

containerd v2.2


An industry-standard container runtime

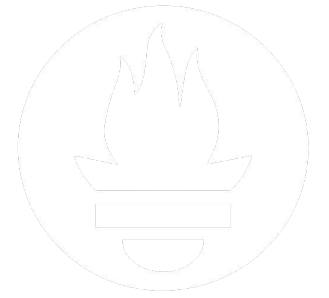


- CNCF Graduated since 2019
- Adopted by well-known enterprise Kubernetes services and distributions
- Designed to be pluggable to support cutting-edge features (remote snapshotters, WASM runtimes, ...)

Runtime plugins

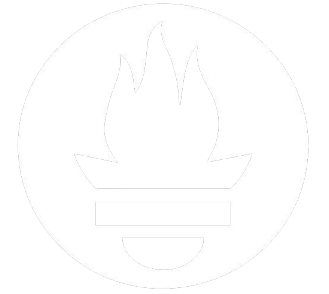
- Regular containers
 - runc: Linux
 - runhcs: Windows
 - runj: FreeBSD
- WebAssembly
 - runwasi
 - spin

- VM
 - Kata
 - nerdbox  ■ supports macOS hosts
- Others
 - runsc (gvisor): ptrace sandbox, etc.
 - urunc: unikernel



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Snapshotter plugins



Regular snapshotters: **overlayfs**, **btrfs**, **zfs**, **devmapper**, ...

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“Remote” snapshotters support pulling image contents on demand to shorten the container startup time

- **stargz**: Forward compatible with OCI v1 tar.gz images
- **nydus**: Uses an alternate image format
- **overlaybd**: Uses block devices as container images

nerdctl: contaiNERD CTL



- <https://github.com/containerd/nerdctl>
- Same UI/UX as the docker CLI (including Compose)
- Made for facilitating new experiments in the containerd platform (e.g., stargz, fast rootless with bypass4netns)
- Useful for debugging Kubernetes nodes too

```
$ nerdctl run hello-world  
$ nerdctl compose up
```

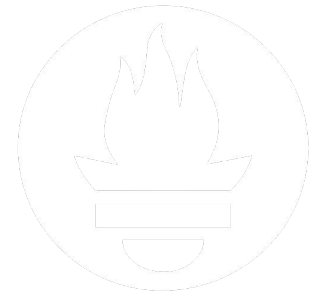
nerdbox: contaiNERD sandBOX



- <https://github.com/containerd/nerdbox>
- Linux containers on macOS
- microVM per container
- Based on libkrun
 - Network passthrough (TSI)
 - GPU passthrough (Venus)

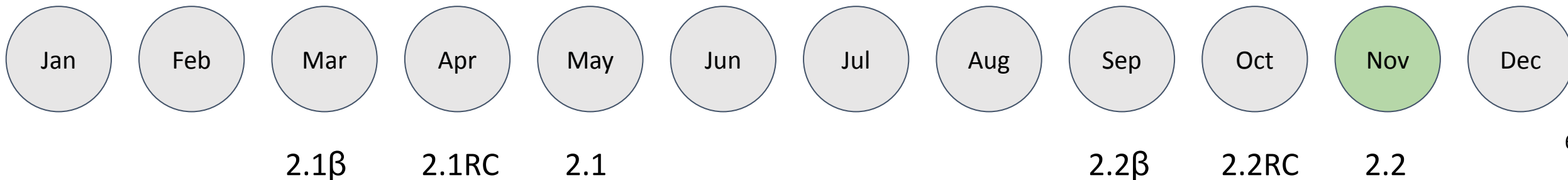
	nerdbox	Lima
#VM : #container	1:1	1:N
containerd	Outside VM	Inside VM
Runtime	krun	runc
Filesystem	EROFS	OverlayFS

