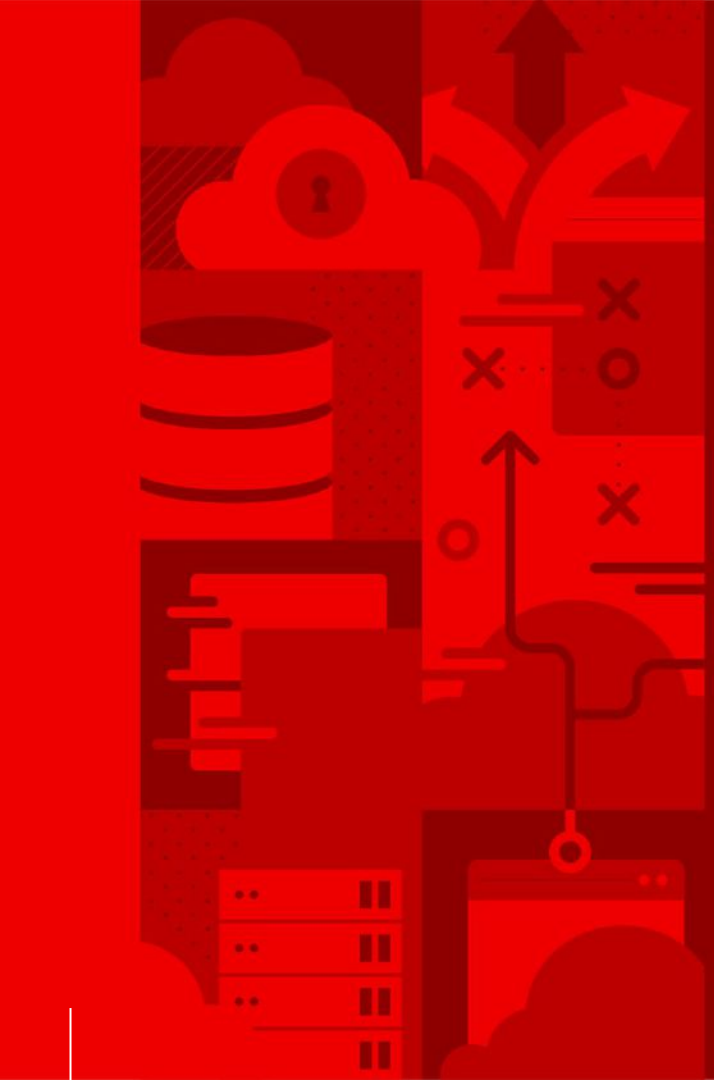
Paving the Golden Path for your developers with backstage.io and an Internal Development Platform (IDP)

Martin Östmark
Principal Specialist Solution Architect
mostmark@redhat.com

Red Hat

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



What is an IDP and Golden Path?

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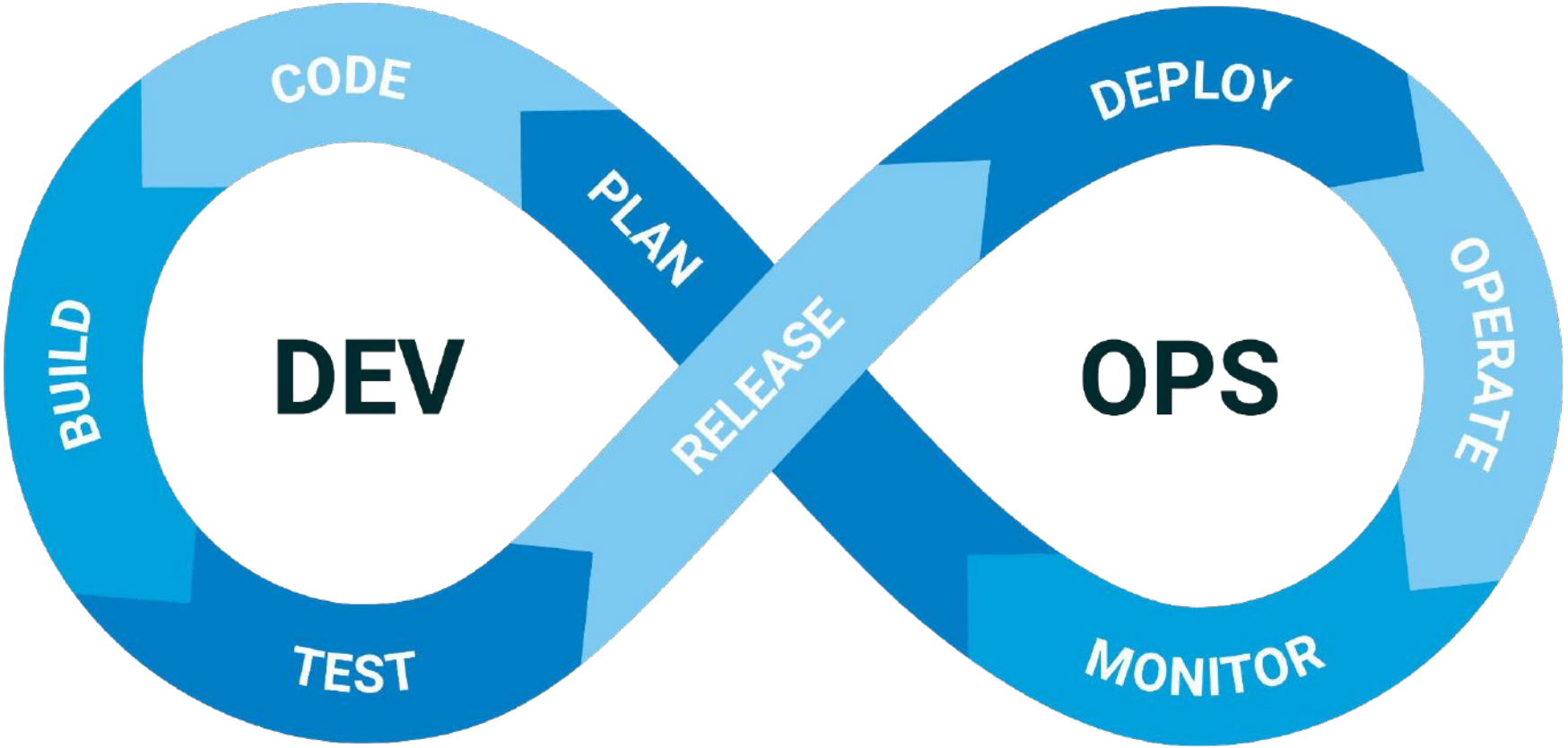
In the new world, it is not the big fish which eats the small fish, it's the fast fish which eats the slow fish
Klaus Schwab
Founder and Executive Chairman
World Economic Forum


CODE
PLAN
BUILD
DEV
RELEASE
TEST
DEPLOY
OPERATE
OPS
MONITOR

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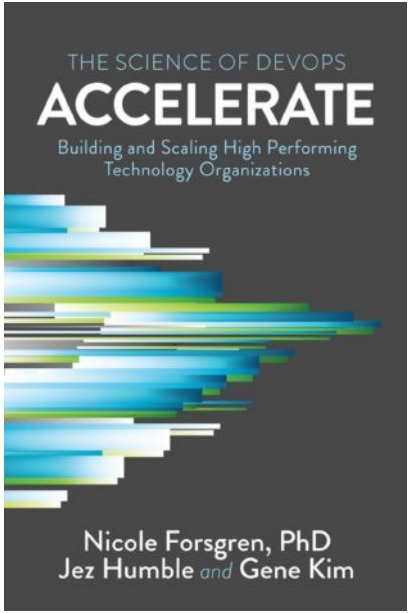
Drivers and Metrics Driven Transformation (DORA)

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)

