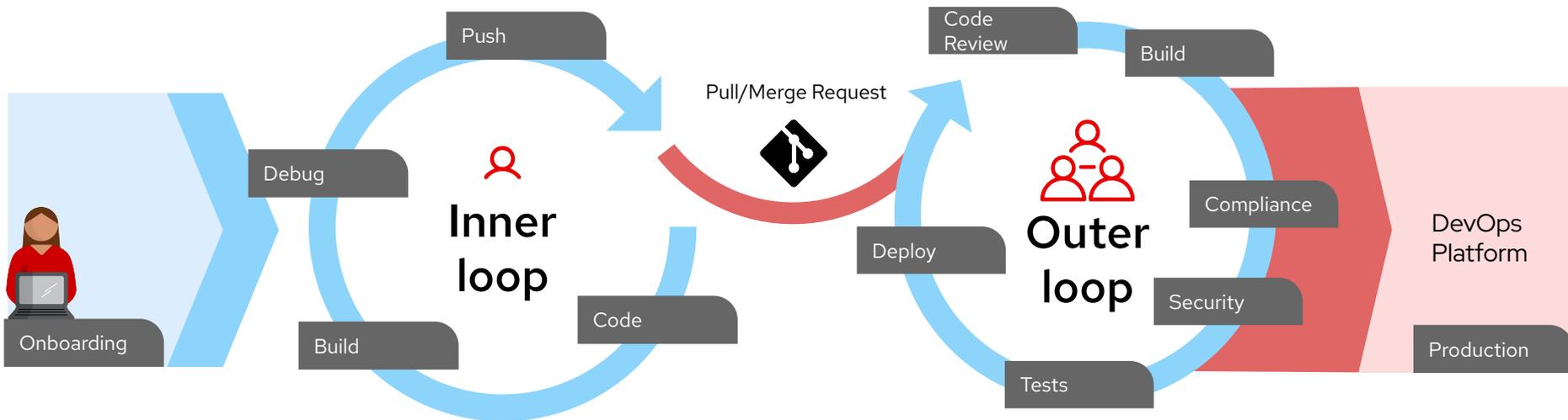# Driving Developer Productivity with Red Hat Dev Tools