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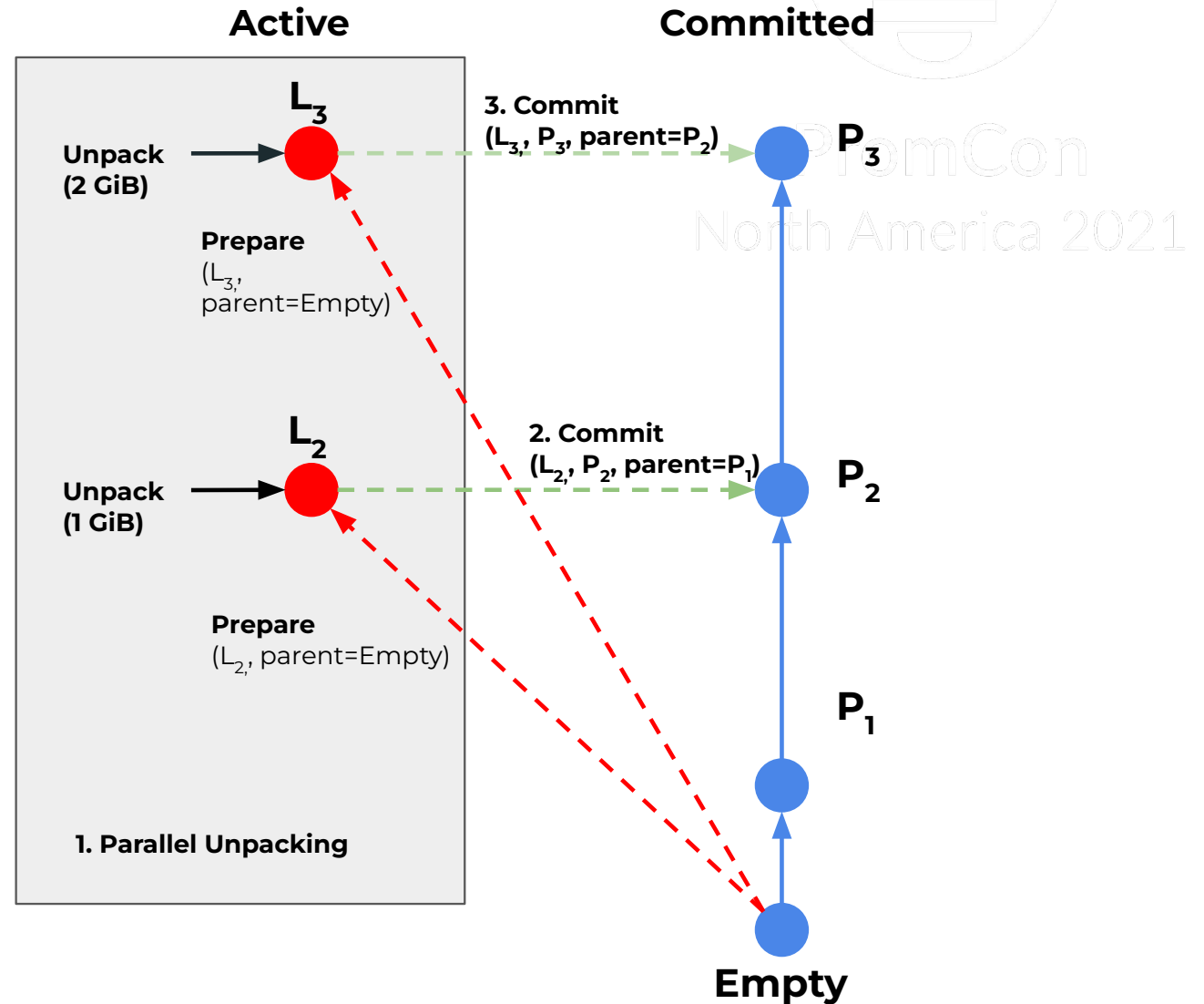
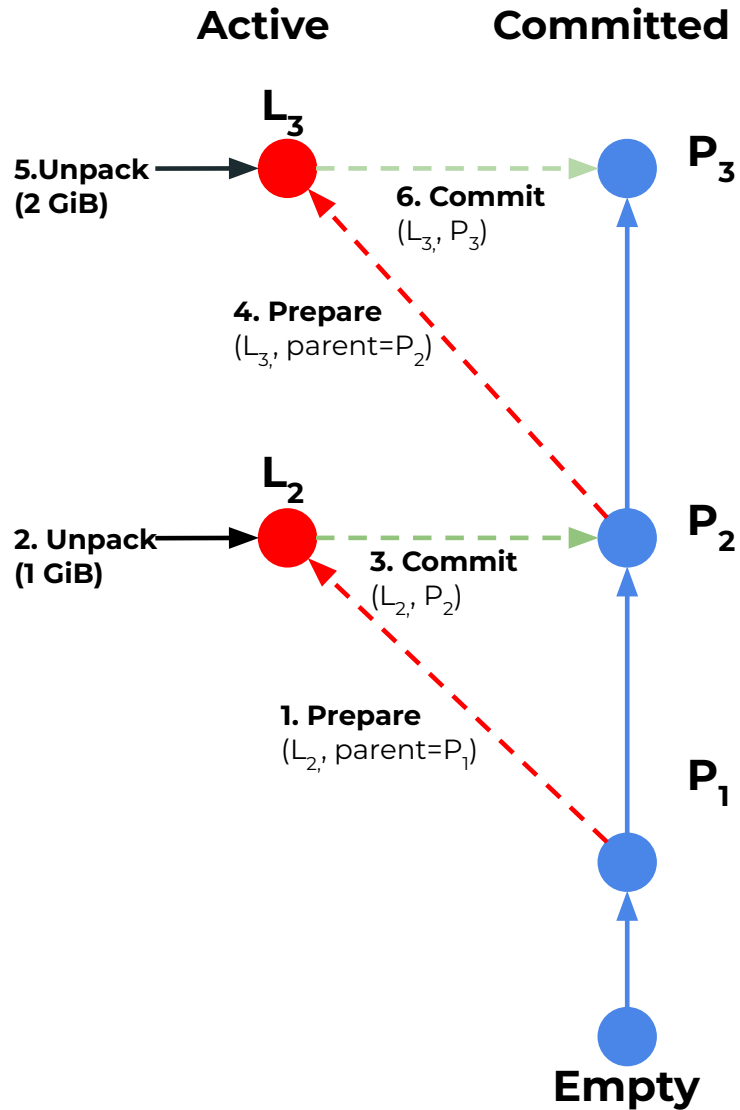
- Mount manager
 - A mount for a container no longer need to be mountable on the host
 - Allows implementing EROFS snapshotter on macOS, without implementing EROFS driver for macOS
- WebAssembly plugins in Node Resource Interface (NRI)
- More features announced yesterday

