Ceph, Docker, Heroku Slugs, CoreOS and Deis Overview

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Welcome
to
the
future

ceph

“Ceph's main goals are to be completely distributed without a single point of failure, scalable to the exabyte level, and freely-available”

ceph

- 100% distributed

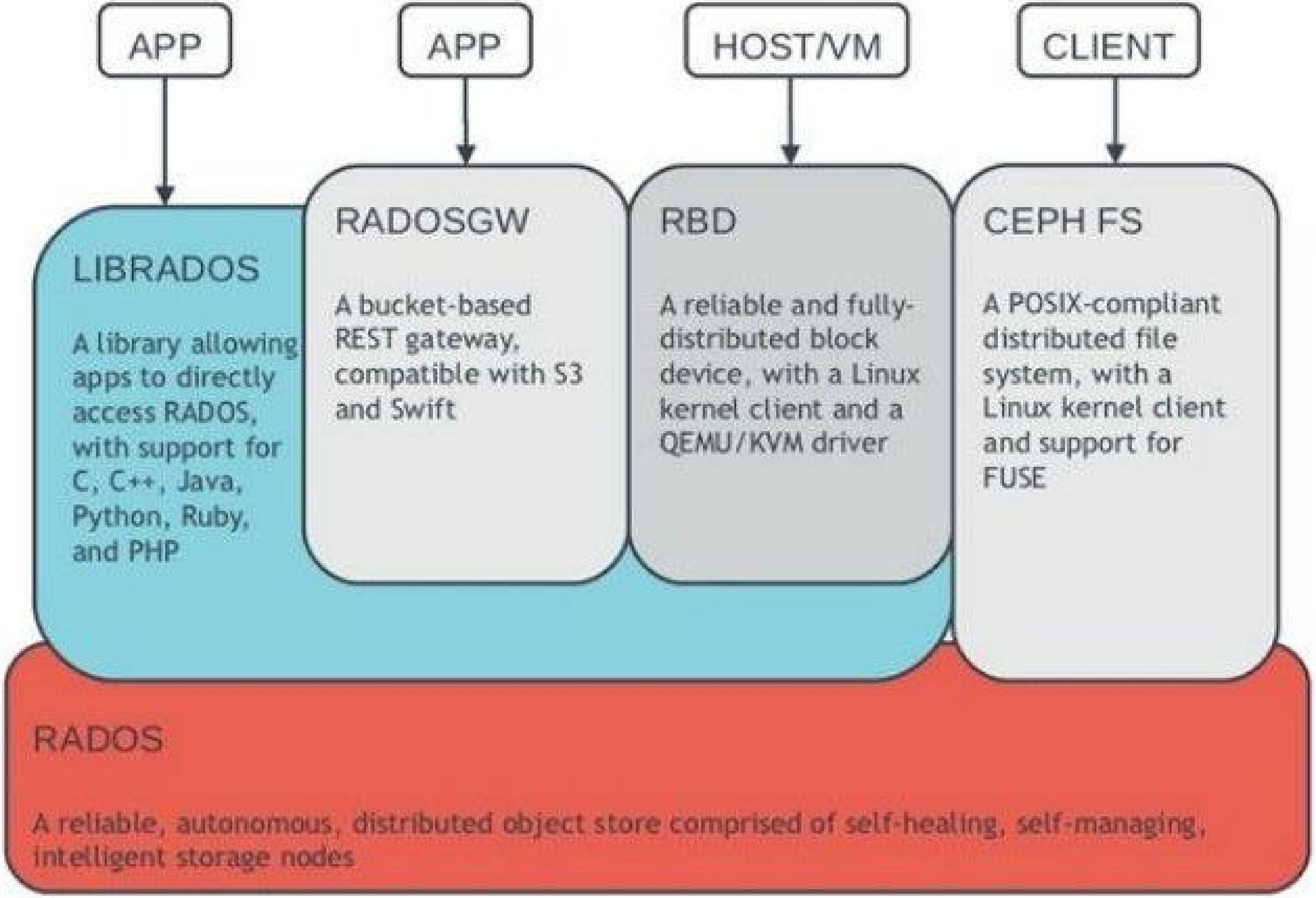
- CephFS
  - For POSIX sharing
  - not really 100% (active-standby)

- LibRados

  - RBD
    - For Blocks

  - Rados Gateway
    - For REST Objects
    - S3 and Swift compatible

ceph



LIBRADOS

A library allowing apps to directly access RADOS, with support for C, C++, Java, Python, Ruby, and PHP

