

Paving the Golden Path for your developers with backstage.io and an Internal Development Platform (IDP)

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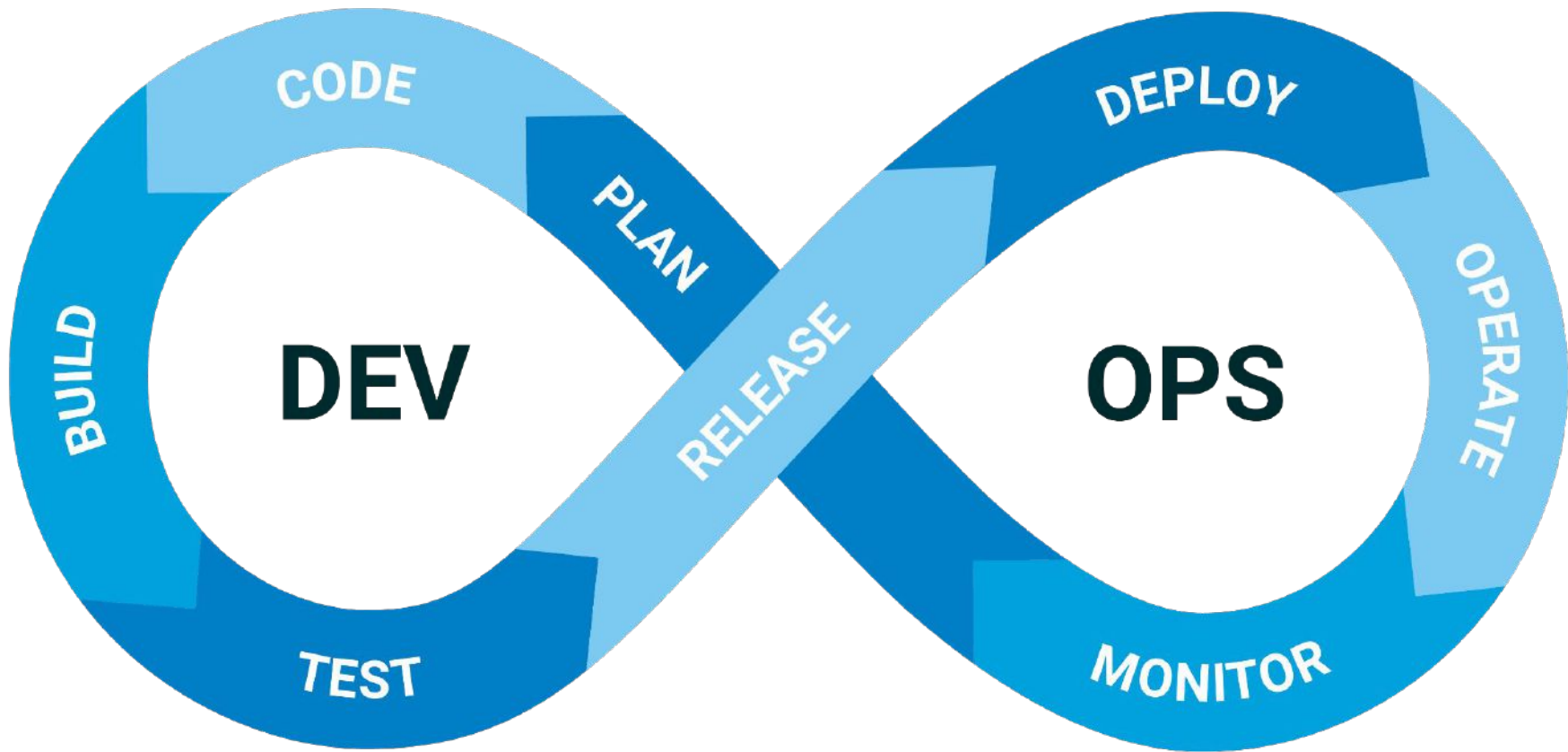
Agenda

- ▶ What is an IDP and Golden Path?
- ▶ How do you create an IDP with OpenShift?
- ▶ Demo - Red Hat Developer Hub
- ▶ Summary & what's next







In the new world,
it is not the big fish
which eats the
small fish, it's the
fast fish which
eats the slow fish

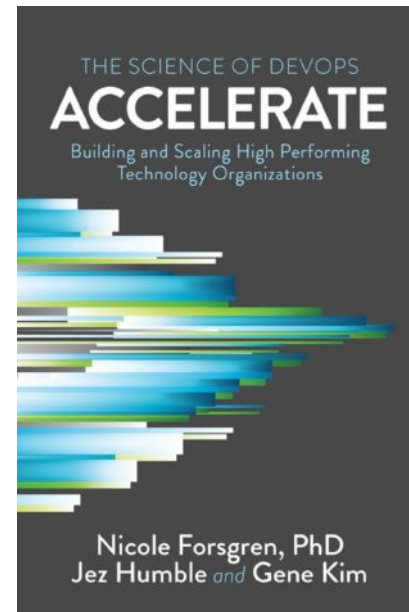
Klaus Schwab
Founder and Executive Chairman
World Economic Forum



Drivers and Metrics Driven Transformation (DORA)

DevOps Research and Assessments Metrics

	 LEAD TIME FOR CHANGE	 DEPLOYMENT FREQUENCY	 MEAN TIME TO RECOVERY (MTTR)	 CHANGE FAILURE RATE*
	Measures of MARKET AGILITY		Measures of RELIABILITY	
WHAT	Time from code committed to deployed to production	Proxy for batch size, how often does an app deploy to production	How long it takes systems to recover from failures in production	Percentage of deployments requiring rollback and/or fixes
WHY	Shorter is better. Enables faster feedback cycles and makes you better able to adjust to the marketplace	Indicator of batch size. Smaller batch size leads to more market agility	Critical to ensure that we aren't speeding up delivery at the expense of negative customer impacts	*Secondary indicator of stability



DORA (DevOps Research and Assessment)

The great DevOps Burnout and Cognitive overload



- ▶ **83%** percent of surveyed developers reported feelings of burnout from high workloads, inefficient processes, and unclear goals and targets
- ▶ **26%** of participants reported working solely on product development, whereas **74%** reported working on operations tasks in some capacity

A day in the life of a Developer

Meet Björn our new Software Developer



Onboarding Challenges:

- Where is the documentation?
- What framework should be used to implement the application?
- What version of the framework?
- Which branch of the code should I use?
- What technology stack should I use for CI/CD, logging ... etc.?
- How to stay compliant with organizational standards and security procedures?
- I want to provision an environment and start coding. I've created a ticket but its taking forever!
- ...
- ...