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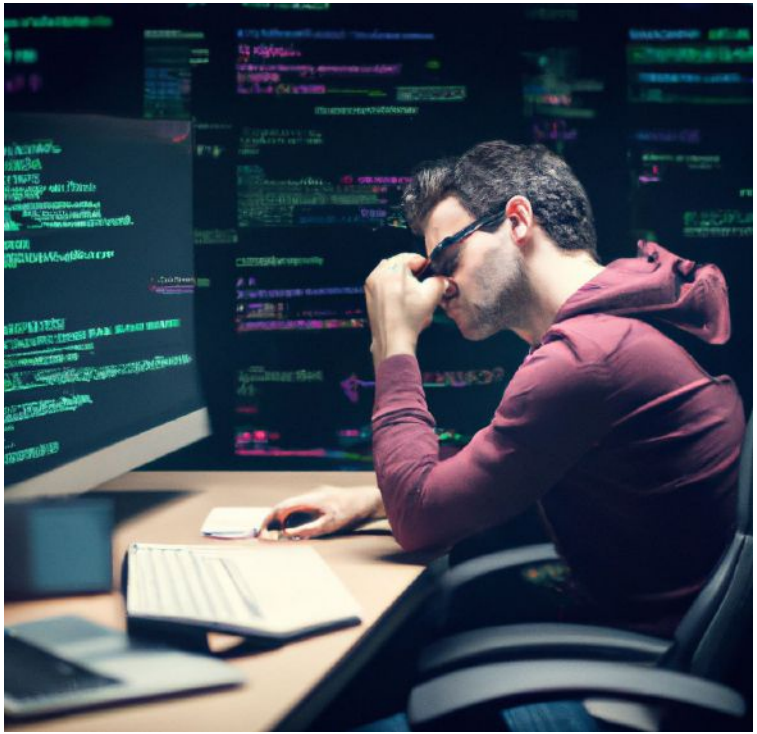
The great DevOps Burnout and Cognitive overload



- **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

https://thenewstack.io/devops-burnout-try-platform-engineering/

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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!
- …
- …

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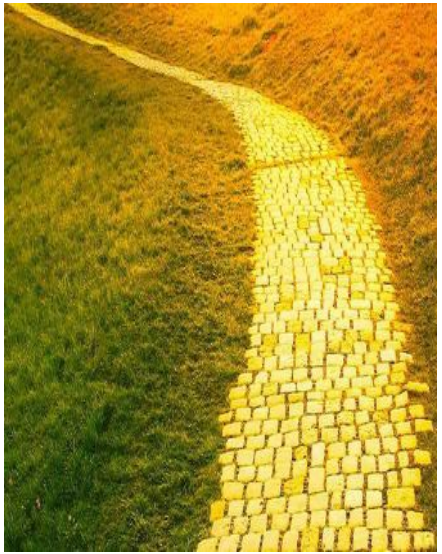
Internal Developer Platform (IDP) & Golden Path

- 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)



https://internaldeveloperplatform.org/what-is-an-internal-developer-platform

https://engineering.atspotify.com/2020/08/how-we-use-golden-paths-to-solve-fragmentation-in-our-software-ecosystem

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

Peter Gillard-Moss, Thoughtworks

• • •

(Volvo Scalable Product Architecture (SPA))

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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

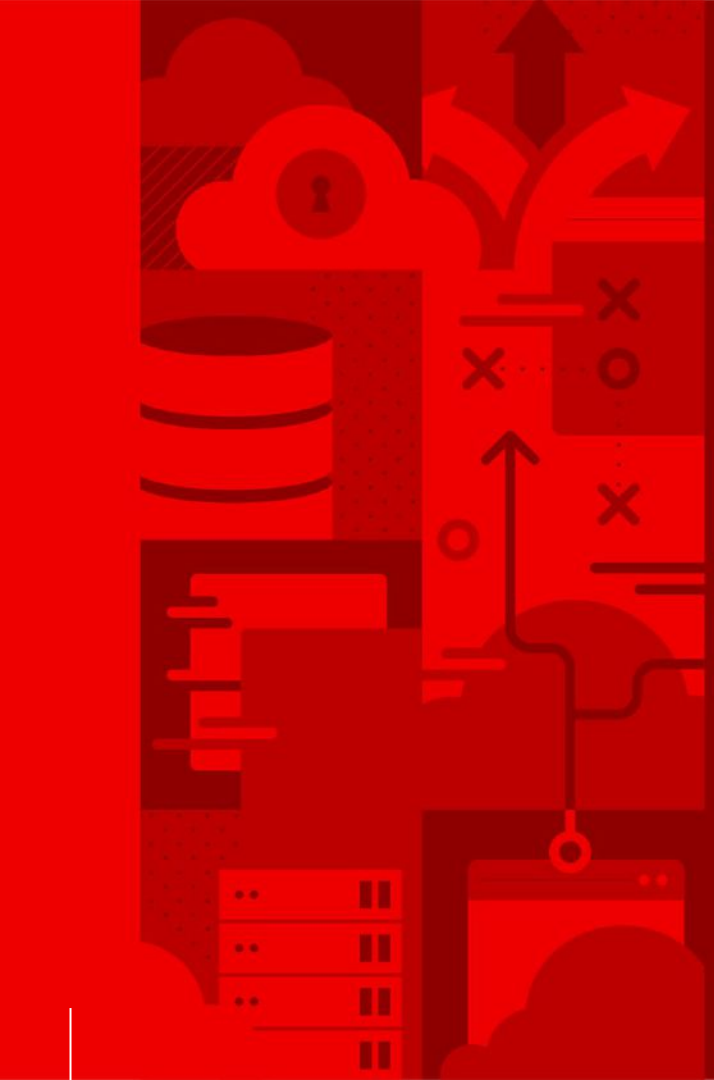
This is basically the ci/cd process that promotes code to production

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?

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Two ways to build a successful platform

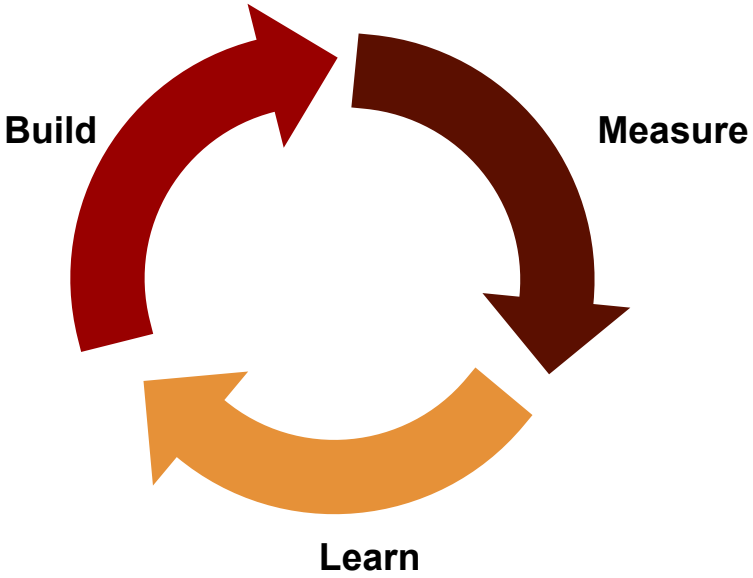
Be smarter than everyone else and anticipate all their needs

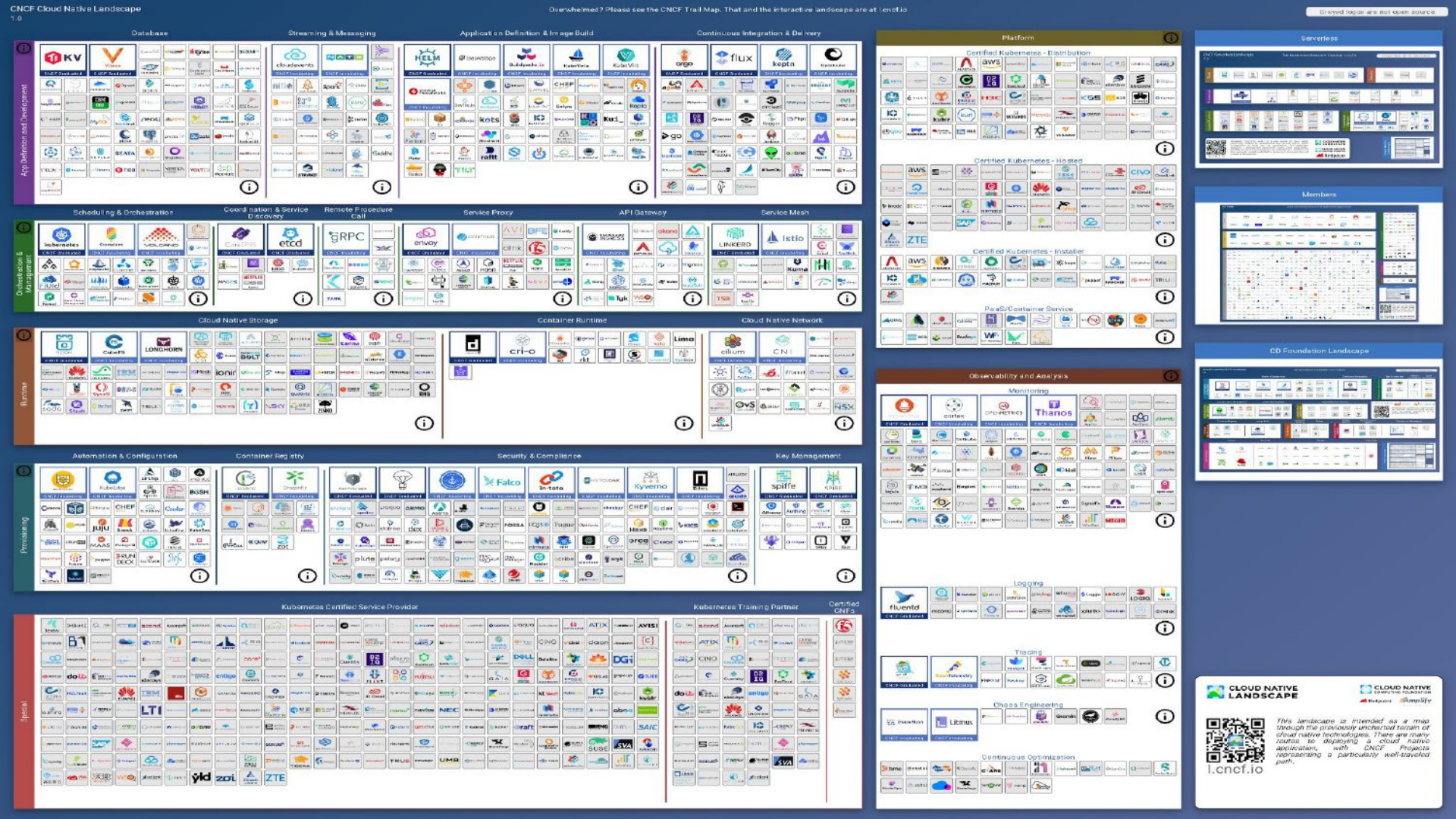
Evolve the platform based on user needs, which can be sensed from platform usage