[What's New in Containerd 2.2 - Derek McGowan, Docker & Phil Estes, AWS \[PDF\]](#)



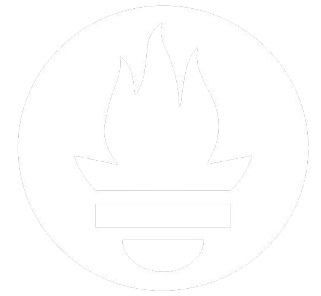
containerd v2.2 NEW

Rebase snapshot - parallel unpacking



containerd v2.2 Deprecation Announcements ! !

- cgroup v1 support
 - Timeline: May 2029
 - Am I affected?
 - `stat -fc %T /sys/fs/cgroup/`
 - If cgroupv2, the output is **cgroup2**
 - If cgroupv1, the output is **tmpfs**



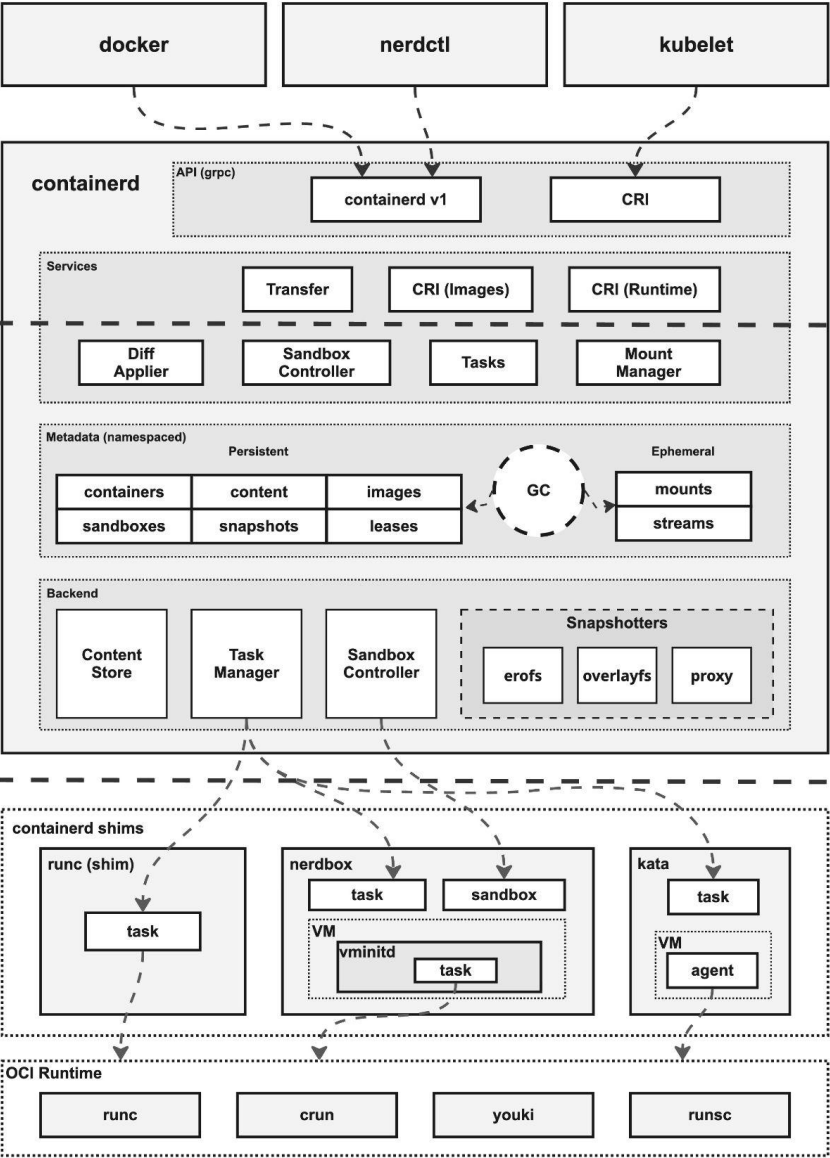
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containerd
architecture
diagram

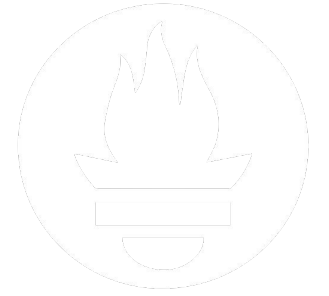
High level
runtime

containerd
core

Low level
runtime



Join the community!



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- **GitHub:** <https://github.com/containerd>
- **Slack:** <https://slack.cncf.io/>
(Channels: `#containerd` `#containerd-dev`)
- **X (former Twitter):** [@containerd](https://twitter.com/containerd)
- **Bluesky:** [@containerd.dev](https://bsky.app/profile/containerd.dev)