Internal Developer Platform (IDP) & Golden Path

- ▶ An IDP is built by a **platform team** to enable developer **self-service**
- ▶ Consists of many different technologies and tools **integrated** together
- ▶ Designed to **lower cognitive load** on developers without abstracting away context and underlying technologies
- ▶ Is build, **constantly improved** and maintained following product management principles
- ▶ A Golden Path is an **opinionated and supported** path to build 'something' (e.g. backend service, website, data pipeline)



“Platforms are means of centralizing expertise while decentralizing innovation to the customer or user”

Peter Gillard-Moss, Thoughtworks



Pillars of an Internal Development Platform (IDP)

All four pillars must be designed for to achieve excellence.

Onboarding

This includes all the task that a developer needs to do to get his/her team, application, component on the platform

This is the first impression that a developer gets of the platform, usually a leading indicator of the rest of the experience.

Code Time

This includes setting up the coding workstation and the inner loop

A quick workstation setup and fast and reliable inner loop both improve the developer productivity

Build Time

This is basically the ci/cd process that promotes code to production

A reliable and comprehensive ci/cd process is one of the most important factors in team productivity and application reliability.

Run Time

This includes the creation of the infrastructure to run the app and all of the post-production processes (monitoring, incident management)

A self-serviceable and observable infrastructure is what team need to be fully autonomous.



How do you create an IDP with OpenShift?

Two ways to build a successful platform

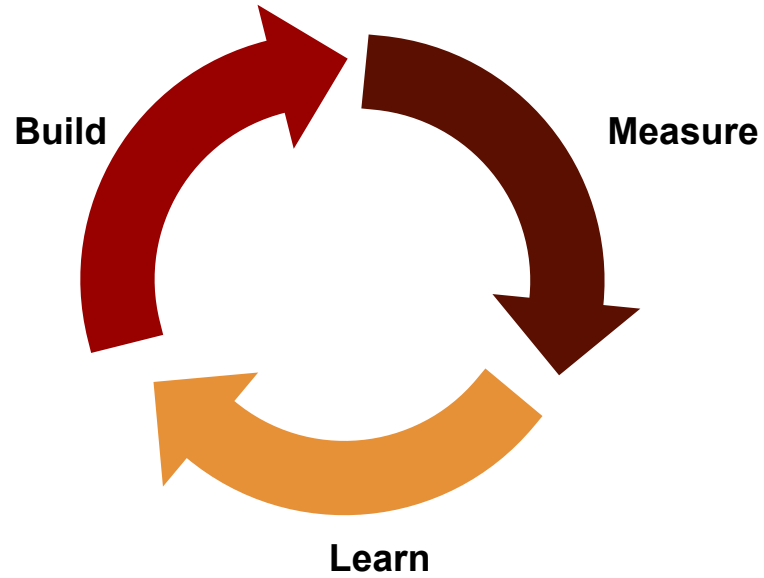
Be smarter than everyone else and anticipate all their needs

Evolve the platform based on user needs, which can be sensed from platform usage

One is more likely than the other...

