State of the Docker Engine

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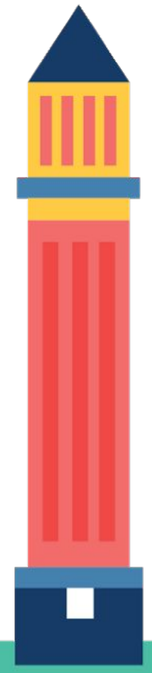
@manikt



Docker Engine: Fueling the container revolution

8M+

Monthly Active Docker Engines

74B+

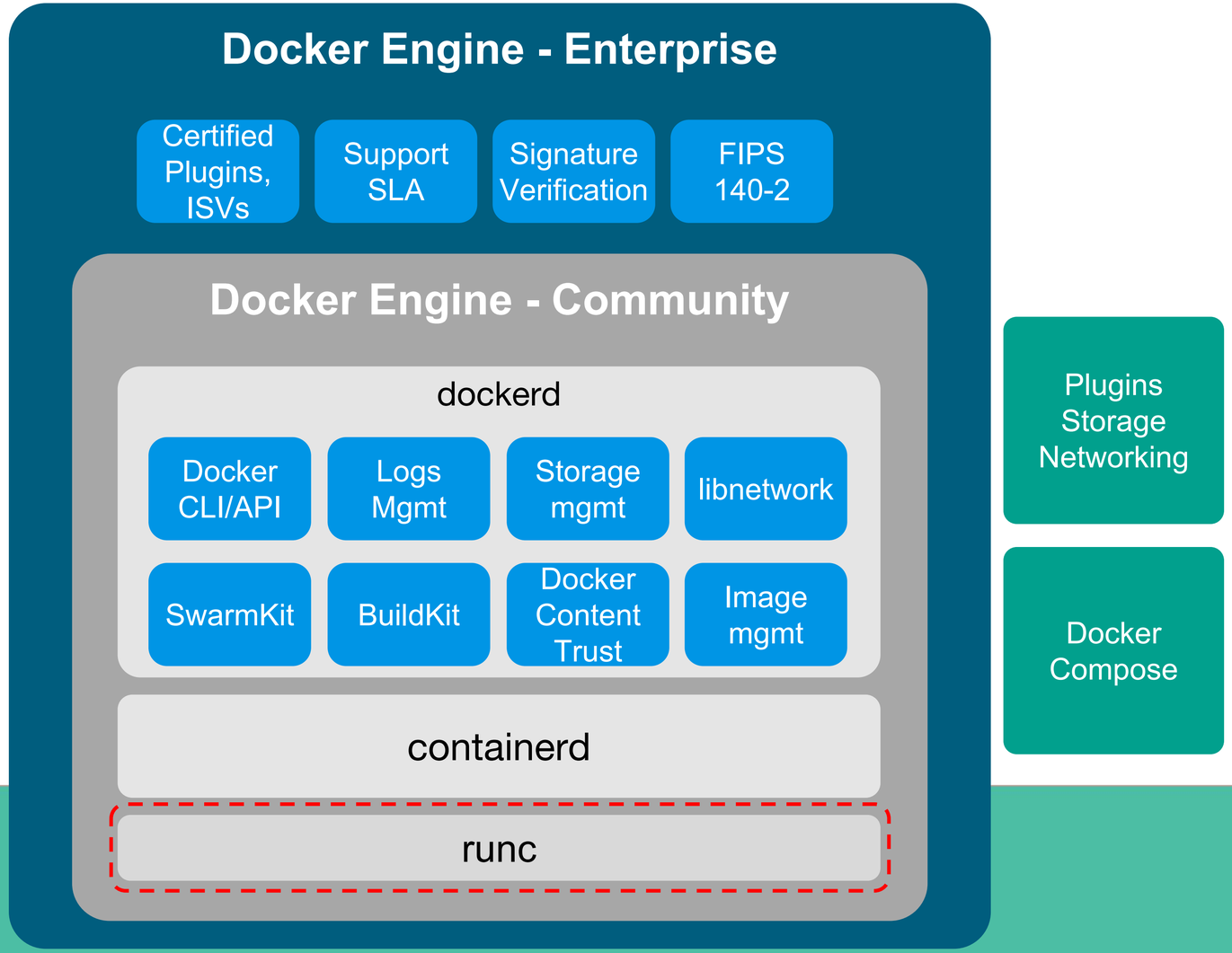
Docker Image Downloads from Docker Hub

Agenda

- Docker Engine Architecture
  - Containerd overview
- Features in Docker Engine 18.09
- Differences between Docker Engine - Community and Enterprise
- Docker Enterprise only features
  - Docker on Windows
- Future

