Red Hat OpenShift Data Science

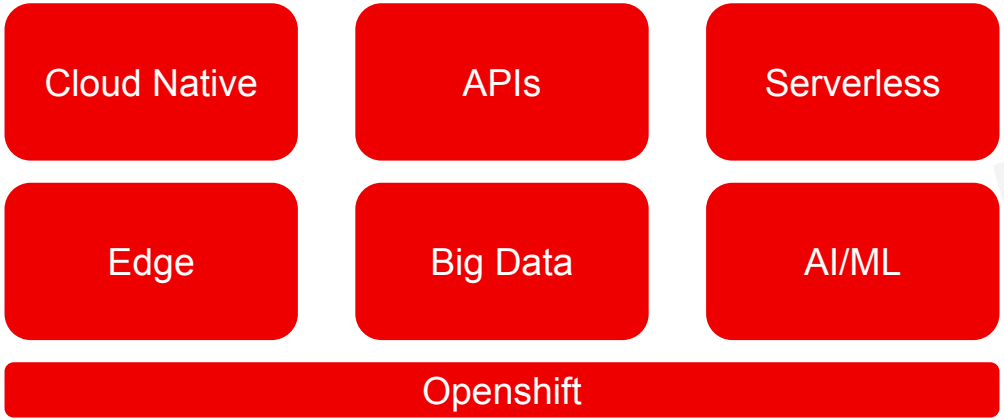
& Application Services

Eoin Crosbie
Technical Partner Enablement Manager

1. Why
2. What
3. Try
4. Application Services

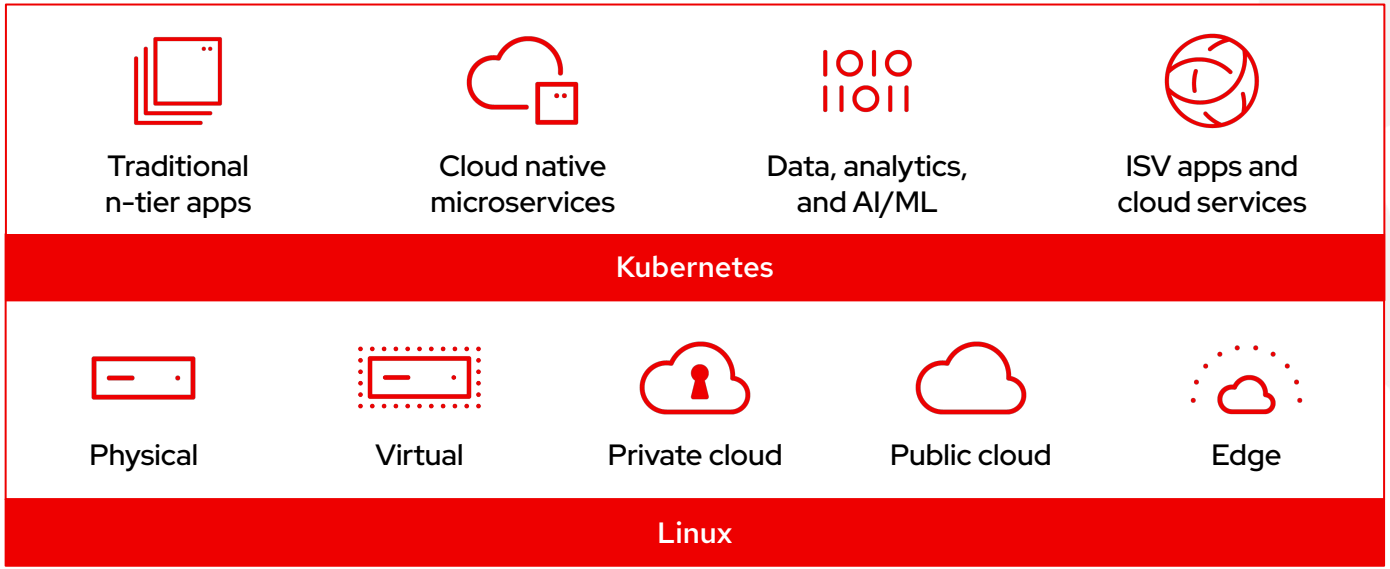
WHY


Cloud Native
APIs
Serverless
Edge
Big Data
AI/ML



Open hybrid cloud

Red Hat helps customers build, run, and manage applications everywhere

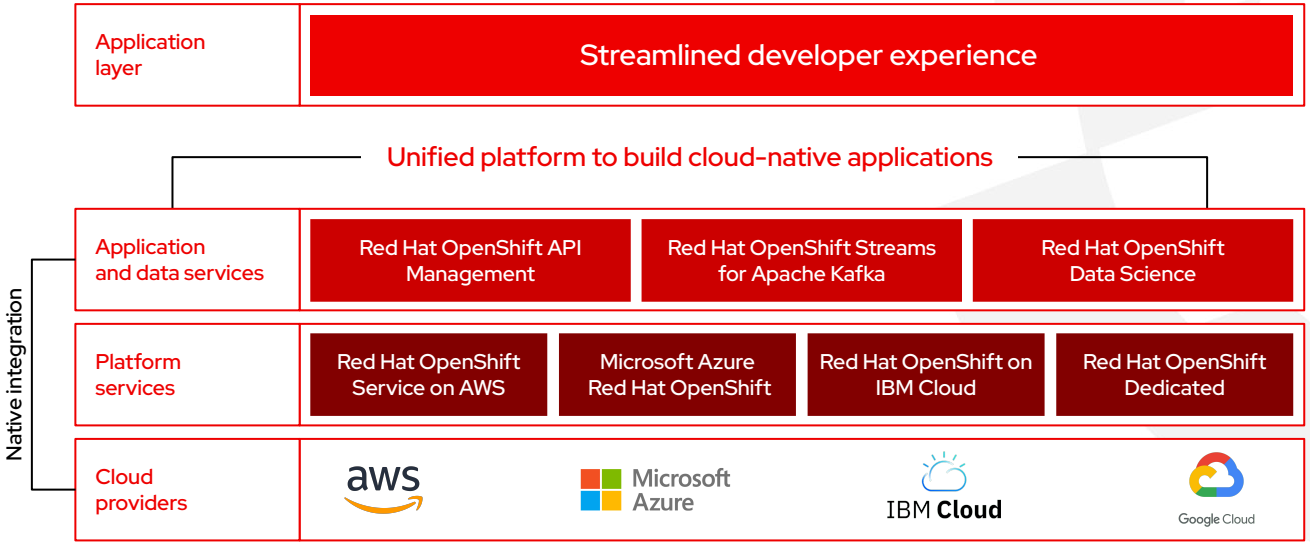


Red Hat managed cloud services

