

**RED HAT
SUMMIT**

RED HAT ENTERPRISE LINUX 8 CONTAINER TOOLS

Understanding how Red Hat Enterprise Linux 8 provides
a foundation for building and deploying containers

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Please Stand

Please read
out loud all
text in

RED

I Promise

To say
Make a copy
Rather than
Make a Xerox

I Promise

To say
Tissue
Rather than
Kleenex

I Promise

To say
Container Registries
Rather than
Docker registries

I Promise

To say
Container Images
Rather than
Docker images

I Promise

To say
Containers
Or
OCI Containers
Rather than
Docker Containers

Sit Down

THE JOURNEY

Single node

TRADITIONAL DEVELOPMENT



Find



Run



Build

THE JOURNEY

Single node+

TRADITIONAL DEVELOPMENT



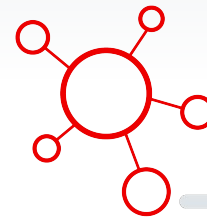
Find



Run



Build



Share

THE JOURNEY

Multinode

TRADITIONAL DEVELOPMENT



Find



Run

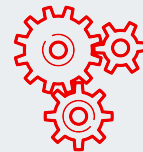


Build

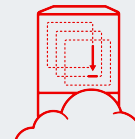


Share

CLOUD-NATIVE



Integrate



Deploy

THE JOURNEY

Can start anywhere

TRADITIONAL DEVELOPMENT



Find



Run



Build

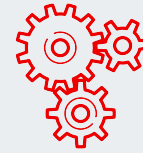
Red Hat® Enterprise Linux®
(Podman, Buildah, and Skopeo, Universal Base Image)



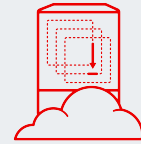
Share

Red Hat
Quay

CLOUD-NATIVE



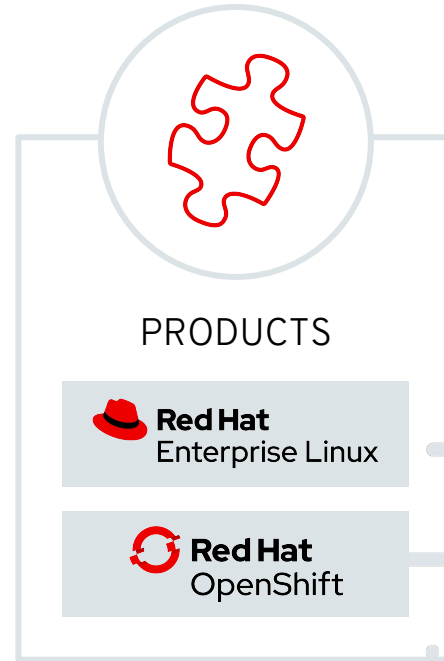
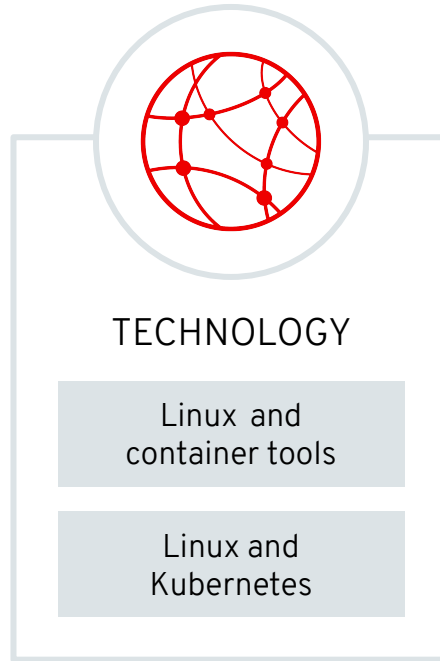
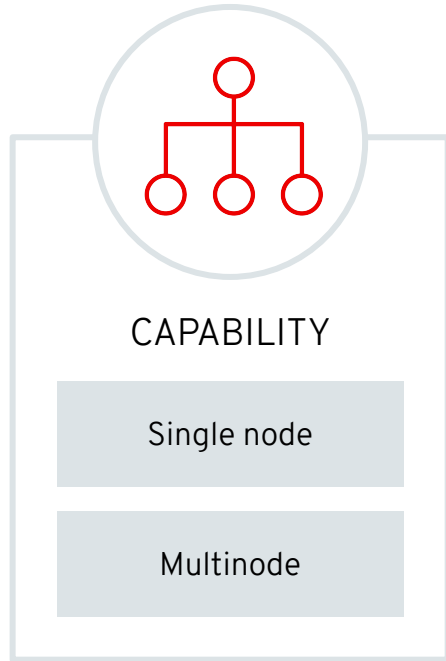
Integrate