Engine Architecture

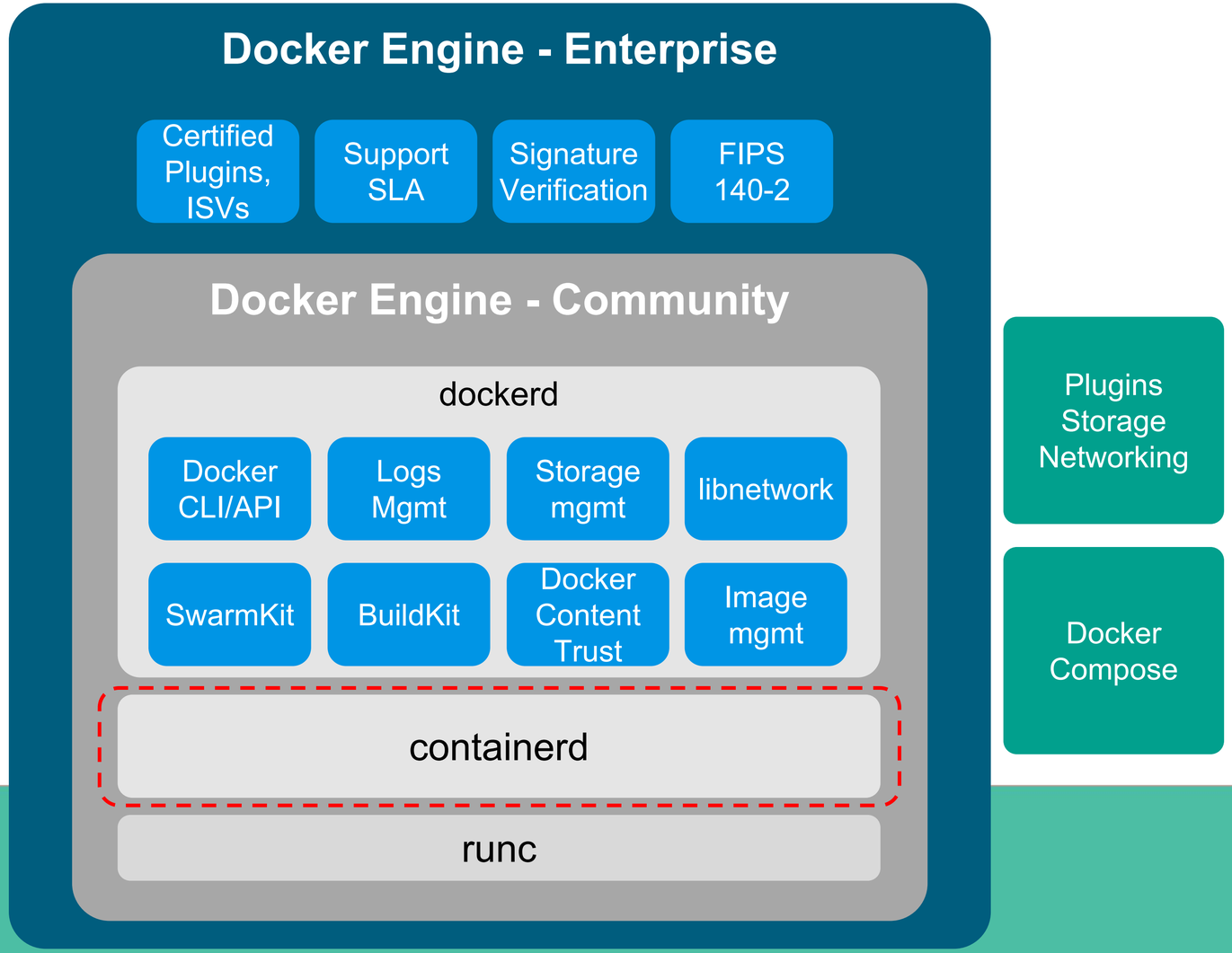
Docker Engine Architecture



Plugins
Storage
Networking

Docker
Compose

Docker Engine Architecture



