



KubeOS: Container OS based on openEuler

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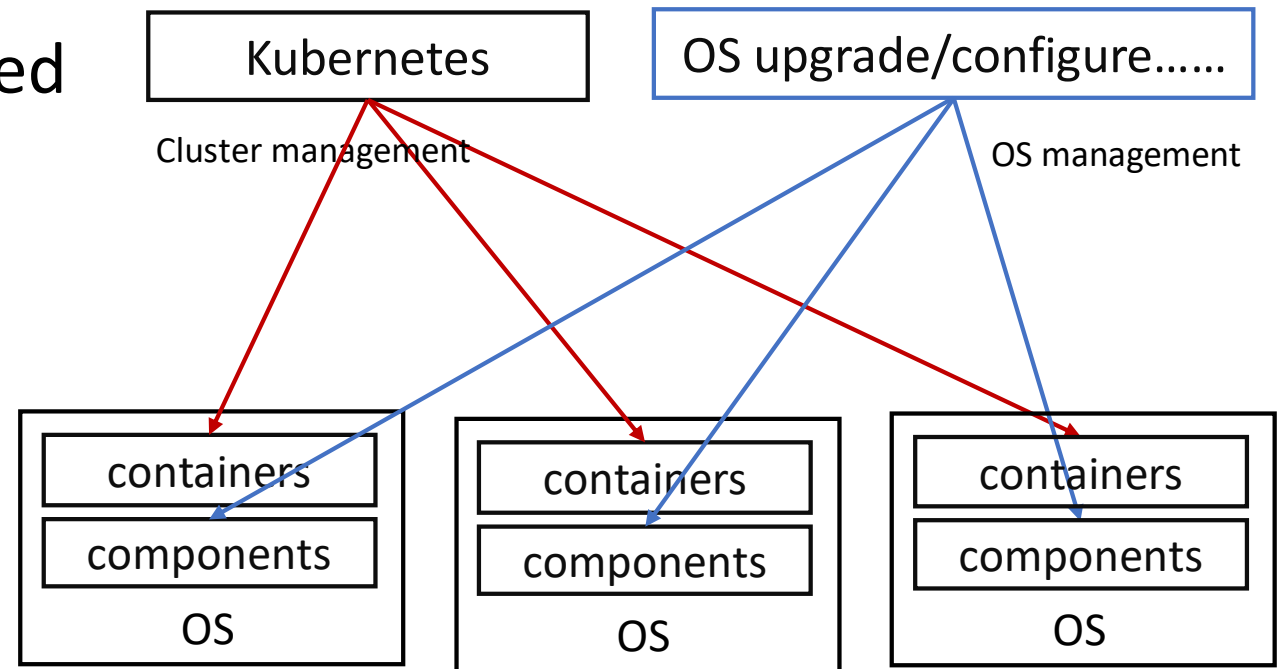
Yuanrong Li <liyuanrong1@huawei.com>

Why Is KubeOS

General-purpose OS distributions usually face some problems in cloud-native environment :

