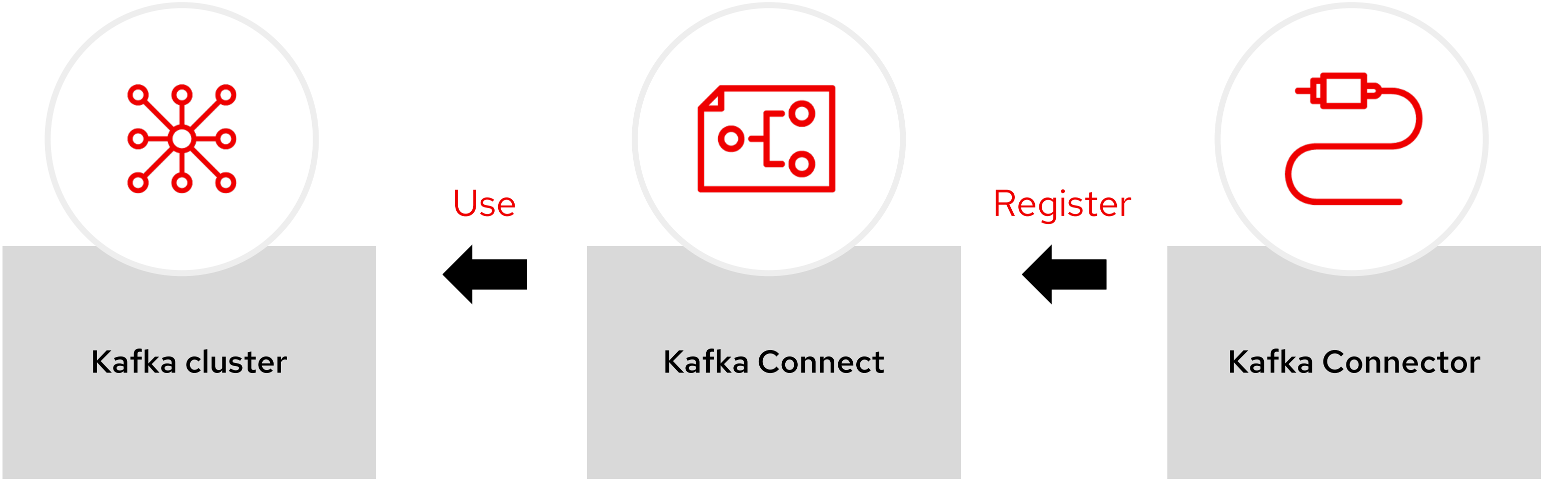


Sign-in to console.redhat.com

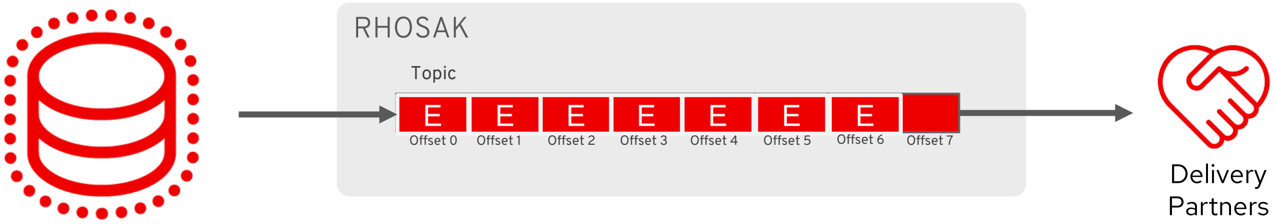
Navigate to OpenShift Streams UI

Create a Kafka cluster (free trial for 48 hours)