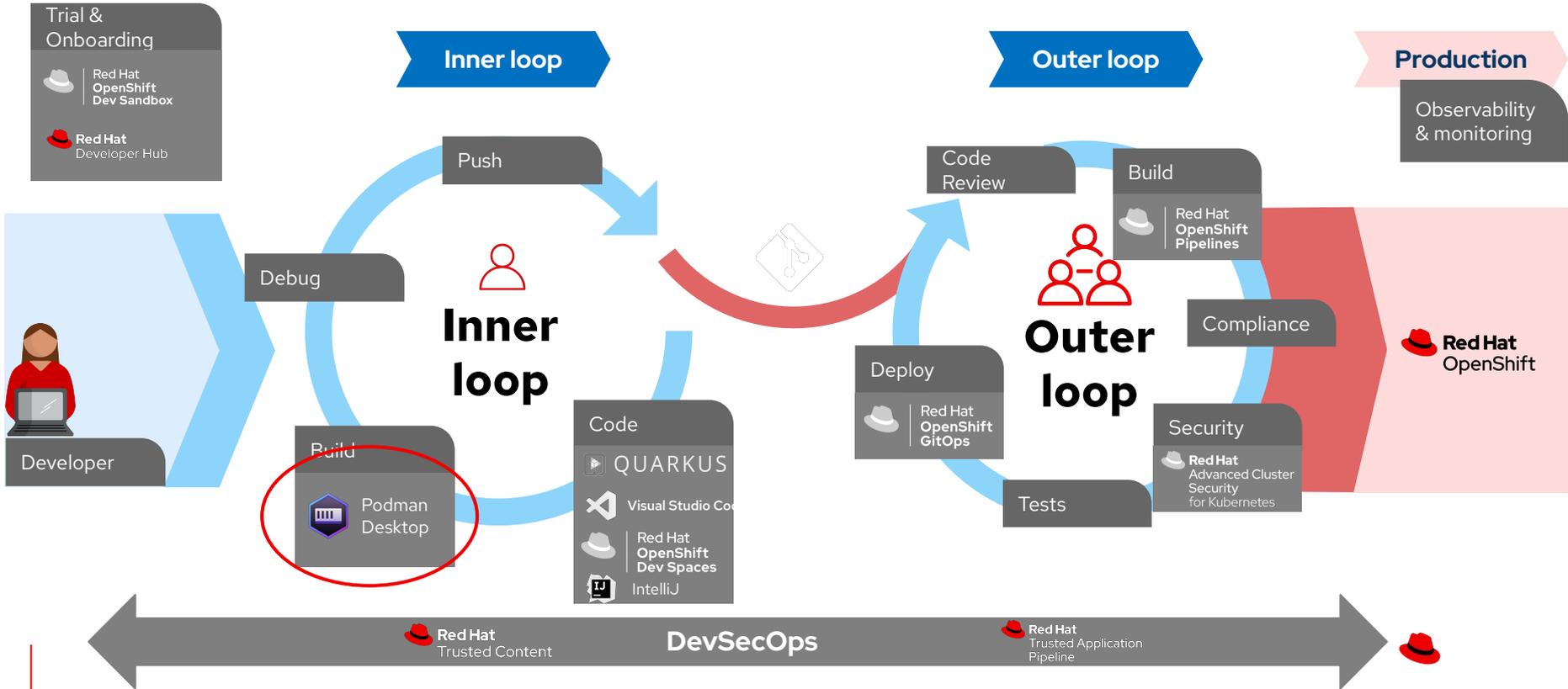Kevin Dubois

Principal Developer Advocate

Red Hat

# Environment, workflows, and tools

## Software Development Life Cycle and Stages

# Developer Strategy follows the Developer Flow

## How Developer **Tools** bring customers from code to production

**Trial & Onboarding**

Red Hat **OpenShift Dev Sandbox**

**Red Hat** Developer Hub

**Inner loop**

**Outer loop**

**Production**

Observability & monitoring

Push

Code Review

Build

Red Hat **OpenShift Pipelines**

Debug

# Inner loop

# Outer loop

Compliance

Deploy

Red Hat **OpenShift GitOps**

Build

Podman Desktop

Code

QUARKUS

Visual Studio Code

Red Hat **OpenShift Dev Spaces**

IntelliJ

Security

**Red Hat** Advanced Cluster Security for Kubernetes

Tests

**Red Hat** OpenShift

Developer

**Red Hat** Trusted Content

**DevSecOps**

**Red Hat** Trusted Application Pipeline

# What is Podman?

A seamless way to work with containers (& Kubernetes!)

**Fast and light**

Daemonless, using the fastest technologies for a snappy experience.

**Secure**

Rootless containers allow you to contain privileges without compromising functionality.

**Open**

Podman is open source first and won't lock you in. Podman Desktop even supports Docker as an engine!

**Compatible**

Compatible with other OCI compliant container formats including Docker, as well as docker-compose files.

Source: https://podman.io

https://www.redhat.com/architect/hpc-containers-scale-using-podman

Red Hat

# Podman in Action

It's easy to get started with Podman to manage containers and container images!

- ▶ Pulling, building, pushing images
- ▶ Running containers & debugging
- ▶ Working with Kubernetes
- ▶ & much more!

```
cedric@cclyburn-mac ~ % podman --help
Manage pods, containers and images

Usage:
  podman [options] [command]

Available Commands:
  attach      Attach to a running container
  build       Build an image using instructions from Containerfiles
  commit      Create new image based on the changed container
  container   Manage containers
  cp          Copy files/folders between a container and the local filesystem
  create      Create but do not start a container
  diff        Display the changes to the object's file system
  events      Show podman system events
  exec        Run a process in a running container
  export      Export container's filesystem contents as a tar archive
  generate    Generate structured data based on containers, pods or volumes
  healthcheck Manage health checks on containers
  help        Help about any command
  history     Show history of a specified image
  image       Manage images
```

# Podman in Action: **Images**

**Container Images:** Lightweight and isolated packages that encapsulate an application & its dependencies.

- ▶ podman search <image>
- ▶ podman pull <image>
- ▶ podman images
- ▶ podman build .
- ▶ podman push <image>
- ▶ podman inspect <image>

cedric — -zsh — 73×19

cedric@cclyburn-mac ~ %

Red Hat

# Podman in Action: **Containers**

**Containers:** Running instance of a container image, sharing host OS kernel and is ephemeral.

- ▸ podman run <image>
- ▸ podman ps
- ▸ podman attach
- ▸ podman logs <container>
- ▸ podman container checkpoint
- ▸ podman container restore