❑ Kubernetes and OSs are managed independently

- Functional Redundancy
- Difficulty in coordination

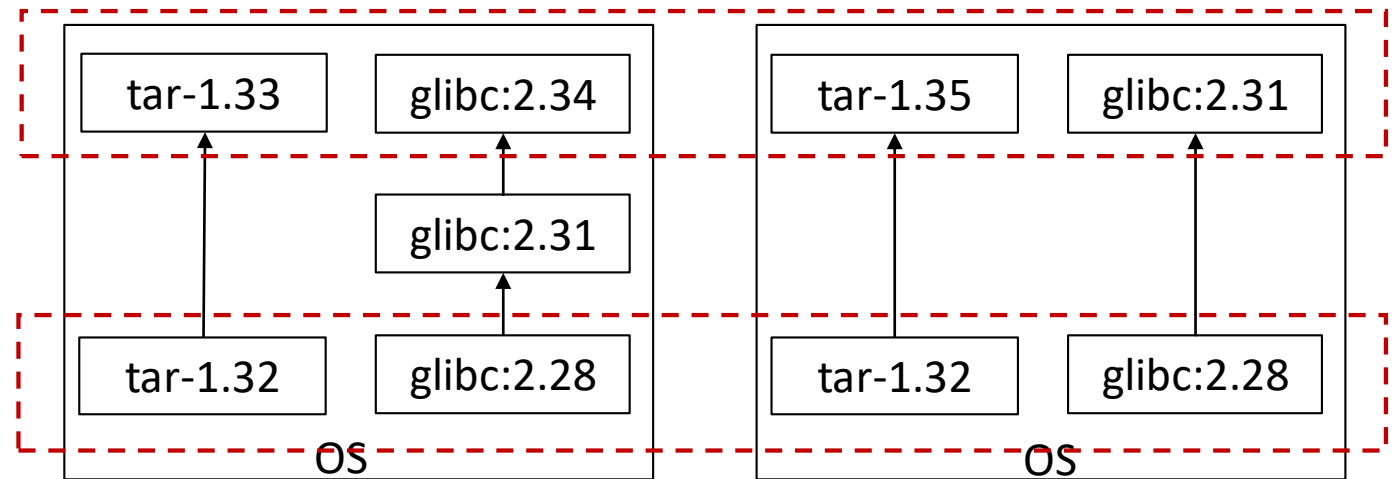


Why Is KubeOS

General-purpose OS distributions usually face some problems in cloud-native environment :

❑ OS version management is difficult.

