



Red Hat
OpenShift
Data Science

Introduction to Red Hat OpenShift Data Science

Cloud service for artificial intelligence
/machine learning (AI/ML) use cases

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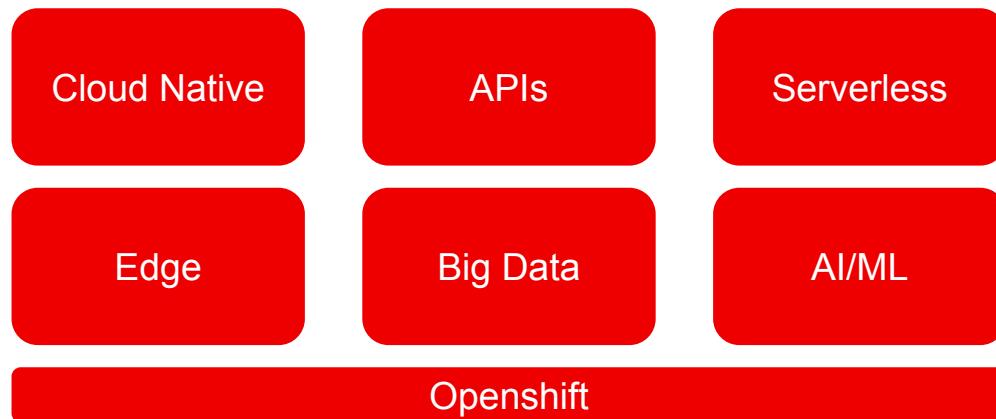
1. Why