cedric — -zsh — 73×19

cedric@cclyburn-mac ~ %

Red Hat

# Podman in Action: **Pods**

**Pods:** Group of containers that run together and share the same storage & network as a single unit.

- ▸ podman pod create <name>
- ▸ podman run –-pod
- ▸ podman generate kube
- ▸ podman play kube
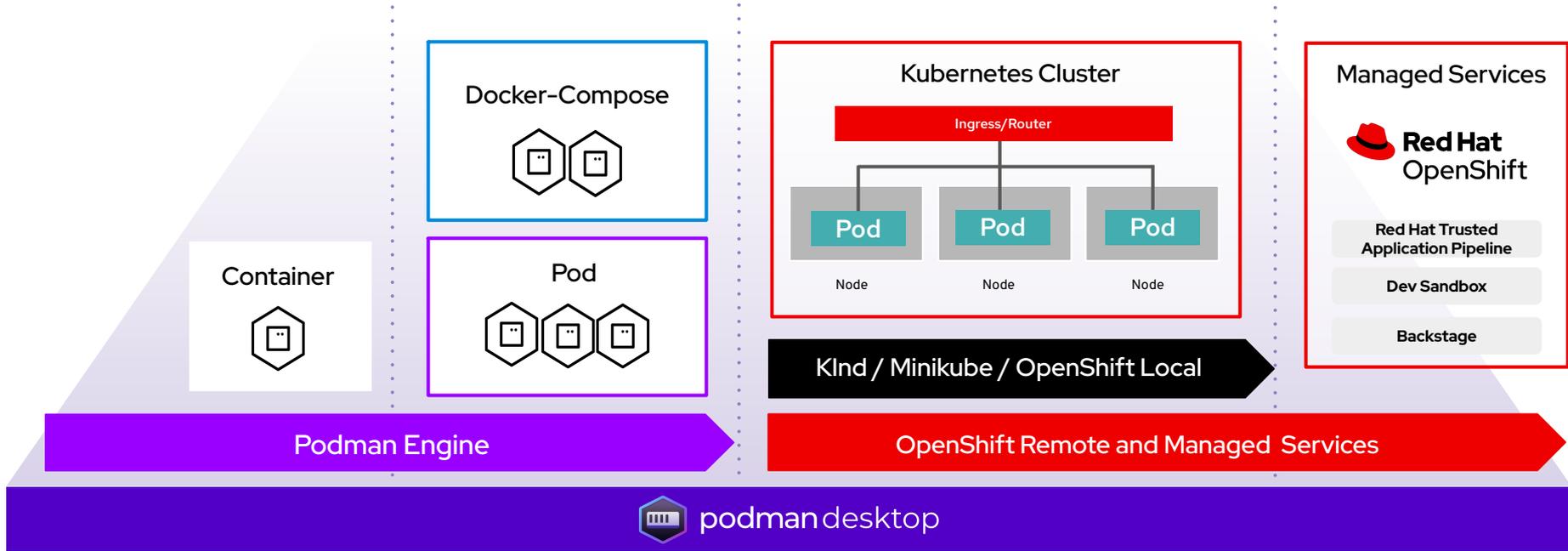
# Podman Desktop

# Simplistic onboarding.

From applications to containers, to pods, to Kubernetes.

# What's going on between local and prod environments?

"Local developer environments have become **impractical** and **lack of consistency** with production."

## Additional complexity
Exposed level of complexity and additional overhead required to go cloud native.
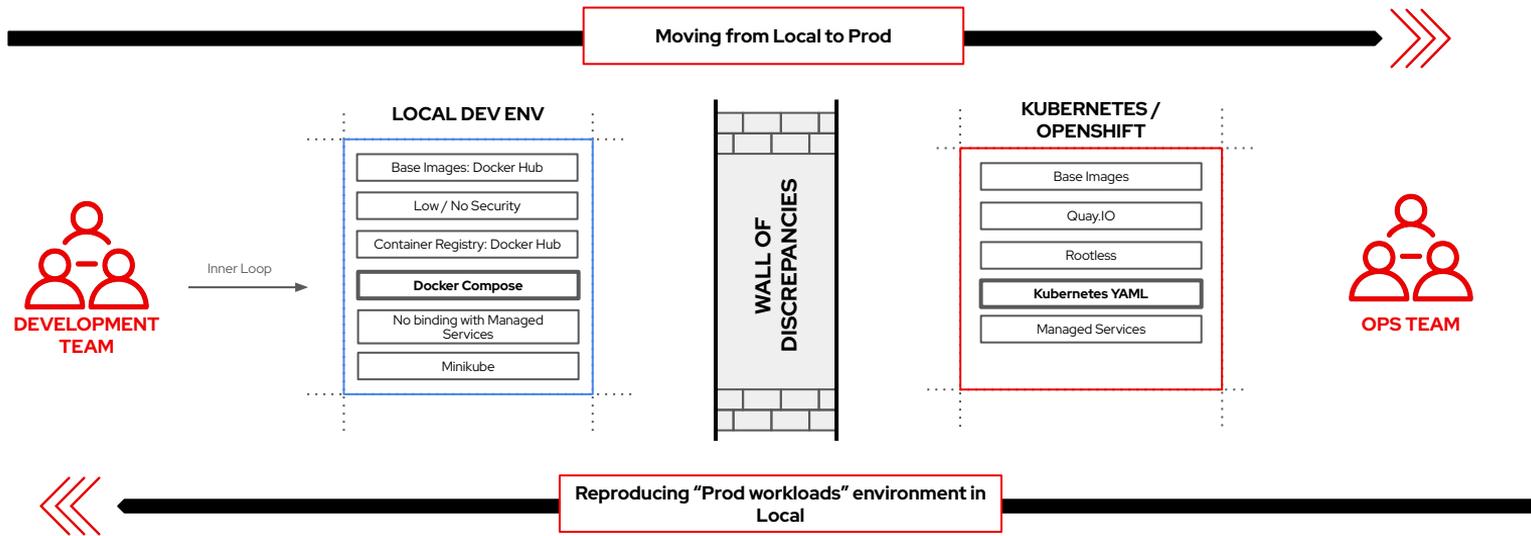
## Skills Gap
Lack of skilled workforce and technological expertise. 70% IT departments have a single expert team on Kubernetes. (1)