Kafka Components



Change Data Capture with Debezium

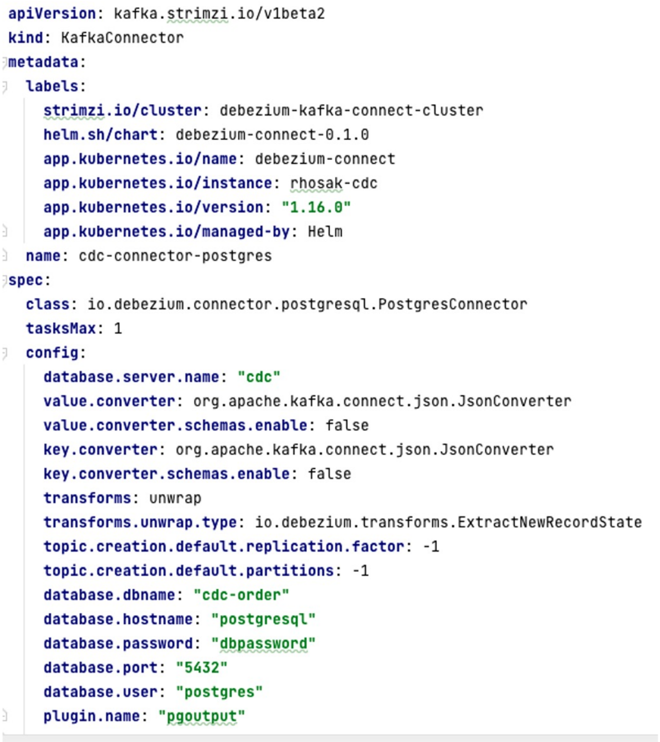


- Change Data Capture (CDC) connectors for Kafka Connect
  - Component connects to selected database, reads its transaction log and publishes it as Kafka messages
  - Supported databases: MySQL, PostgreSQL, MongoDB, SQL Server, Oracle DB
- Part of Red Hat Integration subscription

Running Debezium on OpenShift

Deployment via Operators

- YAML-based custom resource definitions for Kafka/Connect clusters, topics etc.
- Operator applies configuration
- Advantages
  - Automated deployment and scaling
  - Simplified upgrading

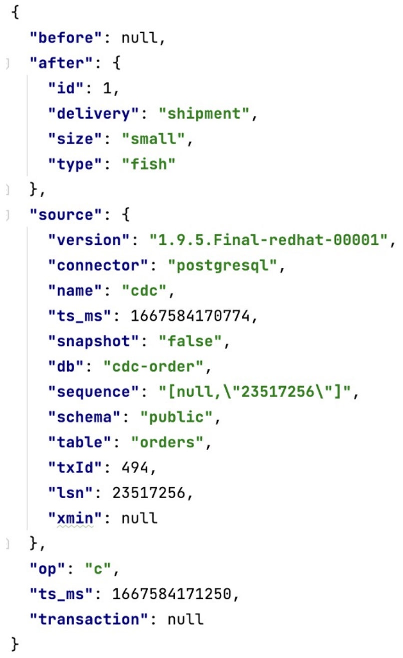


```yaml
apiVersion: kafka.strimzi.io/v1beta2
kind: KafkaConnector
metadata:
  labels:
    strimzi.io/cluster: debezium-kafka-connect-cluster
    helm.sh/chart: debezium-connect-0.1.0
    app.kubernetes.io/name: debezium-connect
    app.kubernetes.io/instance: rhosak-cdc
    app.kubernetes.io/version: "1.16.0"
    app.kubernetes.io/managed-by: Helm
  name: cdc-connector-postgres
spec:
  class: io.debezium.connector.postgresql.PostgresConnector
  tasksMax: 1
  config:
    database.server.name: "cdc"
    value.converter: org.apache.kafka.connect.json.JsonConverter
    value.converter.schemas.enable: false
    key.converter: org.apache.kafka.connect.json.JsonConverter
    key.converter.schemas.enable: false
    transforms: unwrap
    transforms.unwrap.type: io.debezium.transforms.ExtractNewRecordState
    topic.creation.default.replication.factor: -1
    topic.creation.default.partitions: -1
    database.dbname: "cdc-order"
    database.hostname: "postgresql"
    database.password: "dbpassword"
    database.port: "5432"
    database.user: "postgres"
    plugin.name: "pgoutput"
```