Full stack management and unified experience

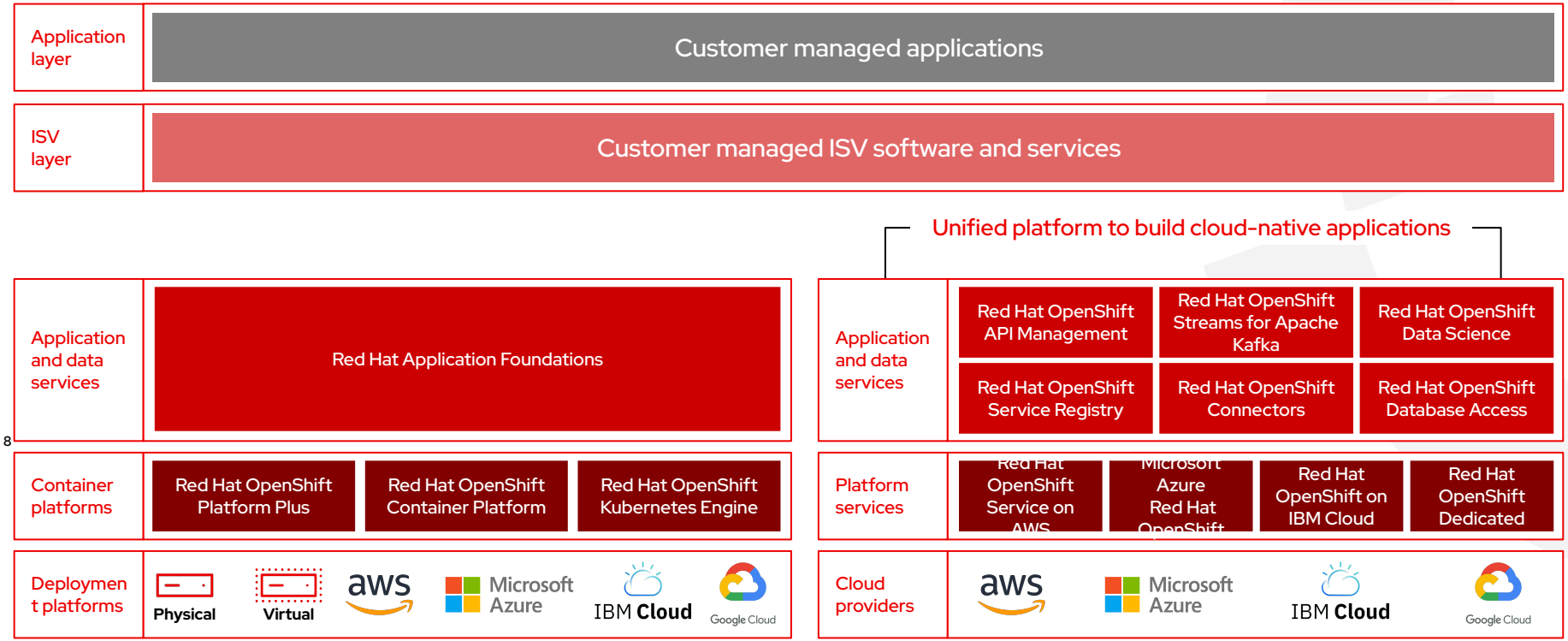
Maximize full value of Red Hat® OpenShift®

Hybrid cloud flexibility



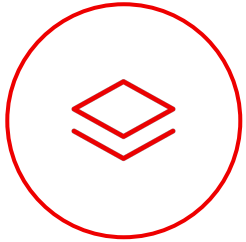
Red Hat OpenShift

Self and fully managed application development



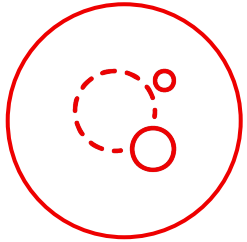
Red Hat OpenShift

Our approach to AI/ML



Hybrid cloud

Represents a workload requirement for our platforms across hybrid cloud.