## Devs & Ops disconnect
82% IT departments claim Kubernetes creates conflicts. (2)

# From local developer environments to deployments on production

**Moving from Local to Prod**

**LOCAL DEV ENV**

| Base Images: Docker Hub |
| --- |
| Low / No Security |
| Container Registry: Docker Hub |
| **Docker Compose** |
| No binding with Managed Services |
| Minikube |

**DEVELOPMENT TEAM**

Inner Loop

**WALL OF DISCREPANCIES**

**KUBERNETES / OPENSHIFT**

| Base Images |
| --- |
| Quay.IO |
| Rootless |
| **Kubernetes YAML** |
| Managed Services |

**OPS TEAM**

**Reproducing "Prod workloads" environment in Local**

**Adoption Barrier**

**Ops are burdened by having to convert developers' artifacts.**

Red Hat

# Introducing Podman Desktop: Community Edition

## Containers and Kubernetes for Application Developers

**Podman and Kubernetes/OpenShift Local**

- Install and run anywhere: Windows, Mac and Linux
- Keep it up-to-date

**Containers and Pods**

- Build, run, manage and debug Containers and Pods
- Run Pods with or without Kubernetes
- Manage multiple container Engines
- Compatibility with Docker and Compose

**Enterprise Readiness**

- VPN and Proxies configuration
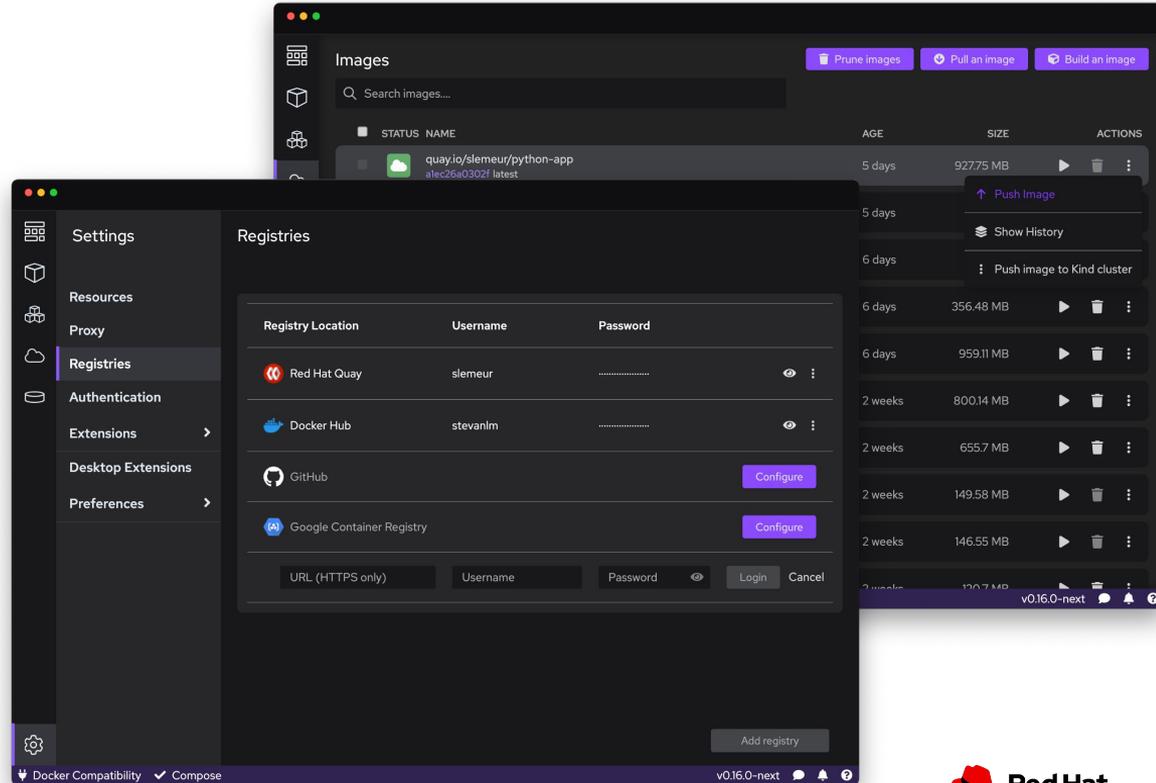- Image registry management
- AirGapped Installation