RADOSGW

A bucket-based REST gateway, compatible with S3 and Swift

RBD

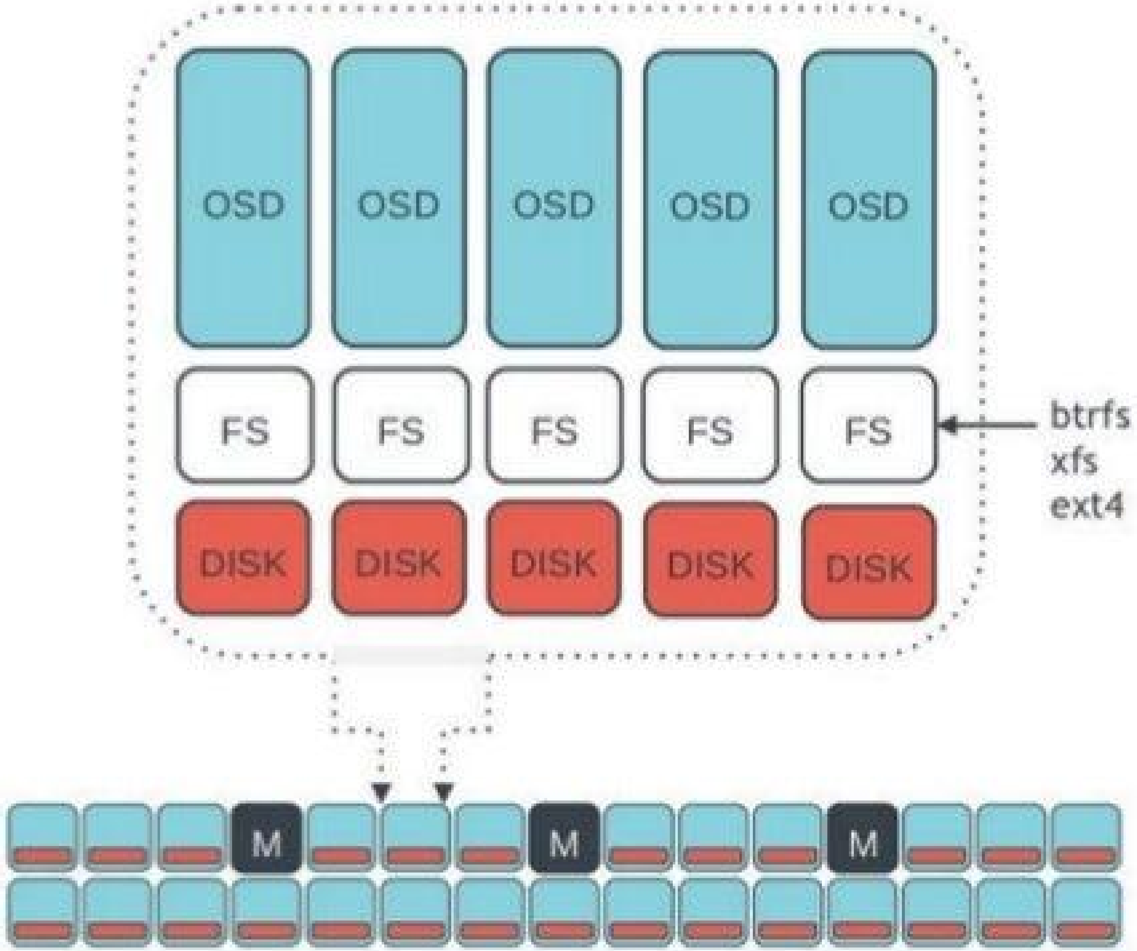
A reliable and fully-distributed block device, with a Linux kernel client and a QEMU/KVM driver