Open source efficiency

Applicable to Red Hat's existing core business in order to increase open source development and production efficiency.

Intelligent platforms

Valuable as specific services and product capabilities, providing an intelligent platform experience.

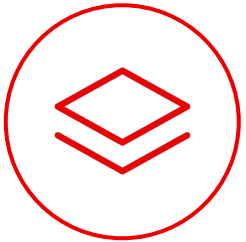
Intelligent apps

Lets customers build intelligent apps using Red Hat products and our broader partner ecosystem.

Data as the foundation

Depth and scale without lock-in

Capabilities delivered through the combination of Red Hat and partner ecosystem

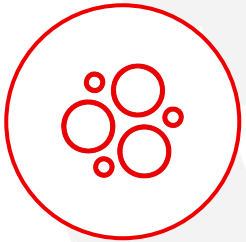


Managed cloud platform

Deployed on Red Hat OpenShift and managed on Amazon Web Services providing access to compute and accelerators based on your workload

Red Hat portfolio and services

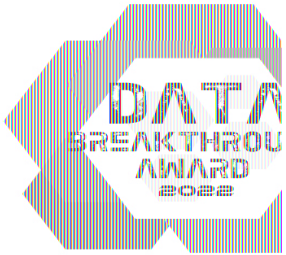
Complement common data science tools in Red Hat OpenShift Data Science with other Red Hat products and cloud services



Partner ecosystem

Access specialized capabilities by adding certified ISV ecosystem products and services from Red Hat Marketplace

... and now Red Hat is award winning for AI/ML



Red Hat OpenShift

MLOps
End-to-End Machine Learning Infrastructure

- OpenShift Data Science Named as the
- More than 150 Innovations and more

- Why Red Hat OpenShift Received the EMA Top 3 Award
- data science environment

WHAT

Conceptual machine learning architecture

Gather and prepare data	Develop model	Deploy models in an application	Model monitoring and management
Data storage Data lake Data exploration Data preparation Stream processing	ML notebooks ML libraries	Model lifecycle CI/CD	Monitor / alerts Model visualization Model drift

Hybrid, multi cloud platform with self service capabilities

Compute acceleration

Infrastructure

Key features of Red Hat OpenShift Data Science

Addressing AI/ML experimentation and integration use cases on a managed platform

Cloud Service

Available on Red Hat OpenShift Dedicated (AWS) and Red Hat OpenShift Service on AWS

Core data science workflow

Provides data scientists and intelligent application developers the ability to build, train, and deploy ML models

Increased capabilities/collaboration

Combines Red Hat components, open source software, and ISV certified software available on Red Hat Marketplace

Rapid experimentation use cases

Model outputs are hosted on the Red Hat OpenShift managed service or exported for integration into an intelligent application

Red Hat OpenShift Data Science

Tools and capabilities

Building on the foundations of data science

Jupyter notebooks

Conduct exploratory data science in JupyterLab with access to core AI / ML libraries and frameworks including TensorFlow and PyTorch.

Source-to-image (S2I)

Publish models as end points via S2I for integration into intelligent apps. Rebuild and redeploy based on changes to the source code.

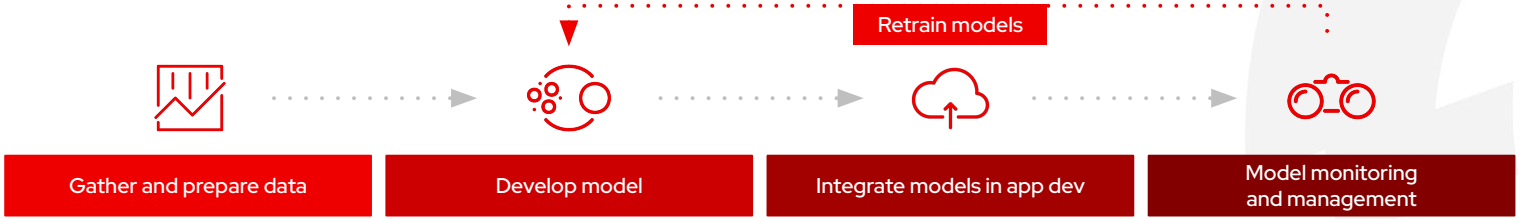
GPU Acceleration (post-initial release)

Accelerate your data science experiments through the use of GPU acceleration on the Red Hat OpenShift Dedicated platform.

Cloud service components

	Gather and prepare data	Develop model	Integrate models in app dev	Model monitoring and management
Customer managed ISV software	Pachyderm	Intel AI Analytics Toolkit	IBM Watson	intel OpenVINO
ISV managed cloud services	Starburst Galaxy	ANACONDA. COMMERCIAL EDITION		
Red Hat managed cloud services	Red Hat OpenShift Streams for Apache Kafka	Red Hat OpenShift Data Science: TensorFlow, jupyter, PyTorch, model serving	Source to image	Red Hat OpenShift API Management
Red Hat managed cloud platform	Open hybrid cloud platform with self service capabilities	Red Hat OpenShift Dedicated	Red Hat OpenShift Service on Amazon Web Services	
	Accelerators	NVIDIA.		
	Cloud infrastructure	powered by aws		

... and integrating our partner ecosystem



Customer managed ISV software

Customer managed applications

elastic, Microsoft, Pachyderm, crunchydata, mongoDB., PerceptiLabs, CLOUDERA, Intel AI Analytics Toolkit, $H_2O.ai$, redislabs, IBM Watson, SAS, C3.ai, OpenVINO, CognitiveScale, avanseus, cnvrg.io