**Bridge between local and remote**

- Connect and deploy to remote OpenShift clusters
- Enable remote managed services locally
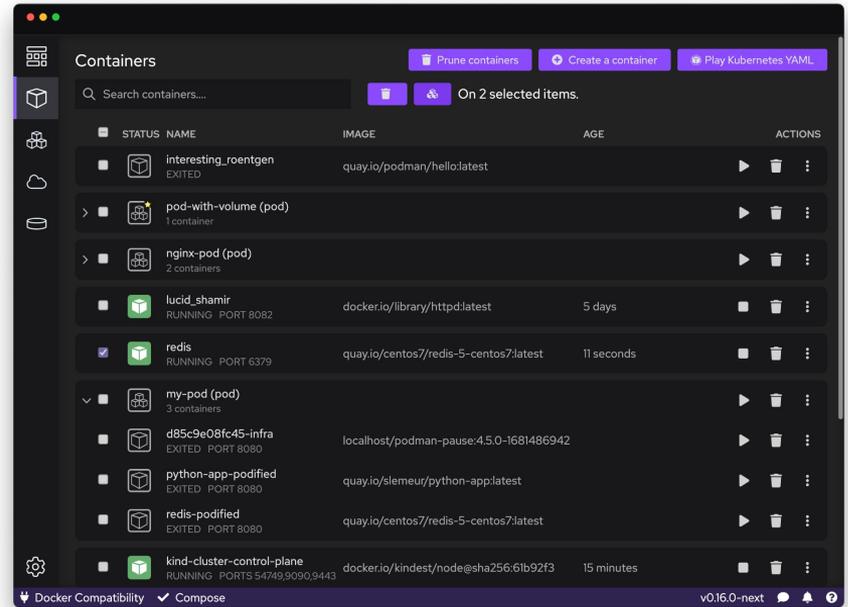
# Podman Desktop: Support for OCI Registries

➤ Configure multiple OCI registries

➤ Authenticate to registries

➤ Pull, tag and push images to your registries

# Podman Desktop: Pods

➤ Create and start Pods with Podman

➤ Select containers to run as a Pod

➤ Play Kubernetes YAML locally without Kubernetes

➤ Generate Kubernetes YAML from Pods
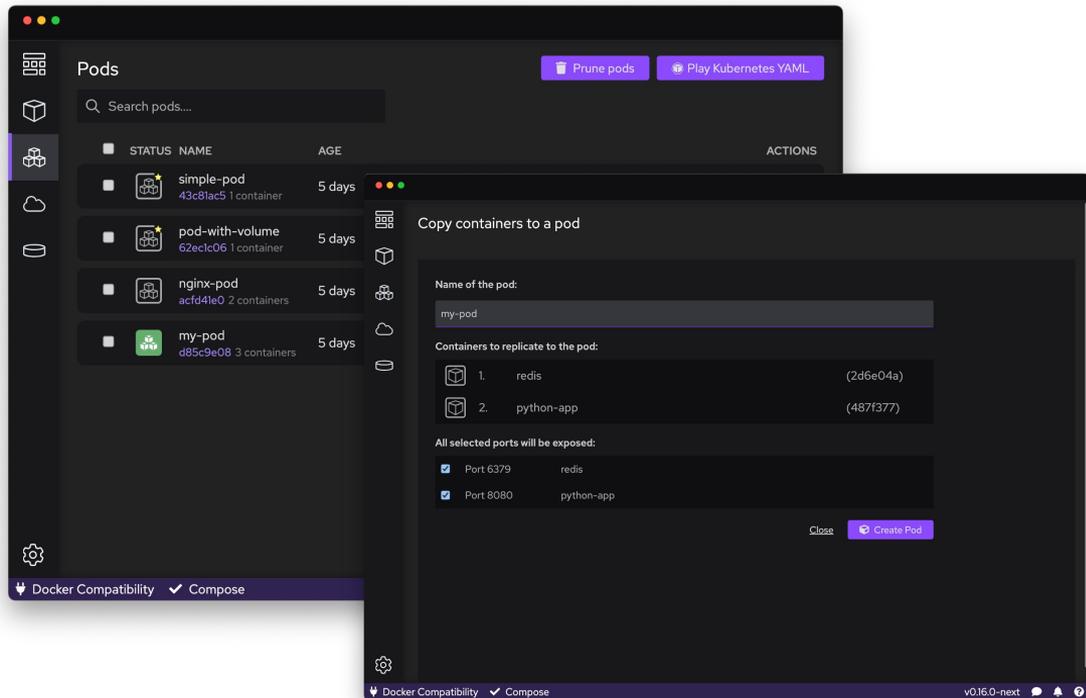
# Podman Desktop: OpenShift and Dev Sandbox Integration