Debezium Payload

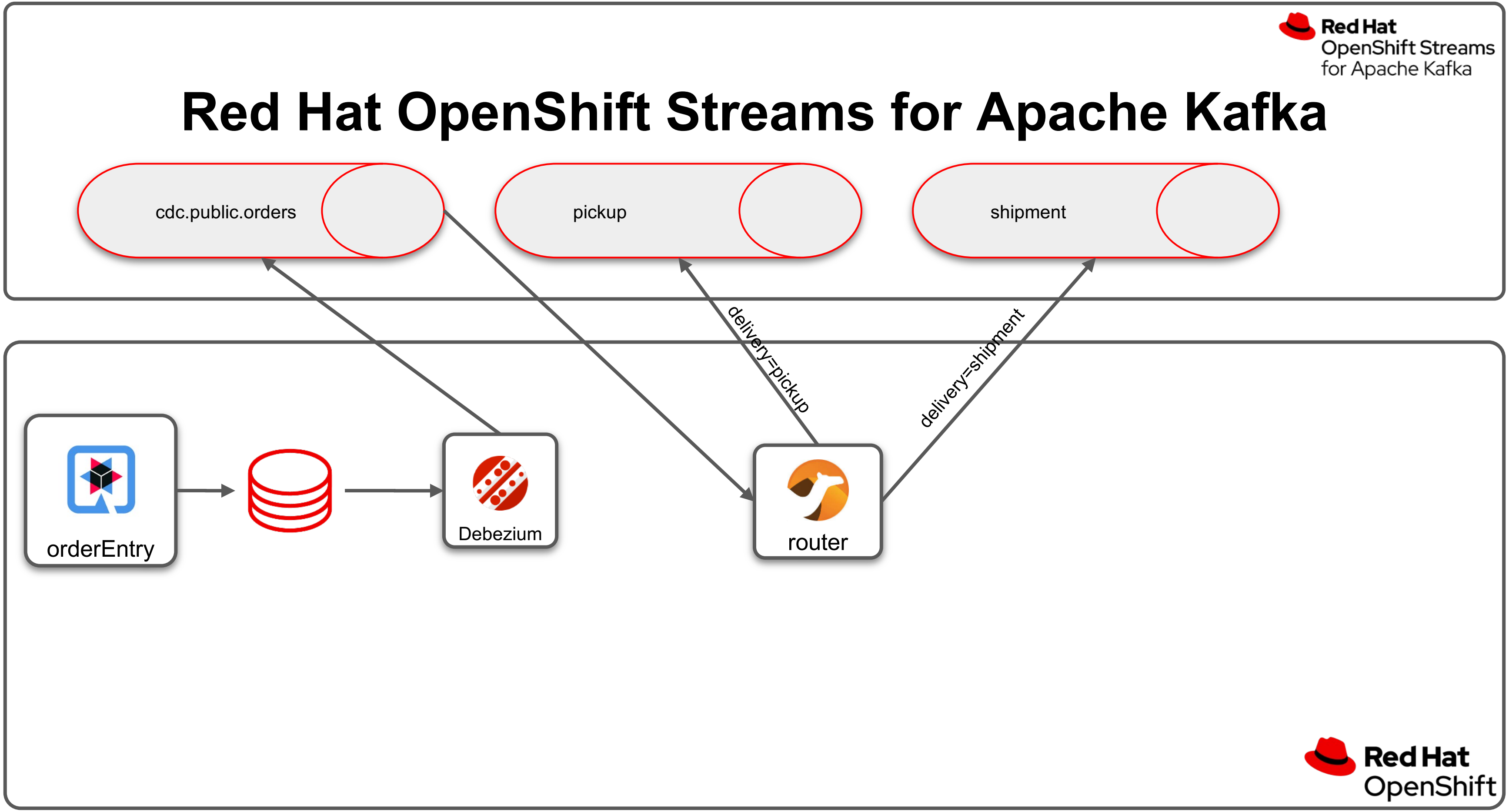
Change Event Structure

- Key: PK of table
- Value: Describing the change event
  - Before state
  - After state
  - Metadata info



```
{
  "before": null,
  "after": {
    "id": 1,
    "delivery": "shipment",
    "size": "small",
    "type": "fish"
  },
  "source": {
    "version": "1.9.5.Final-redhat-00001",
    "connector": "postgresql",
    "name": "cdc",
    "ts_ms": 1667584170774,
    "snapshot": "false",
    "db": "cdc-order",
    "sequence": "[null,\"23517256\"]",
    "schema": "public",
    "table": "orders",
    "txId": 494,
    "lsn": 23517256,
    "xmin": null
  },
  "op": "c",
  "ts_ms": 1667584171250,
  "transaction": null
}
```

Red Hat OpenShift Streams for Apache Kafka



Hands-on

Change Data Capture
with Debezium

Supporting hybrid usage and buying patterns

A consistent platform no matter how or where you run

Start quickly, we manage it for you

Managed Red Hat OpenShift services

aws

Red Hat OpenShift Service on AWS[1]

Azure