ISV managed cloud services

Starburst Galaxy, ANACONDA. COMMERCIAL EDITION

Red Hat managed cloud services

Red Hat OpenShift Streams for Apache Kafka — Red Hat OpenShift Data Science — Red Hat OpenShift API Management

Red Hat managed cloud platform

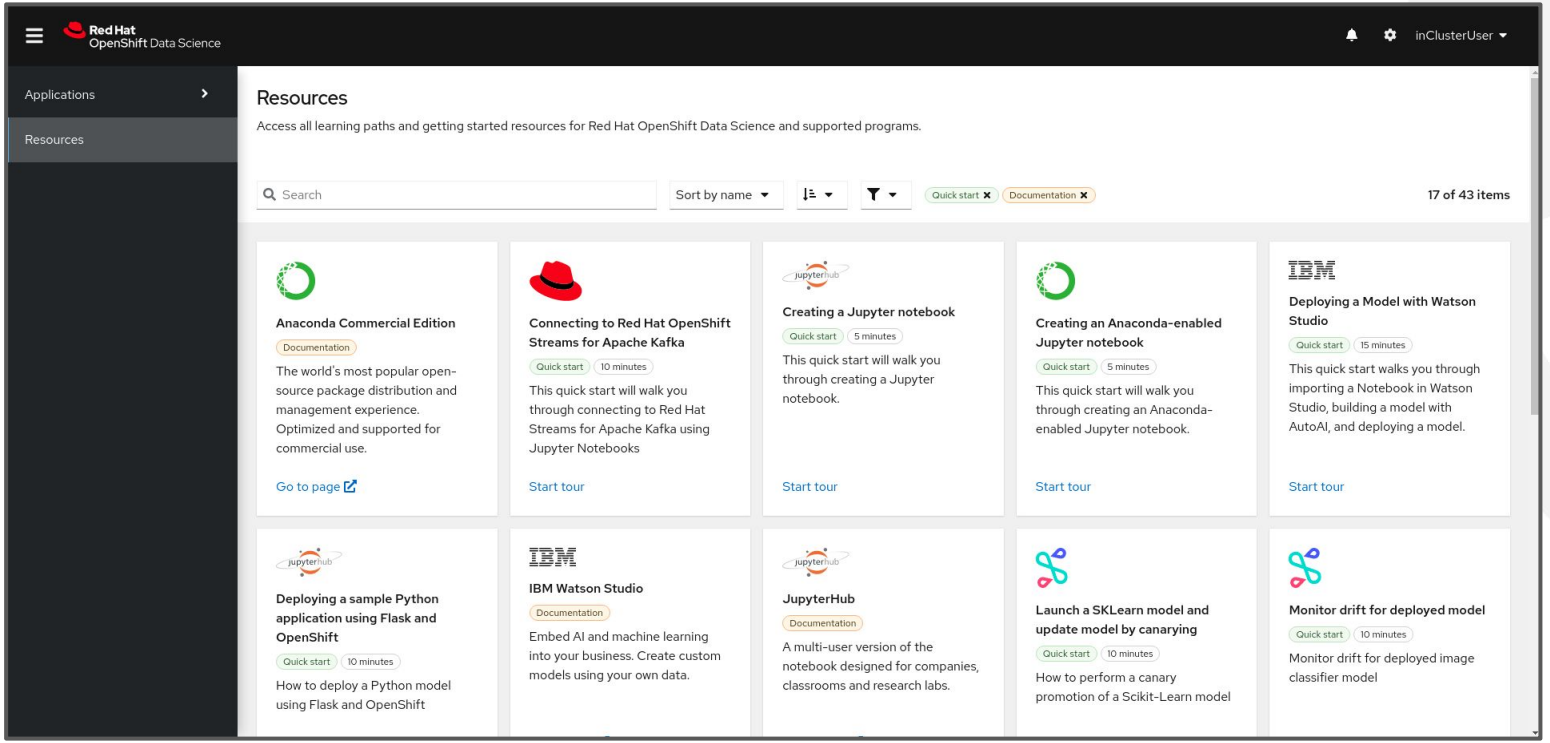
Open hybrid cloud platform with self service capabilities — Red Hat OpenShift Dedicated — Red Hat OpenShift Service on Amazon Web Services

Accelerators — NVIDIA.