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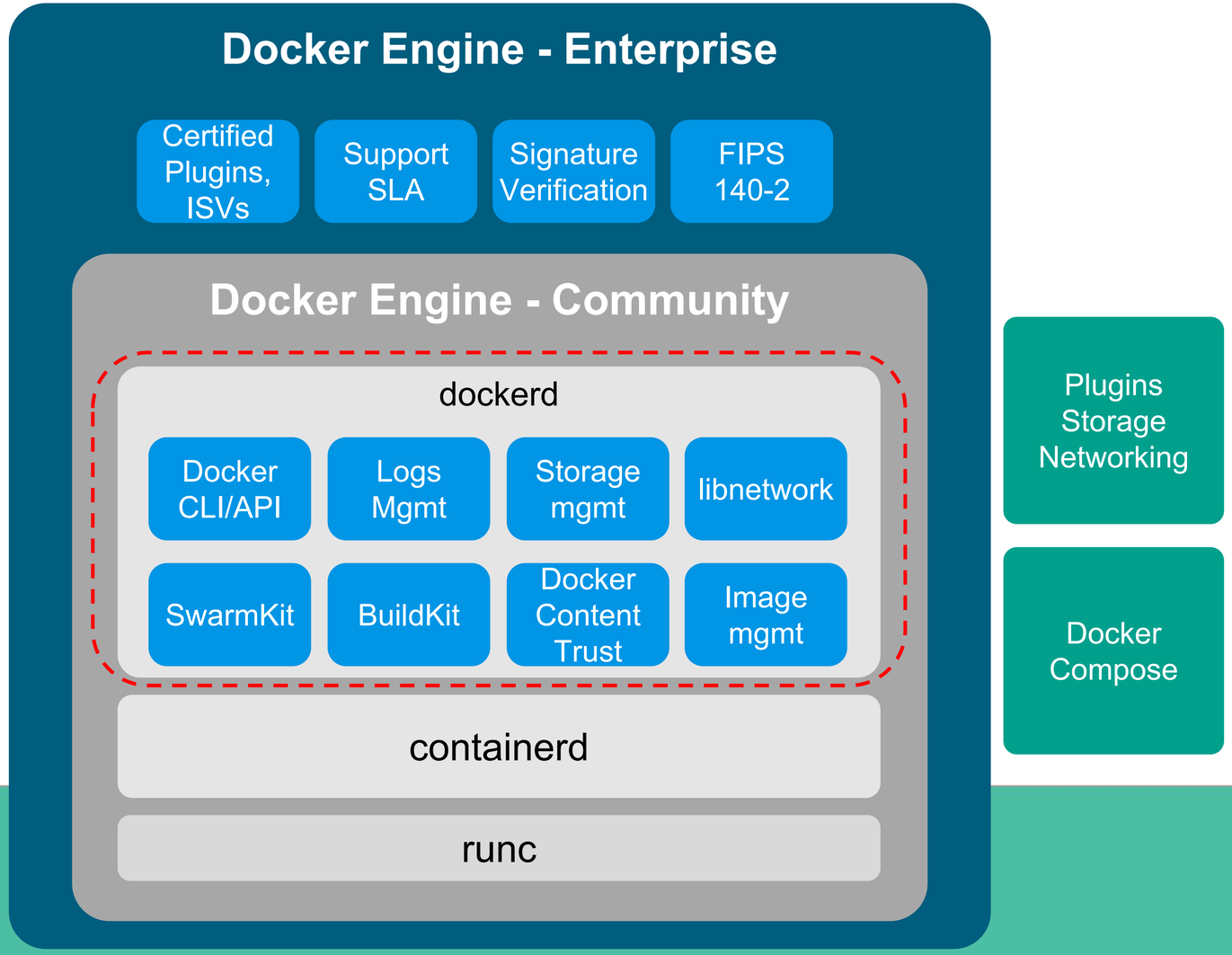
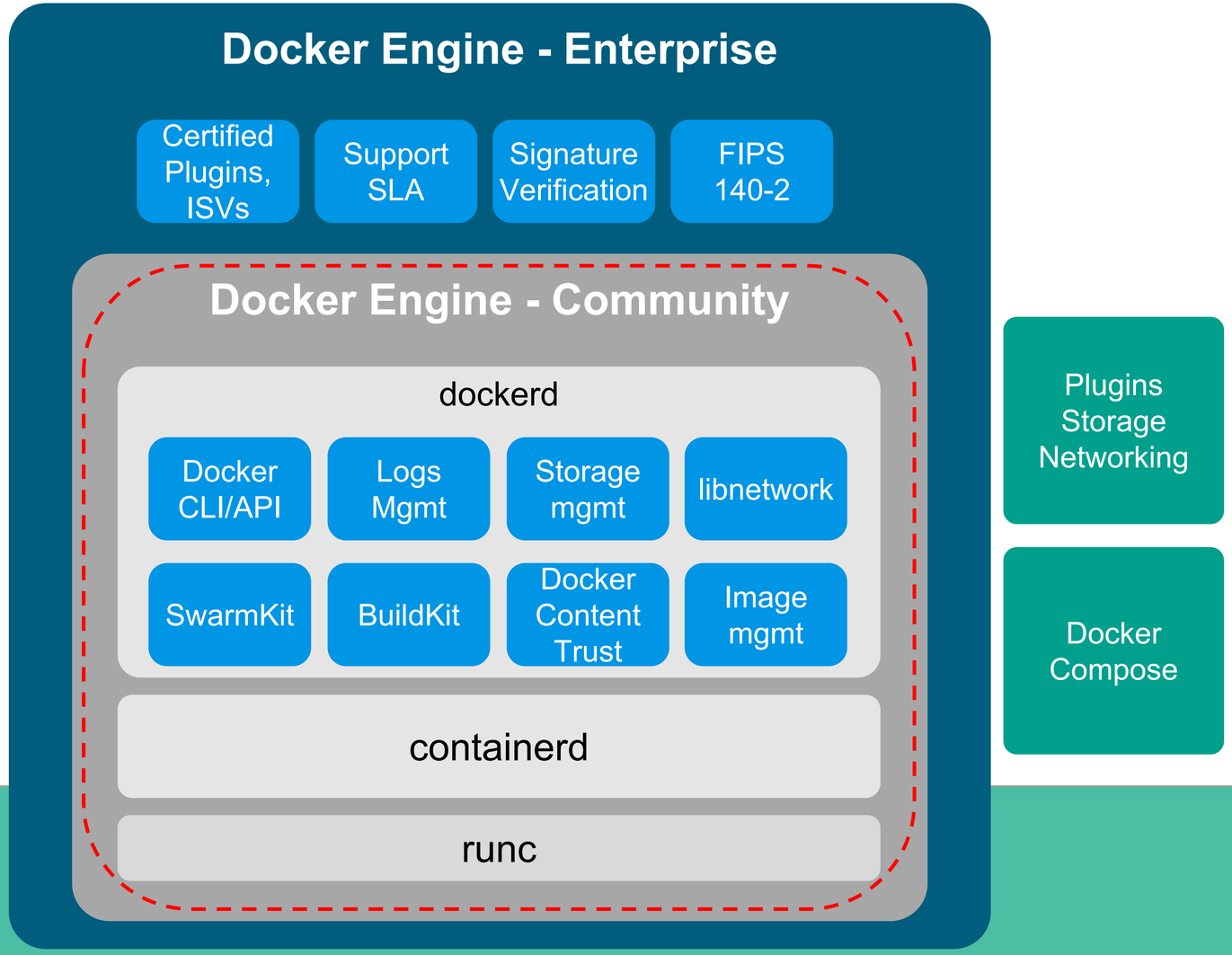