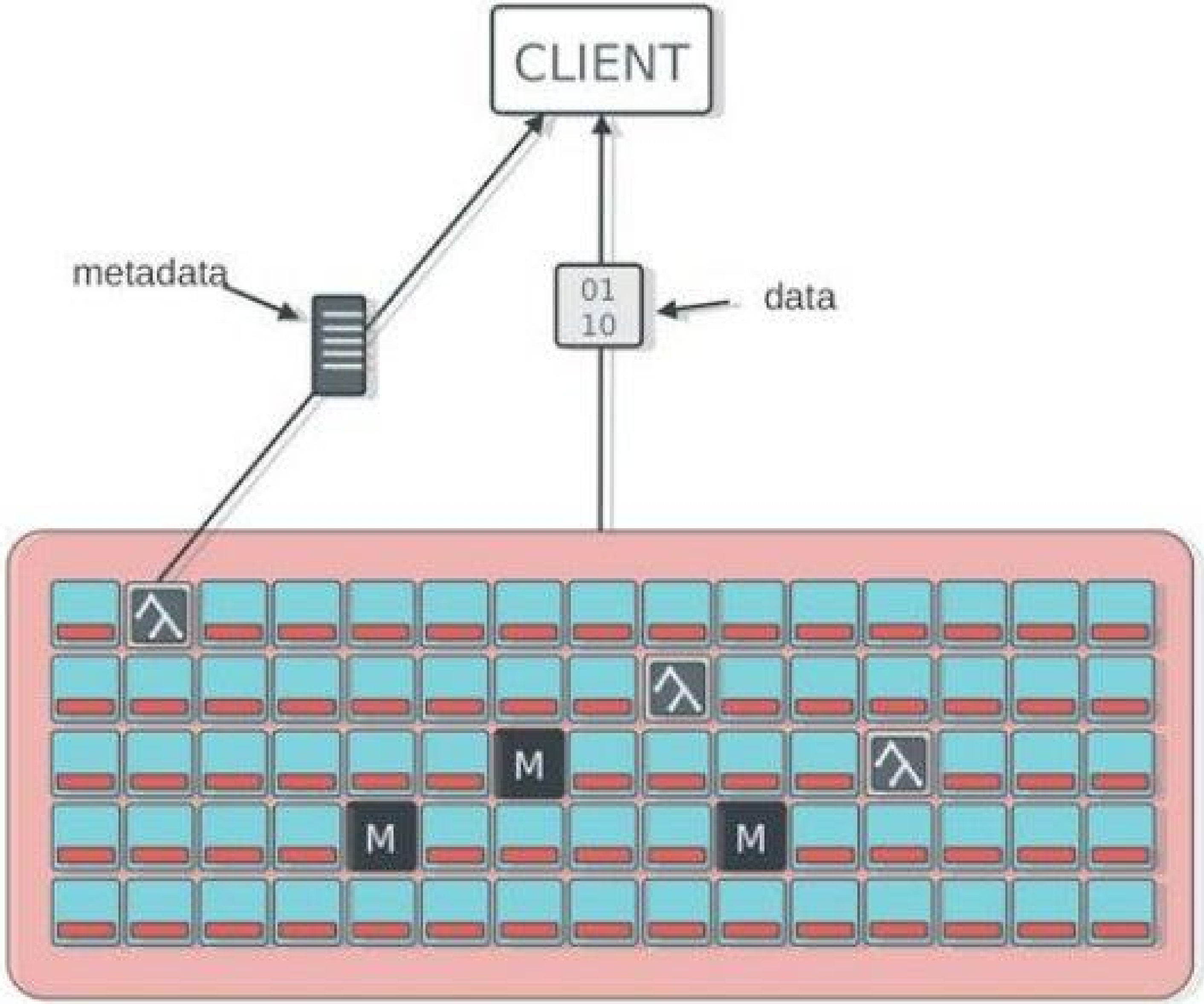
CEPH FS

A POSIX-compliant distributed file system, with a Linux kernel client and support for FUSE

RADOS

A reliable, autonomous, distributed object store comprised of self-healing, self-managing, intelligent storage nodes ceph


OSD
OSD
OSD
OSD
OSD
FS
FS
FS
FS
FS
btrfs
xfs
ext4
DISK
DISK
DISK
DISK
DISK
M
M
M


CLIENT
metadata
01
10
data
M
M
M

CephFS

docker

“Build, Ship and Run

Any App, Anywhere”