Cloud infrastructure — powered by aws

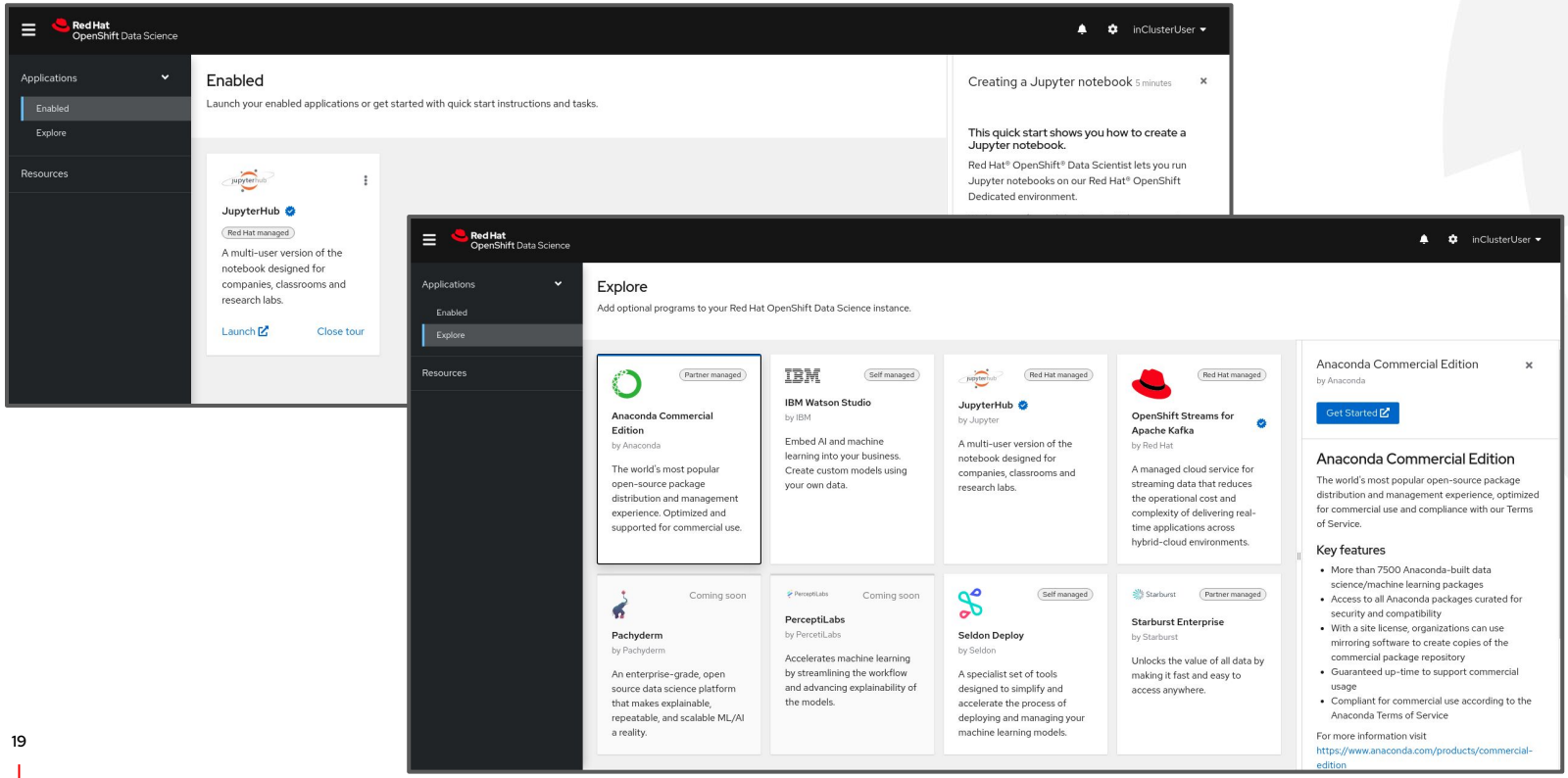
Red Hat OpenShift

Dashboard resources



Red Hat OpenShift

Dashboard user interface



Red Hat OpenShift

The Red Hat Marketplace difference

Any cloud. On-premise. Anywhere OpenShift runs.

Build once, deploy to any environment with software that allows for workload portability across clouds.

Certified enterprise software

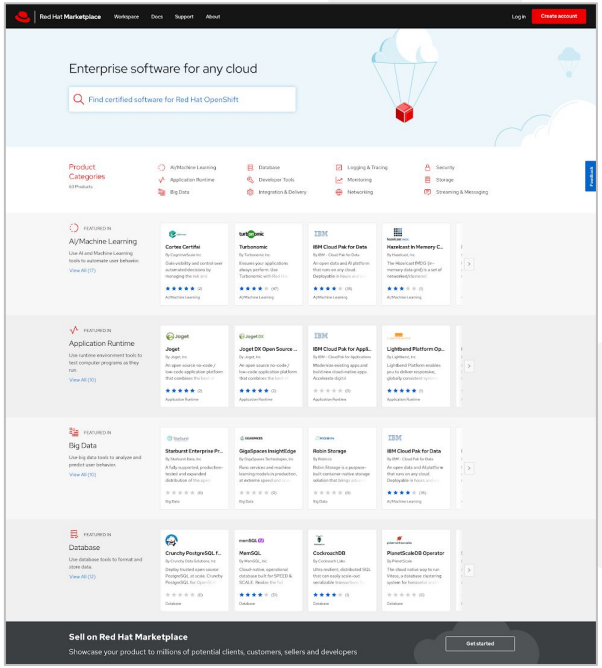
All software is certified for Red Hat OpenShift and uses Kubernetes operators for built-in management logic.

Continuous support

Central support portal offers a single point of entry for any software purchased in the marketplace.

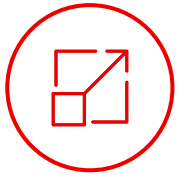
Consolidated usage tracking & spend optimization

Pool spending across clouds. Monitor license usage, expiration, and renewals on a single dashboard.