- OS version splitting
- OS and services are tightly coupled

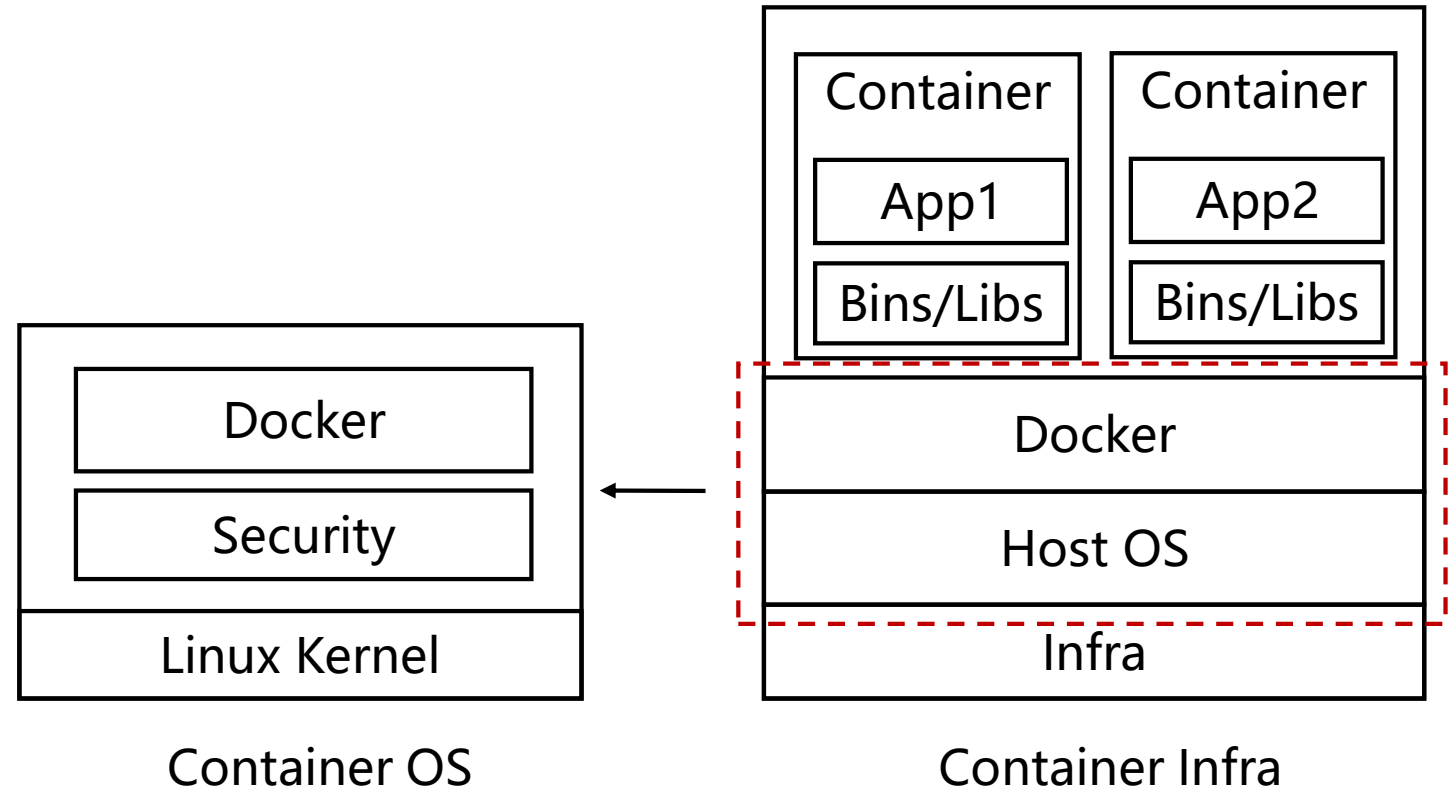


What Is a Container OS

Container OS: A lightweight linux distribution designed