2. What

3. Try

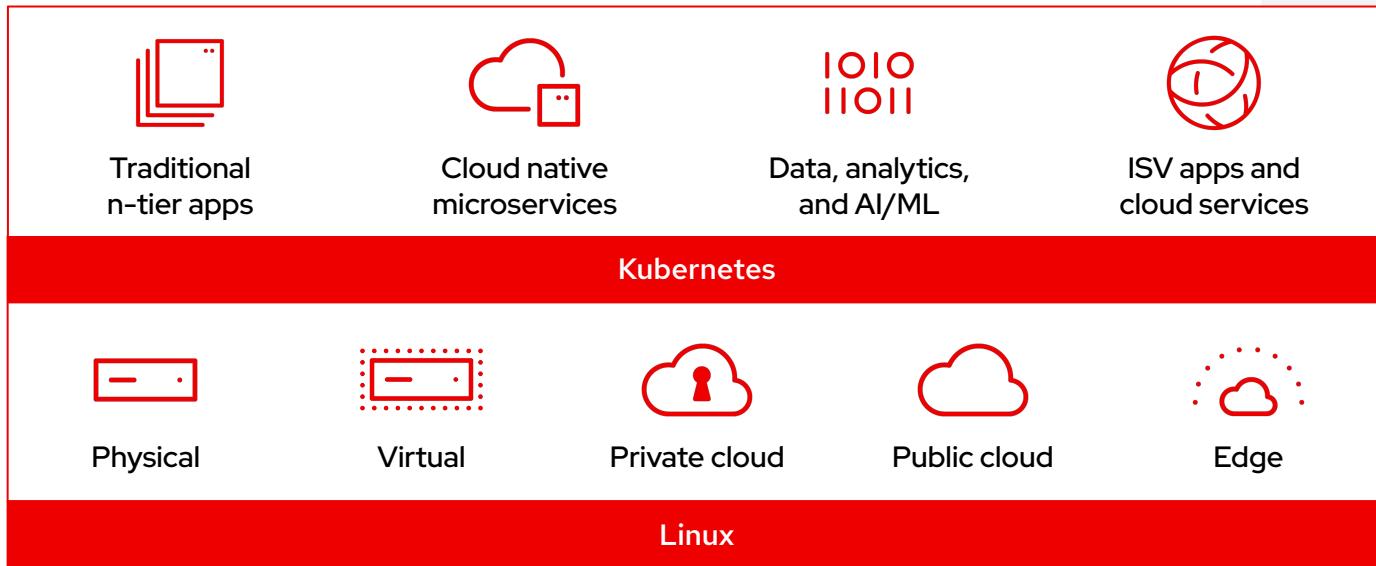
WHY





Open hybrid cloud

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