Gregor Hohpe

Platform evolution



Application Development

Database

Streaming & Messaging

Application Definition & Image Build

Continuous Integration & Delivery



Deployment & Management

Scheduling & Orchestration

Coordination & Service Discovery

Remote Procedure Call

Service Proxy

API Gateway

Service Mesh



Runtime

Cloud Native Storage

Container Runtime

Cloud Native Network



Provisioning

Automation & Configuration

Container Registry

Security & Compliance

Key Management



Special

Kubernetes Certified Service Provider

Kubernetes Training Partner

Certified CNFs



Platform

Certified Kubernetes - Distribution

Certified Kubernetes - Hosted

Certified Kubernetes - Installer

Paas/C Container Service



Observability and Analysis

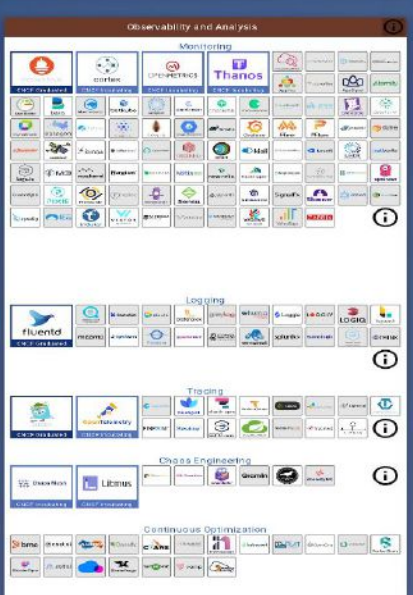
Monitoring

Logging

Tracing

Chaos Engineering

Continuous Optimization



Serverless



Members



CD Foundation Landscape



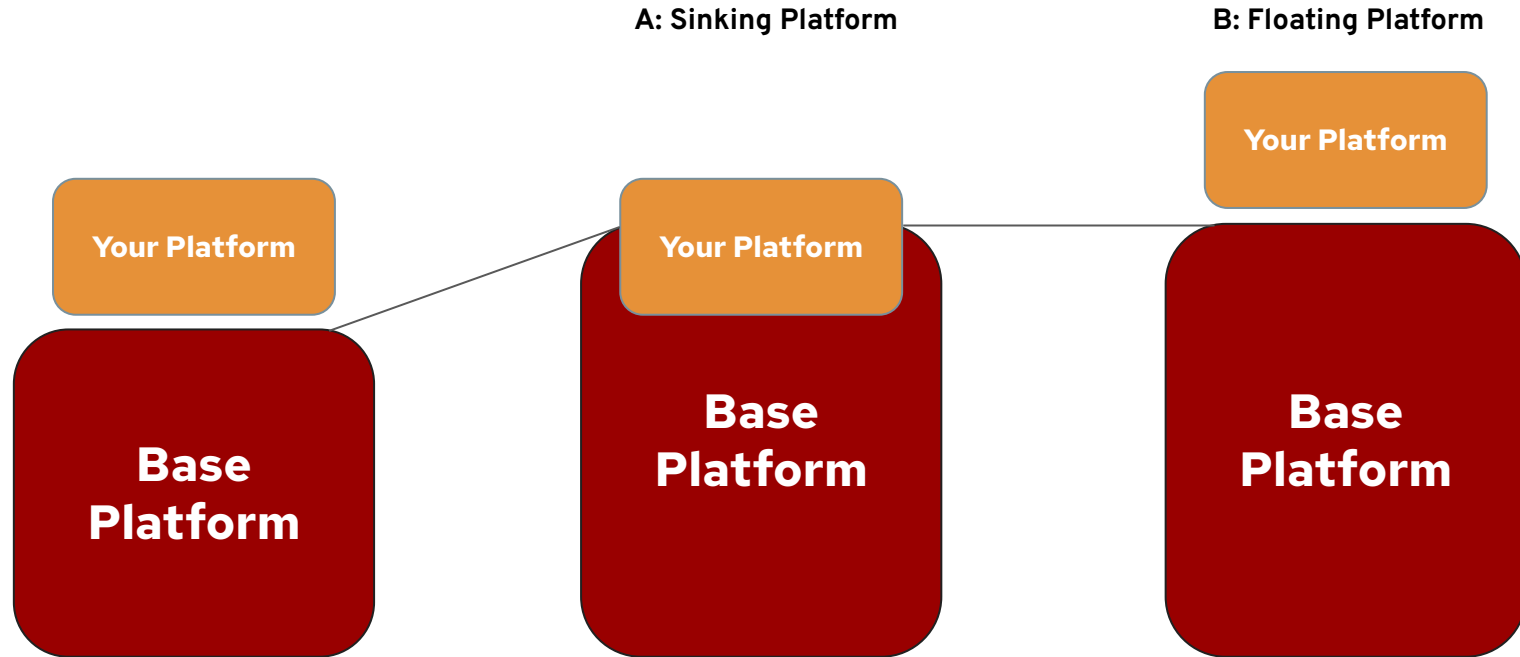
CLOUD NATIVE LANDSCAPE

CNCF FOUNDATION

Redhat | Spotify



Building a platform: Floating or Sinking



OpenShift Platform - the base platform



Multicluster management

Observability | Discovery | Policy | Compliance | Configuration | Workloads



Cluster security

Declarative security | Container vulnerability management | Network segmentation | Threat detection and response



Global registry

Image management | Security scanning | Geo-replication Mirroring | Image builds



Cluster data management

RWO, RWX, Object | Efficiency | Performance | Security | Backup | DR Multicloud gateway

Manage workloads

Platform services

- Service mesh | Serverless
- Builds | CI/CD pipelines
- GitOps | Distributed Tracing
- Log management
- Cost management

Build cloud-native apps

Application services

- Languages and runtimes
- API management
- Integration
- Messaging

Data-driven insights

Data services

- Databases | Cache
- Data ingest and preparation
- Data analytics
- AI/ML

Developer productivity

Developer services

- Developer CLI | IDE
- Plugins and extensions
- CodeReady workspaces
- CodeReady containers

Kubernetes cluster services

Install | Over-the-air updates | Networking | Ingress | Storage | Monitoring | Log forwarding | Registry | Authorization | Containers | VMs | Operators | Helm

Kubernetes (orchestration)



Linux (container host operating system)



Physical



Virtual



Private cloud



Public cloud



Edge

A developer portal = one frontend for your entire infrastructure

Unifies all your tooling, services, apps, data, and docs with **a single, consistent UI**

Makes sense of everything in your ecosystem, regardless of how and where individual components are running

Let developers focus on what they do best (leading to much less activity in #aaargh Slack channel)



Article

Red Hat joins the Backstage.io community

October 24, 2022 [Twitter](#) [Facebook](#) [LinkedIn](#) [Email](#) [Share](#) [Helm, Kubernetes, Operators, Open Source](#)



Serena Chechile Nichols

Senior Principal Product Manager, OpenShift Developer Tooling, Distinguished Engineer



The concept of platform engineering and the end-to-end developer experience is a burgeoning topic industry wide. Building an IdP (Internal Developer Portal) is extremely complex. This topic is new for many, and there are still a lot of unknowns regarding how to evolve an organization that has no, or a low, concept of internal platforms.

Enter [Backstage](#). Backstage is an [open source](#) framework for building developer portals donated to the Cloud Native Computing Foundation by Spotify. Backstage has a vibrant ecosystem that development teams successfully use to streamline and rapidly onboard applications. It provides a portal into an internal developer platform by delivering an application catalog that can aggregate several sources of information regarding applications.

Backstage is becoming a standard for developer scaffolding. Building this type of platform to fit into your environment is both complex and time consuming. Knowledge around Backstage is still hard to find. Organizations are looking for a standardized approach on how to implement and adopt Backstage. We have seen an increased interest in Backstage by our Red Hat customers. We have a number of consulting engagements targeting building IdPs and implementing Backstage, which will allow

Recent Articles

[Why service mesh and API management are better together](#)

[How to add public Ingress to a PrivateLink ROSA cluster](#)

[Optimize container images for NGINX and Apache HTTPd](#)

[How to debug OpenShift operators](#)

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Press releases > Red Hat Unveils Red Hat Developer Hub to Help Fuel Developer Produc...