specifically for running containers

- Minimal
- Immutable
- Automic Update

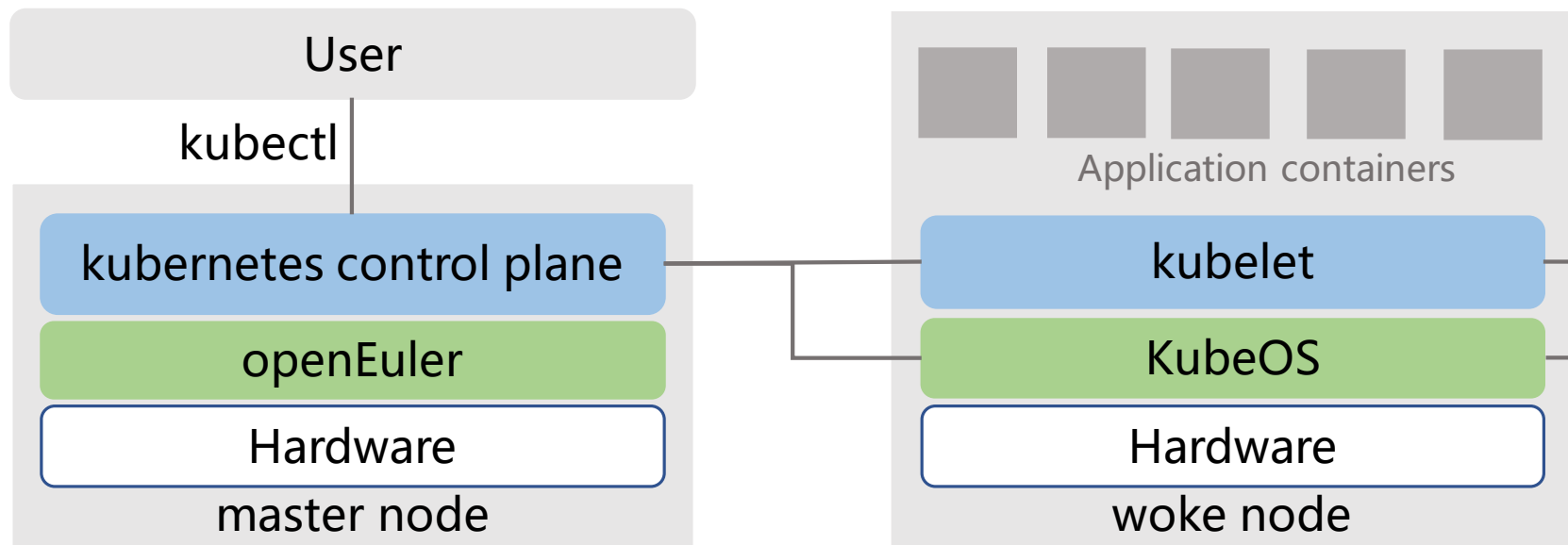
CoreOS/Bottlerocket/Flatcar/
Container-Optimized OS/...