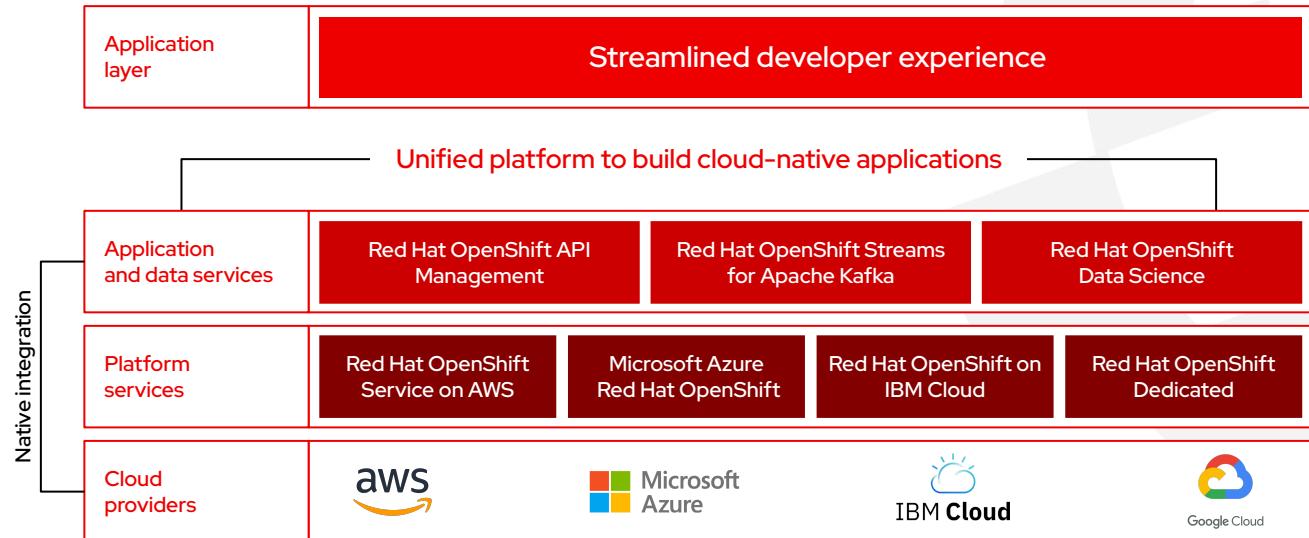
Red Hat managed cloud services



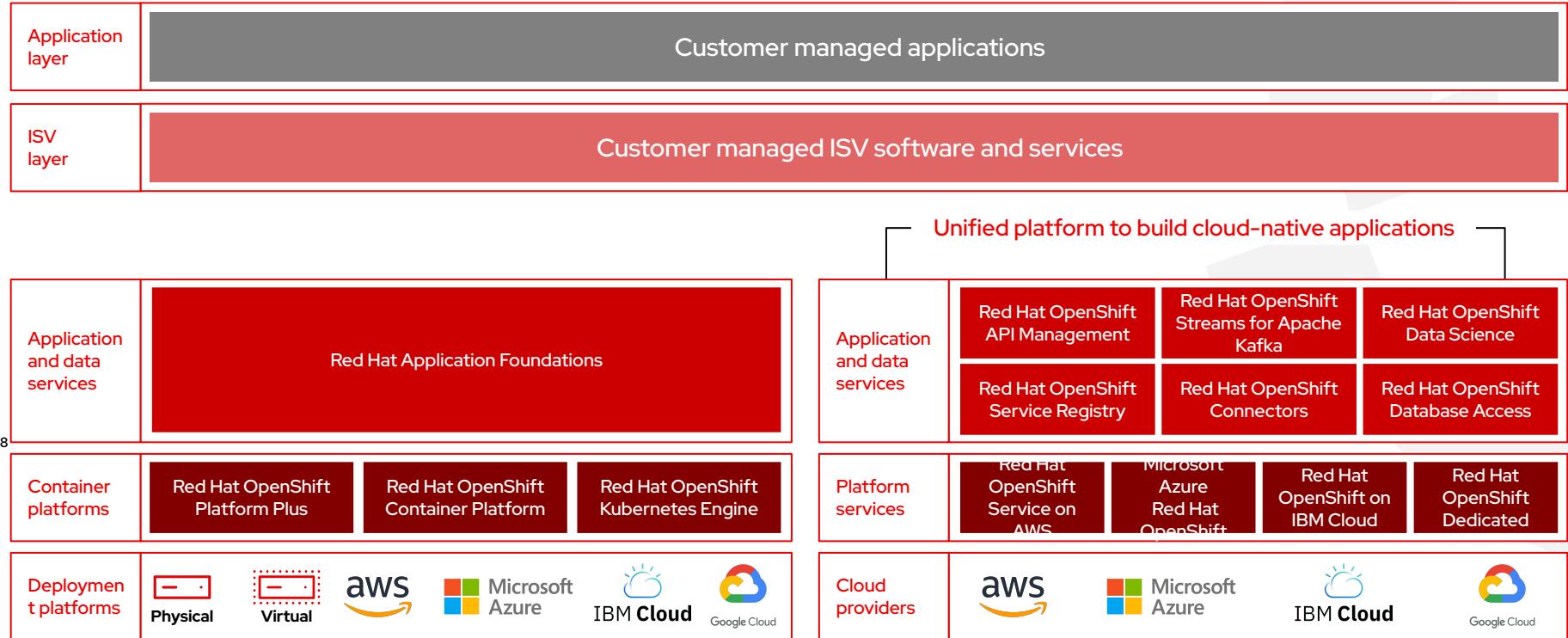
**Full stack management
and unified experience**