Red Hat Unveils Red Hat Developer Hub to Help Fuel Developer Productivity

The internal developer portal standardizes the developer experience, providing an internally-curated and managed set of tools and deployment paths to help deliver software faster and more efficiently

BOSTON – RED HAT SUMMIT - May 23, 2023 – Red Hat, Inc., the world's leading provider of open source solutions, today announced [Red Hat Developer Hub](#), a enterprise-grade, unified and open portal designed to streamline the development process through a supported and opinionated framework. Crafted from the CNCF incubating open source project [Backstage](#), the

IN SHORT
Red Hat Developer Hub, and the



A vertical strip of various icons representing cloud computing, data storage, and network connectivity. The icons include a cloud with a keyhole, a database cylinder, a server rack, a cloud with an upward arrow, a network diagram with nodes and arrows, a document with an 'X', a document with an 'O', a document with an 'X', a server rack, and a computer monitor. The icons are rendered in a dark red color against a lighter red background.

What is Backstage?

An open platform for building developer portals



<http://backstage.io>

Allowing developers to focus on what they want to ... coding, rather than navigating to all the different tools

*Resulting in **lowering the cognitive load and unlocking developer productivity***

Happy developers makes happy code!

Core features:

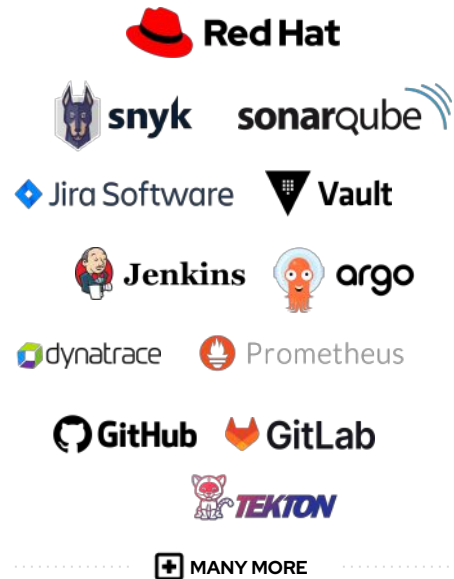
- Centralized Software Catalog
- Plugins
- Software templates
- Tech Docs
- Search

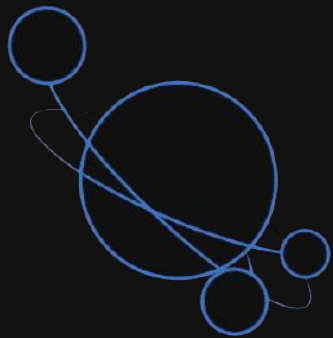
Backstage Plugin Ecosystem



100+ plugins, some examples:

- ▶ SCM
- ▶ CI/CD
- ▶ Monitoring
- ▶ Issue tracking
- ▶ Code quality





Backstage lets any developer:

- ❑ **Create** new software in seconds, aligned to your best practices
- ❑ **Manage** all the software they own in one centralized location
- ❑ **Explore** the entire software ecosystem, enabling collaboration across your org



But the front-end is just the tip of the iceberg. A developer platform is usually a complex integration between several diverse systems.

The front-end is the developer's first impression, so it is important, but making a useful IDP involves lots of coordination under the surface.

Where is Red Hat investing?



Upstream

Backstage Core



Charts



Project Janus

Midstream

Best practices

Custom actions



Plugins



Charts

Sample Golden Path Templates

Showcase Application

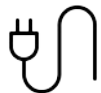


Red Hat
Developer Hub

Downstream

Enterprise grade, self-managed and fully supported

Red Hat build and distribution of Backstage core & selected plugins



Available today!

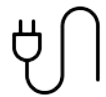


- ▶ Authentication & Authorization with Keycloak **
- ▶ Container Image Registry for Azure Container Registry (ACR)
- ▶ Container Image Registry for JFrog Artifactory
- ▶ Container Image Registry for Quay **
- ▶ Multi Cluster View with Open Cluster Management (OCM) **
- ▶ Application Topology for Kubernetes **
- ▶ Pipelines with Tekton **
- ▶ GitOps with Argo CD **
- ▶ Kiali Service Mesh
- ▶ 3scale

** Included in **Red Hat Plug-Ins for Backstage**

Plugins available today [here](#)





Plugins on our backlog



- ▶ Ansible / Ansible Automation Platform (AAP)
- ▶ Container Image Registry for Nexus
- ▶ Tekton v2 - access go PLR logs
- ▶ Topology v2 - access to pod logs
- ▶ Web Terminal
- ▶ Scorecard
- ▶ Learning
- ▶ Advanced Cluster Security (ACS)