Red Hat OpenShift

How we differentiate versus alternatives



Hybrid cloud

Deploy models in containerized format for intelligent apps on-premise or in cloud

Fully managed cloud service

Management of entire Kubernetes stack, application services, and Jupyter-as-a-service

Open source innovation

Track changes and fixes to core open source AI/ML tooling and get access to upstream innovation

Partner ecosystem

Choice of over 30+ AI/ML technology partners as alternative to many monolithic frameworks

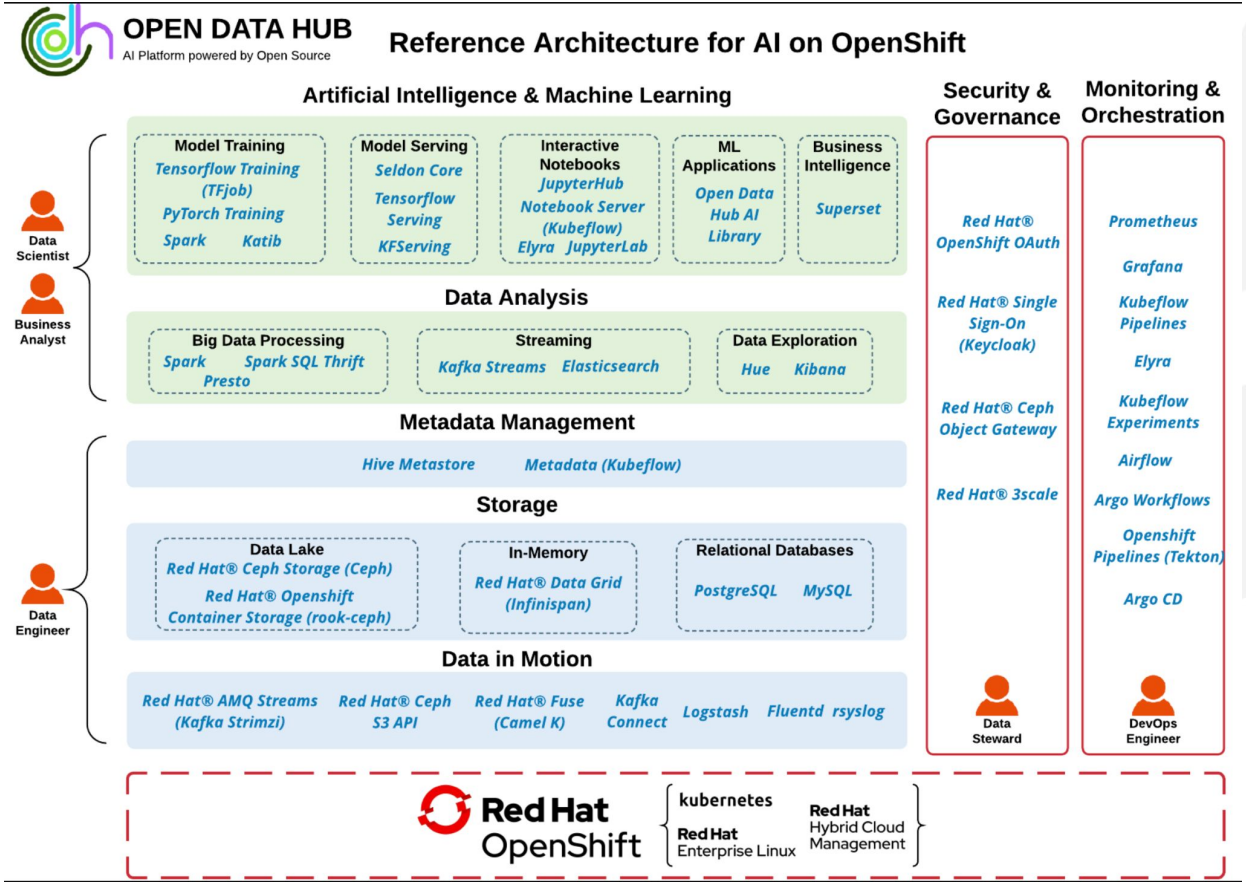
Red Hat OpenShift Data Science is HIPAA compliant

Ensure your cloud journey has the necessary privacy and security safeguards

Products that are HIPAA compliant are:

- Red Hat OpenShift Dedicated (AWS & GCP)
- Red Hat OpenShift Service on AWS
- Red Hat OpenShift API Management
- Red Hat OpenShift Streams for Apache Kafka
- Red Hat OpenShift Service Registry
- Red Hat OpenShift Data Science

Red Hat


OPEN DATA HUB
AI Platform powered by Open Source
Reference Architecture for AI on OpenShift
Artificial Intelligence & Machine Learning
Model Training
Tensorflow Training (TFjob)
PyTorch Training
Spark
Katib
Model Serving
Seldon Core
Tensorflow Serving
KFServing
Interactive Notebooks
JupyterHub
Notebook Server (Kubeflow)
Elyra
JupyterLab
ML Applications
Open Data Hub AI Library
Business Intelligence
Superset
Data Analysis
Big Data Processing
Spark
Spark SQL Thrift
Presto
Streaming
Kafka Streams
Elasticsearch
Data Exploration
Hue
Kibana
Metadata Management
Hive Metastore
Metadata (Kubeflow)
Storage
Data Lake
Red Hat® Ceph Storage (Ceph)
Red Hat® Openshift Container Storage (rook-ceph)
In-Memory
Red Hat® Data Grid (Infinispan)
Relational Databases
PostgreSQL
MySQL
Data in Motion
Red Hat® AMQ Streams (Kafka Strimzi)
Red Hat® Ceph S3 API
Red Hat® Fuse (Camel K)
Kafka Connect
Logstash
Fluentd
rsyslog
Data Scientist
Business Analyst
Data Engineer
Security & Governance
Red Hat® OpenShift OAuth
Red Hat® Single Sign-On (Keycloak)
Red Hat® Ceph Object Gateway
Red Hat® 3scale
Data Steward
Monitoring & Orchestration
Prometheus
Grafana
Kubeflow Pipelines
Elyra
Kubeflow Experiments
Airflow
Argo Workflows
Openshift Pipelines (Tekton)
Argo CD
DevOps Engineer
Red Hat OpenShift
kubernetes
Red Hat Enterprise Linux
Red Hat Hybrid Cloud Management