KubeOS: Container OS based on openEuler



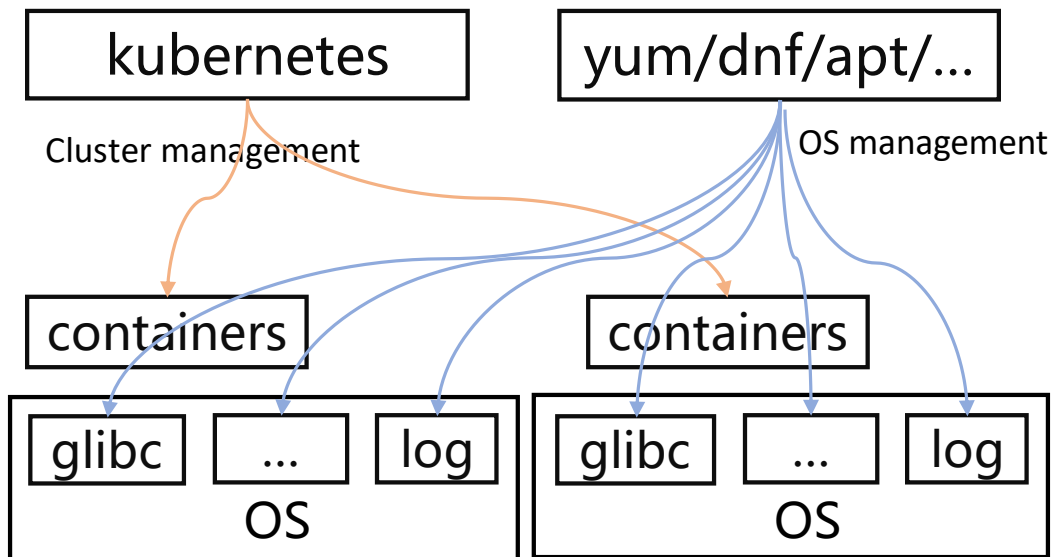
Ideas: OS becomes a component of Kubernetes. Kubernetes manages containers and OSs in a unified manner