Project Janus

Sample Golden Path Templates

Available runtimes

- NET
- Go
- Node
- Python
- Quarkus
- Spring

Choose CI method

- GH Actions
- Tekton

Create a New Component

Create new software components using standard templates

Node.js Backend Golden Path Template

- 1 Provide information about the GitHub location**

GitHub Organization*

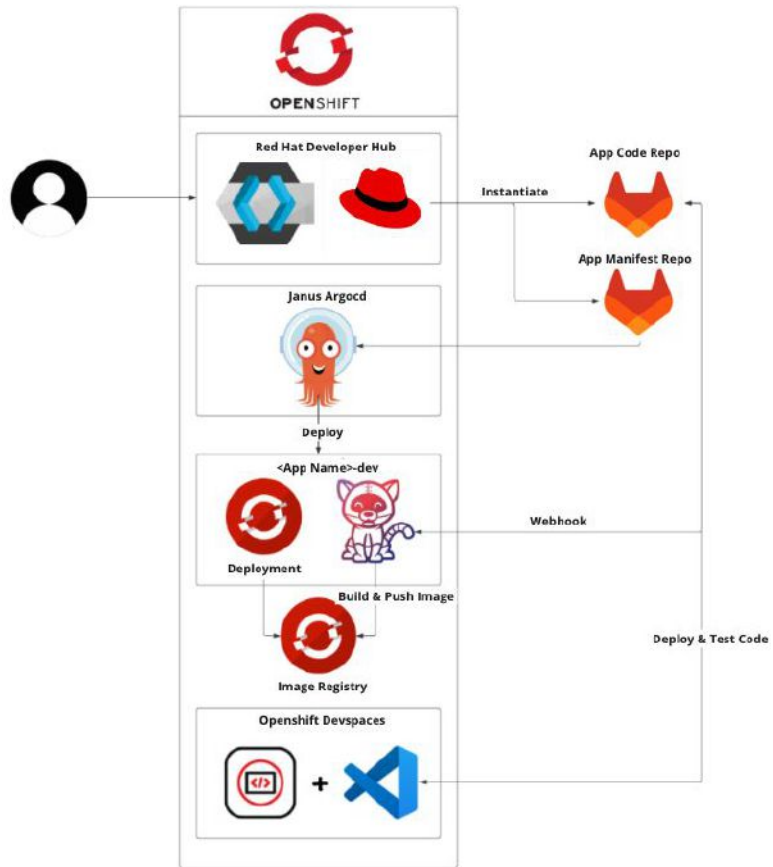
Repository Name*

BACK NEXT STEP
- 2 Provide information about the new component**
- 3 Provide information about the ArgoCD deployment**
- 4 Choose a CI method**



Demo

Demo architecture



Demo steps

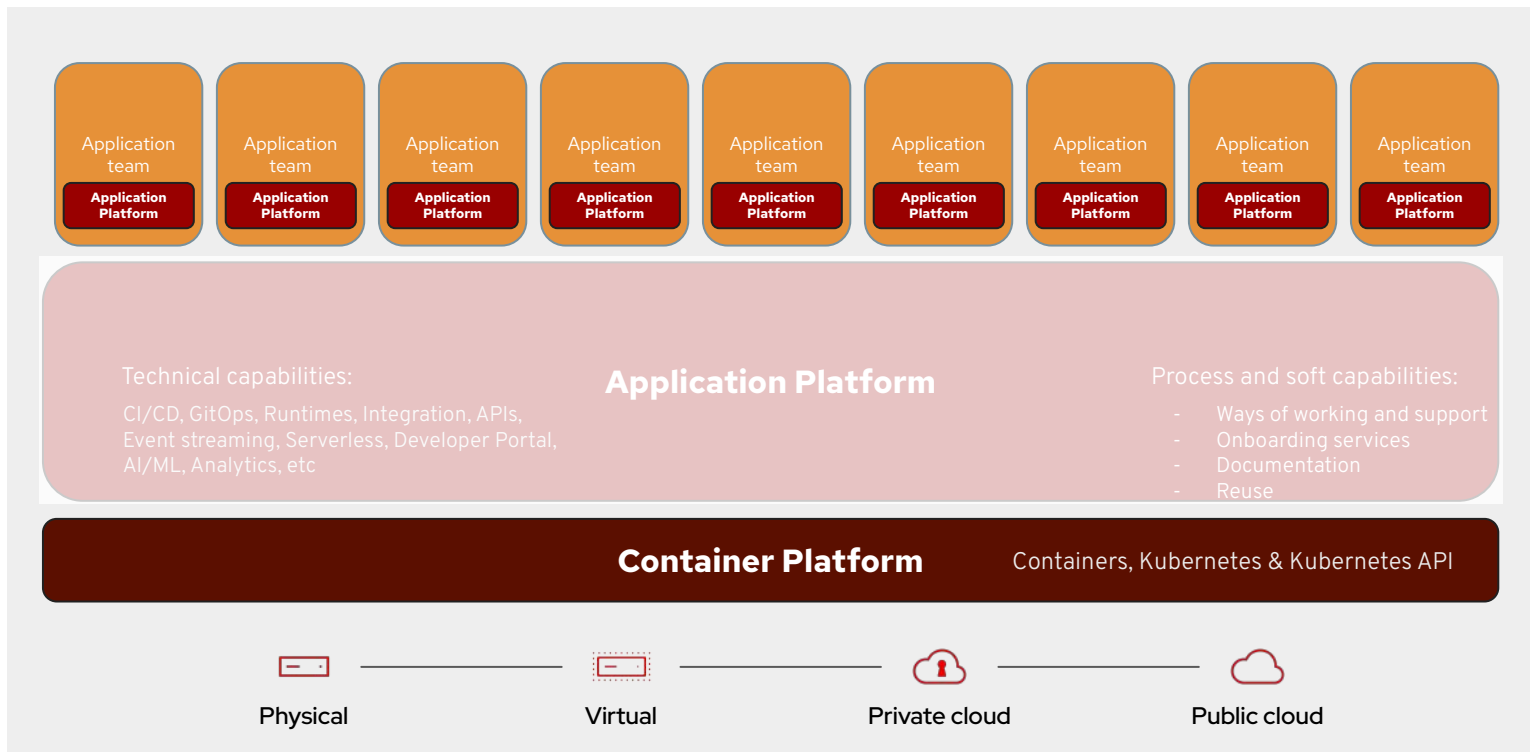
1. Backstage/Red Hat Developer Hub UI walkthrough
2. Create an application using a template (golden path)
3. Make an update to the application
4. Build the application using OpenShift Pipelines
5. Deploy the application using OpenShift GitOps (ArgoCD)



