



Virtuozzo Persistent Storage for Docker

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dockercon 16

Agenda

Docker and persistent storage

- Why go persistent from test to production?
- Available options

State-of-the-art and future development

- Developing for Docker
- Storage in Kubernetes

Virtuozzo Storage for Docker

- Solution overview and benefits
- Performance

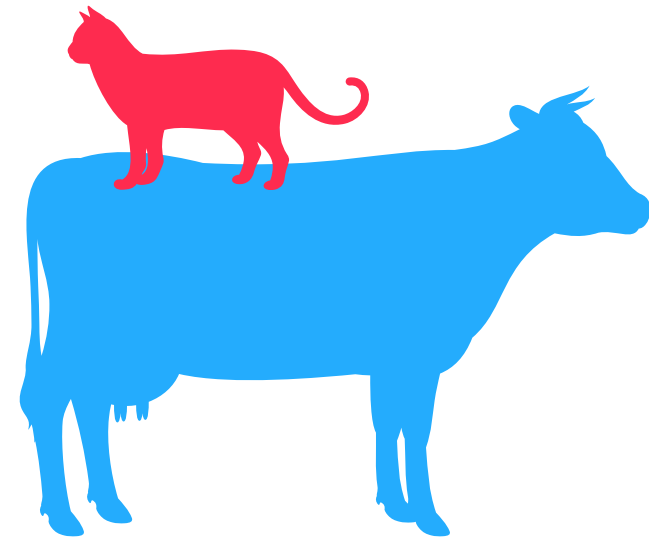


^zVirtuozzo

**Persistent Storage in Docker:
Why and How?**

Persistent Storage in Docker

- “Cattle” vs “Pets”
- Persistent data for “Cattle” containers
- Storing persistent data in Docker

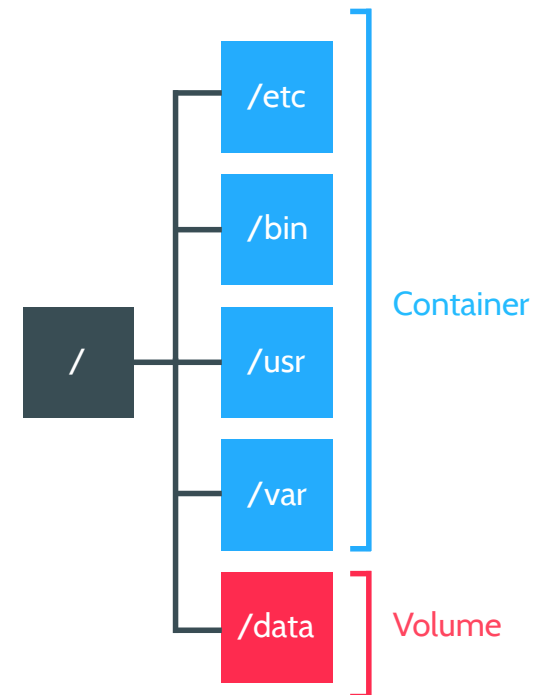


What You Need to Know About Docker Volume

And why you should care

Docker Volume: a directory with persistent data in an ephemeral container

- Long lived
- Attaches to a container on start
- Can be initialized with initial content

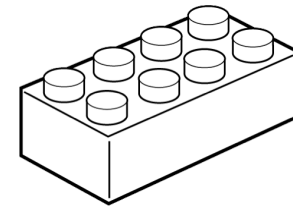


Docker Volumes in Production

Basics won't do the job

Native Docker volumes:

- Coupled with physical servers
- Hard to manage
- Mostly for testing and development
- Better options are available via plugin extensions





Docker Volume Plugins 101

Docker Volume plugin:
externally stored and managed Docker volumes

- Available since Docker 1.8
- Simple to leverage
- Simple to implement
- Many plugins are available



Developing Docker Volume Plugin

Our experience

Things change rapidly

- Changes of APIs/semantics during Q1 of 2016
- From 9 plugins in January to 18 in June of 2016

Room for improvement

- “Globally available” volumes are not (yet) recognized by Swarm
- Very little storage management exposed via Docker, Swarm or UCP (no resize, snapshot, clone, QoS)
- No way to define volume availability boundaries in Compose