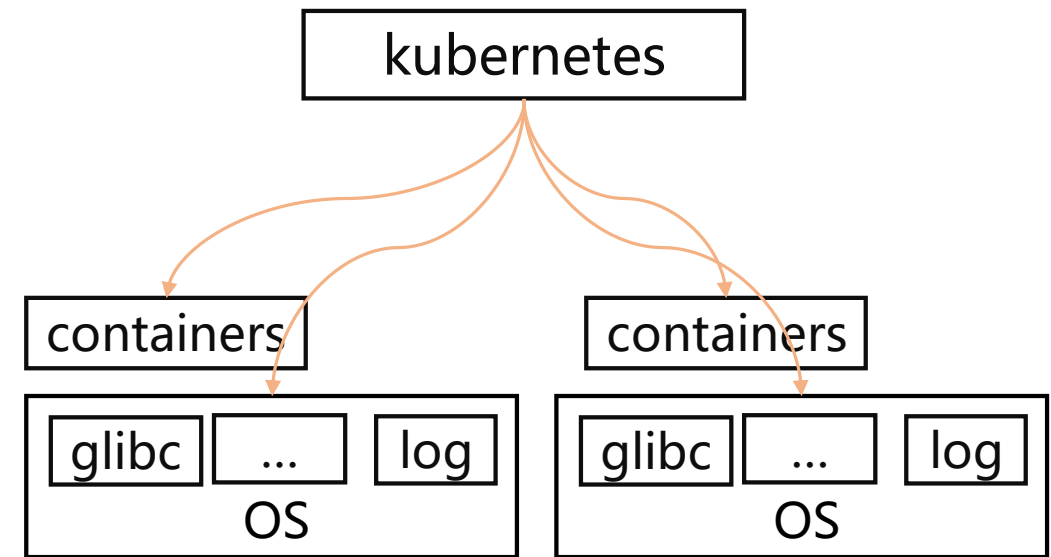
KubeOS: Manage OSs Using Kubernetes

- Use Kubernetes APIs to manage OSs of cluster nodes
- Implement connecting OS to Kubernetes through CRD + Operator
- Manage OSs on the kubernetes control plane

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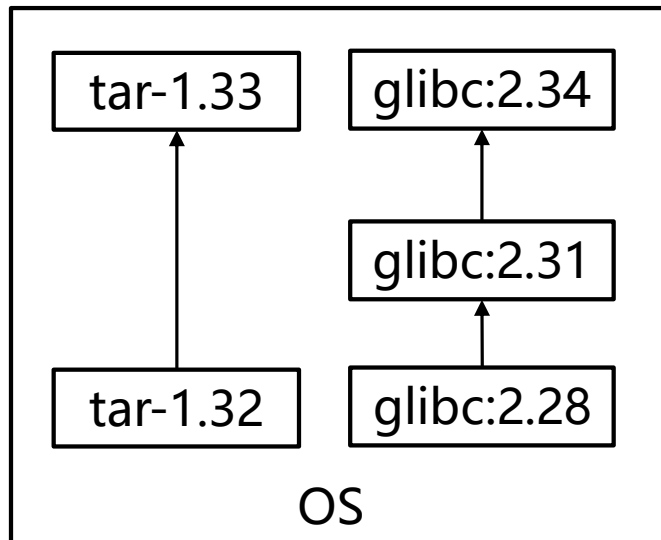
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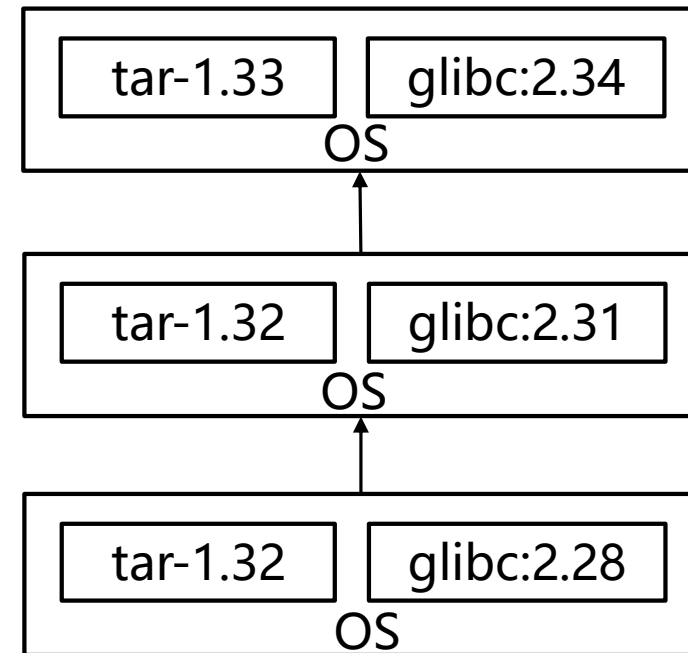
KubeOS: Manage OSs Atomically