Azure Red Hat OpenShift

IBM Cloud

Red Hat OpenShift on IBM Cloud[1]

Google Cloud

Red Hat OpenShift Dedicated[2]

You manage it, for control and flexibility

Self-managed Red Hat OpenShift

Red Hat OpenShift Container Platform

On public cloud, or on-premises on physical or virtual infrastructure[3]

Physical | Virtual | aws | Google Cloud | Azure | IBM Cloud

Who does what ?

Self-managed OpenShift

Responsibilities	
User management	⬜
Project and quota management	⬜
Application lifecycle	⬜
Cluster creation	⬜
Cluster management	⬜
Monitoring and logging	⬜
Network configuration	⬜
Software and security updates	⬜
Platform support	🟥

⬜ Customer 🟥 Red Hat

RedHat Managed OpenShift

Responsibilities	
User management	⬜
Project and quota management	⬜
Application lifecycle	⬜
Cluster creation	🟥
Cluster management	🟥
Monitoring and logging	🟥
Network configuration	🟥
Software and security updates	🟥
Platform support	🟥

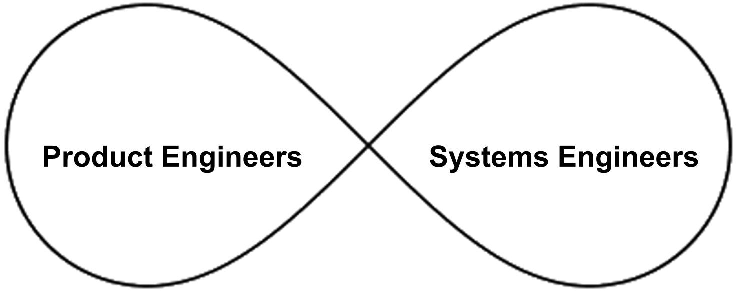
⬜ Customer 🟥 Red Hat

Who’s actually Running this thing ?