One is more likely than the other…

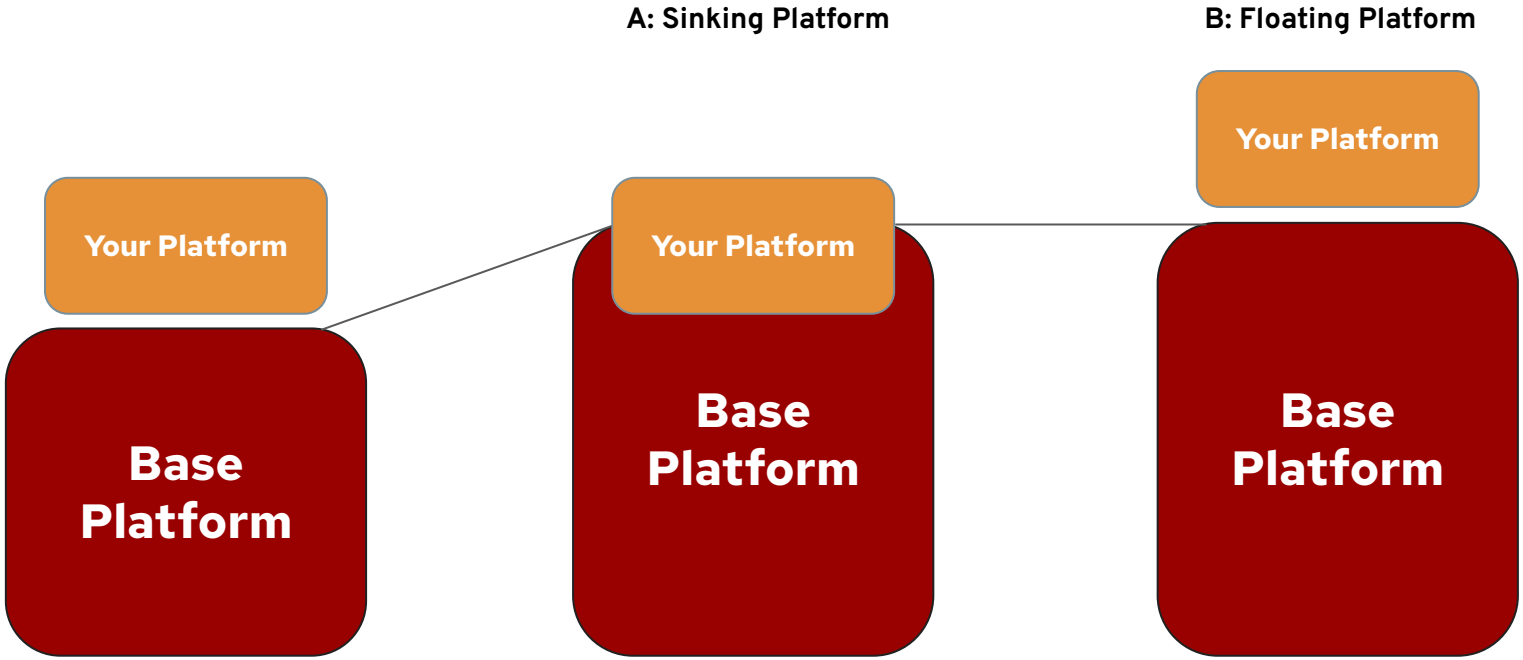
Gregor Hohpe

Platform evolution




CNCF Cloud Native Landscape
1.0
Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at l.cncf.io
Greyed logos are not open source
App Definition and Development
Database
Streaming & Messaging
Application Definition & Image Build
Continuous Integration & Delivery
Orchestration & 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/Container Service
Observability and Analysis
Monitoring
Logging
Tracing
Chaos Engineering
Continuous Optimization
Serverless
Members
CD Foundation Landscape
CLOUD NATIVE LANDSCAPE
CLOUD NATIVE COMPUTING FOUNDATION
l.cncf.io
This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path.

Building a platform: Floating or Sinking



OpenShift Platform - the base platform

Red Hat Advanced Cluster Management for Kubernetes

Multicluster management

Observability | Discovery | Policy | Compliance | Configuration | Workloads

Red Hat Advanced Cluster Security for Kubernetes

Cluster security

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

Red Hat Quay

Global registry

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

Red Hat OpenShift Data Foundation

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)

Red Hat Enterprise Linux

Linux (container host operating system)

Red Hat Enterprise Linux CoreOS

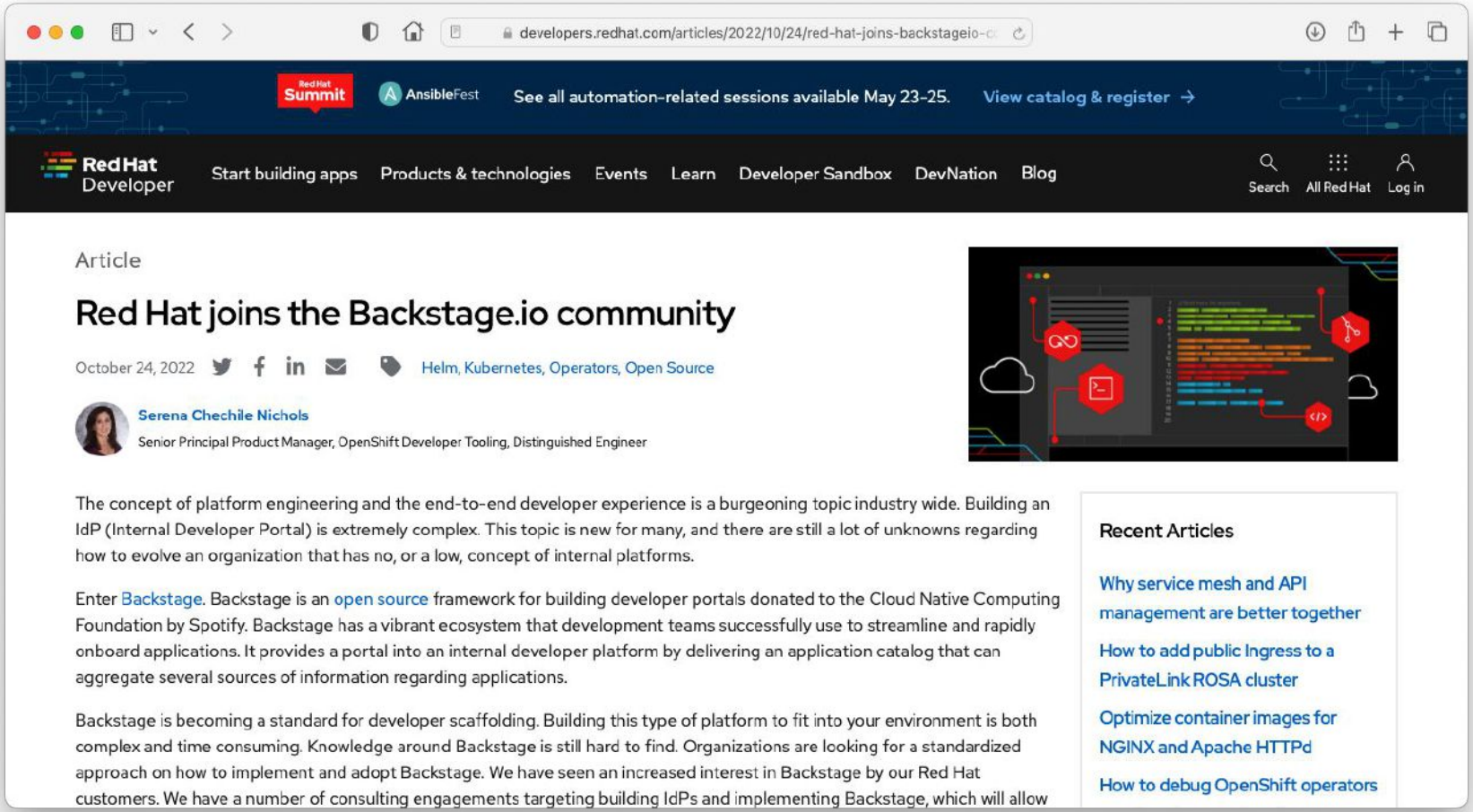
Red Hat

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)