Deploy

Red Hat OpenShift® Container
Platform (Kubernetes)

CUSTOMER NEEDS



UNDERSTANDING CONTAINER TOOLS

CONTAINERS DON'T RUN “ON” DOCKER



Containers are processes—they run on a container host. **Containers are Linux.**

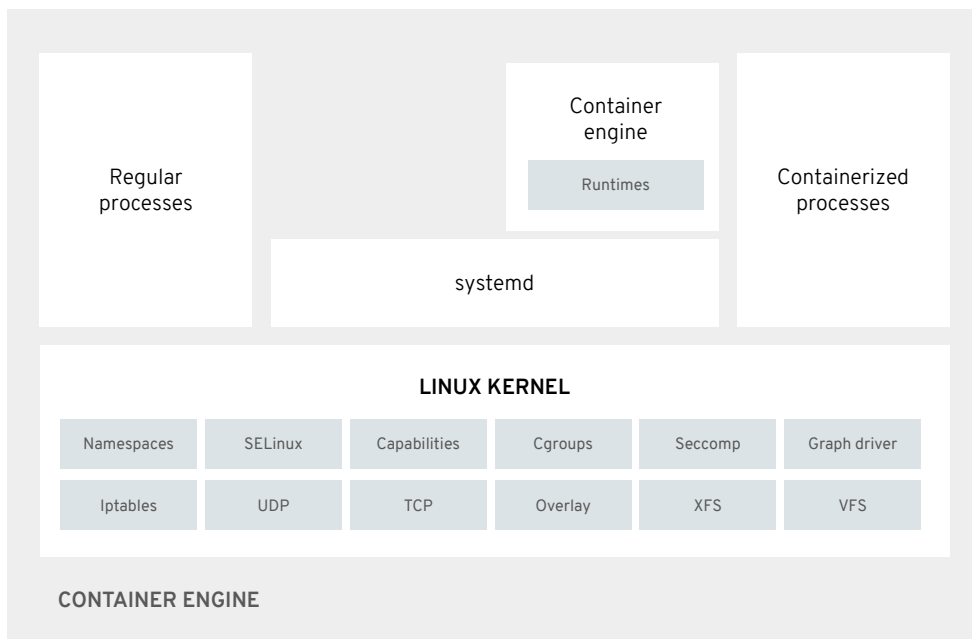
Containers are defined by the Open Containers Initiative (OCI), a collaborative project hosted by the Linux Foundation.

The docker daemon is one of the many user space tools/libraries that talk to the kernel to set up containers.