Creative Commons Content

The Global SRE Team

The Global SRE Team



Product Engineers

Systems Engineers

Develop & Deploy managed clusters

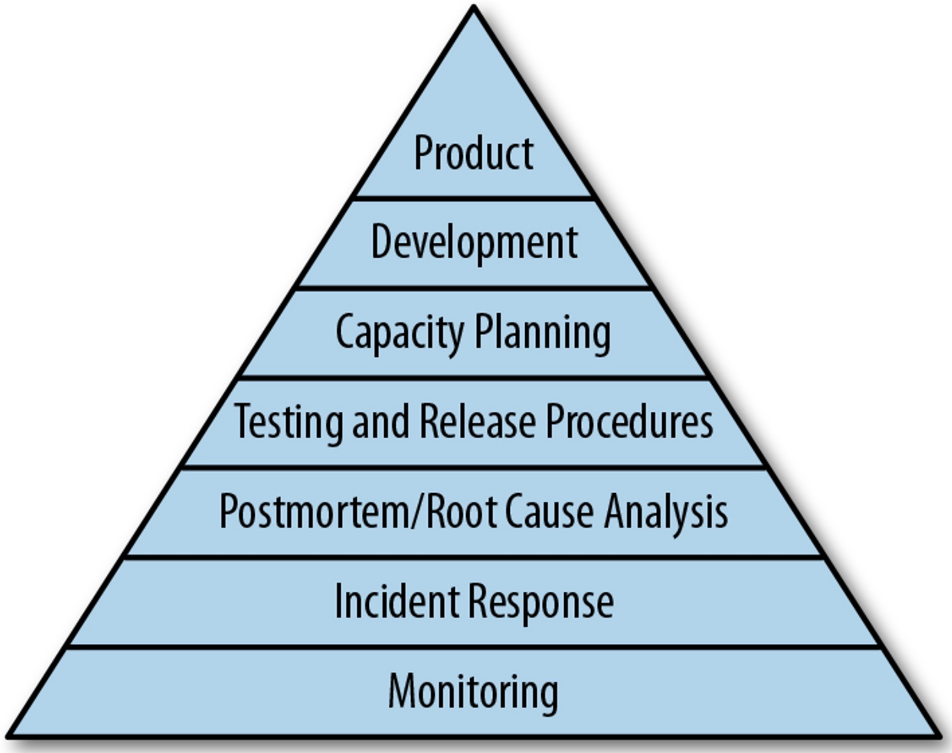
“Day One” Operations

“Day Two” Operations

People and Skills

Process and Automation

Support and Security

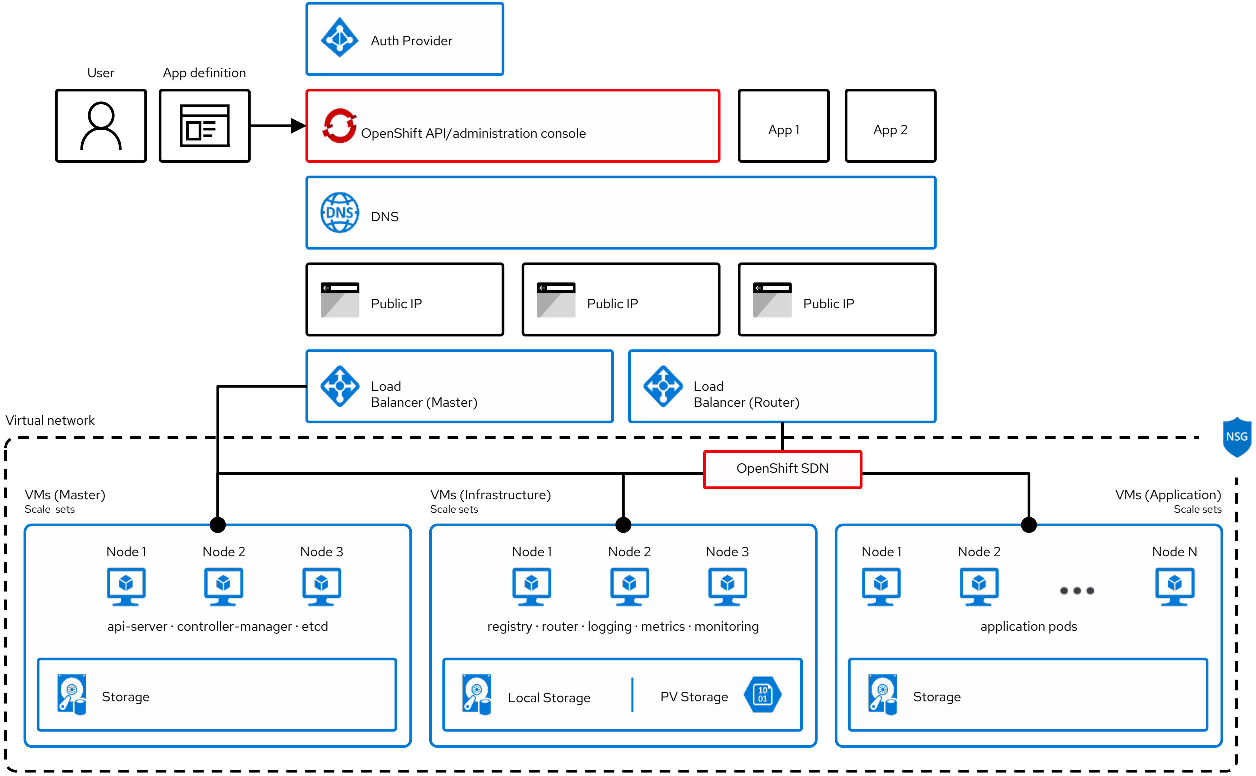


Dickerson’s "Hierarchy of Reliability"

Running your own Red Hat OpenShift cluster

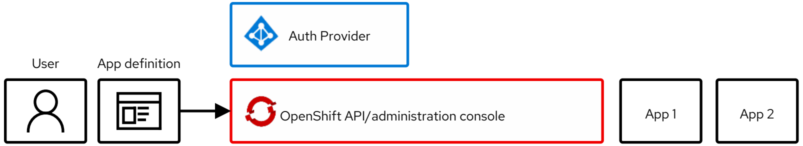
Responsibilities	
User management	⬜
Project and quota management	⬜