https://developers.redhat.com/articles/2022/10/24/red-hat-joins-backstageio-community

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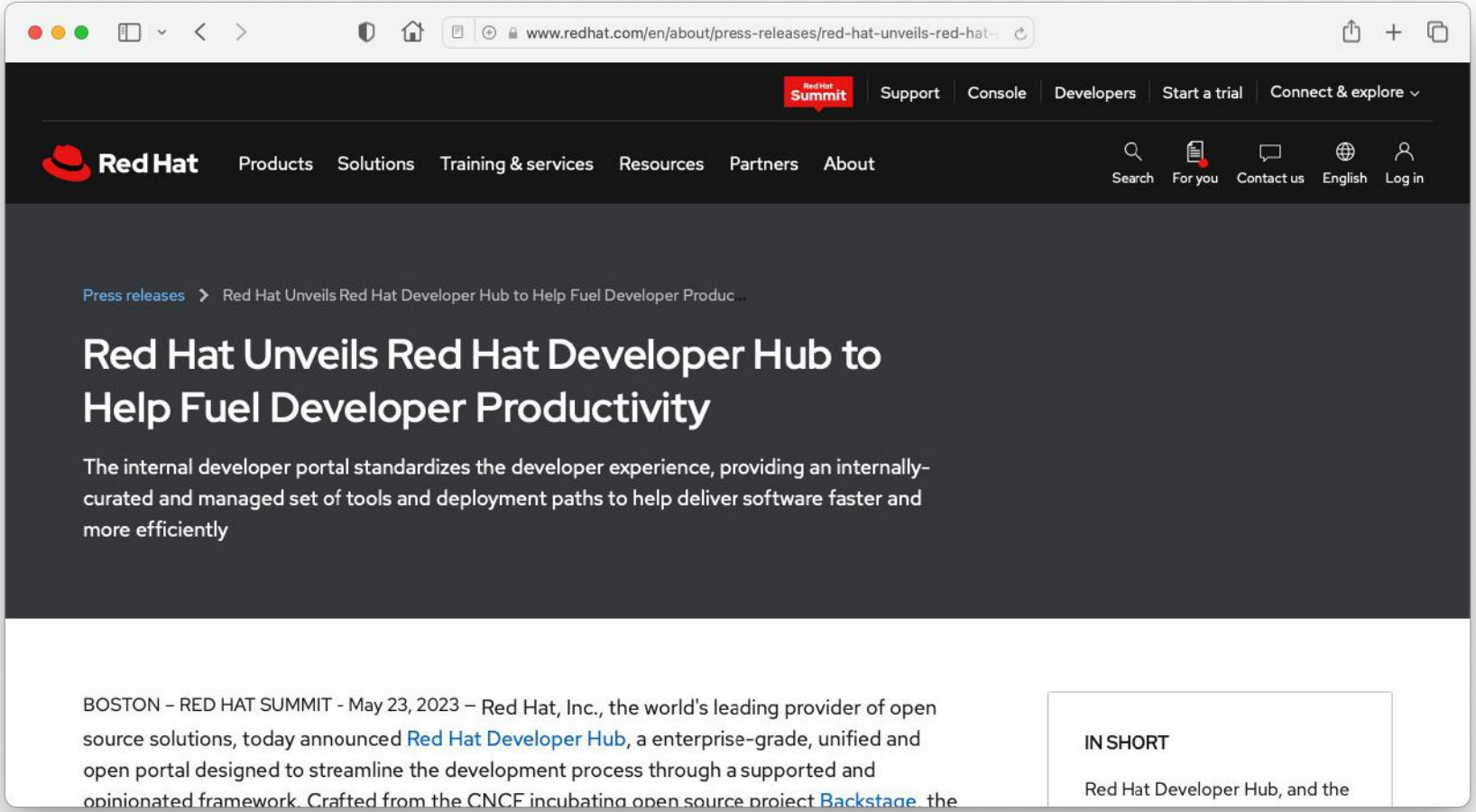

https://www.redhat.com/en/about/press-releases/red-hat-unveils-red-hat-developer-hub-help-fuel-developer-productivity

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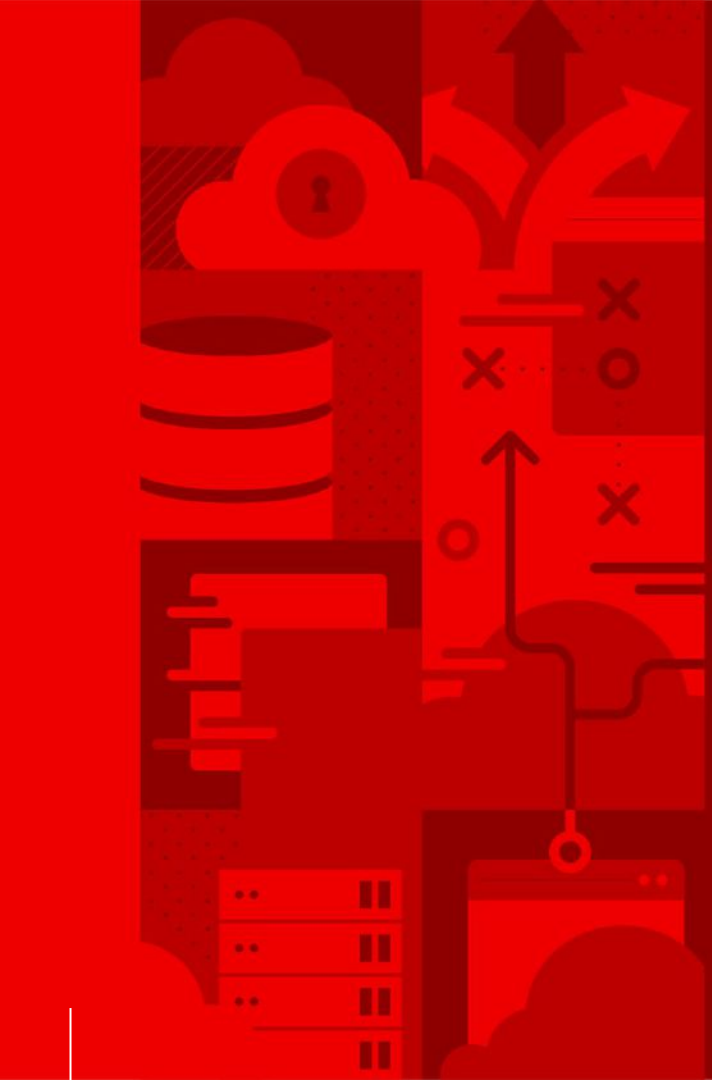

What is Backstage?

