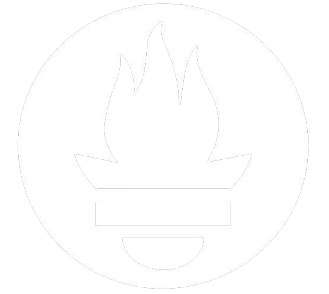# An industry-standard container runtime

- 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, …)

Snapshotter plugins

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

"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
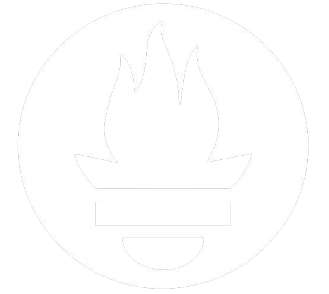- **overlaybd**: Uses block devices as container images

Runtime plugins

- **runc**: the regular runtime for Linux

- **runhcs**: Windows

- **runj**: FreeBSD jail

- **runwasi**: WASM

- **kata**: VM

- **runsc (gvisor)**: ptrace sandbox, etc.
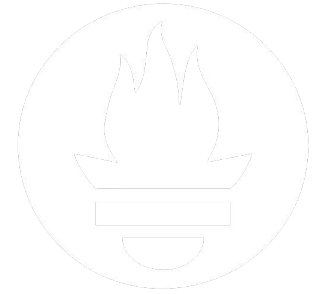
nerdctl: contaiNERD CTL

- 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)

- Useful for debugging Kubernetes nodes too

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

containerd v2.0 [rc.0]

- The focus is on cleaning up deprecated features

  (runtime v1 API, aufs snapshotter, non-sandboxed pods…)

- Huge improvements on the support for User Namespaces

  - Overhead for chowning is now eliminated

Snapshotter is overlayfs.

Image	Size	Inodes	Chown without metacopy	Chown with metacopy	IDMapped Mount
tensorflow/tensorflow:2.13.0	1.6GiB	37460	2m58.18635105s	1.425115168s	21.969618ms
library/node:20.11.1	1.1GiB	33210	2m40.427234391s	1.047708275s	17.713161ms
library/ubuntu:22.04	84MiB	3517	14.986225994s	101.244062ms	9.268065ms

- Highly compatible with v1.x
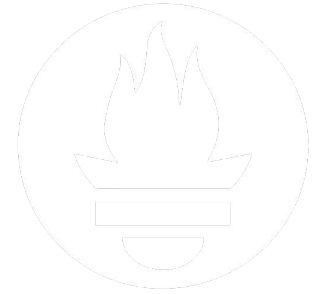
Deprecation Warning

- ctr deprecations list

  - Supported in v1.6.27+, v1.7.12+

  - For each warning, you can see

    - What is being removed

    - A suggestion for migration

    - When it was last used

Deprecation Warnings in containerd - Getting Ready for 2.0!
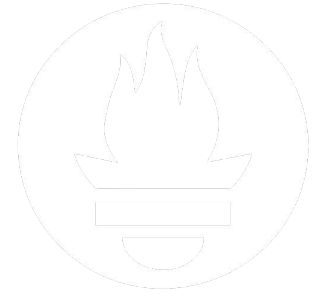
nerdctl v2.0 [beta.2]
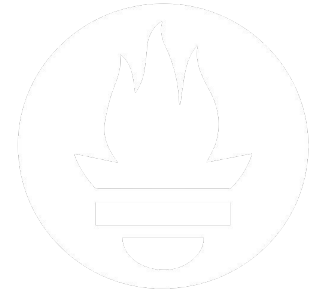
- Rootless networking is refactored to support "detach-netns"
  - Faster pull/push
  - Proper support for --net=host
  - Proper support for localhost registries

Join the community!

- **GitHub:** https://github.com/containerd

- **Slack**:   https://slack.cncf.io/
  (Channels: #containerd #containerd-dev)

- **X (former Twitter)**: @containerd