Persistent Storage in Kubernetes

Kubernetes storage driver implementation

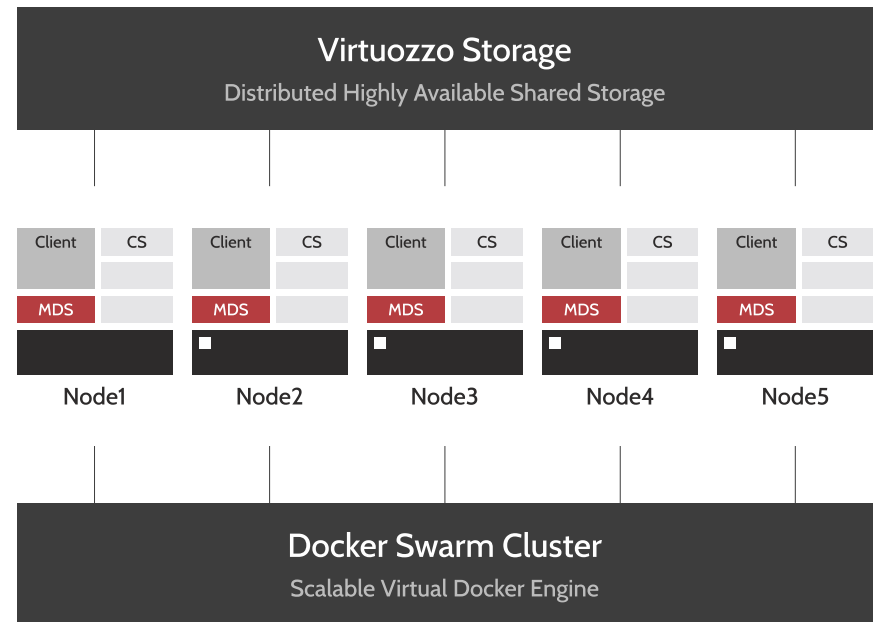
- Unique plugin system
- Shares pod's lifetime
- About a dozen of plugins available
- Standard storages supported
- Native Virtuozzo storage/Kubernetes plugin is in development



Virtuozzo Storage for Docker

The perfect match

- Originally built for system containers
- Software-defined storage
- Combines compute and storage
- Focus on multi-tenant performance
- Scalable to hundreds of nodes and PBs of data



Features and Benefits

of Virtuozzo Storage

Features

- **Redundant and highly available**
- **SSD** cache
- **Hot/Cold data tiered**
- Flexible redundancy
- **Auto-balancing**

Benefits

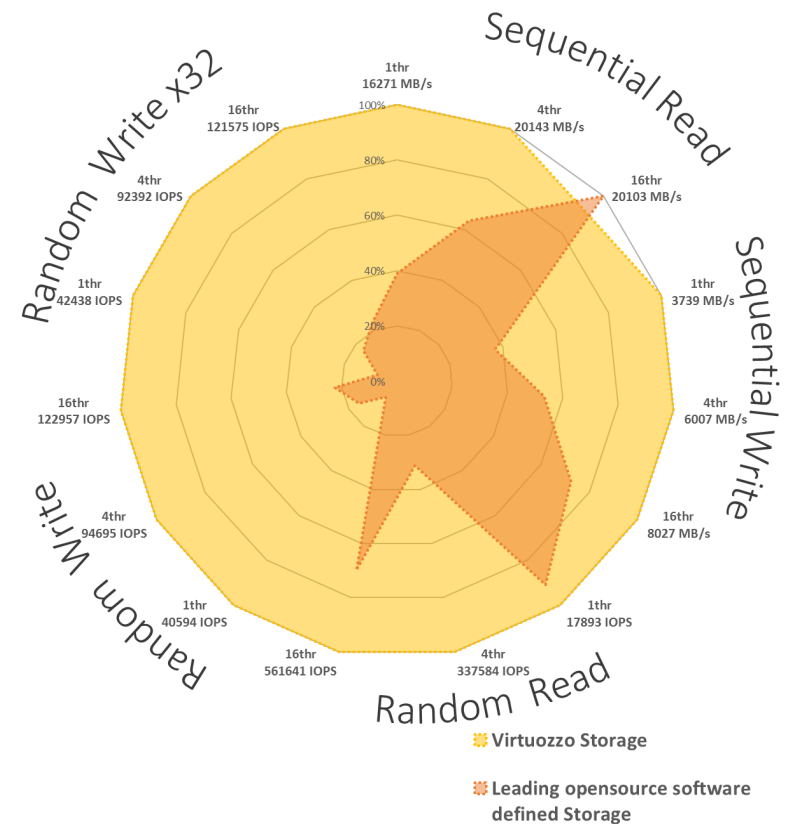
- Works on **commodity hardware**
- **Converged platform**: increase both storage and compute capacity simultaneously
- **Block, File, Object (S3)** storage
- Put idle drives at work
- Fast replication/**self-healing** times



Virtuozzo Storage Performance

Optimized for a multi-tenant, multi-user environment

- Great performance for random IO
- Up to 15x faster than alternatives
- Scales linearly as clusters grows
- Automatically (re)-balances data



Sound interesting?

- Visit Virtuozzo at booth S28
- Download Virtuozzo Storage for Docker at <https://virtuozzo.com/docker-storage/>
- Check out our performance comparison <https://goo.gl/IozPSW>
- Developer? Our Docker Volume plugin is at <https://github.com/virtuozzo/docker-volume-ploop>



Thank you.

Virtuozzo Booth S28