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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

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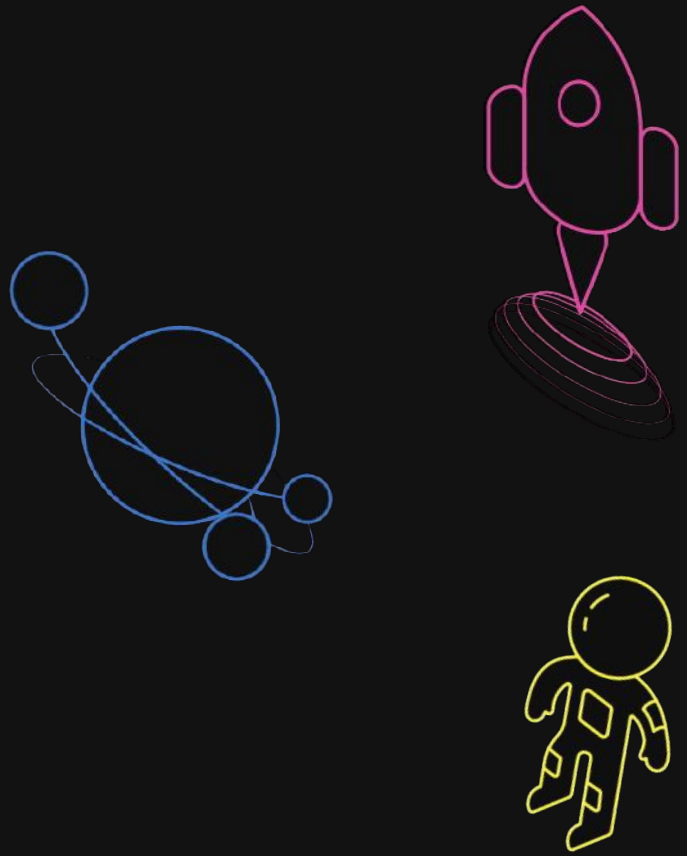
Backstage Plugin Ecosystem

100+ plugins, some examples:

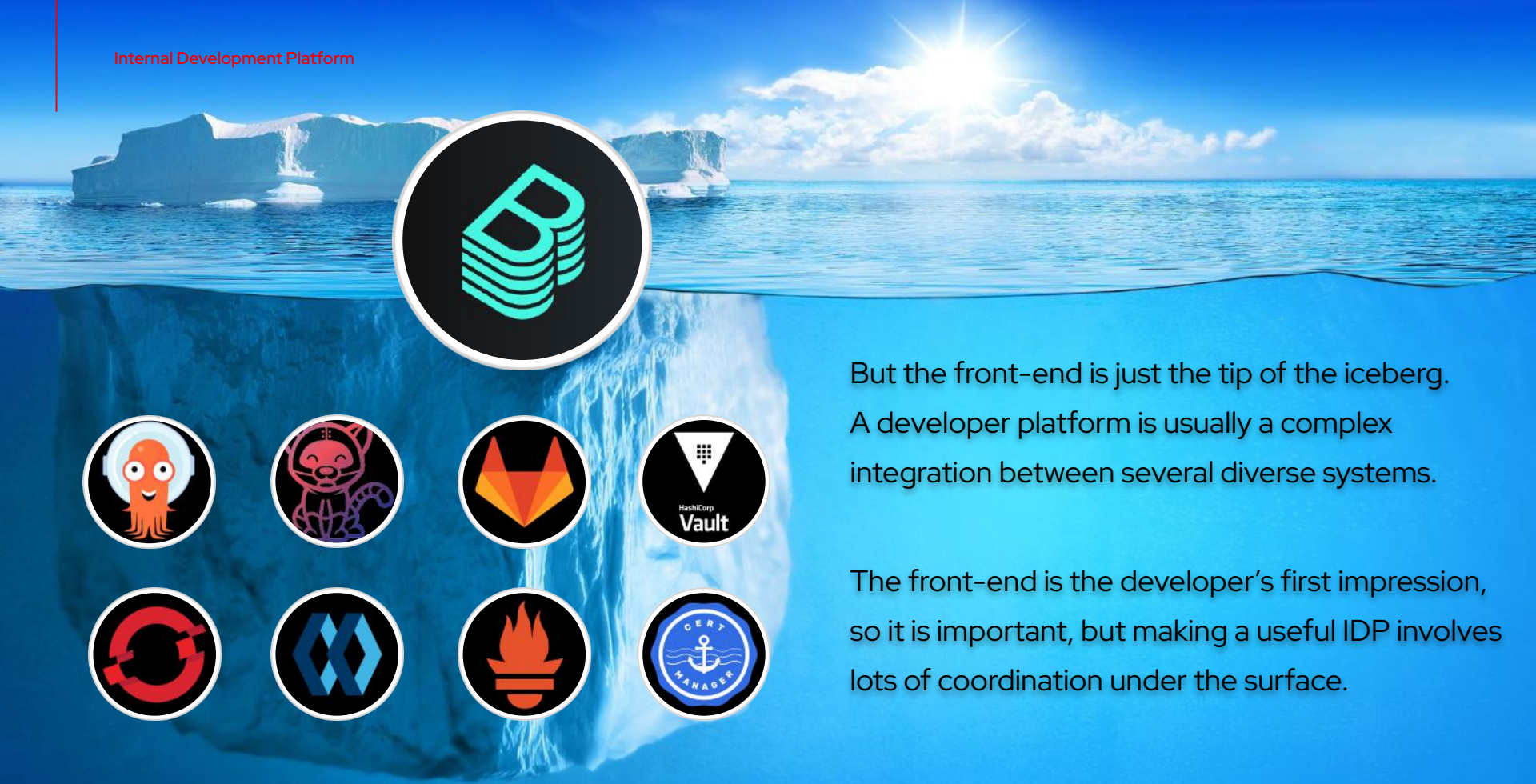
- SCM
- CI/CD
- Monitoring
- Issue tracking
- Code quality

Red Hat
snyk
sonarqube
Jira Software
Vault
Jenkins
argo
dynatrace
Prometheus
GitHub
GitLab
TEKTON
MANY MORE



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

HELM Charts

Project Janus

Midstream

Best practices

Custom actions

Plugins

HELM 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

Red Hat

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

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Plugins on our backlog

janus

- 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)