Docker Engine Architecture



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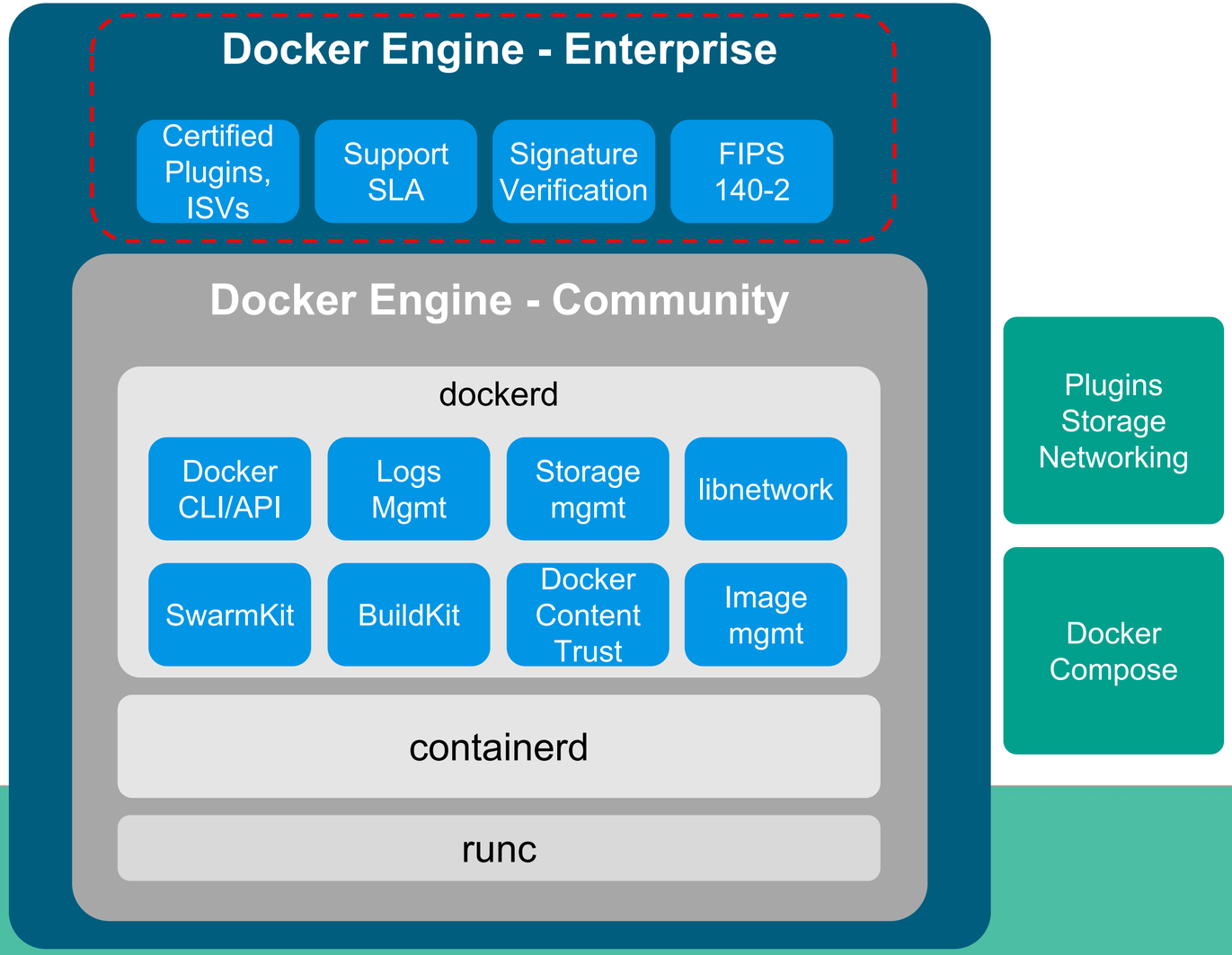
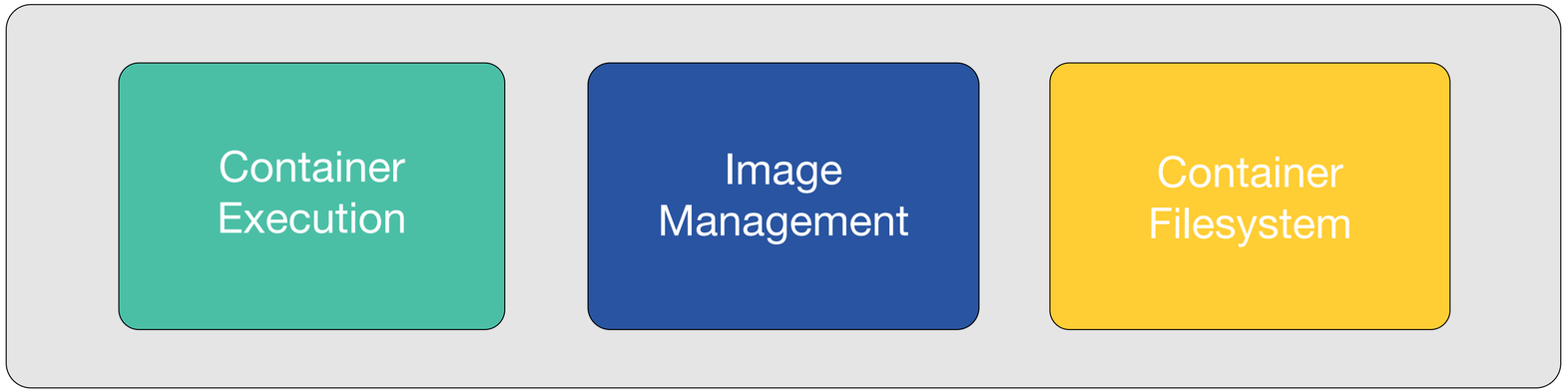
Docker Engine Architecture



containerd overview



Create, Start, Stop, Delete

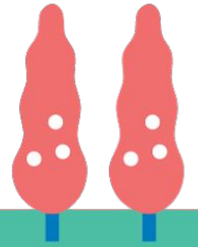
Image Push, Pull

Union mount filesystem

New Features in Docker Engine 18.09

containerd 1.2 merged

- **Feature parity** with open source
  - in upstream containerd 1.2
- **Building block changes** to support:
  - buildkit
  - CE→EE activation
- **New runtime shim** added for better support of runtimes