CONTAINER HOST PROCESSES

Regular processes, daemons, and containers all run side by side

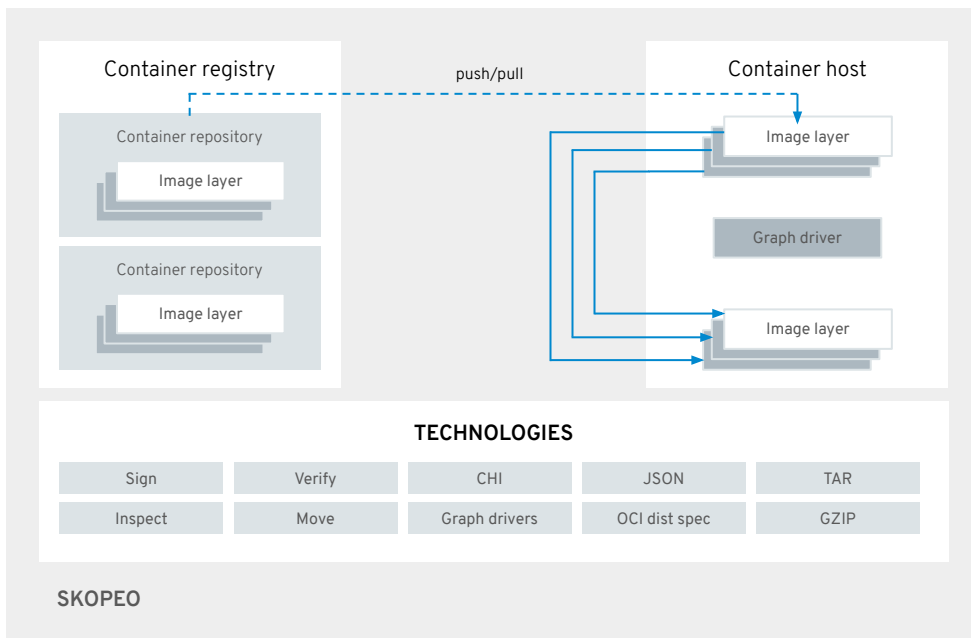


Tightly coupled communication through the kernel—all-or-nothing feature support:

- › Operating system (kernel)
- › Container runtime (runC)
- › Container engine
- › The whole stack is responsible for containers—the container host

CONTAINER HOST STORAGE

Inspect, move, sign, and verify image layers



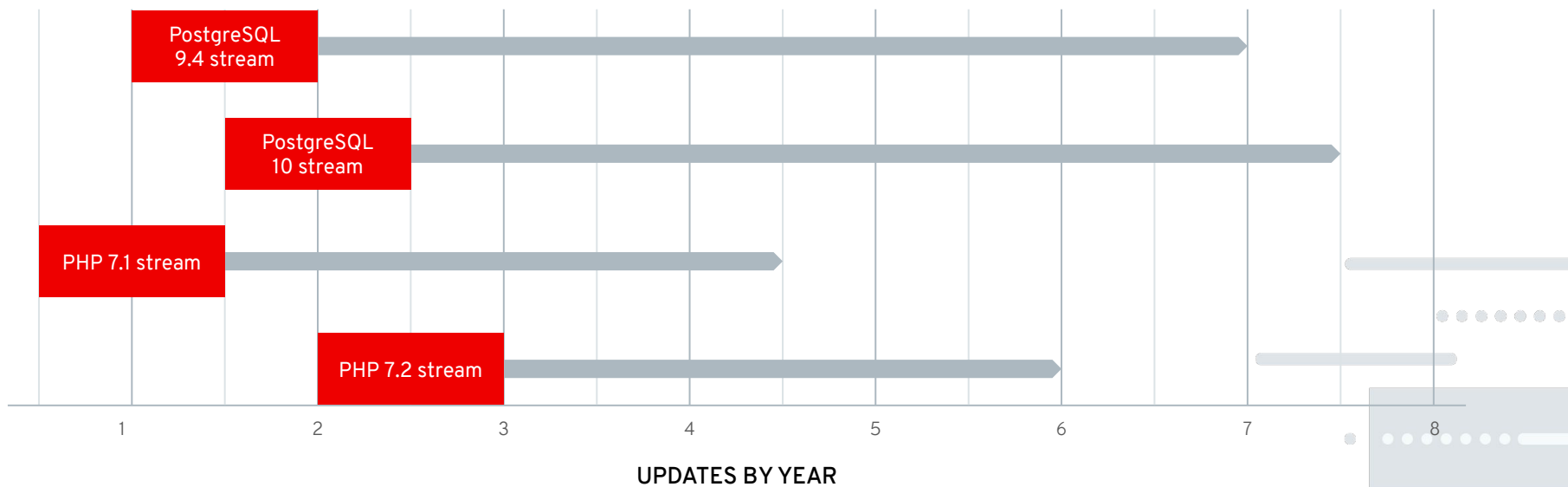
Container engines and runtimes rely on the kernel for storage:

- Cached container images map to layered file system
- Running containers often use an extra copy on write layer