docker

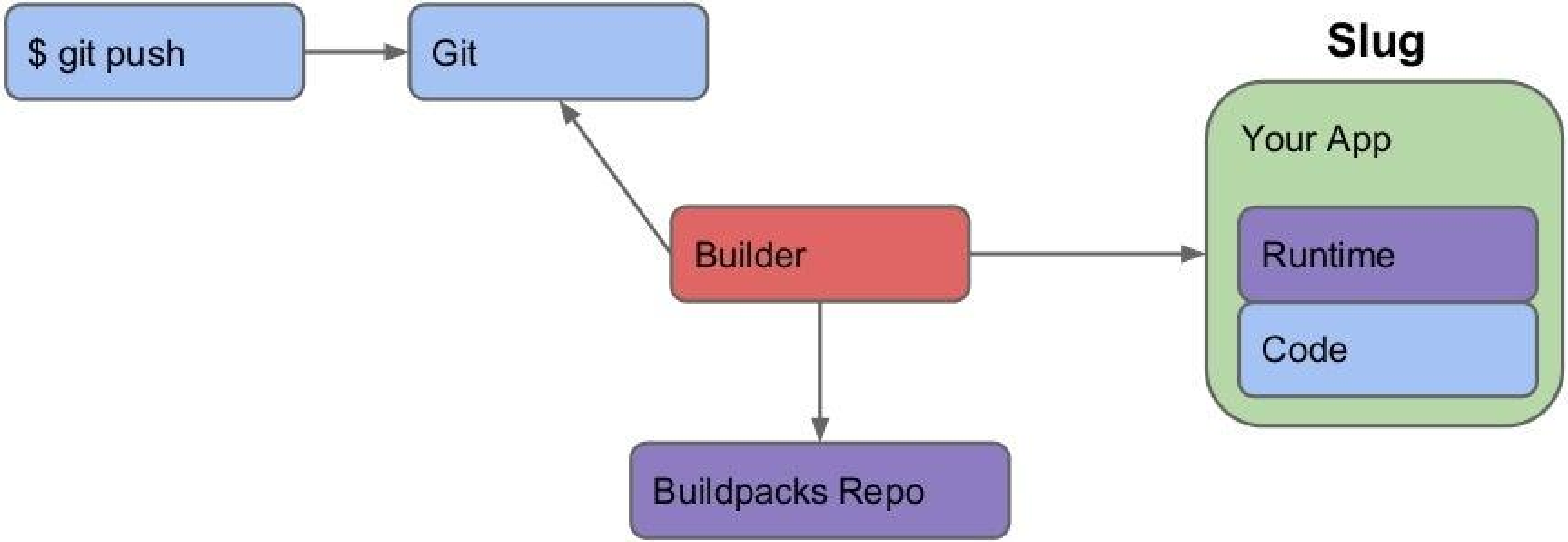
- 100% portable
- Easy API for LXC
- Public Repository
- Lightweight, 1 process (ideal)
- Layers (Union File System)
  - Shares read-only data
  - Incremental
- Volumes (not layered volumes)

heroku

- **We will only talk about slugs**
  - **(and twelve-factor later)**

“A slug is a bundle of your source, fetched dependencies, the language runtime, and compiled/generated output of the build system - ready for execution.”

heroku


$ git push
Git
Slug
Your App
Builder
Runtime
Code
Buildpacks Repo

CoreOS

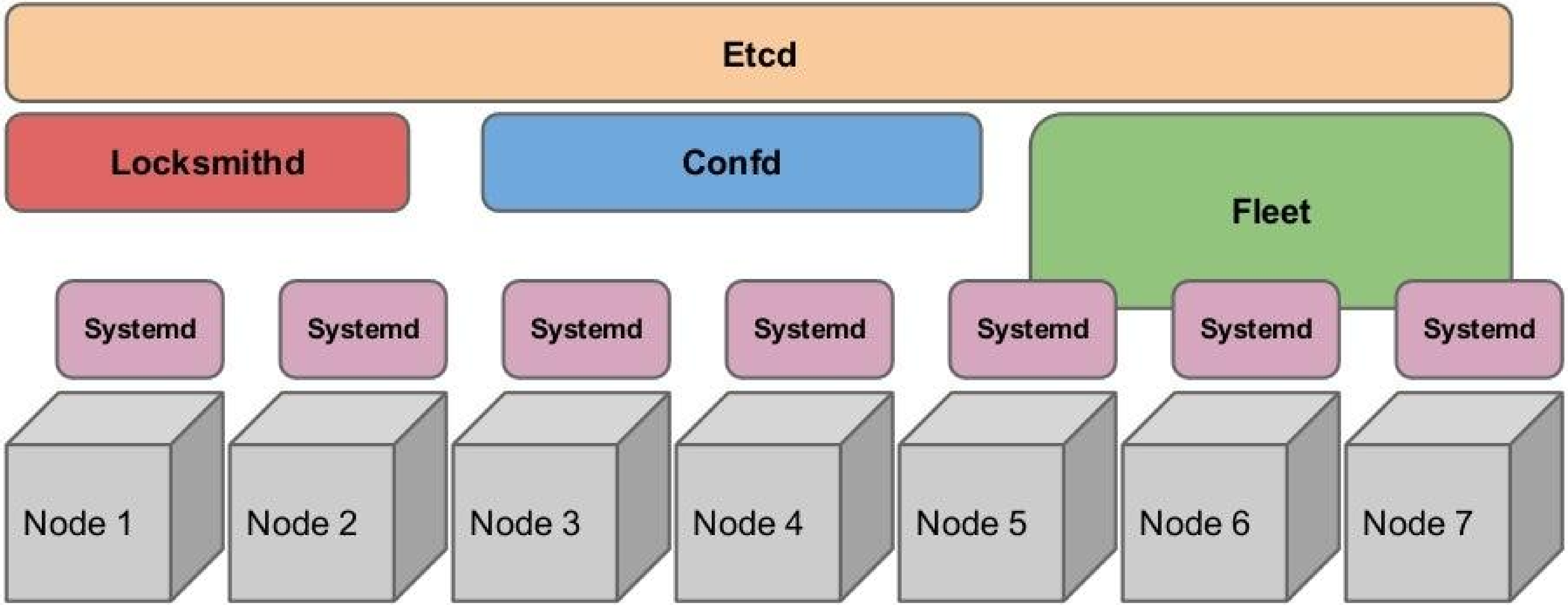
“Linux for Massive Server Deployments

CoreOS enables warehouse-scale computing on top of a minimal, modern operating system.”