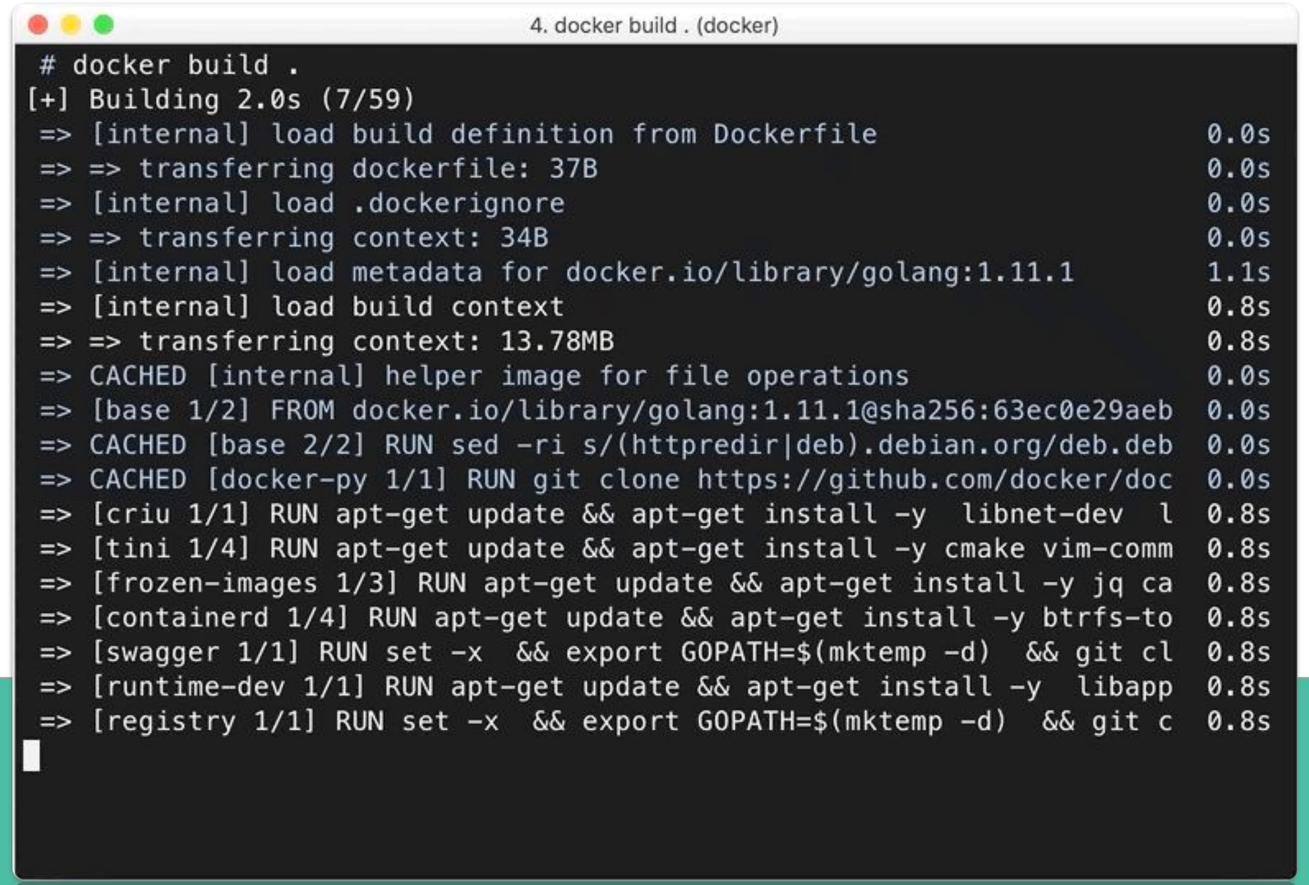
Build improvements

- **Performance improvements:** Re-designed concurrency and caching model:
  - Parallel build stages
  - Skip unused stages and unused context files
  - Incremental context transfer between builds
- **Build-time secrets**
- **SSH forwarding**
- **Feature parity** with the old builder except UX
- **Extensibility:** Create extensions for Dockerfile parsing by using the new #syntax directive

Enabling BuildKit support

```
export DOCKER_BUILDKIT=1
```

... or enable on daemon level in **/etc/docker/daemon.json**



Docker build sessions

- **Dockerfile Best Practices**
  - Tue, Dec 4, 5:25PM
  - Using Docker for Developers: Room 115
- **Supercharged Docker Build with BuildKit**
  - Wed, Dec 5, 12:00 PM
  - Black Belt: Room 114

Support for SSH connections to remote Host

Connections to remote Docker daemon via SSH, TLS and plain HTTP are now supported:

```
$ docker -H ssh://me@example.com
```

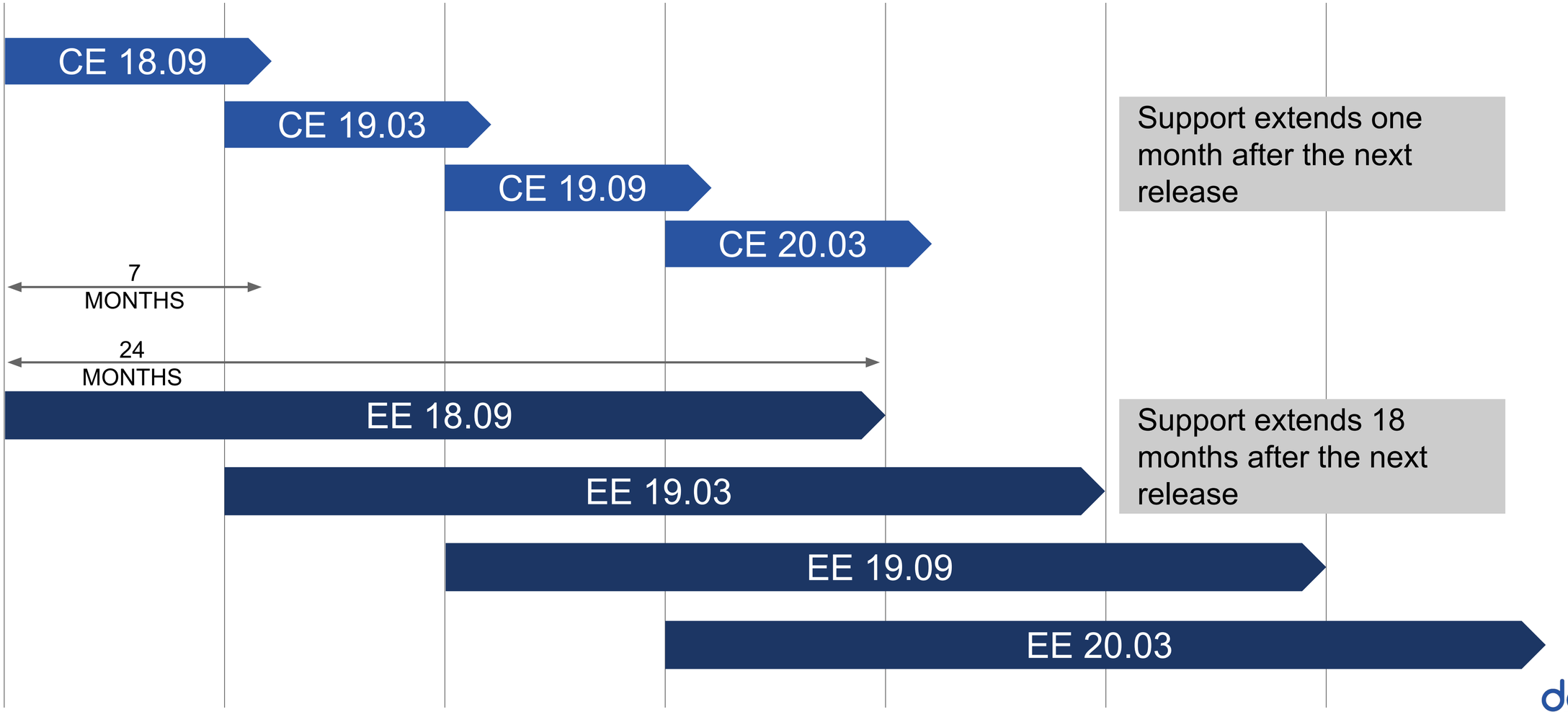
Support for Compose on Kubernetes

```
$ docker stack deploy --orchestrator=kubernetes
```

- **Use Compose files to deploy apps to Kubernetes on EE**
  Move applications between Kubernetes and Swarm, and simplify application configuration
- **Create native Kubernetes Stack object**
  Able to interact with Stacks via the Kubernetes API
- **Improve UX and move out of experimental**
  Functionality now available in the main, supported Docker CLI

Docker Engine - Community vs Enterprise

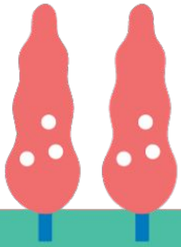
Release Cadence



Extended Docker - Enterprise Support

Timeline	Description of Support Interaction Provided	Severity and Criticality of Patches provided
GA to 12 months	Support for all issue types: Break-fix, troubleshooting, RCA, etc.	Patches provided for defects related to Urgent and High priority issues and security issues
13-18 months	Support for all issue types: Break-fix, troubleshooting, RCA, etc.	Patches for Urgent (S0) issues and critical security issues
19-24 months	Limited support for existing installations*	Patches for critical security issues only