Summary & What's next

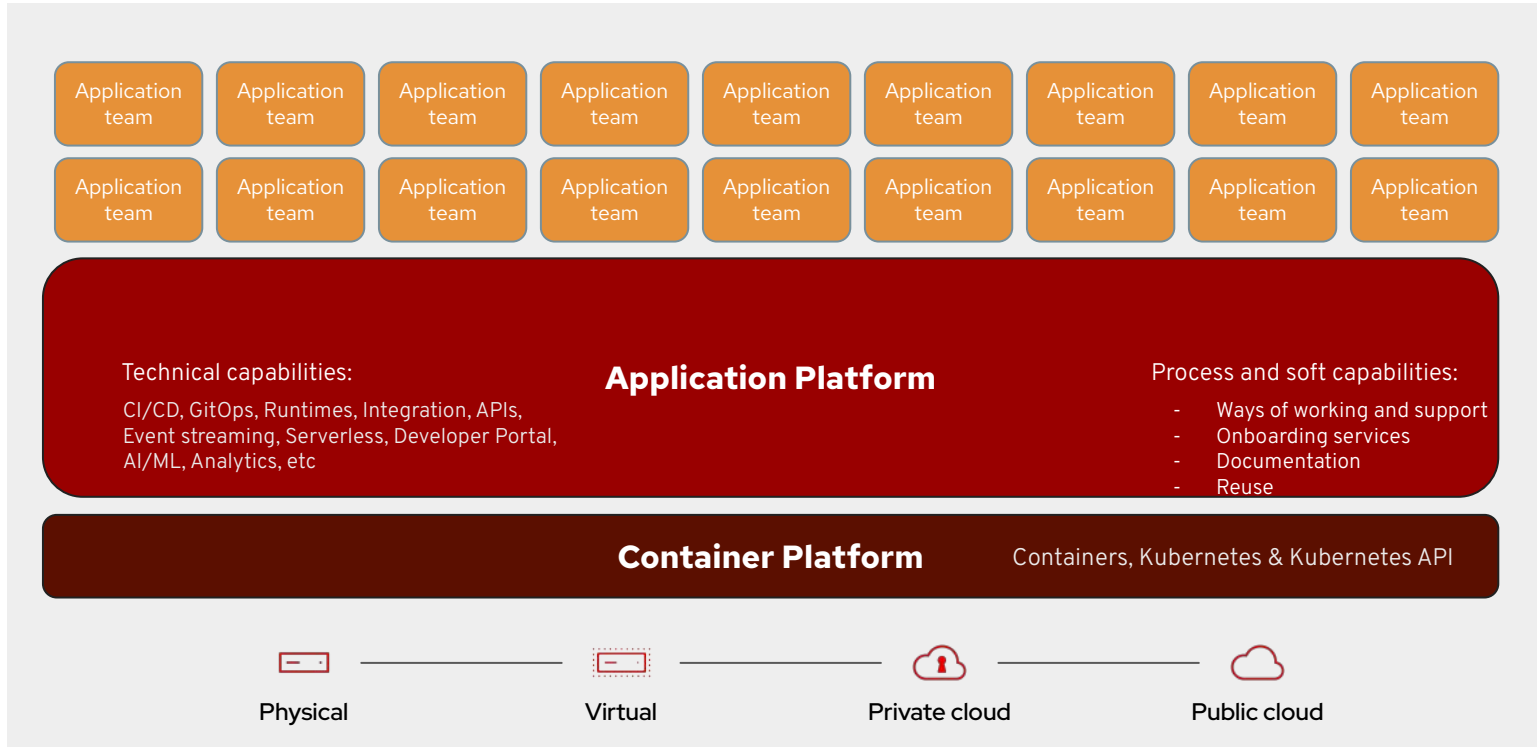
Application and Platform model - (non optimal use)