- Atomic dual-partition upgrade
- No package manager, software package changes mean OS version changes
- Simplified OS, fast startup

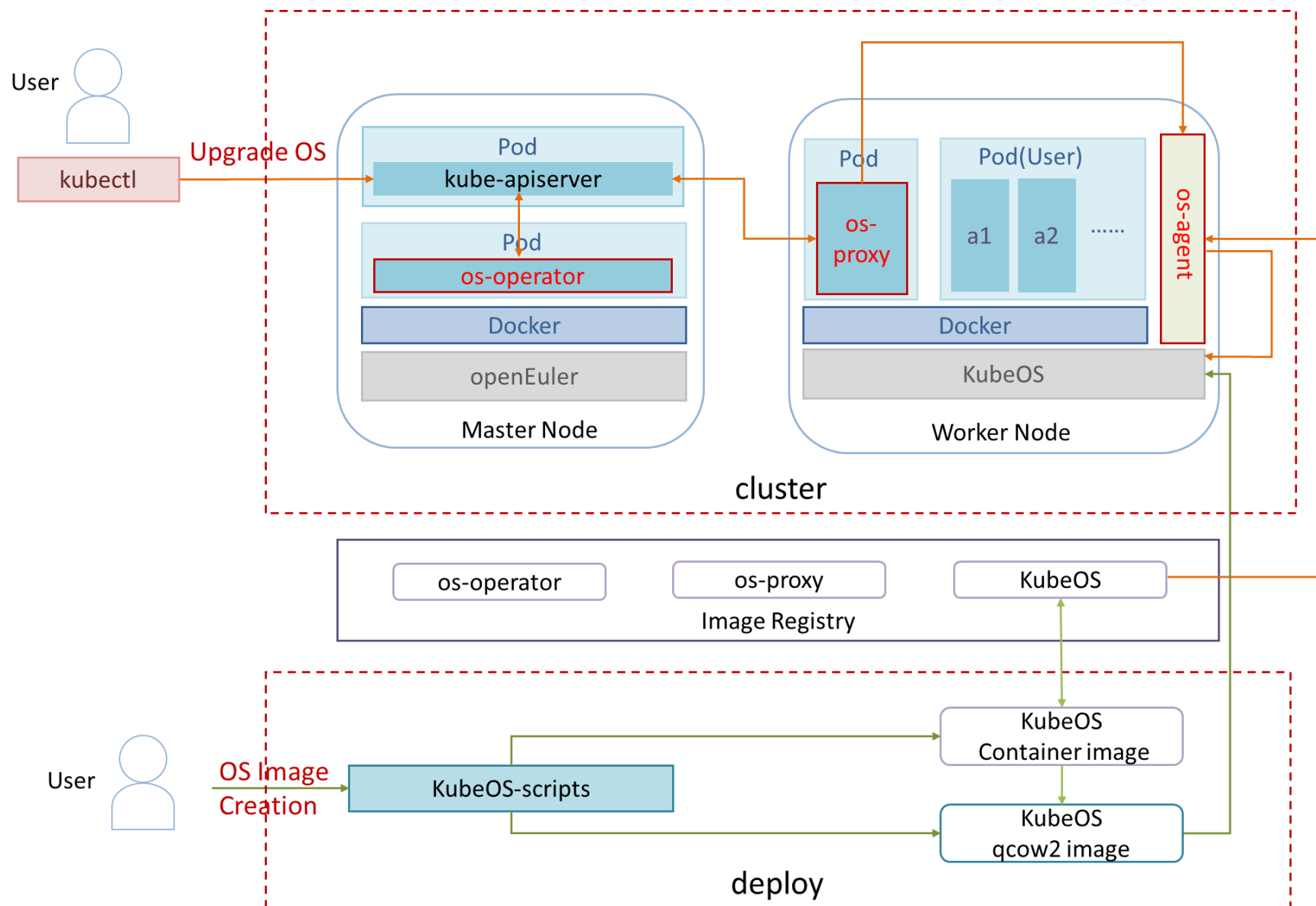
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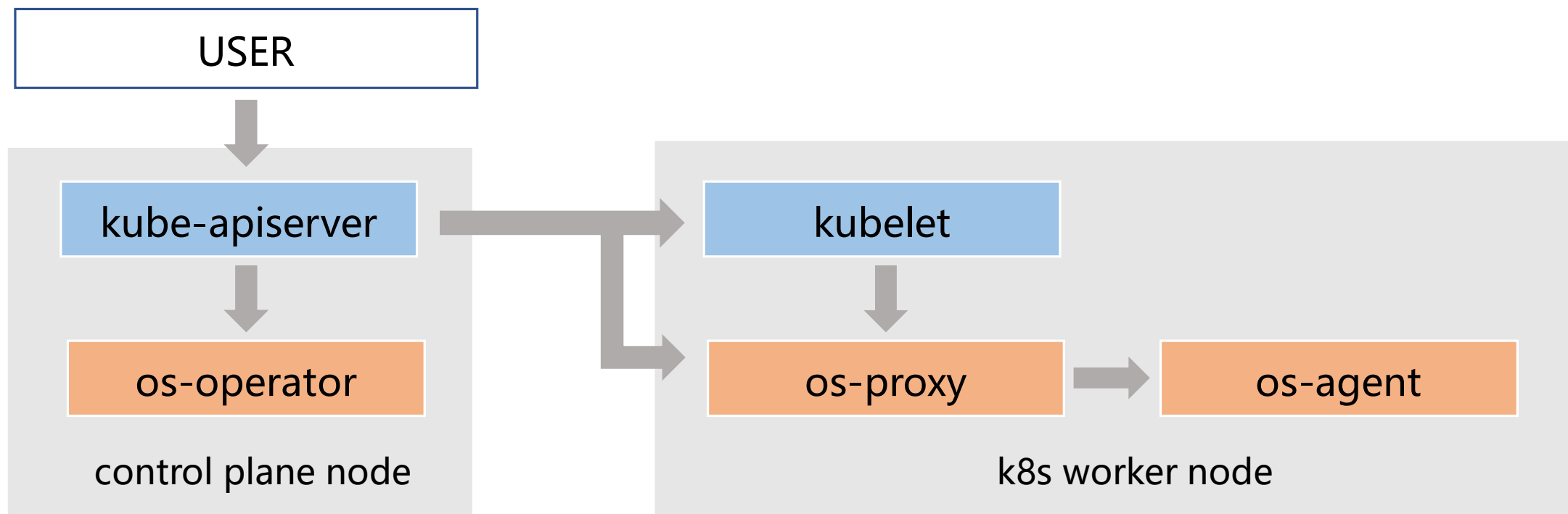
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KubeOS Architecture