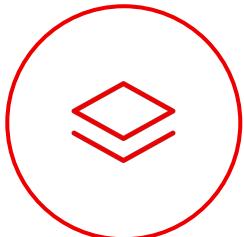
**Maximize full value of
Red Hat® OpenShift®**



Self and fully managed application development

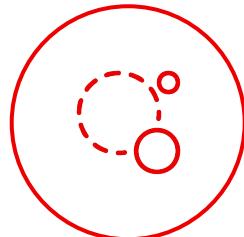


Our approach to AI/ML



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.

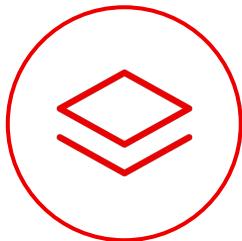
IOIO
IIIOII

Data as the foundation

IOIO
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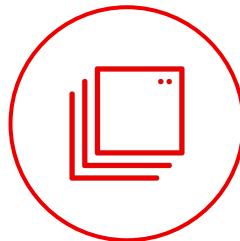
Depth and scale without lock-in

Capabilities delivered through the combination of Red Hat and partner ecosystem



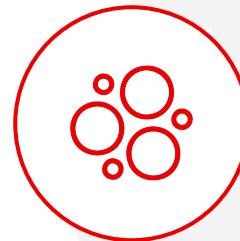
Managed cloud platform

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

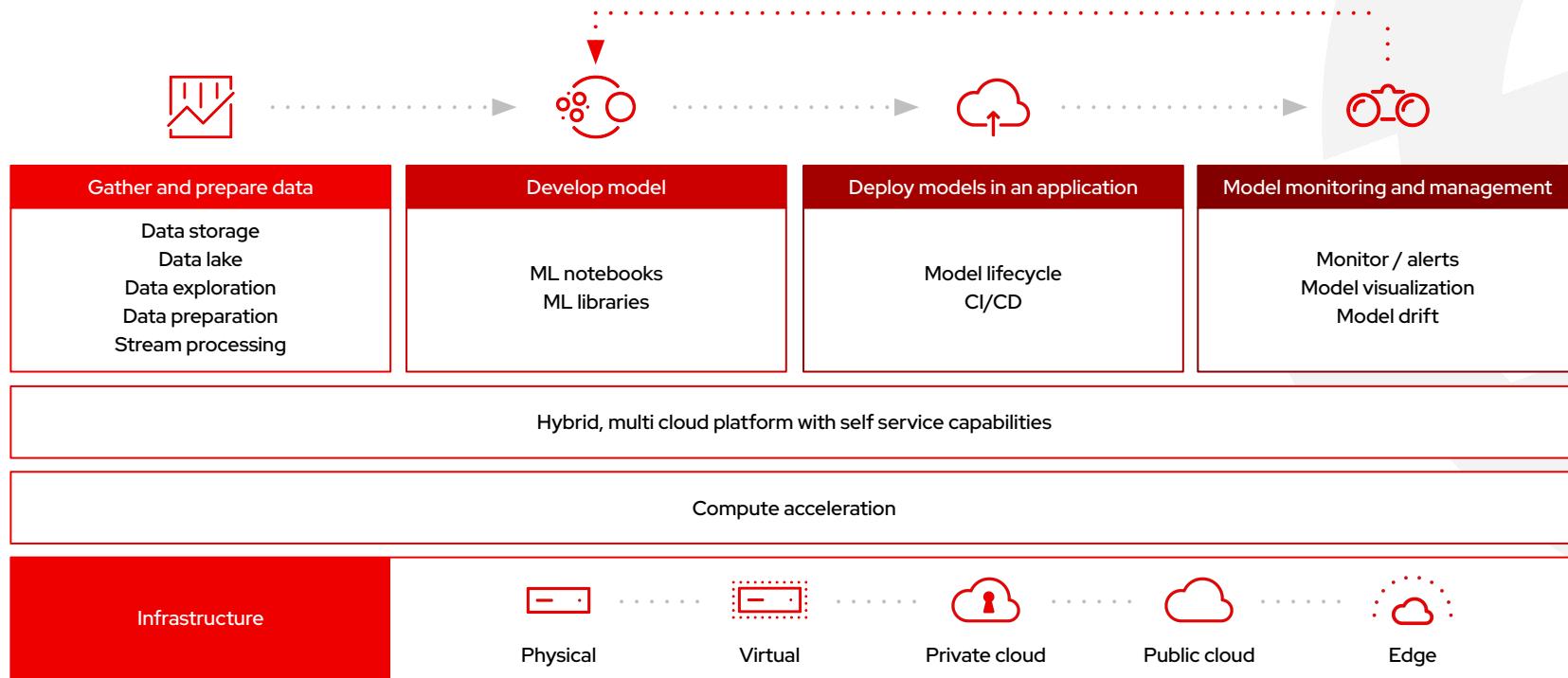
End-to-End Machine Learning Infrastructure