INTRODUCING RED HAT ENTERPRISE LINUX 8 CONTAINER TOOLS MODULE

APPLICATION STREAMS USE MODULES

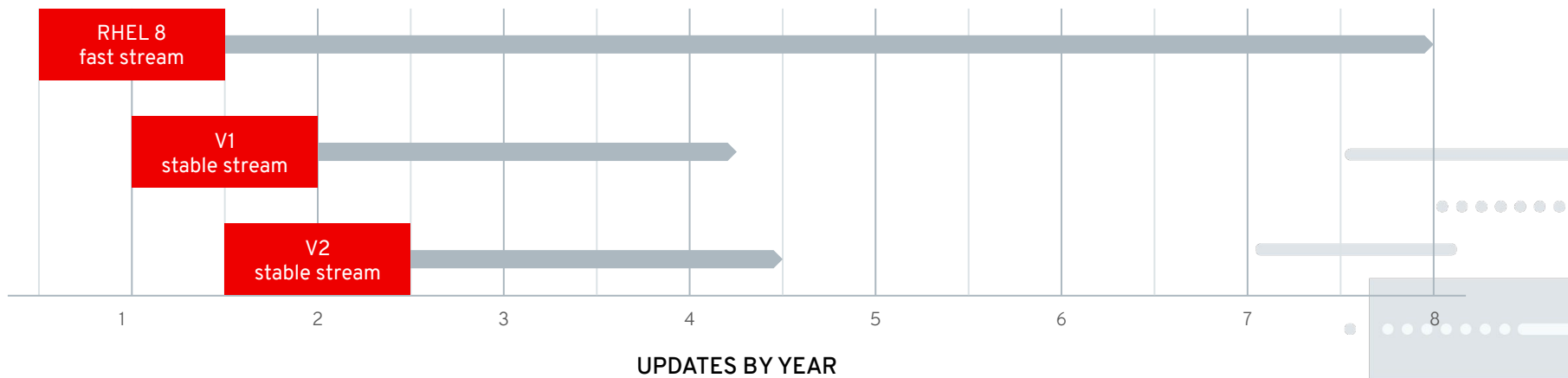
Each module defines its own life cycle, which is closer to the natural life of the application rather than the Red Hat Enterprise Linux life cycle.



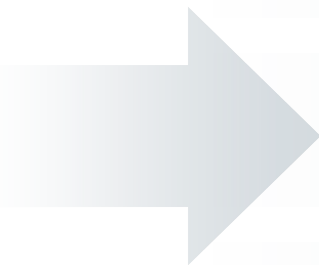
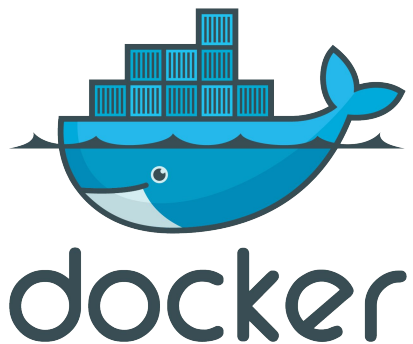
THE CONTAINER TOOLS MODULE

One module delivered with multiple application streams based on different use cases:

- The Red Hat Enterprise Linux 8 stream delivers new versions for developers
- The versioned, stable streams provide stability for operations



MAJOR TOOLS IN THE MODULE



podman



skopeo



buildah



OPEN CONTAINER INITIATIVE

Replacing Docker With Podman

By Dan Walsh @rhatdan

```
dnf install -y podman
```

```
dnf install -y podman
```

```
alias docker=podman
```

Questions

Blog: <https://podman.io/blogs>

Github:

- <https://github.com/projectatomic/libpod> (podman)
- <https://github.com/containers/storage>
- <https://github.com/containers/image>
- <https://github.com/containers/buildah>

IRC: freenode: #podman

Site: <https://cri-o.io>



docker=podman

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 **RDO** @RDOcommunity
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 **Alex Polvi** @polvi
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Why Americans celebrate Flag Day on June 14

#WorldCupRussia2018
89.9K Tweets

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51.9K Tweets

Degrassi
Drake reunites with Degrassi cast in new music video

Spieth
1,924 Tweets

Clinton
159K Tweets

#USOpen2018
1,749 Tweets

 **Alan Moran** @ialanmoran Follow

I completely forgot that ~2 months ago I set up "alias docker='podman'" and it has been a dream. #nobigfatdaemons @projectatomic