KubeOS Architecture

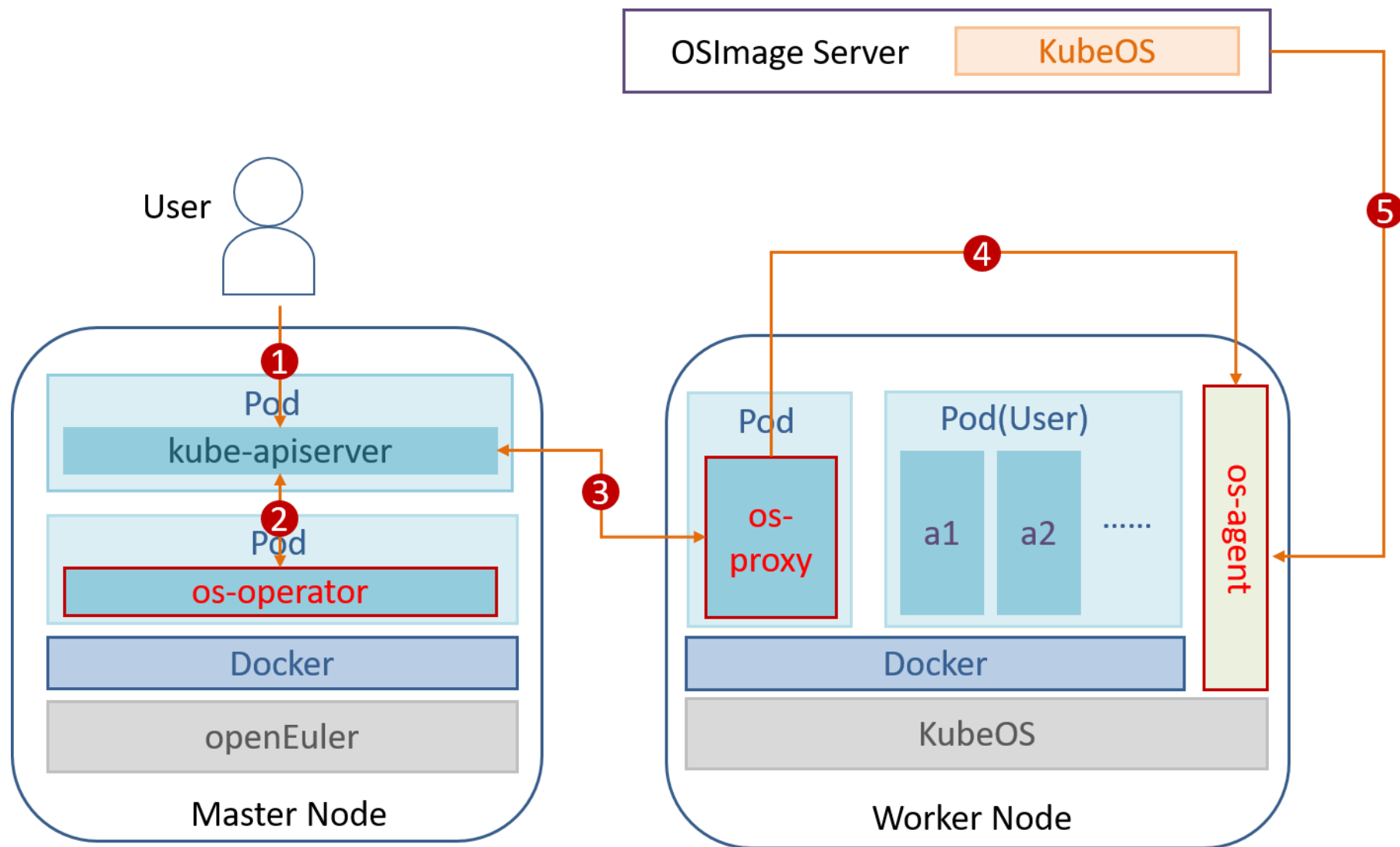


os-operator: monitors OS instances on all nodes , delivers tasks to each node in the cluster

os-proxy: monitors OS instances on a single node , sends OS information to os-agent

os-agent: acts as the real executor of OS management

KubeOS Upgrade Process



KubeOS File System



persist
partition

Union Path /persist/etc	Writable Path /persist/var
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rootA
partition

OS Image bin boot dev etc home lib mnt root run sbin srv sys tmp usr var

rootB
partition

OS Image bin boot dev etc home lib mnt root run sbin srv sys tmp usr var

boot
partition

bootloader /boot/efi/

root partition

Two read-only partitions for the dual-partition upgrade.

persist partition

Stores persistent user data

- Union Path: overlay mount
- Writable path: bind mount

boot partition

Store the boot loader files

More Functions

- Configuration
 - Deliver OS system settings to each node in the cluster using Kubernetes
 - Configuration during KubeOS image building
- Upgrade
 - Customized upgrade policies, such as based on labels

Better to use

- Display
- Easy to use