* Excludes Feature Enablement, Bugfix, Patch Backport (exclusive of security issues, which are covered), and post-outage Root Cause Analysis



Docker Engine Enterprise

- Enterprise-class support with defined SLAs
- 24 months of extended software maintenance
- Engage with Docker products teams on roadmap priorities
- FIPS 140-2 compliant Engine
- Certified ecosystem plugins and ISV containers
- Docker logs support for all logging drivers
- Enterprise readiness testing: Scalability, Stress, Longevity
- Support for Compose on Kubernetes
- Windows Server Support

Docker Engine Community

- Community Support
- 7 months of software maintenance
- Community driven roadmap

Docker Engine - Enterprise only

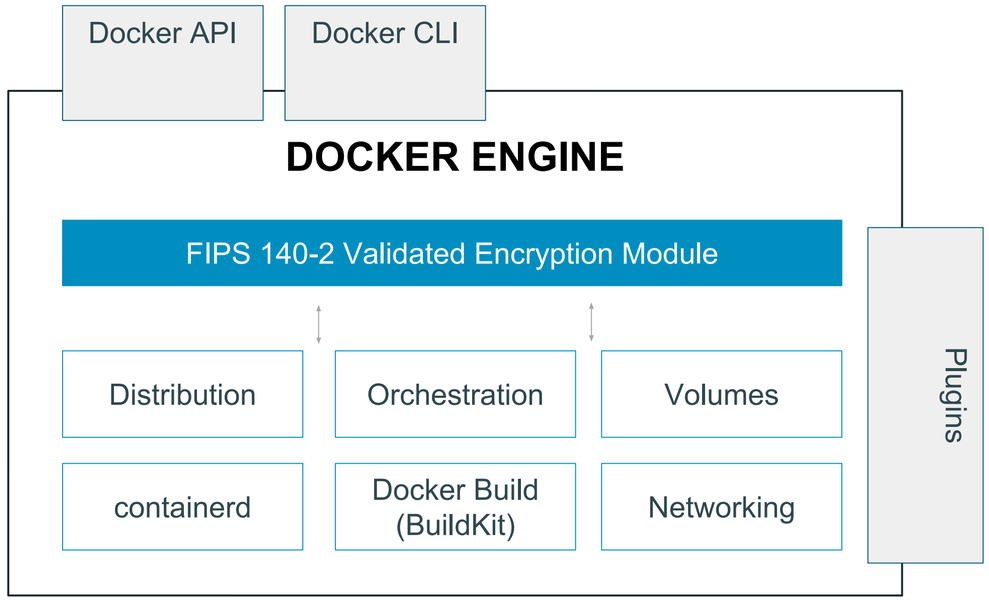
Logs support for all logging drivers

- New file based `local` cache logging driver
- Automatically enabled for log drivers that do *not* support reads
- Logs available at:

```
$ /var/lib/docker/container/<id>/container-cached.log
```

- Supports compression and rotation

FIPS 140-2 Validated Engine



FEATURE

- Linux support included in 18.03 Engine, 18.09 now adds FIPS compliance for Windows
- Automatically enable FIPS mode for Docker engine based upon host OS FIPS status
- Use env variable to override O/S FIPS state

BENEFITS

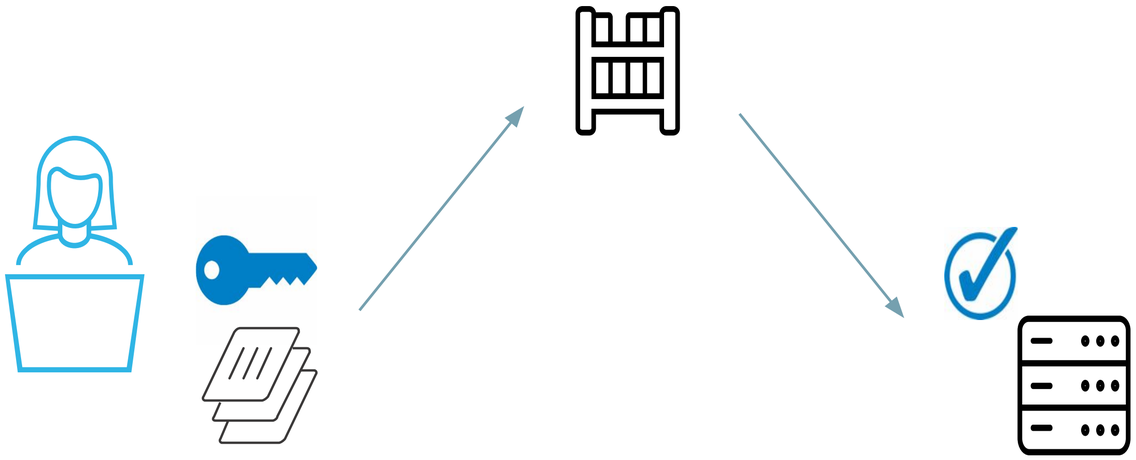
- Meet regulatory requirements by deploying Docker Engines in a FIPS compliant mode
- Prevent non-FIPS nodes from joining a FIPS compliant cluster

Easy setup for Docker Content Trust

- **Simplified image signing** through `$ docker trust`
- **Validated** for DTR 2.5 & Docker Hub

Commands	Description
docker trust key	Manage keys for signing Docker images
docker trust signer	Manage signing entities
docker trust inspect	Retrieve signing information of images
docker trust revoke	Remove trust for an image
docker trust sign	Sign an image

Run trusted images with Engine Signature Verification



Developer signs an image and checks it into a registry

Engine verifies that image is signed before pulling to local environment

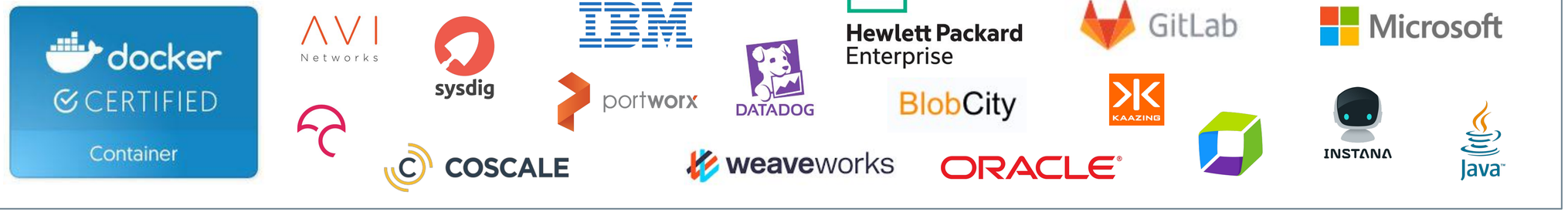
FEATURE

- Verify that images are signed before pulling from registry
- Enable or disable on a per-shell or per-invocation basis