Red Hat

Project Janus

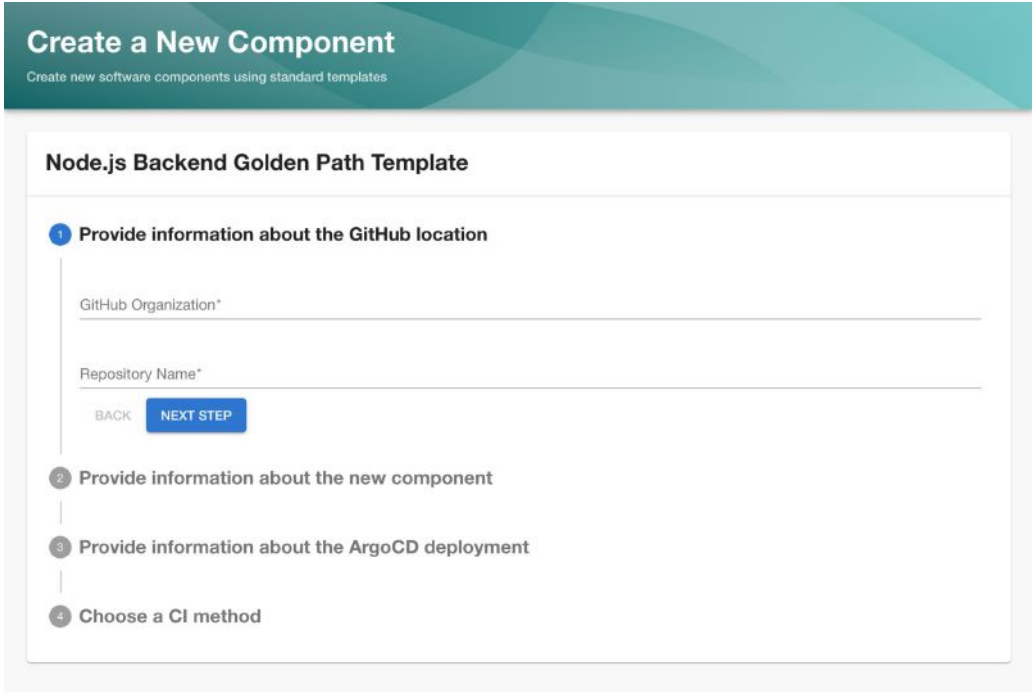
Sample Golden Path Templates

Available runtimes

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

Choose CI method

- GH Actions
- Tekton



https://github.com/janus-idp/software-templates

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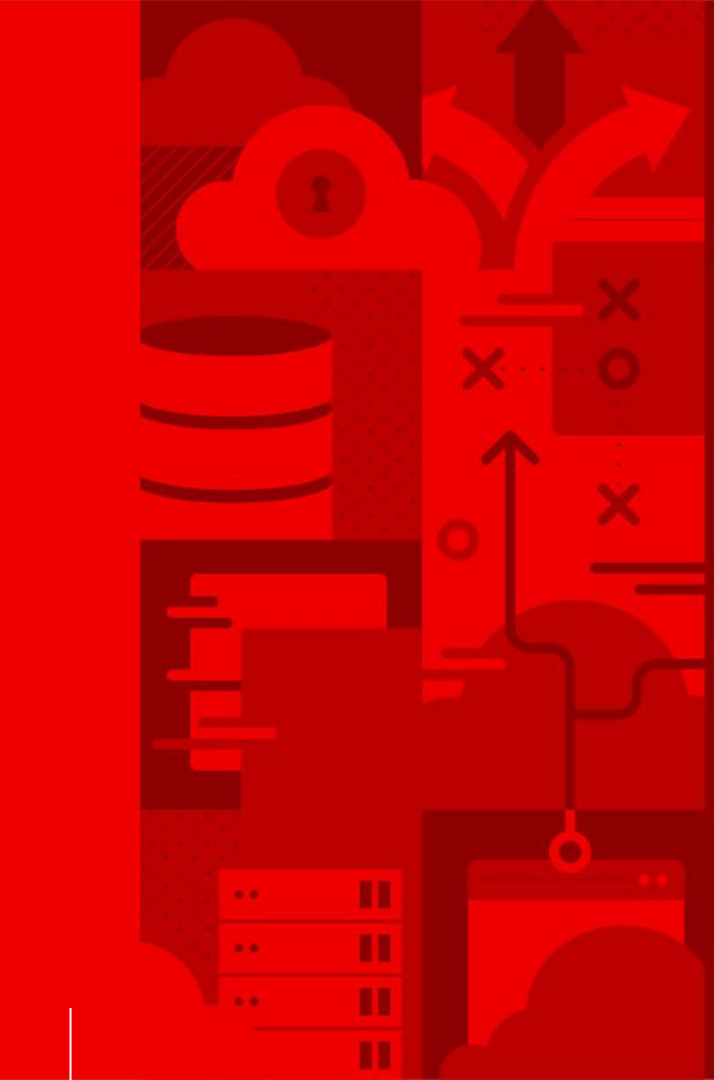
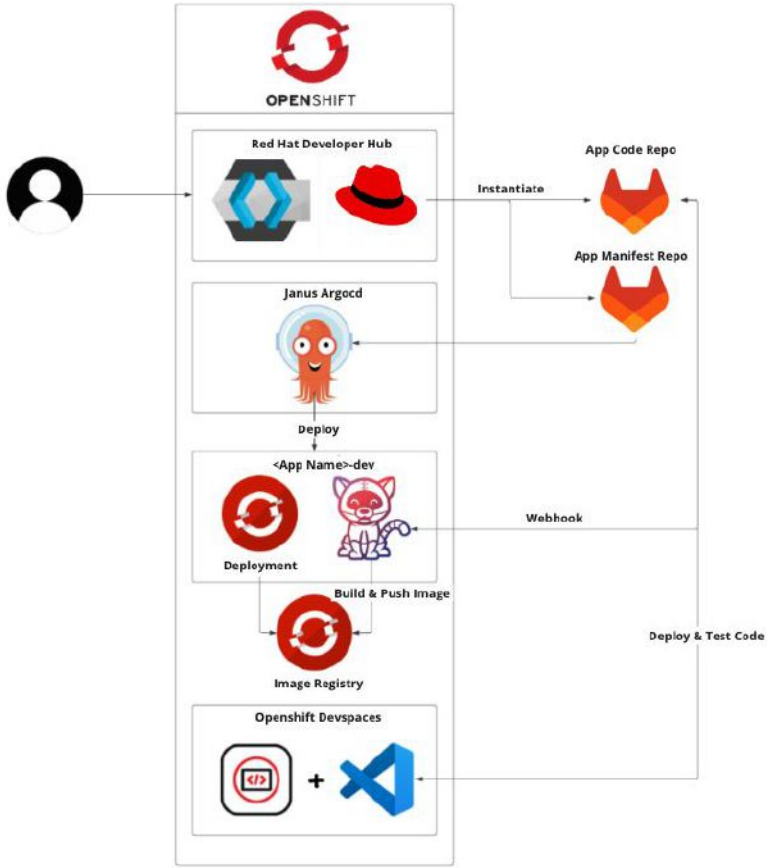


Demo

Red Hat

Demo architecture



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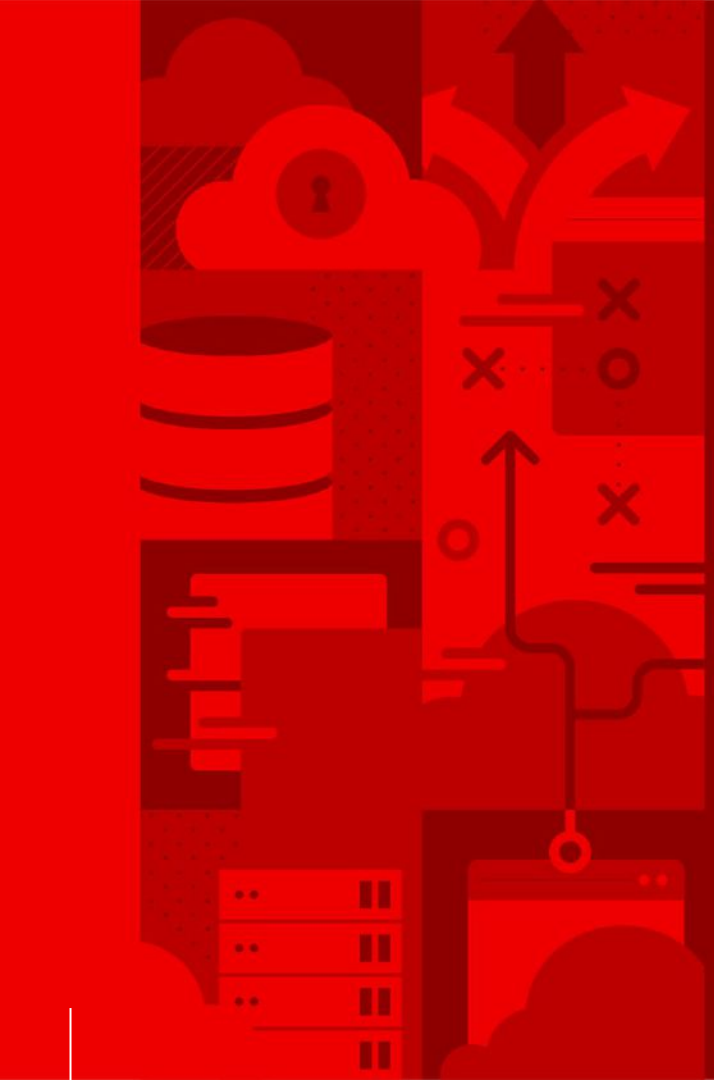
Demo steps

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

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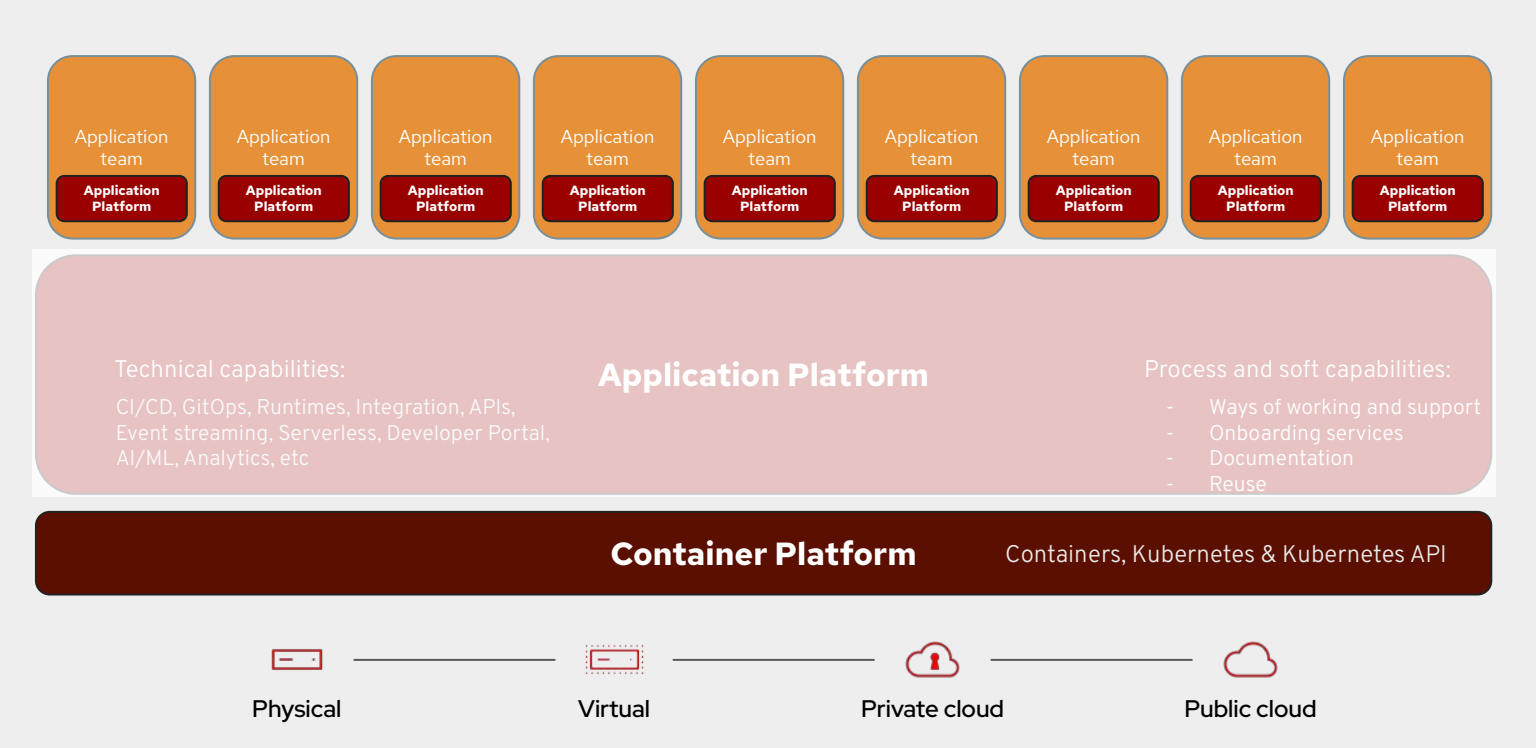
Application and Platform model - (non optimal use)