➤ OpenShift Local extension

 ○ **Light and optimized** – Powered by Microshift (experimental)

 ■ For Developers

 ■ Minimal services set

 ■ Fast and lightweight

 ○ **Single-node OpenShift** – Powered by OpenShift Container Platform

 ■ Full services set

 ■ Complete and more resource-intensive

➤ Support for Dev Sandbox
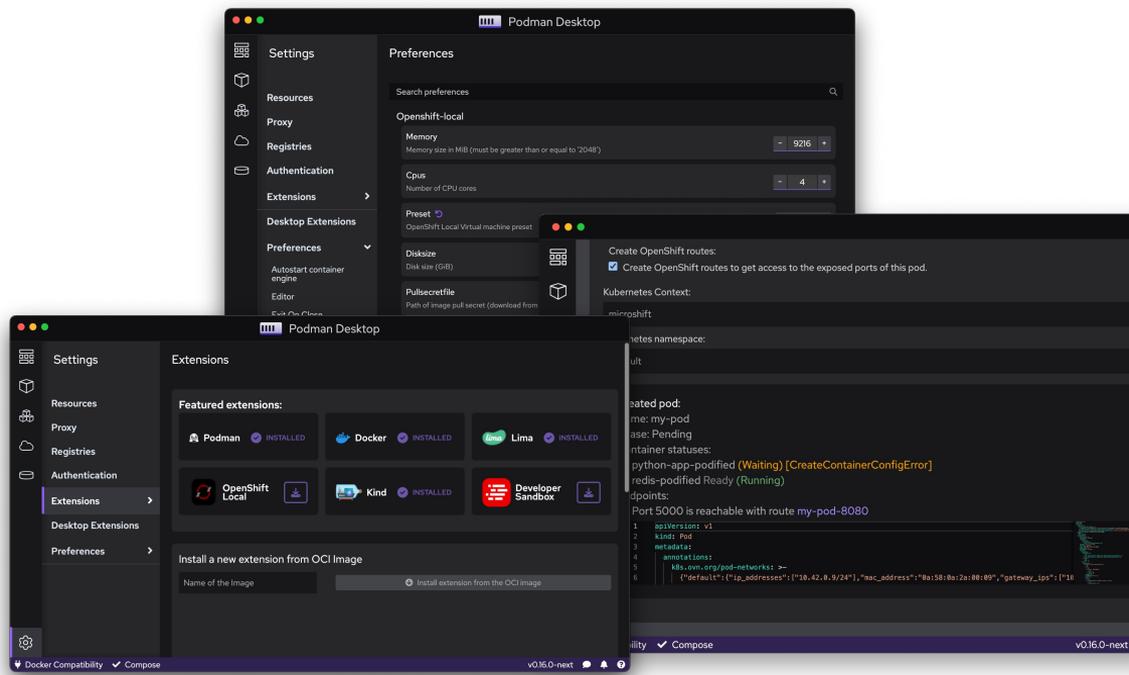
# Extensibility with Podman Desktop

## Enabling extension points and other container/K8s technologies



Supports Docker Desktop extensions
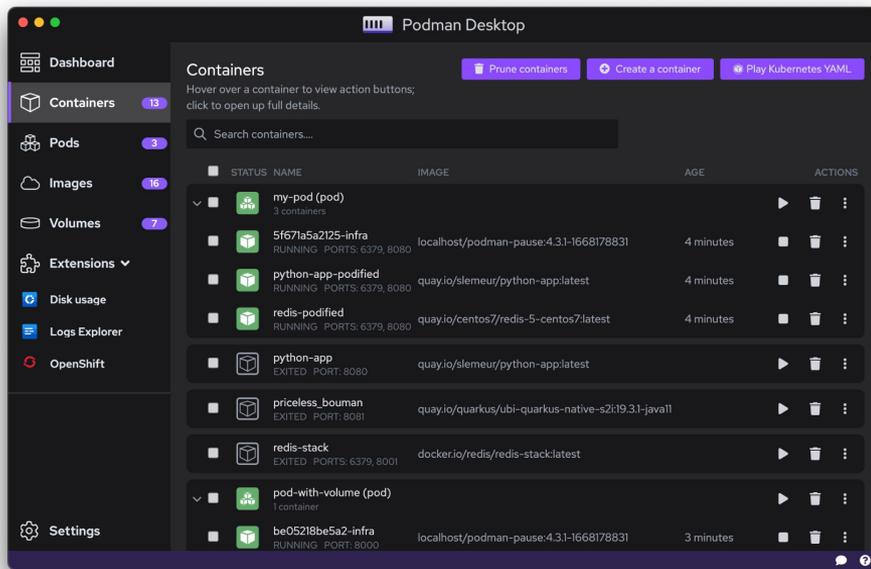
But Podman Desktop extensions can also do much more:

➤ **Container engine providers**

➤ **Kubernetes providers**

➤ Add actions

➤ Add menus

➤ Add configuration

➤ **Add default registries**

➤ Add to status bar

➤ Add to system tray
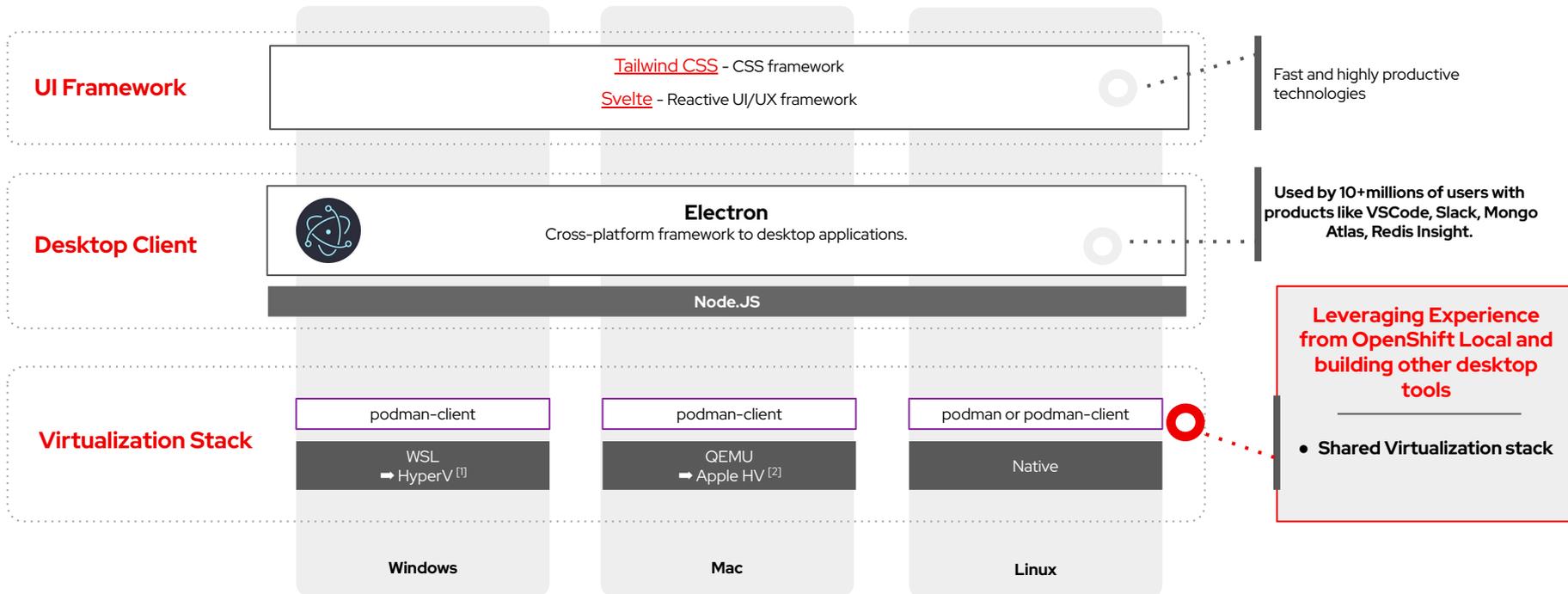
**Current extensions:**

Podman　　Kind　　Lima　　Docker　　OpenShift Local　　*& more!*

Red Hat

# Demo Time!

# Podman Desktop: Behind the Scenes

**UI Framework**

Tailwind CSS - CSS framework

Svelte - Reactive UI/UX framework

Fast and highly productive technologies

**Desktop Client**

**Electron**
Cross-platform framework to desktop applications.

Node.JS

Used by 10+millions of users with products like VSCode, Slack, Mongo Atlas, Redis Insight.

**Virtualization Stack**

| podman-client | podman-client | podman or podman-client |
|---|---|---|
| WSL ➡ HyperV [1] | QEMU ➡ Apple HV [2] | Native |

**Windows**          **Mac**          **Linux**

**Leveraging Experience from OpenShift Local and building other desktop tools**

- **Shared Virtualization stack**

[1] HyperV under active development
[2] Apple Hypervisor support in early (but active) planning

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# What's next &
# How to get started!

# What's next for Podman?

A seamless way to work with containers (& Kubernetes!)