BENEFITS

- Prevent the deployment of containers that use unsigned images
- Enforce policies around image signing

Integrates with your Existing Tooling



Docker on Windows

Windows Server support with Swarm

Pain Point	Details
Image Compatibility	• Windows version: Major.Minor.Build.Revision • WS2016: host OS image and container base images must have same Revision (patch) number • WS1709 / WS1803: host and container images must have same Build (release) number **(easier)**
Image sizes	• WS2016 server core 6GB, nanoserver 420MB • WS1709 server core 3GB, nanoserver 136MB • WS1803 server core 2GB, nanoserver 141MB **(smaller = better)**
Networking	• WS2016: host mode and DNSRR networking • WS1709 / 1803: add ingress networking & VIP load balancing **(equivalent to Linux)**
Kubernetes Support	• Beta support in Kubernetes 1.9 and WS1709 • Kubernetes community GA expected in 1.14 (~ Mar 2019)
Windows Server Support Lifecycle	• Microsoft has a multiple release channels with different support lengths: • Long term service channel (**LTSC**, e.g. WS2016, WS2019) -- **5 years support** • Semi-annual channel (**SAC**, e.g. WS1709, WS1803) -- **18 months support**

Named pipe mounting

Windows improvements

- Access daemon from within container
- Mounted via standard volume mount syntax

```
docker run -it -v
'\\.\pipe\docker_engine:\\.\pipe\docker_engine'
microsoft/windowsservercore:1803 powershell
```

FEATURE

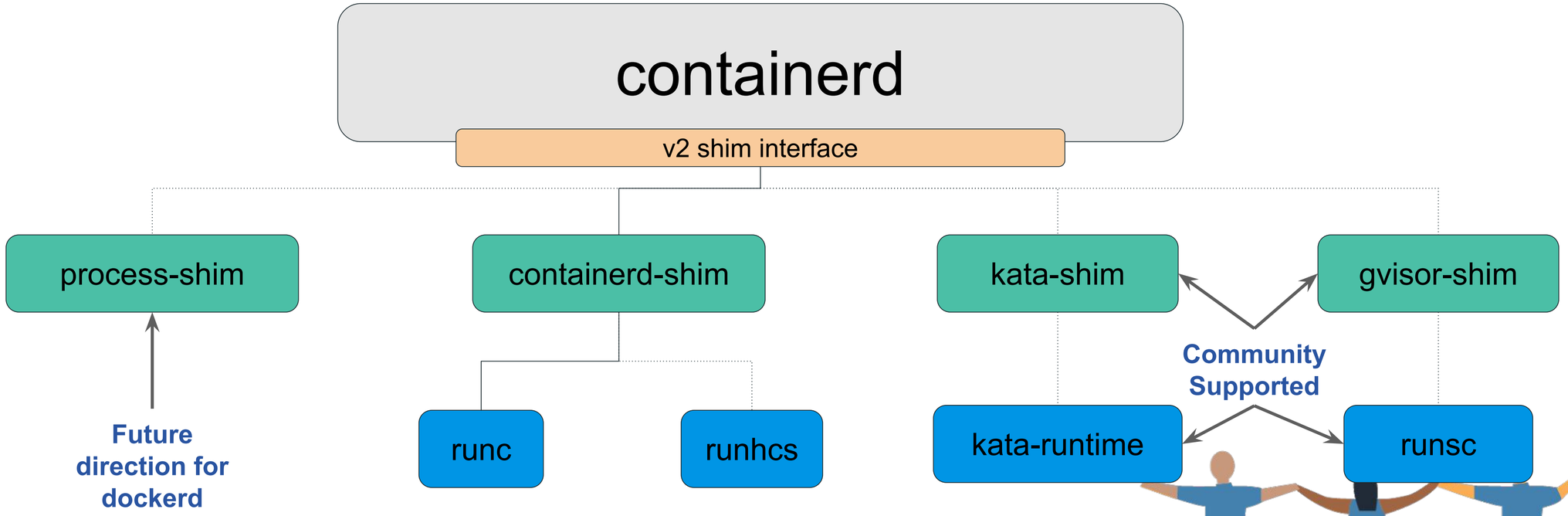
- Equivalent to Unix domain sockets on Linux
- Process and Hyper-v isolated containers

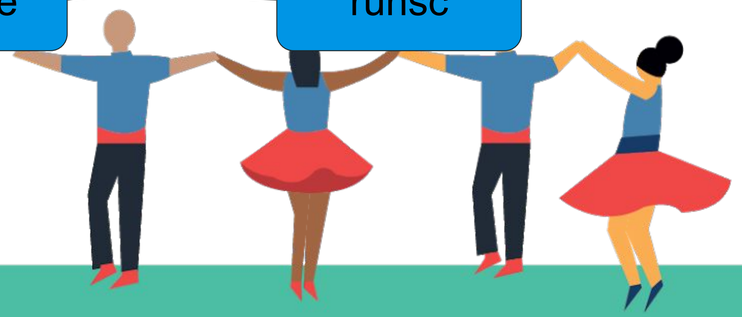
BENEFITS

- Enable Windows developers to create apps that require access to the host docker daemon or other host pipe
- Use Docker for Desktop to build and test apps the same way they will run in production