Timeline

Nov/Dec ‘22

Next

- MLOps
  - Model serving (ModelMesh + UI)
  - Initial model monitoring
- Model experimentation
  - Data science projects UI
- DataOps
  - Starburst managed service (field trial)
- Self-managed offering capabilities
  - Self-managed beta program
- Cloud service capabilities
  - GA for cloud service
  - AWS Marketplace support
  - GCP support
  - Consumption-based pricing model

1H’23

Future

- MLOps
  - Data science pipelines (Kubeflow Pipelines Tekton)
  - Enhance model serving & monitoring
- Model experimentation
  - Support VS Code
  - R support
  - Model explainability
  - Enhance collaboration capabilities
- Self-managed offering capabilities
  - GA for self-managed offering
  - Disconnected support
- Cloud service capabilities
  - ARO support
- Security
  - ISO, SOC 2

This is an uncommitted roadmap and Red Hat reserves the right to change it.

TRY

- Dev Sandbox

  https://developers.redhat.com/products/red-hat-openshift-data-science/overview

- License Plate Detection

  https://redhat-scholars.github.io/rhods-lp-workshop/rhods-lp-workshop/index.html

Red Hat
OpenShift
Data Science

Partner-Led Workshop Event

AI/ML consulting services portfolio

A modular approach to customer implementations

Open AI/ML platform
- 4-8 weeks

MLOps Foundation
- 6-12 weeks

Intelligent application development pilot
- 6-12 weeks

Data engineering pilot
- 6-12 weeks

Red Hat OpenShift Data Science

Learn more ▸

Contact us ▸

BOSTON UNIVERSITY

- **Implemented interactive lecture and lab environment** for computer scientists and engineers based on Red Hat OpenShift Data Science
- **Currently over 300 users** including over 100 concurrent
- **Integrates with the Boston University online textbook material,** also authored using the Red Hat OpenShift Data Science
- **Fast time to solution:** cloud services environment enabled BU to configure and deploy in December for classes that started in January
- **Lowers cost:** auto-scales based on demand; enables bursty interactive use cases at optimized cost