Core OS

- 100% distributed
- Lightweight
- cloud-init for every boot
- Automatic Updates
  - 2 boot partitions

CoreOS



Etcd

Locksmithd

Confd

Fleet

Systemd

Systemd

Systemd

Systemd

Systemd

Systemd

Systemd

Node 1

Node 2

Node 3

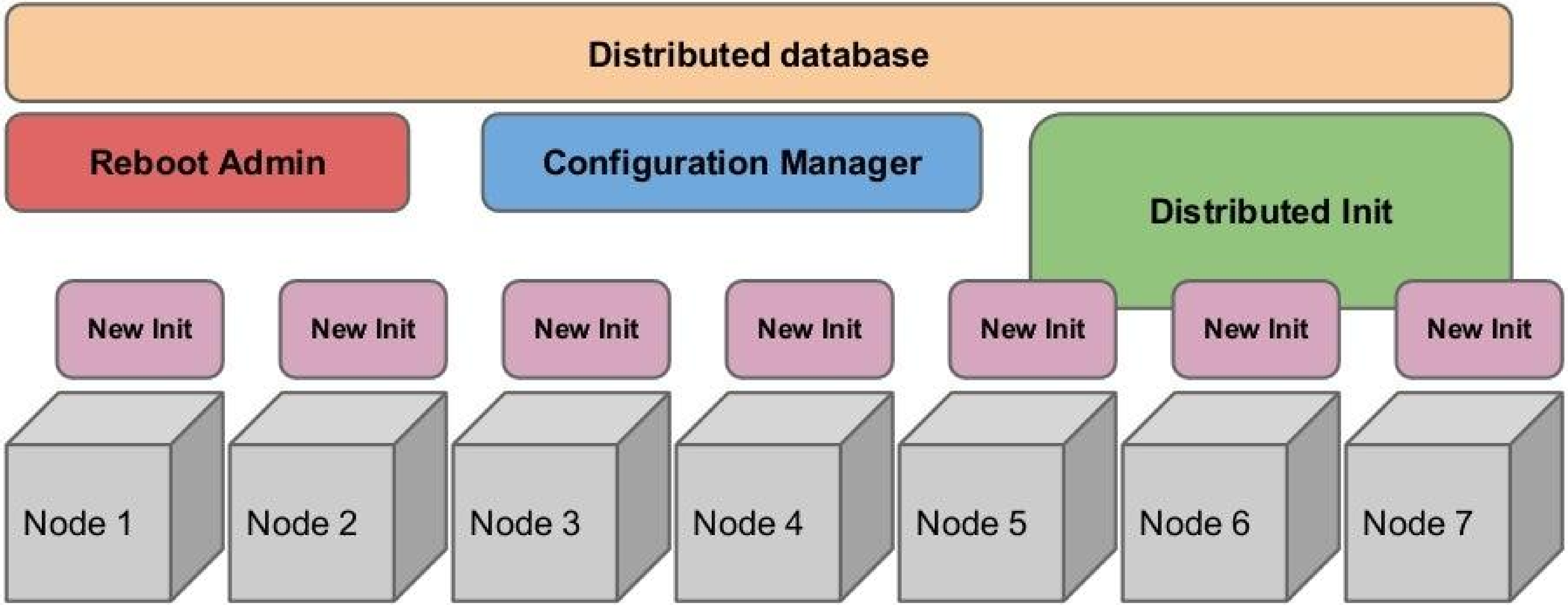
Node 4

Node 5

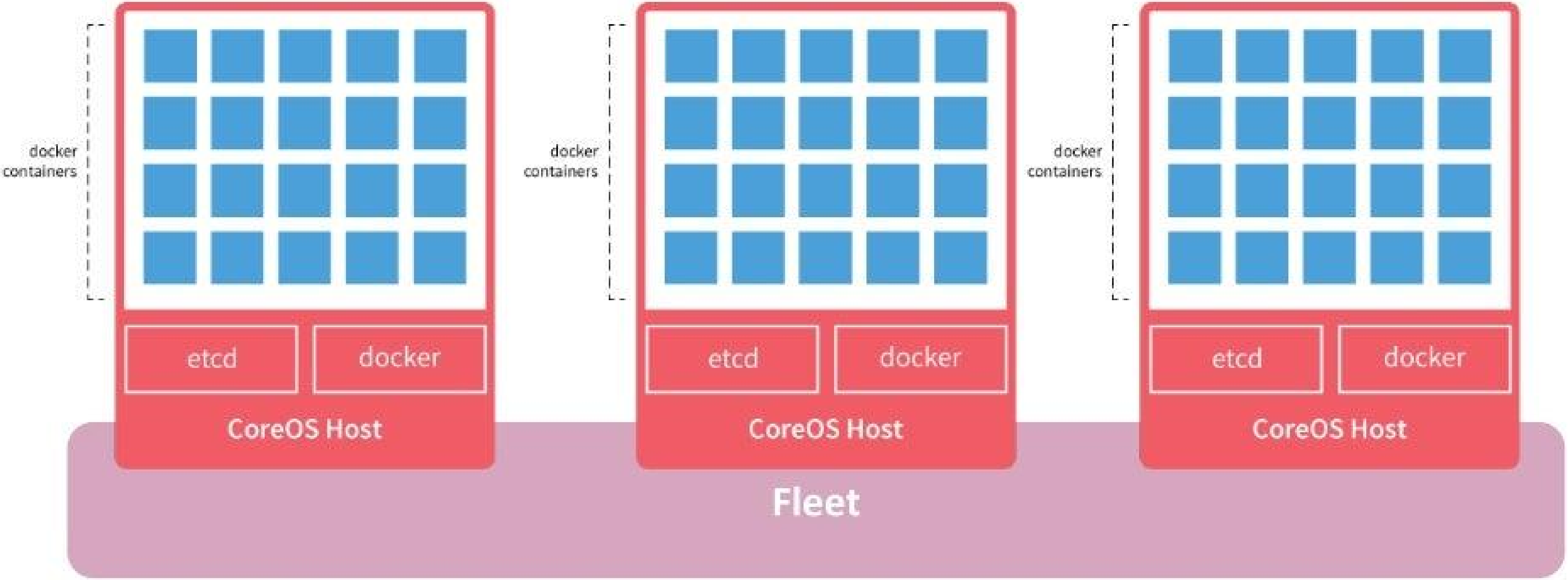
Node 6

Node 7

CoreOS


Distributed database
Reboot Admin
Configuration Manager
Distributed Init
New Init
New Init
New Init
New Init
New Init
New Init
New Init
Node 1
Node 2
Node 3
Node 4
Node 5
Node 6
Node 7