- Decentralized and not standardised across teams



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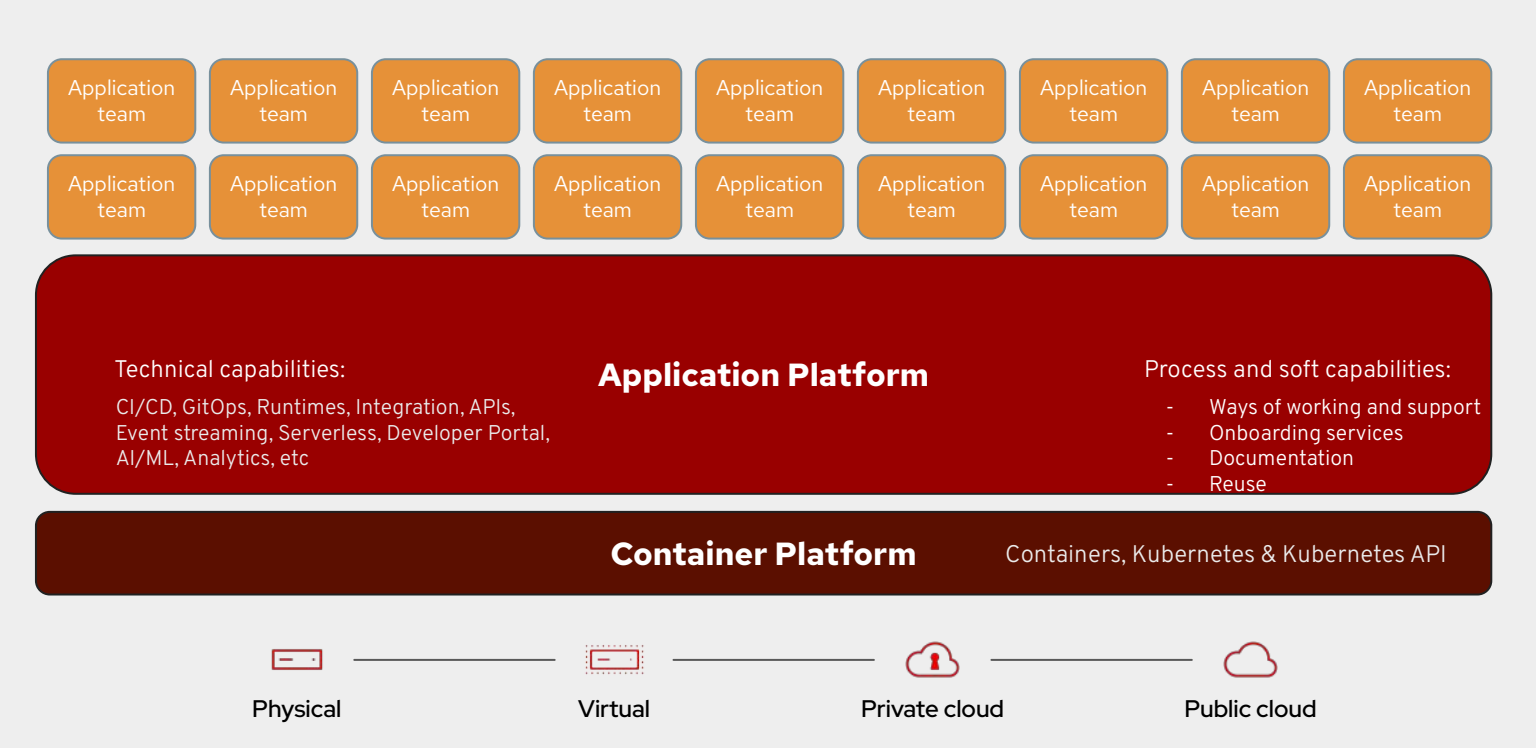
Application and Platform model

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



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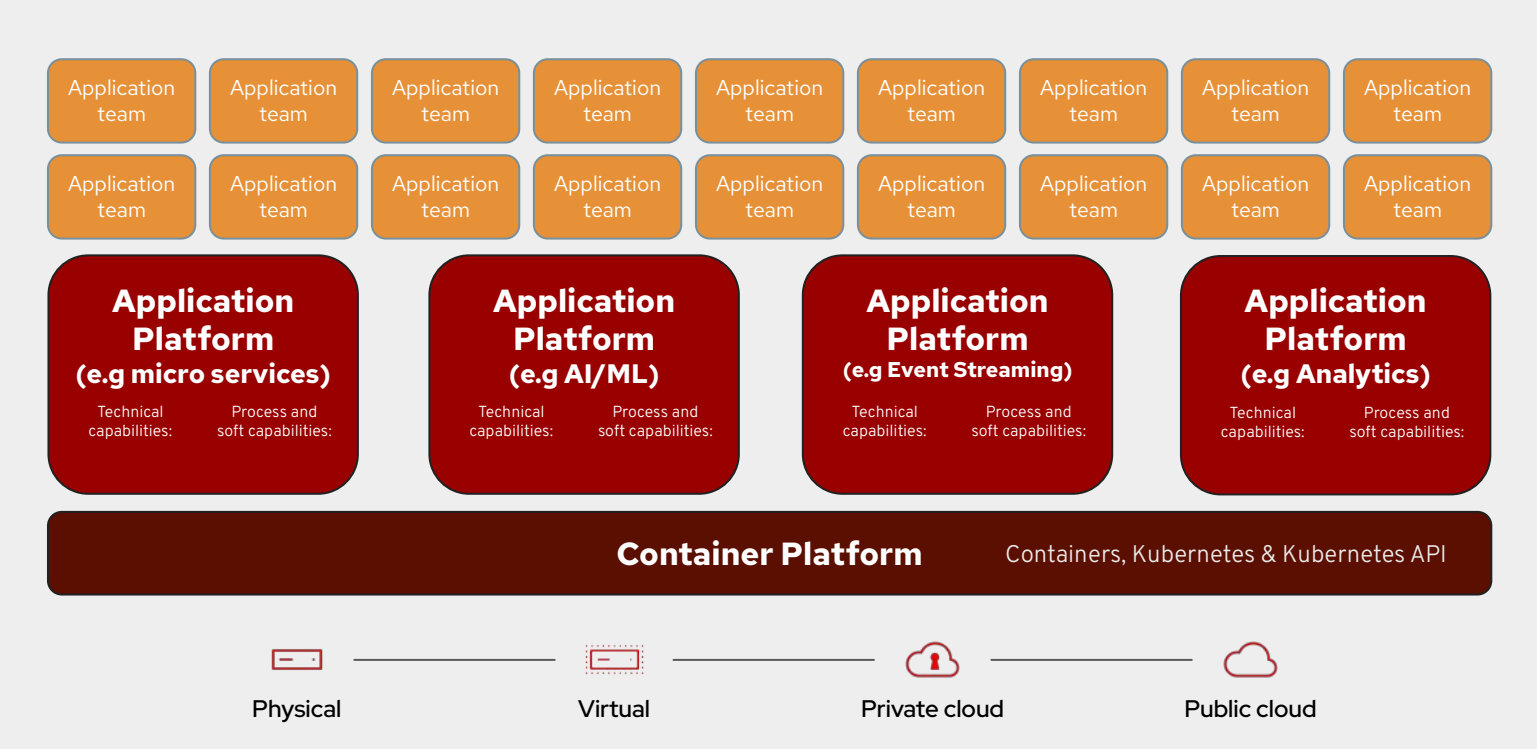
Application and Platform model