11:49 PM - 29 May 2018

7 Retweets 15 Likes

2 7 15

 Tweet your reply

 **Alan Moran** @ialanmoran · May 30
Only downside is no Mac OS support (Main dev machine)

 **Joe Thompson** @caffeinepresent · May 30
Replying to @ialanmoran @projectatomic
So, what reminded you?

 **Alan Moran** @ialanmoran · May 30
docker help 🙄



DEMO



#nobigfatdaemons

MODERN CONTAINER TOOLS

Providing stability, flexibility, and performance with containers and images



podman

Container-tools – OCI tooling to create, run, and manage Linux containers with an enterprise life cycle



skopeo

- › Conform to the OCI image and runtime specifications
- › Daemon-less, OS-native container tooling
- › Separation of concerns



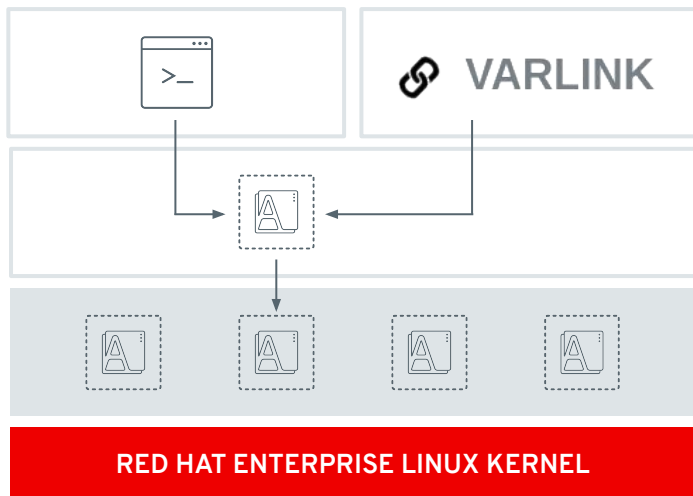
buildah

CONTAINER TOOLS

Improved security model, stability, and life cycle



A daemon-less CLI/API for running, managing, and debugging OCI containers and pods



- › Fast and lightweight
- › Uses runC
- › Provides a “docker-style” syntax for working with containers
- › Standard CNI networking
- › Remote management API via Varlink
- › Provides systemd integration and advanced namespace isolation

CONTAINER TOOLS

Improved security model, stability, and life cycle



buildah

A daemon-less tool for building and modifying OCI/Docker images

Start from an existing image or from scratch



Generate new layers and/or run commands on existing layers



Commit storage and generate the image manifest



Deliver image to a local store or remote OCI/Docker registry

- › Preserves existing Dockerfile workflow
- › Allows fine-grained control over image layers, the content, and commits
- › Lets you minimize container images by using tools from the container host rather than adding them in the image
- › Shares the underlying image and storage components with Podman and CRI-O

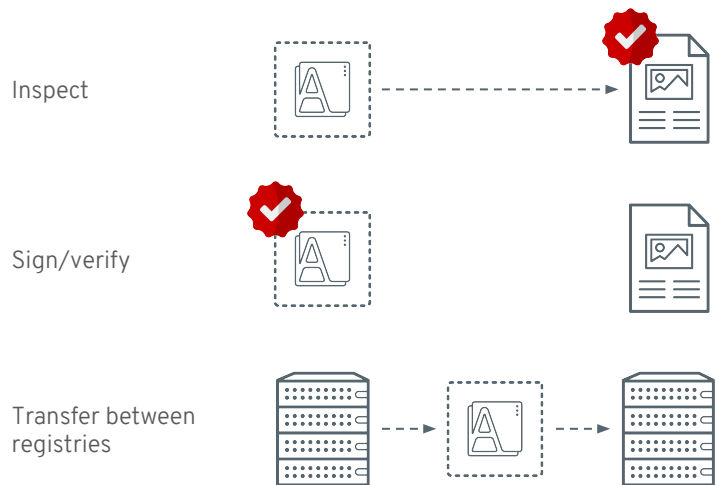
CONTAINER TOOLS

Improved security model, stability, and life cycle



skopeo

A comprehensive tool and library to inspect, sign, and transfer images.



- › Inspect image manifests
- › Sign and verify image manifests
- › Push/pull images
- › Currently the only tool capable of copying images between registries
- › Disconnected environments
- › Same code base as the/containers/image library which is used by buildah, podman, and CRI-O

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THANK YOU



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