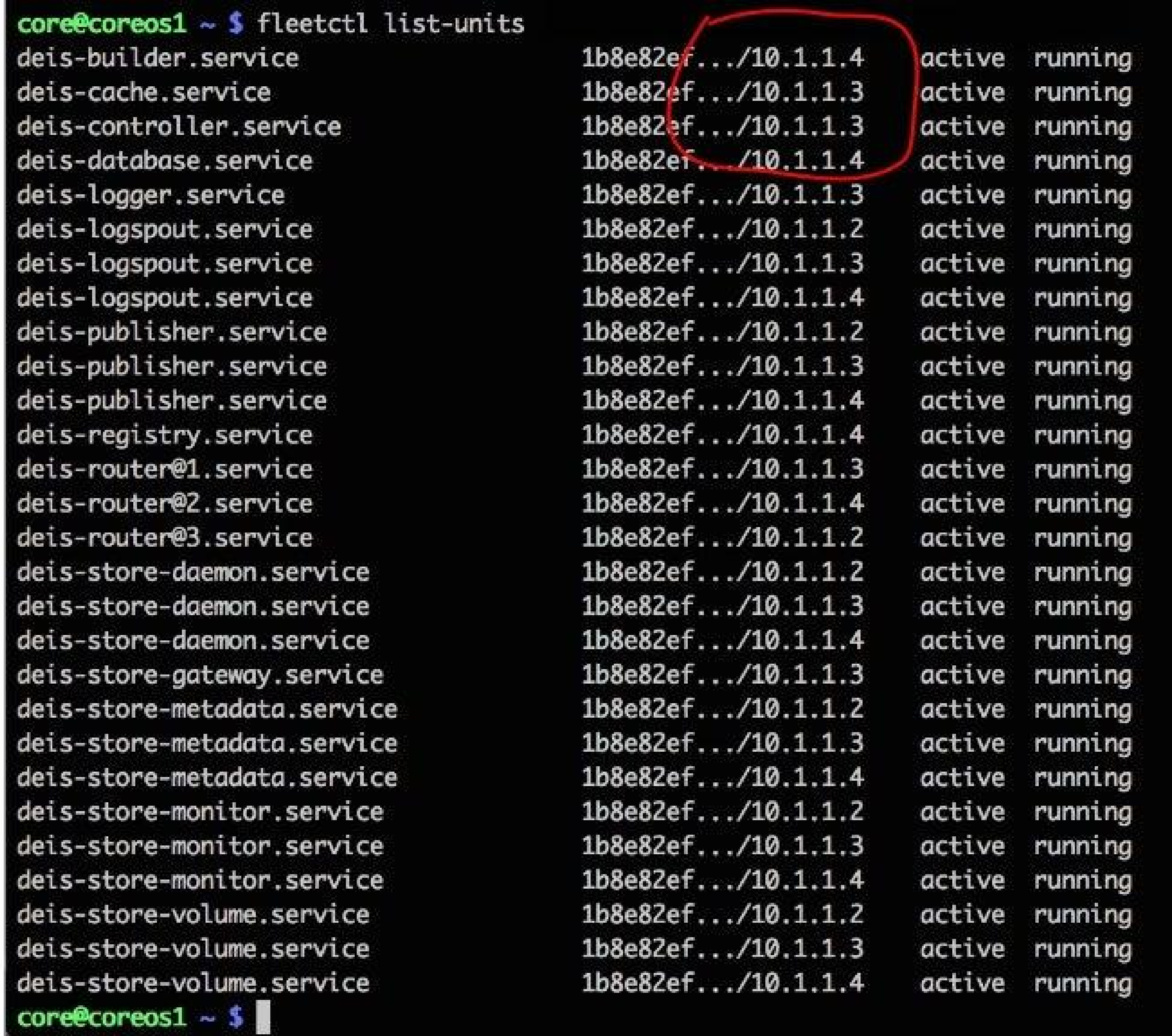
CoreOS + docker



CoreOS

- **Fleet**

Distributed Services

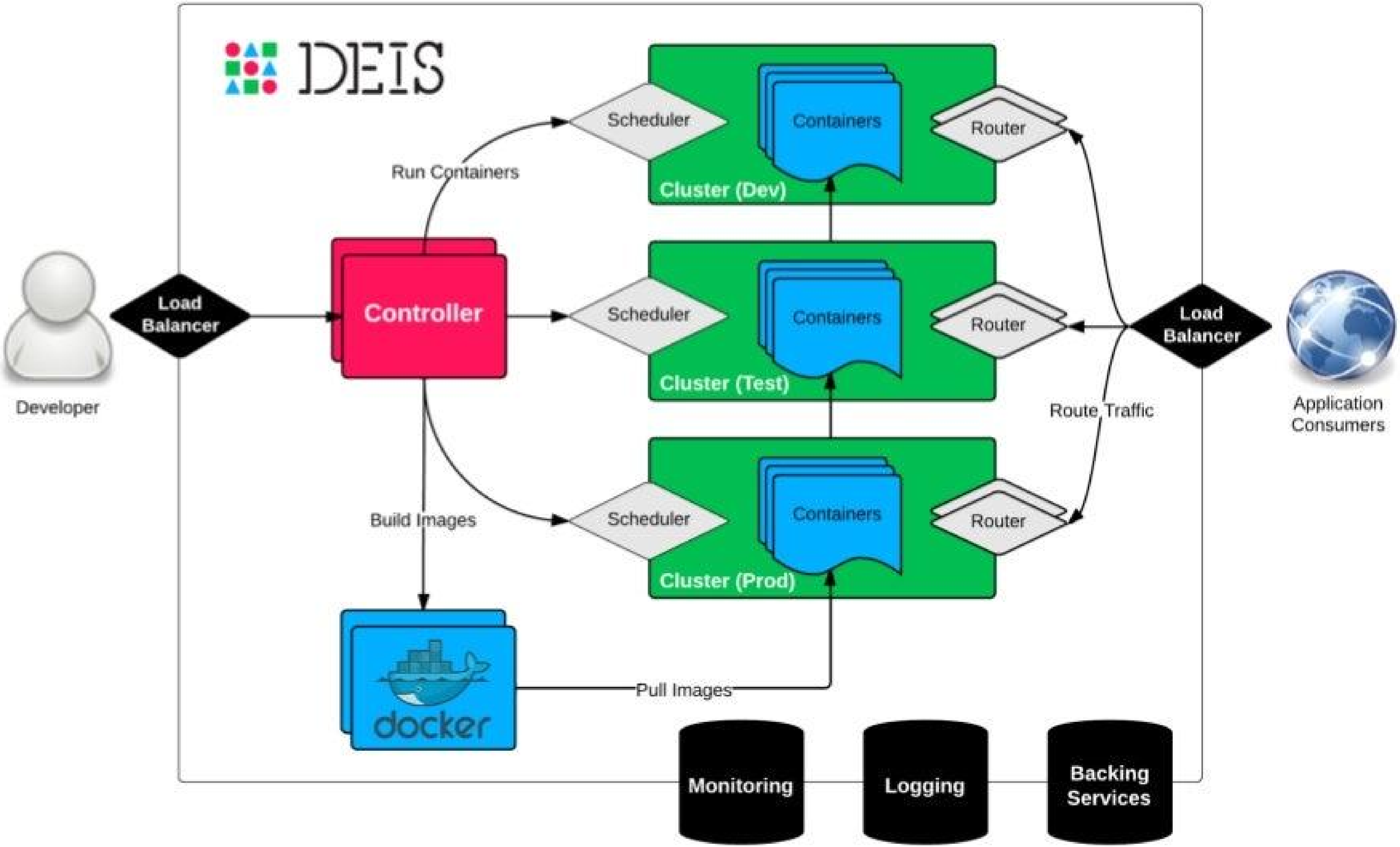


```
core@coreos1 ~ $ fleetctl list-units
deis-builder.service              1b8e82ef.../10.1.1.4   active   running
deis-cache.service                1b8e82ef.../10.1.1.3   active   running
deis-controller.service           1b8e82ef.../10.1.1.3   active   running
deis-database.service             1b8e82ef.../10.1.1.4   active   running
deis-logger.service               1b8e82ef.../10.1.1.3   active   running
deis-logspout.service             1b8e82ef.../10.1.1.2   active   running
deis-logspout.service             1b8e82ef.../10.1.1.3   active   running
deis-logspout.service             1b8e82ef.../10.1.1.4   active   running
deis-publisher.service            1b8e82ef.../10.1.1.2   active   running
deis-publisher.service            1b8e82ef.../10.1.1.3   active   running
deis-publisher.service            1b8e82ef.../10.1.1.4   active   running
deis-registry.service             1b8e82ef.../10.1.1.4   active   running
deis-router@1.service             1b8e82ef.../10.1.1.3   active   running