- ▶ Improvements for Podman Machine

  - · Native Apple hypervisor support

  - · Windows Hyper-V hypervisor support

- ▶ Faster container startup

- ▶ Enhancements for Podman's Kubernetes yaml support

- ▶ Better rootless networking
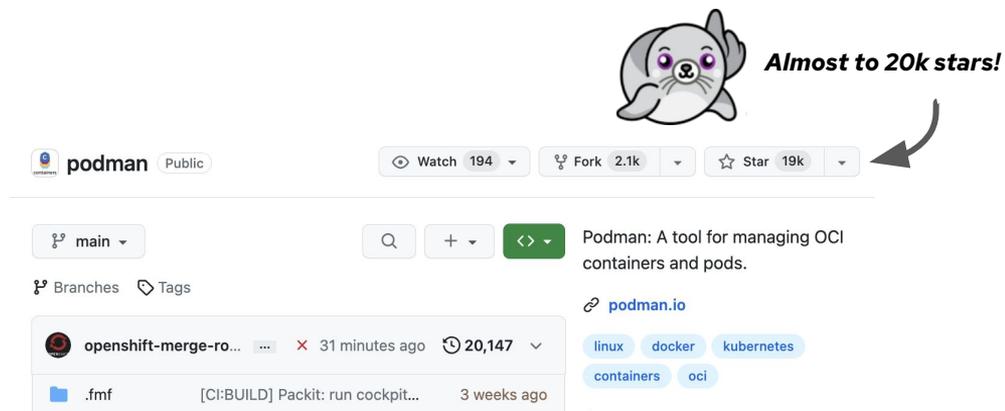


*Almost to 20k stars!*

# What's next for Podman Desktop?

## Containers tooling

- Native Hypervisors support
- Onboarding experience   `Contribute`
- Simpler Docker compatibility configuration

## Kubernetes Capabilities

- Improvements in Podify and Kubify flows
- Kubernetes Objects Explorer   `Contribute`
- Compose to Kubernetes

## OpenShift Support

- DevSandbox account creation and token renewal flow
- Image checker
- Continue exploration on Microshift for developers

**Efficient developer flows**

**Simple transitions to Kubernetes**

**Tighter OpenShift Integration**

# Get started with Podman & Podman Desktop!

## Get involved with Podman and adopt a seal (figuratively)!

### On the Web

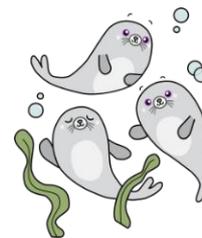Learn how to install Podman

podman.io

podman-desktop.io

### Github

Contribute and report issues

github.com/containers/podman

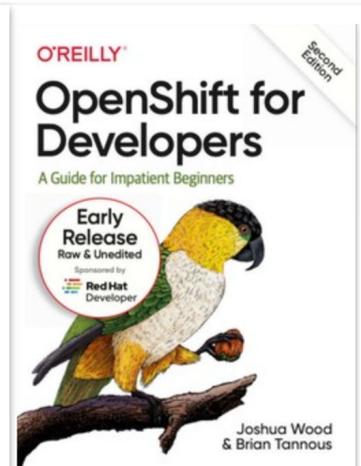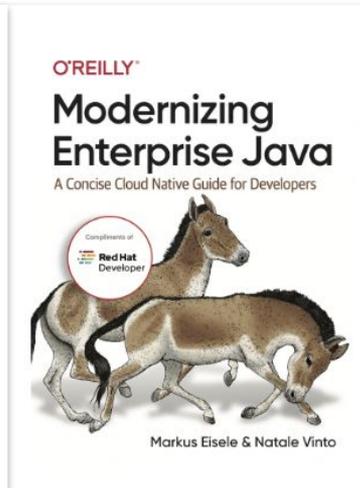github.com/containers/podman-desktop

### Chat

Get connected with the community
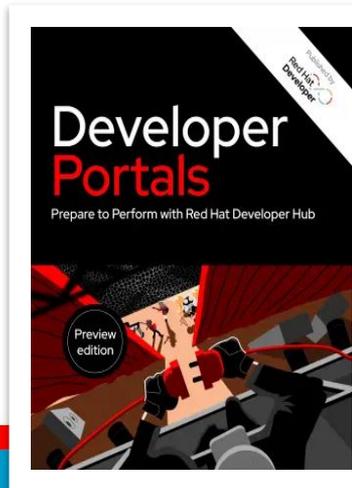
podman.io/community

Red Hat
Developer

Source:
https://developers.redhat.com/e-books/podman-action

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# Free Developer e-Books!

## https://developers.redhat.com/eventtutorials

Developer Portals
Prepare to Perform with Red Hat Developer Hub
Preview edition

Quarkus for Spring Developers
Eric Deandrea
with Daniel Oh and Charles Moulliard
Foreword by Martijn Verburg

Compliments of Red Hat Developer
Podman IN ACTION
The next generation of container engines
Daniel J Walsh
MANNING

O'REILLY
Modernizing Enterprise Java
A Concise Cloud Native Guide for Developers
Compliments of Red Hat Developer
Markus Eisele & Natale Vinto

O'REILLY
Second Edition
OpenShift for Developers
A Guide for Impatient Beginners
Early Release
Raw & Unedited
Sponsored by Red Hat Developer
Joshua Wood & Brian Tannous

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