Application lifecycle	⬜
Cluster creation	⬜
Cluster management	⬜
Monitoring and logging	⬜
Network configuration	⬜
Software and security updates	⬜
Platform support	🟥

⬜ Customer 🟥 Red Hat



Simplify cluster operations with managed OpenShift

Responsibilities	
User management	⬜
Project and quota management	⬜
Application lifecycle	⬜
Cluster creation	🟥
Cluster management	🟥
Monitoring and logging	🟥
Network configuration	🟥
Software and security updates	🟥
Platform support	🟥



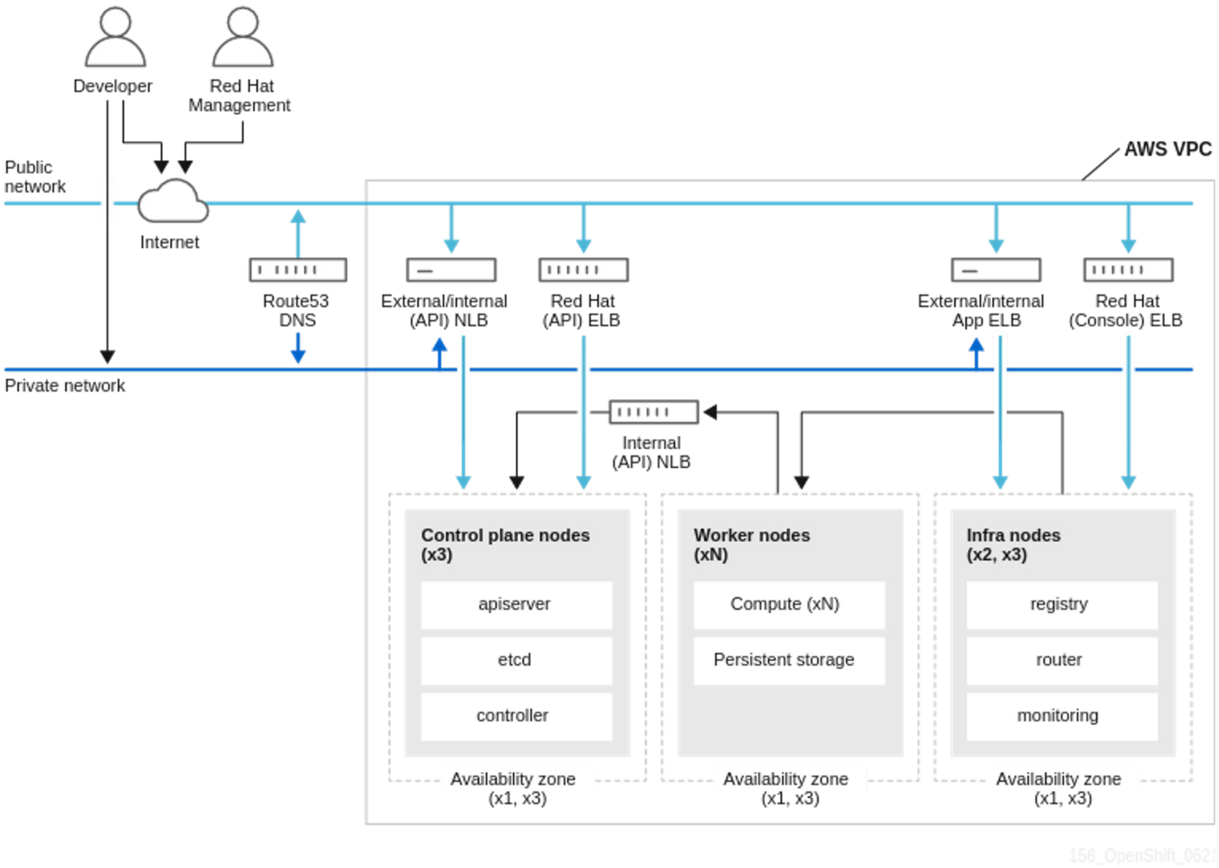
Let Red Hat ...