Application Services

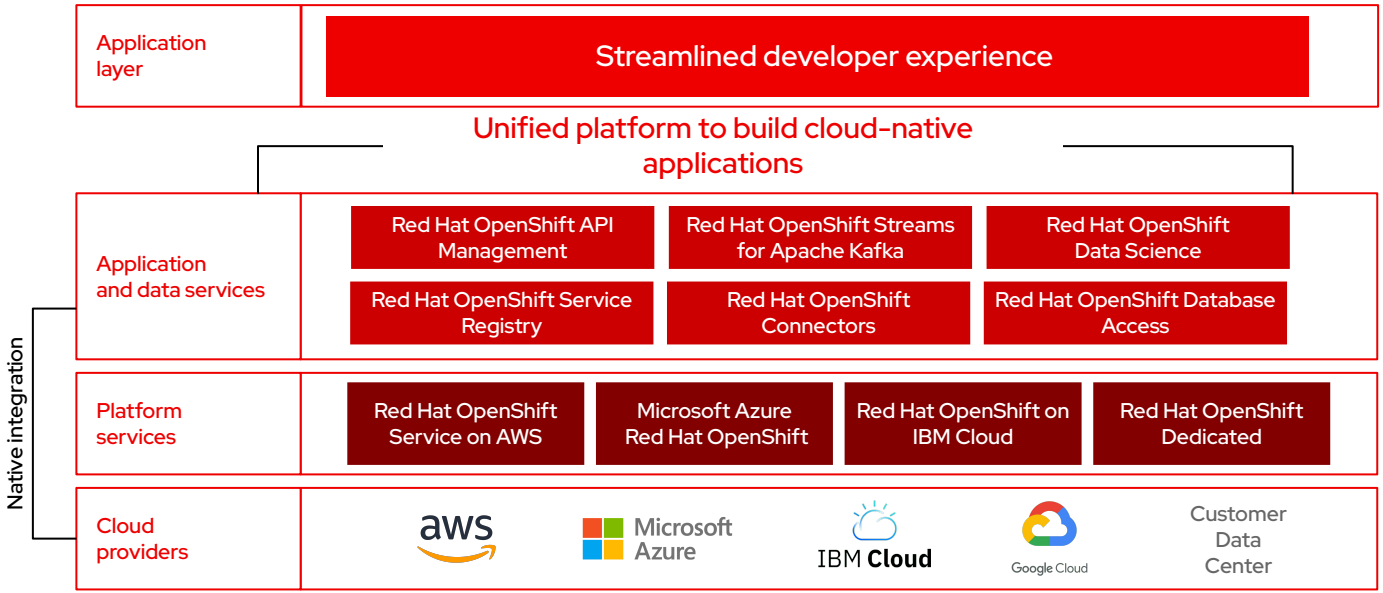
Red Hat Cloud Services

Managed OpenShift + Application Services + Data Services

Full stack management and unified experience

Maximize full value of Red Hat OpenShift

Hybrid cloud flexibility



Red Hat

Red Hat OpenShift Data & Application Services

App & data services

- Red Hat OpenShift API Management
- Red Hat OpenShift Streams for Apache Kafka
- Red Hat OpenShift Data Science
- Red Hat OpenShift Connectors
- Red Hat OpenShift Database Access
- Red Hat OpenShift Service Registry
- Red Hat OpenShift Smart Events
- Red Hat OpenShift API Designer

Native integration with OpenShift

Cloud providers support

Hyperscalers Marketplaces integration

Streamlined dev experience

Coming soon | GA | Service Preview

Red Hat

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Red Hat

Red Hat OpenShift Streams for Apache Kafka

is a fully hosted and managed Kafka service for stream-based applications

that reduces the operational cost and complexity of delivering real-time applications across hybrid-cloud environments

Let your customers try it!

RHOSAK 48 hour trial

- 48 hour trial, unlimited number of trials
- Extended trials available with approval
- Close partnership with BU to ensure success

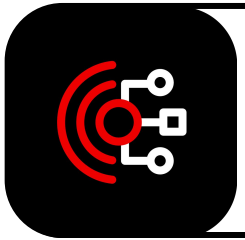
Red Hat OpenShift API Management

Hosted and managed API management service for managed OpenShift

that accelerates time to value and reduces the operational cost of delivering API-first, microservices-based applications.

Try RHOAM on the sandbox and promote our free tier!

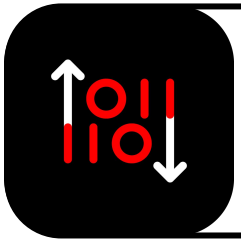
Free tier is included in OSD/AWS and ROSA SKUs



100k API calls/day
Full production support
99.95% SLA

- No expiration date
- Customer has to pay for additional nodes
- Customers exceeding the number of calls/day should move to the next paid tier.

RHOAM in the Developer Sandbox



TRY IT TODAY!

Sandbox activity for RHOAM

- 30 days no-cost trial environment
- Access to fully managed OpenShift cluster, API Manager and API-Gateway

Red Hat

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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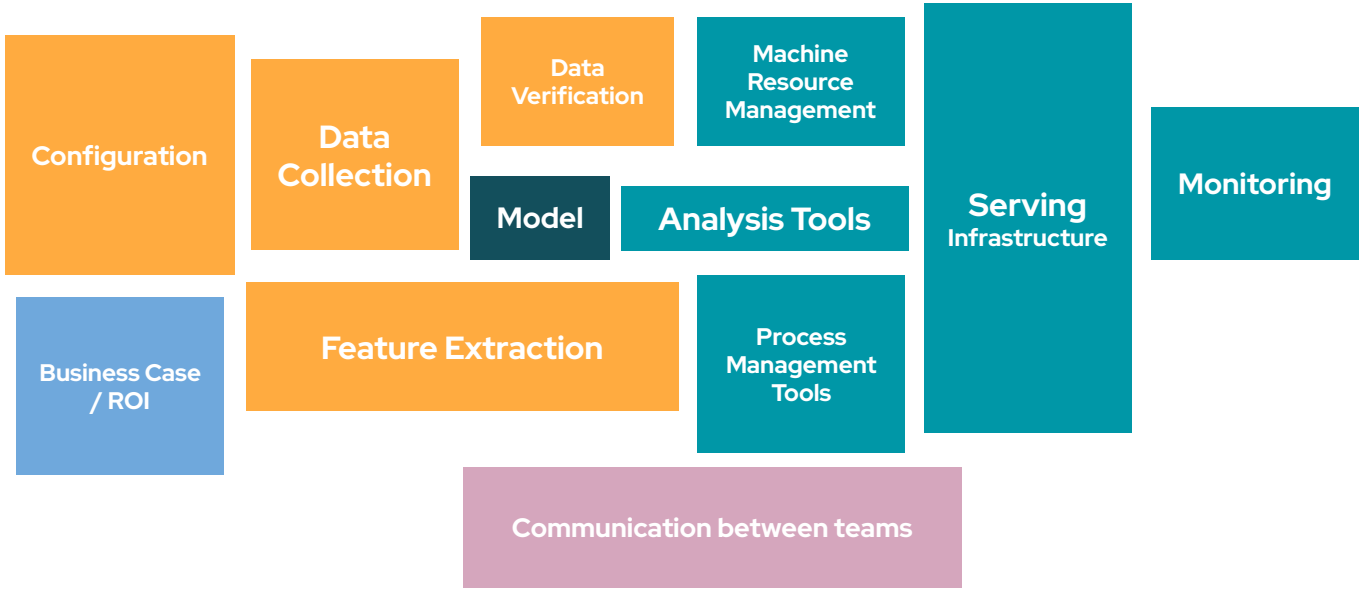
Red Hat

The surrounding **infrastructure platform** and **processes** to support ML models are complex



Hidden Technical Debt in Machine Learning Systems, Google Inc.