- ▶ **OpenShift Data Science selected as the winner of the DATA BREAKTHROUGH AWARD**

- ▶ **Why Red Hat OpenShift Received the eMA Top 3 Award for MLOps**

WHAT

Conceptual machine learning architecture



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)

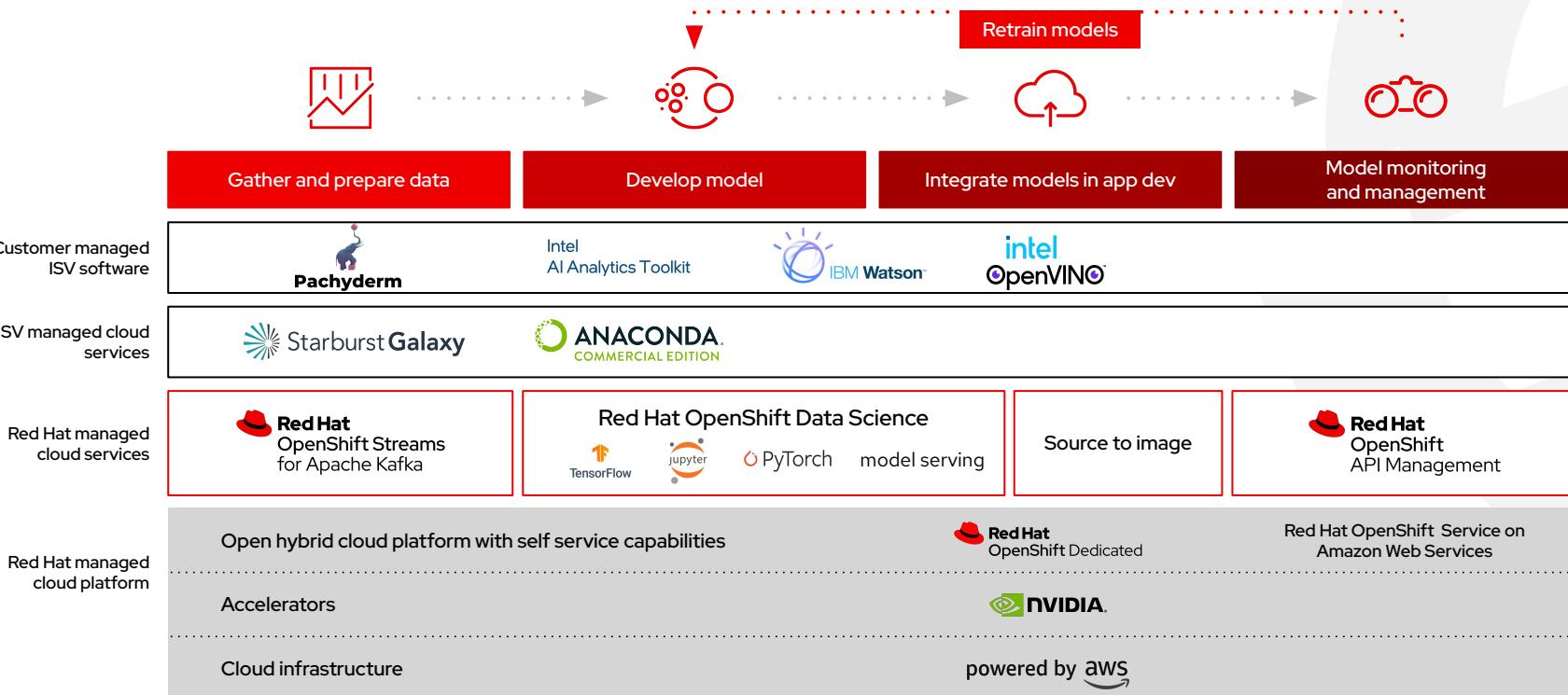
Publish models as end points via S2I for integration into intelligent apps. Rebuild and redeploy based on changes to the source code.