deis-router@2.service             1b8e82ef.../10.1.1.4   active   running
deis-router@3.service             1b8e82ef.../10.1.1.2   active   running
deis-store-daemon.service         1b8e82ef.../10.1.1.2   active   running
deis-store-daemon.service         1b8e82ef.../10.1.1.3   active   running
deis-store-daemon.service         1b8e82ef.../10.1.1.4   active   running
deis-store-gateway.service        1b8e82ef.../10.1.1.3   active   running
deis-store-metadata.service       1b8e82ef.../10.1.1.2   active   running
deis-store-metadata.service       1b8e82ef.../10.1.1.3   active   running
deis-store-metadata.service       1b8e82ef.../10.1.1.4   active   running
deis-store-monitor.service        1b8e82ef.../10.1.1.2   active   running
deis-store-monitor.service        1b8e82ef.../10.1.1.3   active   running
deis-store-monitor.service        1b8e82ef.../10.1.1.4   active   running
deis-store-volume.service         1b8e82ef.../10.1.1.2   active   running
deis-store-volume.service         1b8e82ef.../10.1.1.3   active   running
deis-store-volume.service         1b8e82ef.../10.1.1.4   active   running
core@coreos1 ~ $
```

DEIS

“Your PaaS. Your Rules.

An open source PaaS that makes it easy to deploy and manage applications on your own servers. Deis builds upon Docker and CoreOS to provide a lightweight PaaS with a Heroku-inspired workflow.”


DEIS
Scheduler
Containers
Router
Cluster (Dev)
Run Containers
Developer
Load Balancer
Controller
Scheduler
Containers
Router
Cluster (Test)
Load Balancer
Application Consumers
Route Traffic
Build Images
Scheduler
Containers
Router
Cluster (Prod)
docker
Pull Images
Monitoring
Logging
Backing Services

DEIS

- CoresOS + Docker + Ceph + Heroku
- Twelve-Factor
  - for Deis: must be stateless (no wordpress)
- Nginx Router + Wildcard DNS
- First release using Ceph
  - more features coming soon
- Limited
  - twelve-factor
  - only HTTP port (non-http soon)
  - must expose ONLY one port

DEIS

- **Installation:**
  - **Install CoreOS and ssh keys then:**

```
$ export DEISCTL_TUNNEL=coreos01
$ curl -sSL http://deis.io/deisctl/install.sh | sh
$ git clone https://github.com/deis/deis.git ; cd deis
$ deisctl config platform set \
  domain=mylocalpaas.com
$ deisctl install platform && deisctl start platform
```