Manage all your clusters

Monitor and operate your VMs

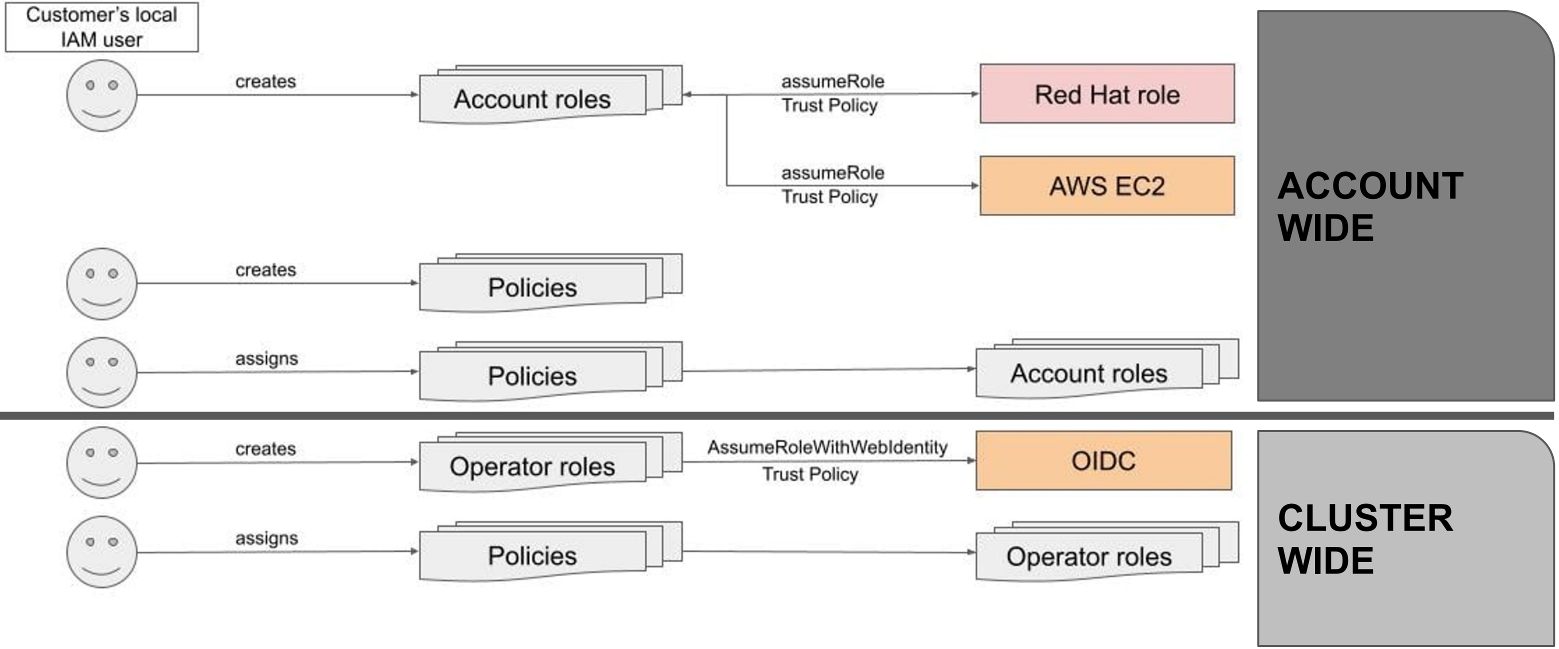
⬜ Customer 🟥 Red Hat

ROSA architecture



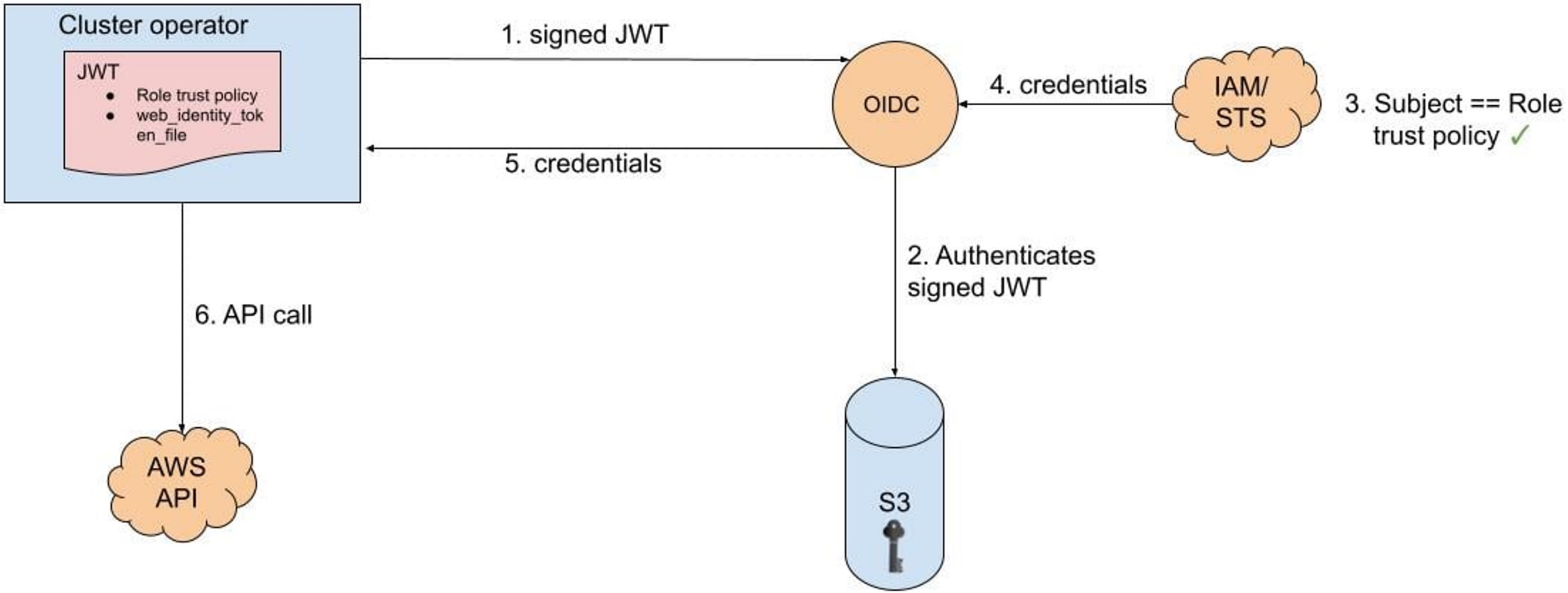
How does ROSA with STS work?

Setup



How does ROSA with STS work?