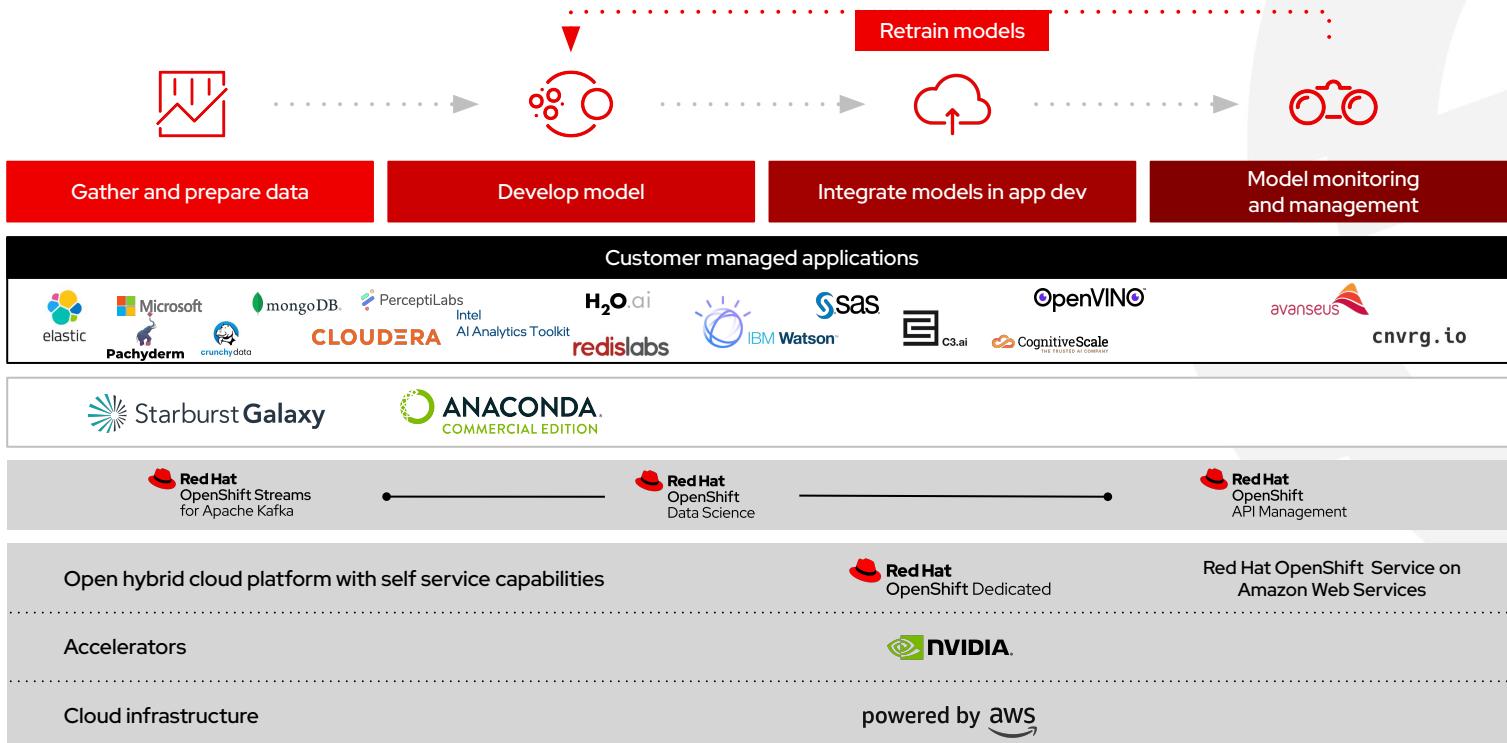
GPU Acceleration (post-initial release)

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

Cloud service components



... and integrating our partner ecosystem



Dashboard resources

The screenshot shows the Red Hat OpenShift Data Science dashboard under the 'Resources' tab. The page title is 'Resources' and the subtitle is 'Access all learning paths and getting started resources for Red Hat OpenShift Data Science and supported programs.' A search bar, sorting options, and filter buttons for 'Quick start' and 'Documentation' are at the top. The main area displays 17 of 43 items in a grid:

Icon	Title	Description	Quick Start	Documentation
	Anaconda Commercial Edition	The world's most popular open-source package distribution and management experience. Optimized and supported for commercial use.	Go to page	Documentation
	Connecting to Red Hat OpenShift Streams for Apache Kafka	This quick start will walk you through connecting to Red Hat Streams for Apache Kafka using Jupyter Notebooks.	Start tour	Quick start (10 minutes)
	Creating a Jupyter notebook	This quick start will walk you through creating a Jupyter notebook.	Start tour	Quick start (5 minutes)
	Creating an Anaconda-enabled Jupyter notebook	This quick start will walk you through creating an Anaconda-enabled Jupyter notebook.	Start tour	Quick start (5 minutes)
	Deploying a Model with Watson Studio	This quick start walks you through importing a Notebook in Watson Studio, building a model with AutoAI, and deploying a model.	Start tour	Quick start (15 minutes)
	Deploying a sample Python application using Flask and OpenShift	How to deploy a Python model using Flask and OpenShift	Start tour	Quick start (10 minutes)
	IBM Watson Studio	Embed AI and machine learning into your business. Create custom models using your own data.	Start tour	Documentation
	JupyterHub	A multi-user version of the notebook designed for companies, classrooms and research labs.	Start tour	Documentation
	Launch a SKLearn model and update model by canarying	How to perform a canary promotion of a Scikit-Learn model	Start tour	Quick start (10 minutes)
	Monitor drift for deployed model	Monitor drift for deployed image classifier model	Start tour	Quick start (10 minutes)

Dashboard user interface

The screenshot displays two main sections of the Red Hat OpenShift Data Science dashboard:

- Enabled:** Shows the JupyterHub application, which is Red Hat managed. It's described as a multi-user version of the notebook designed for companies, classrooms, and research labs. Buttons for "Launch" and "Close tour" are present.
- Explore:** Shows various optional programs for the instance, including:
 - Anaconda Commercial Edition (Partner managed) - The world's most popular open-source package distribution and management experience. Optimized and supported for commercial use.
 - IBM Watson Studio (Self managed) - Embed AI and machine learning into your business. Create custom models using your own data.
 - JupyterHub (Red Hat managed) - A multi-user version of the notebook designed for companies, classrooms and research labs.
 - OpenShift Streams for Apache Kafka (Red Hat managed) - A managed cloud service for streaming data that reduces the operational cost and complexity of delivering real-time applications across hybrid-cloud environments.
 - Pachyderm (Coming soon) - An enterprise-grade, open source data science platform that makes explainable, repeatable, and scalable ML/AI a reality.
 - PerceptLabs (Coming soon) - Accelerates machine learning by streamlining the workflow and advancing explainability of the models.
 - Seldon Deploy (Self managed) - A specialist set of tools designed to simplify and accelerate the process of deploying and managing your machine learning models.
 - Starburst Enterprise (Partner managed) - Unlocks the value of all data by making it fast and easy to access anywhere.

A modal window titled "Creating a Jupyter notebook" is open, providing quick start instructions for creating a Jupyter notebook. It states: "This quick start shows you how to create a Jupyter notebook. Red Hat® OpenShift® Data Scientist lets you run Jupyter notebooks on our Red Hat® OpenShift Dedicated environment."

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.

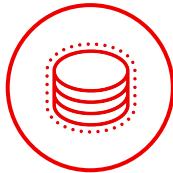
The screenshot shows the Red Hat Marketplace homepage. At the top, there's a search bar with the placeholder "Find certified software for Red Hat OpenShift". Below the search bar, there are several categories: Product Categories (General), AI/Machine Learning (TensorFlow, PyTorch, etc.), Application Runtime (Java, Node.js, Python, etc.), Database (MySQL, PostgreSQL, Oracle, etc.), Developer Tools (IntelliJ IDEA, Eclipse, etc.), Integration & Delivery (Apache Kafka, Apache Flink, etc.), Logging & Tracing (Logstash, Fluentd, etc.), Monitoring (CloudWatch Metrics, CloudWatch Metrics Insights, etc.), Networking (Apache ZooKeeper, Apache Kafka Connect, etc.), Security (AWS Lambda, AWS Step Functions, etc.), Storage (Amazon S3, Amazon EBS, etc.), and Streaming & Messaging (Apache Kafka, Apache Flink, etc.). The main content area displays featured products under these categories, such as "AI/Machine Learning" (TensorFlow, PyTorch, etc.), "Application Runtime" (Java, Node.js, Python, etc.), "Database" (MySQL, PostgreSQL, Oracle, etc.), "Developer Tools" (IntelliJ IDEA, Eclipse, etc.), "Integration & Delivery" (Apache Kafka, Apache Flink, etc.), "Logging & Tracing" (Logstash, Fluentd, etc.), "Monitoring" (CloudWatch Metrics, CloudWatch Metrics Insights, etc.), "Networking" (Apache ZooKeeper, Apache Kafka Connect, etc.), "Security" (AWS Lambda, AWS Step Functions, etc.), "Storage" (Amazon S3, Amazon EBS, etc.), and "Streaming & Messaging" (Apache Kafka, Apache Flink, etc.). Each product listing includes a brief description, a star rating, and a "View All" link. At the bottom of the page, there's a banner with the text "Sell on Red Hat Marketplace" and "Showcase your product to millions of potential clients, customers, sellers and developers".