- Decentralized and not standardised across teams



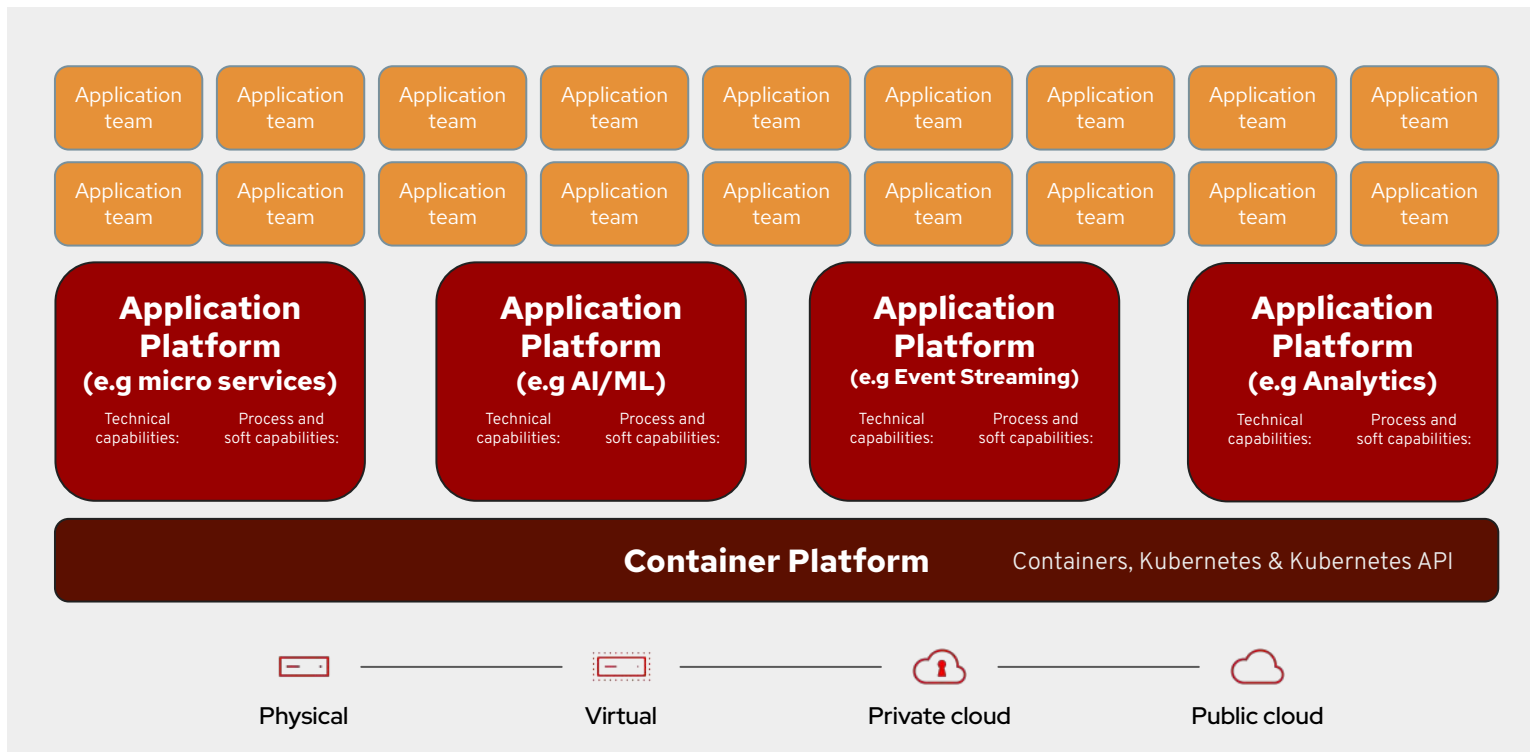
Application and Platform model

- Centralized and standardized innovation, multiple teams onboarded to the platform



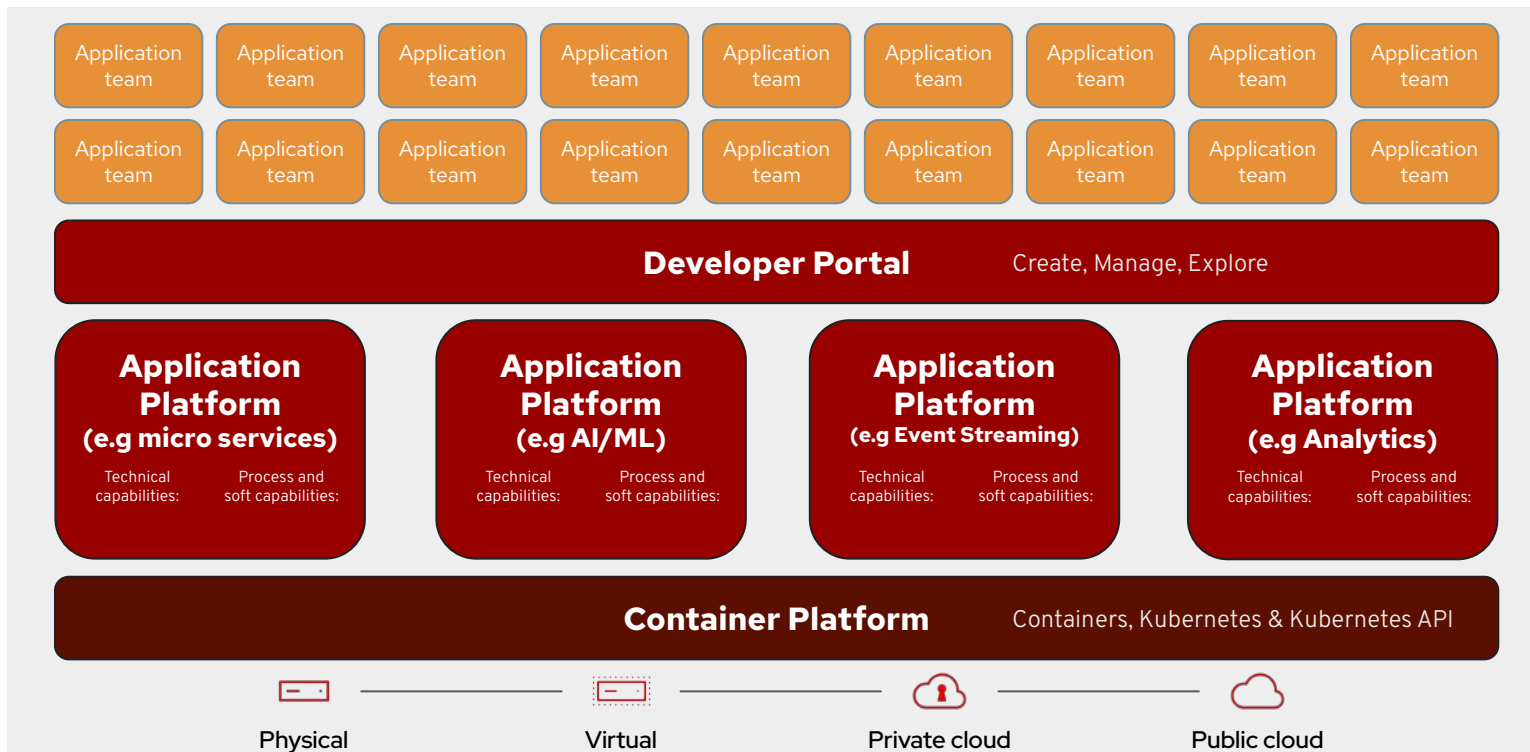
Application and Platform model

- Multiple platforms covering specific technology domains



Application and Platform model

- A developer portal unifies the developer experience for use of the platforms



Red Hat Developer Hub



Red Hat Plug-ins for Backstage
Includes **supported plugin bundle**



Authentication and Authorization with Keycloak



GitOps with Argo CD



Pipelines with Tekton



Application Topology for Kubernetes



Container Image Registry for Quay



Multi Cluster View with Open Cluster Manager (OCM)

Single pane of glass to increase engineering productivity.

Integrates with industry standards and technologies through a broad ecosystem of community plugins.



Self-service with guardrails for cloud-native development.

Based on Backstage, an open source platform for building developer portals.



Best practices with GitOps and automation.