Authentication Process

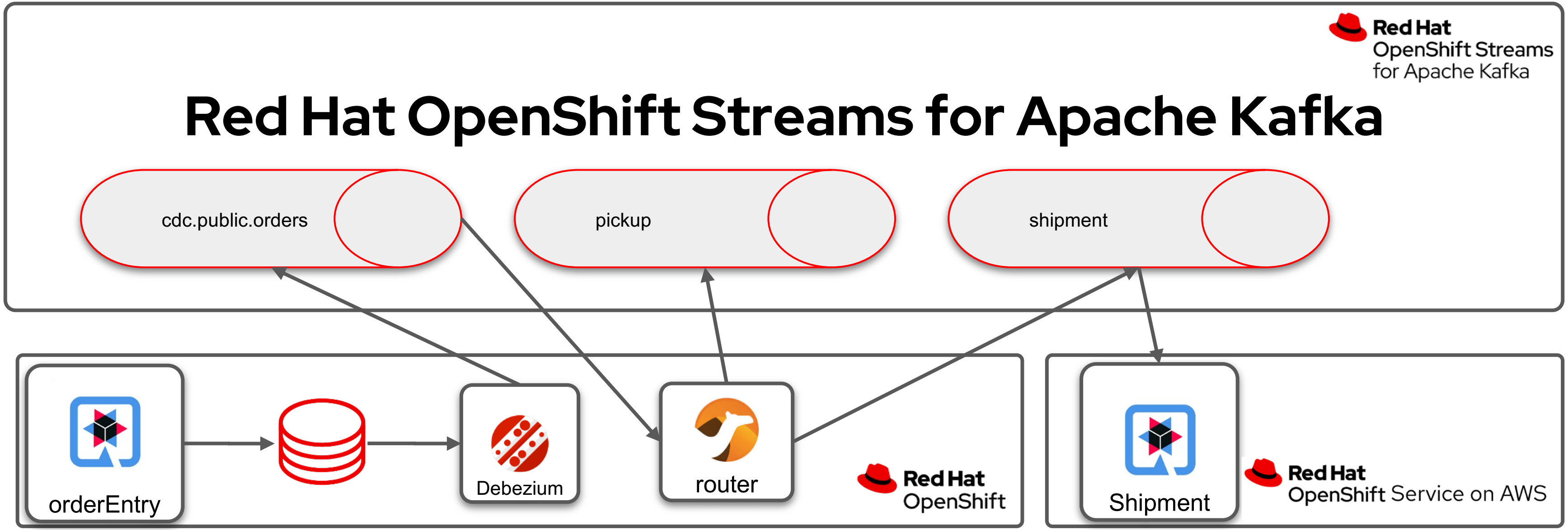


Hands-on

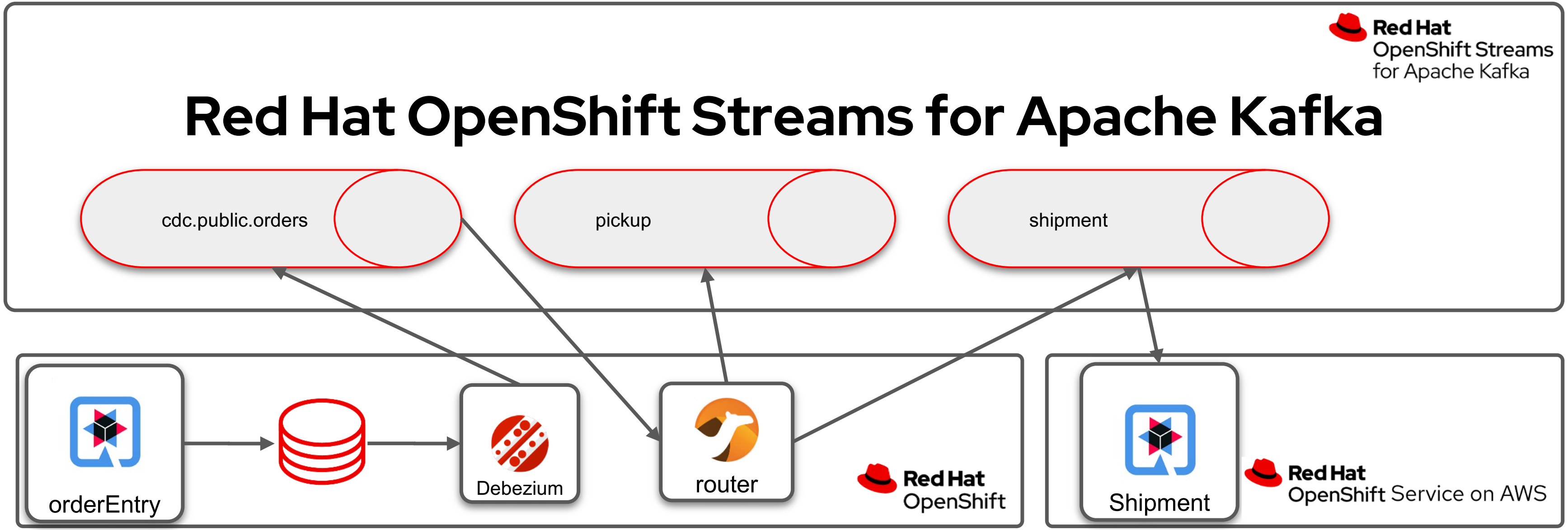
ROSA with STS

For Partner Deployment

Red Hat OpenShift Streams for Apache Kafka



Red Hat OpenShift Streams for Apache Kafka



Red Hat OpenShift Streams for Apache Kafka

cdc.public.orders

pickup

shipment

orderEntry

Debezium

router

Red Hat OpenShift

Shipment

Red Hat OpenShift Service on AWS

.. and **you**
enjoy sweet dreams

Recap and Benefits

- Overview of Red Hat Openshift Streams for Apache Kafka
- Overview of Red Hat Openshift Services on AWS with STS
- Create Change Data Capture platform

CUSTOMER BENEFITS

- Reduced operational costs
- Focus on Business Application
- Speed Up your business