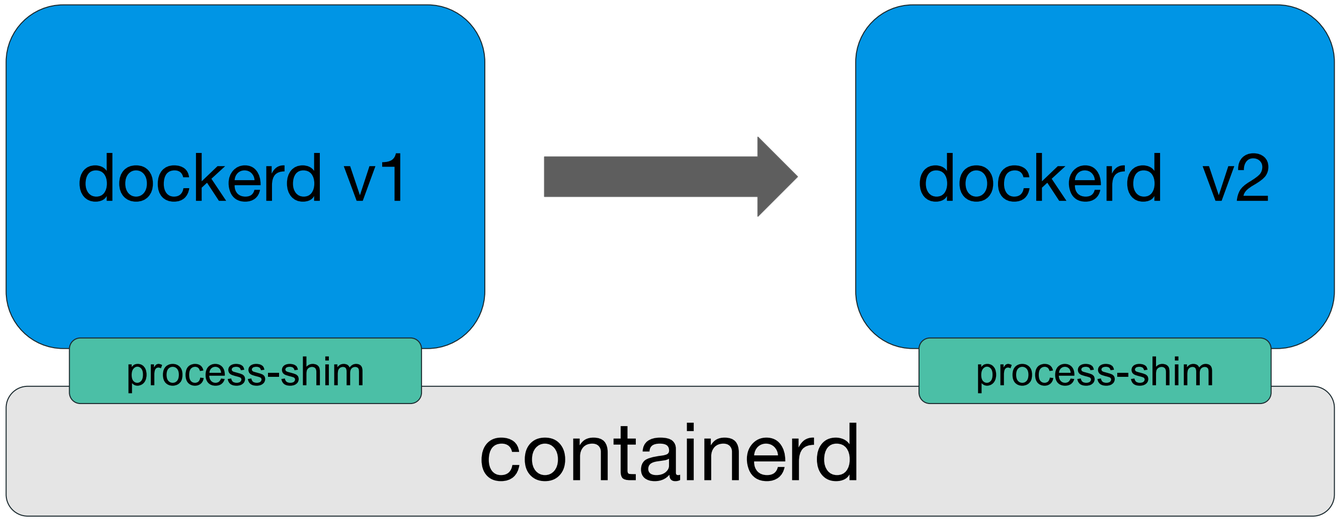
Future

containerd evolution



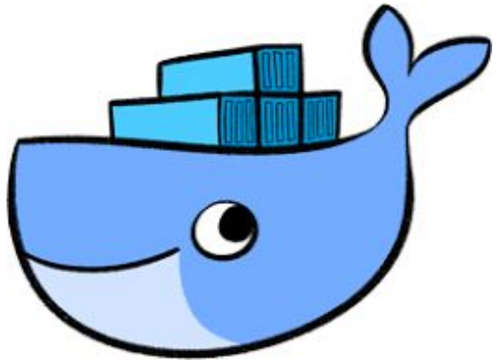


Docker evolution



Ready to see for yourself?

Let’s activate the Enterprise features from Docker Engine - Community



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2. Download and Develop with free Docker Engine - Community
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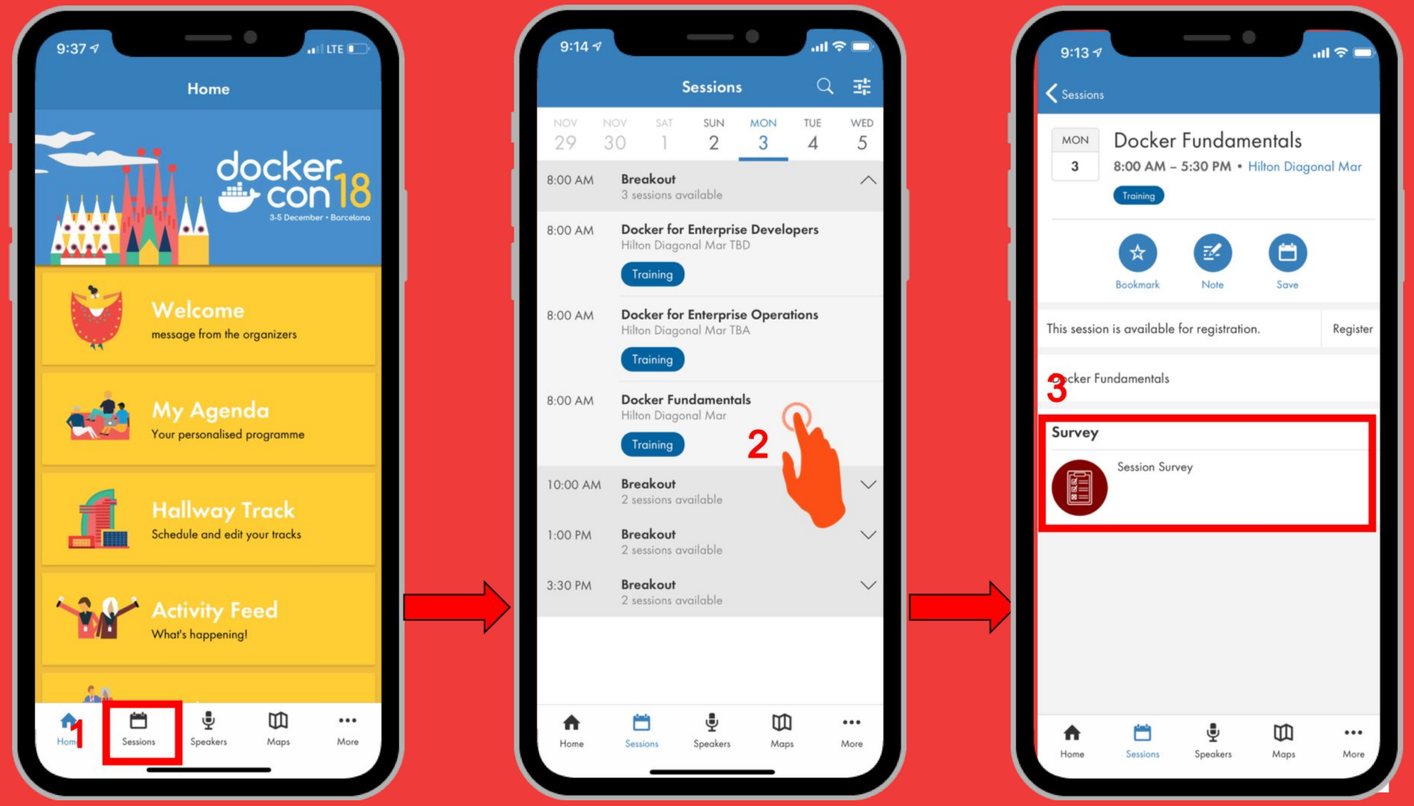

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dockercon19

April 29-May 2

2019

Thank you

Questions? or find me in the Hallway
Track: "*Learn about containerd and Docker Engine - Community/Enterprise*"