Red Hat Developer Hub - **supported when deployed on**

Customer-managed Red Hat OpenShift



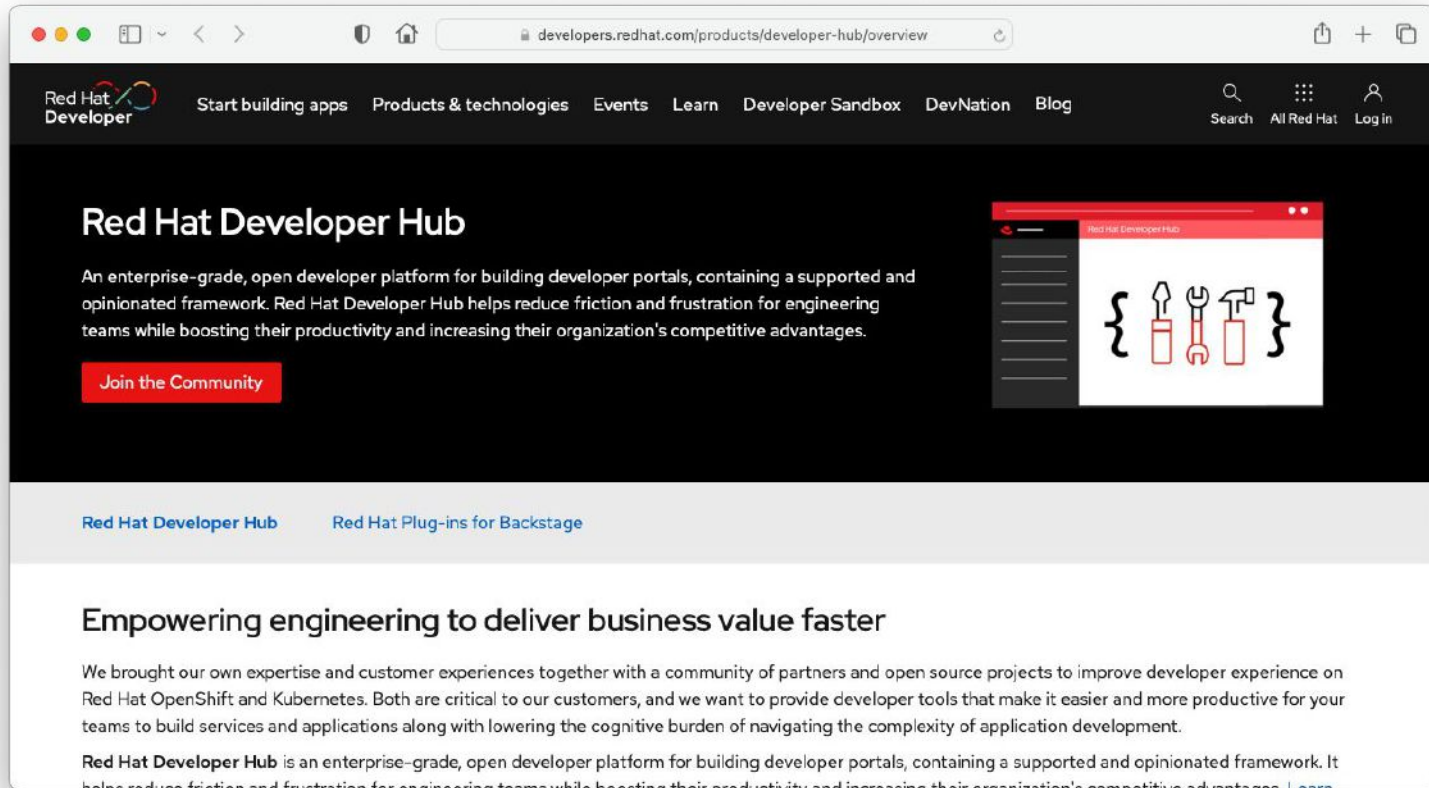
Managed Red Hat OpenShift services



Managed Kubernetes Services



Red Hat Developer Hub



The screenshot shows a web browser window with the URL `developers.redhat.com/products/developer-hub/overview`. The page features a dark header with the Red Hat Developer logo and navigation links: Start building apps, Products & technologies, Events, Learn, Developer Sandbox, DevNation, and Blog. On the right side of the header are search, All Red Hat, and Log in options. The main content area has a large heading "Red Hat Developer Hub" followed by a paragraph: "An enterprise-grade, open developer platform for building developer portals, containing a supported and opinionated framework. Red Hat Developer Hub helps reduce friction and frustration for engineering teams while boosting their productivity and increasing their organization's competitive advantages." Below this is a red button labeled "Join the Community". To the right is a preview image of the Red Hat Developer Hub interface, showing a sidebar and a main content area with icons for a lightbulb, a wrench, a hammer, and a code block. Below the main content area are two tabs: "Red Hat Developer Hub" (selected) and "Red Hat Plug-ins for Backstage". The bottom section of the page has a heading "Empowering engineering to deliver business value faster" and a paragraph: "We brought our own expertise and customer experiences together with a community of partners and open source projects to improve developer experience on Red Hat OpenShift and Kubernetes. Both are critical to our customers, and we want to provide developer tools that make it easier and more productive for your teams to build services and applications along with lowering the cognitive burden of navigating the complexity of application development." Below this is another paragraph: "Red Hat Developer Hub is an enterprise-grade, open developer platform for building developer portals, containing a supported and opinionated framework. It helps reduce friction and frustration for engineering teams while boosting their productivity and increasing their organization's competitive advantages. Learn

<https://developers.redhat.com/products/developer-hub/overview>



Janus community

Want to learn more and participate?



www.github.com/janus-idp



janus-idp.slack.com - [Invite](#) to our community Slack workspace



<https://groups.google.com/g/janus-idp-community>



Join our bi weekly community calls! [Community calendar](#)



Community site: <https://janus-idp.io>

Showcase application: <https://showcase.janus-idp.io/>

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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