- Multiple platforms covering specific technology domains



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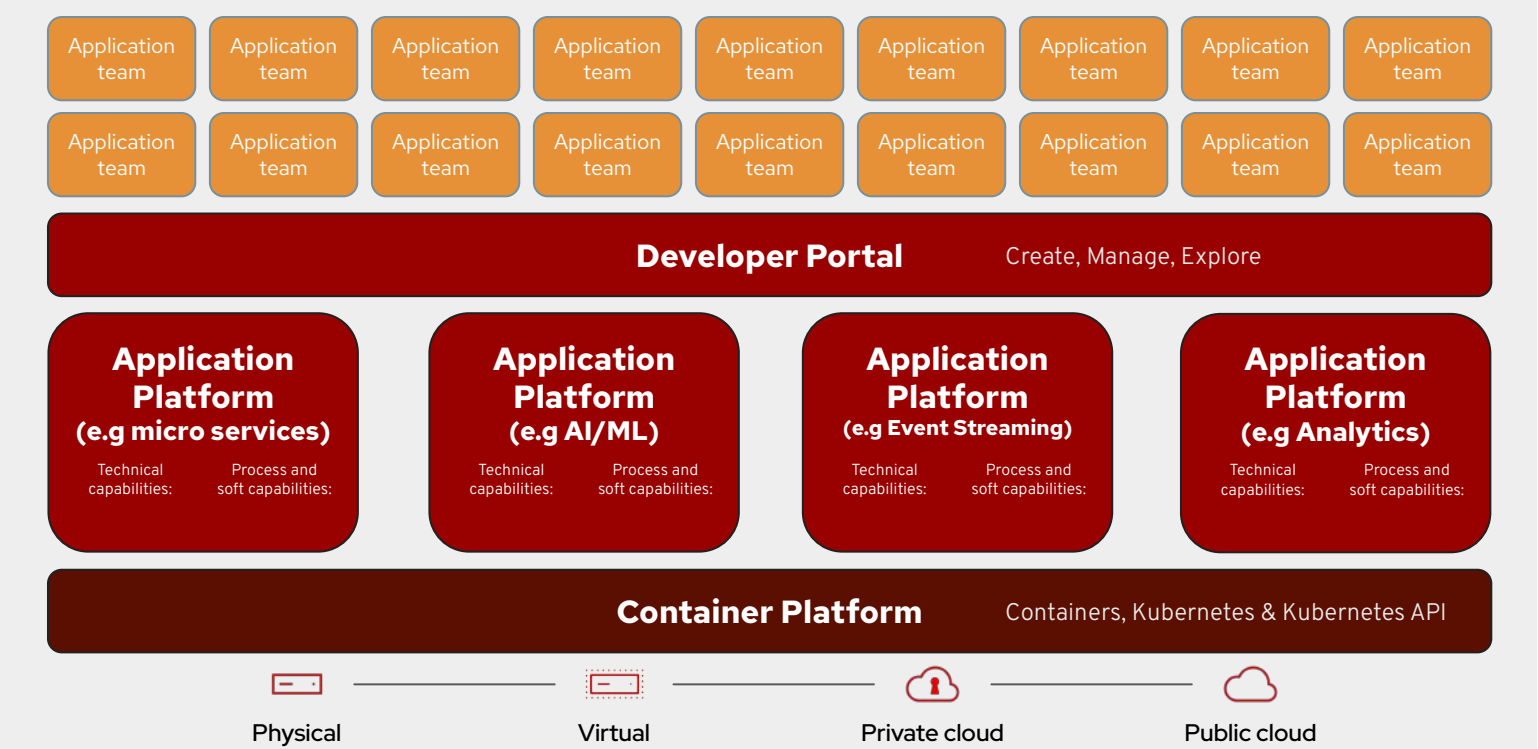
Application and Platform model

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



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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)

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

GitLab · git · Jenkins · sonarqube · argo · MANY MORE

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

Backstage

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

Customer-managed Red Hat OpenShift	Managed Red Hat OpenShift services	Managed Kubernetes Services
Red Hat OpenShift Platform Plus Red Hat OpenShift Container Platform Red Hat OpenShift Kubernetes Engine	IBM Cloud · aws · Azure · Google Cloud	EKS · AKS · GKE

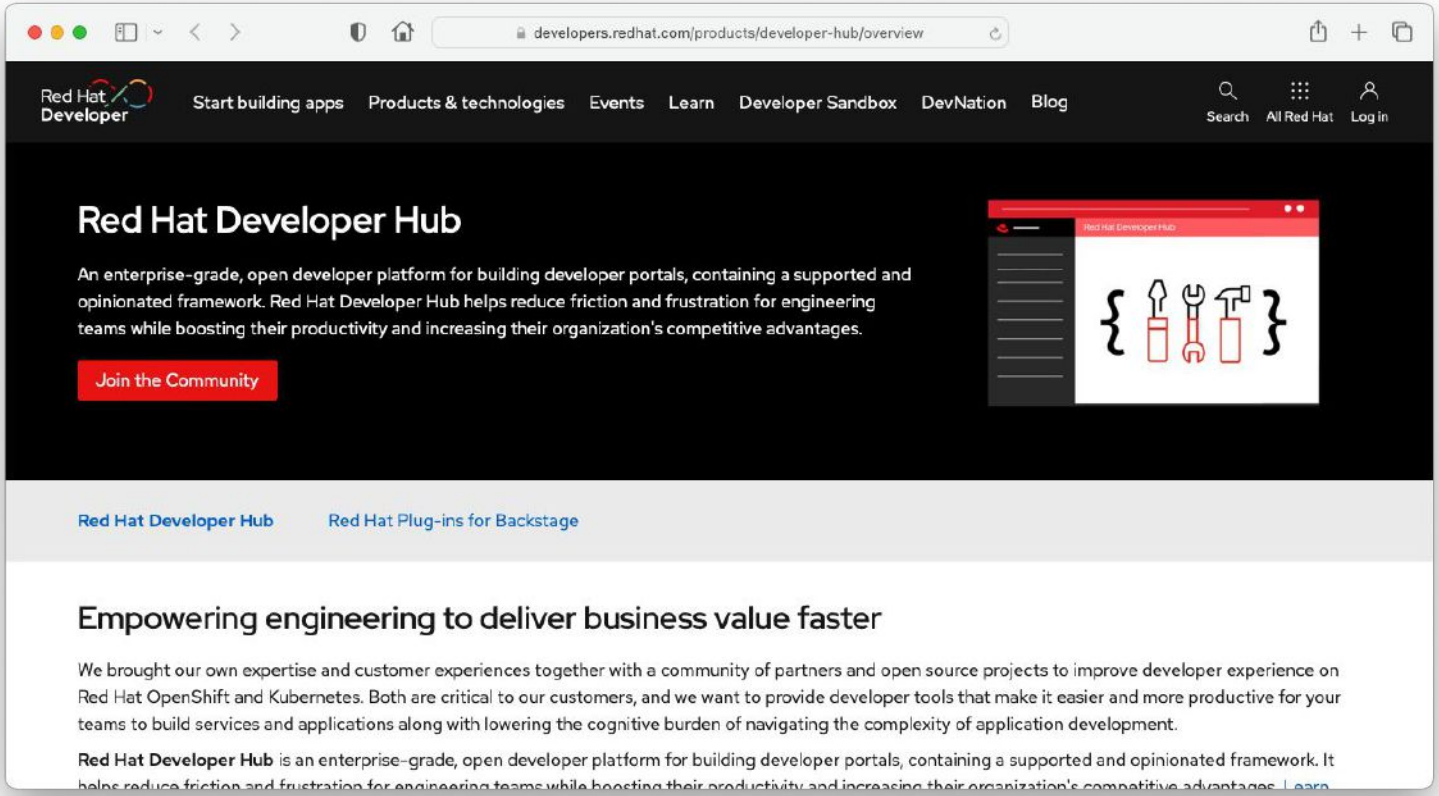
Single pane of glass to increase engineering productivity.

Self-service with guardrails for cloud-native development.

Best practices with GitOps and automation.

Red Hat

Red Hat Developer Hub



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

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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/

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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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