How we differentiate versus alternatives



Hybrid cloud

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



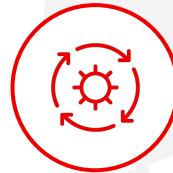
Fully managed cloud service

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

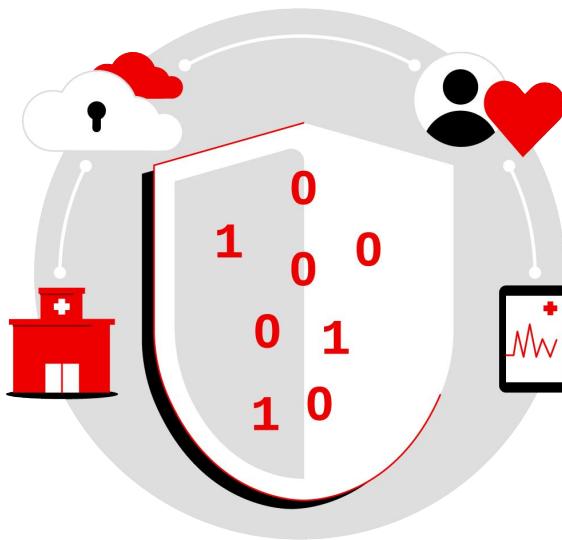


Partner ecosystem

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

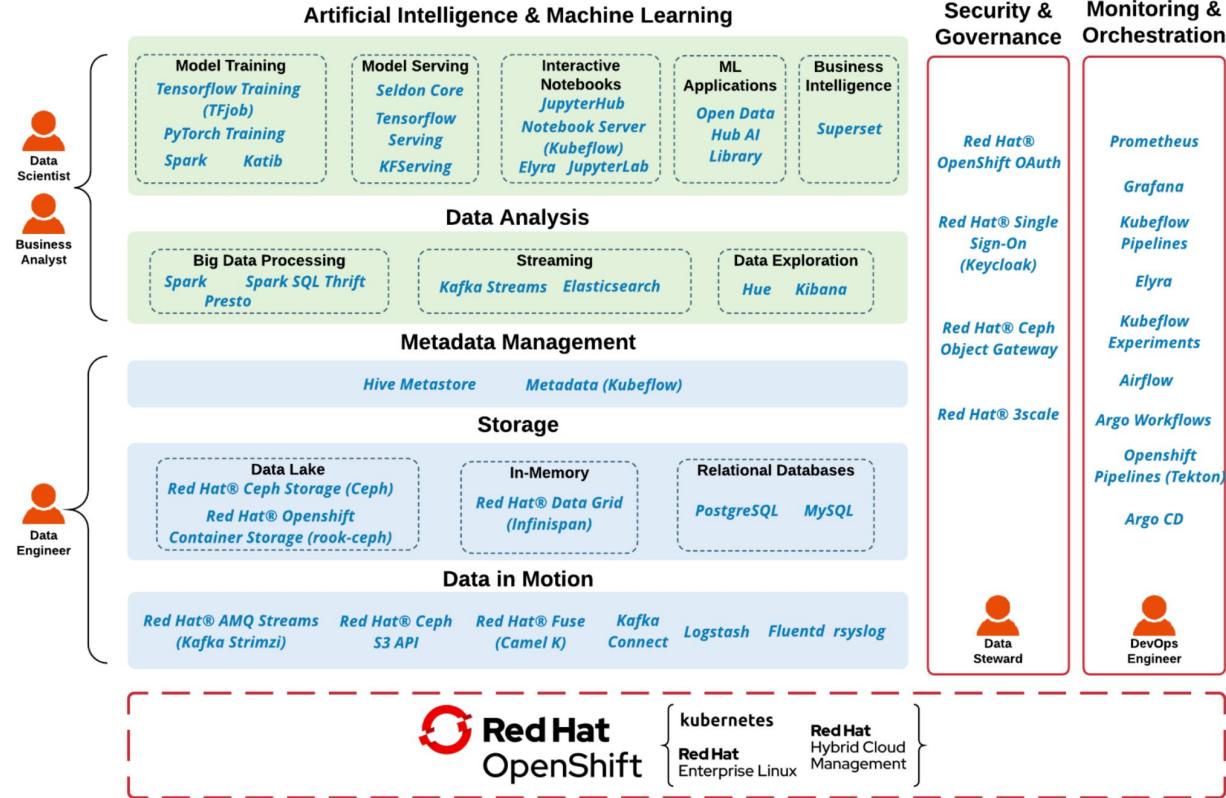


Products that are HIPAA compliant are:

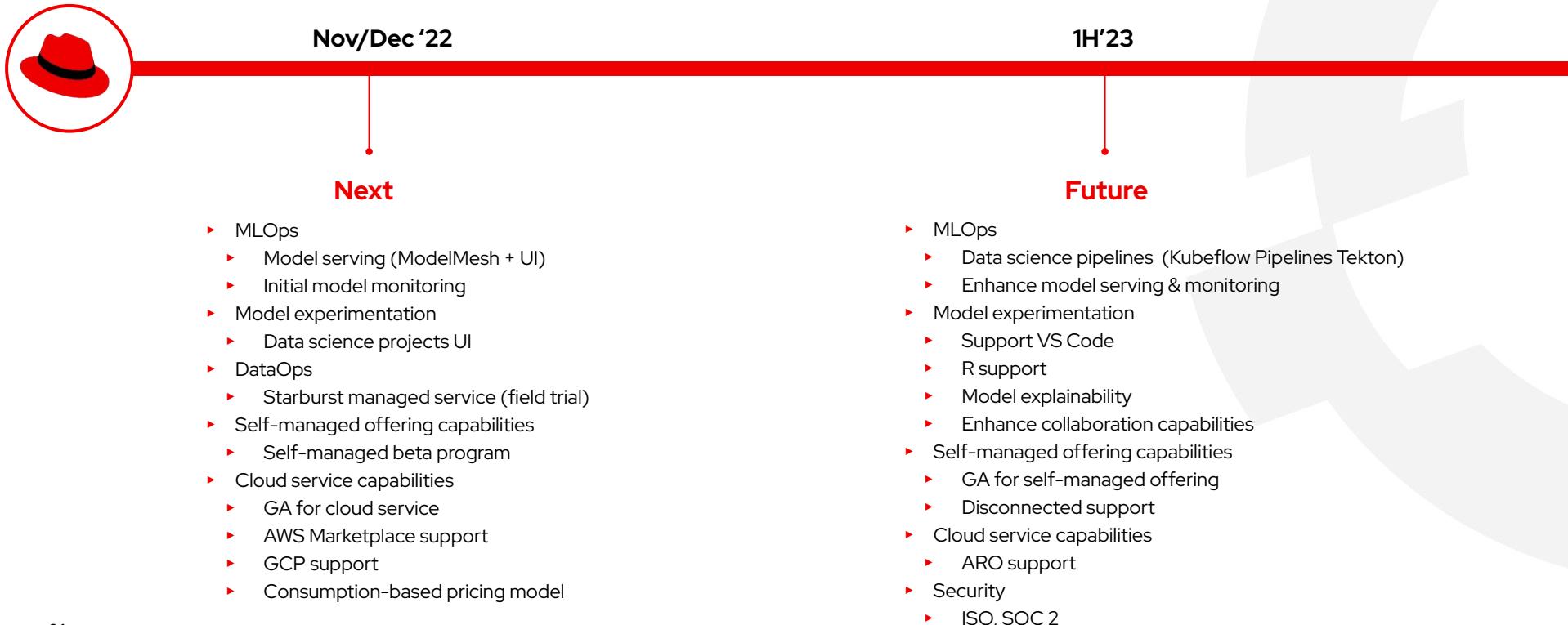
- ▶ Red Hat OpenShift Dedicated (AWS & GCP)
- ▶ Red Hat OpenShift Service on AWS
- ▶ Red Hat OpenShift API Management
- ▶ Red Hat OpenShift Streams for Apache Kafka
- ▶ Red Hat OpenShift Service Registry
- ▶ Red Hat OpenShift Data Science



Reference Architecture for AI on OpenShift



Timeline



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



- ▶ **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



Red Hat OpenShift Data Science



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[Contact us ▶](#)

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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