What Happens When I Type kubectl run? 🤔

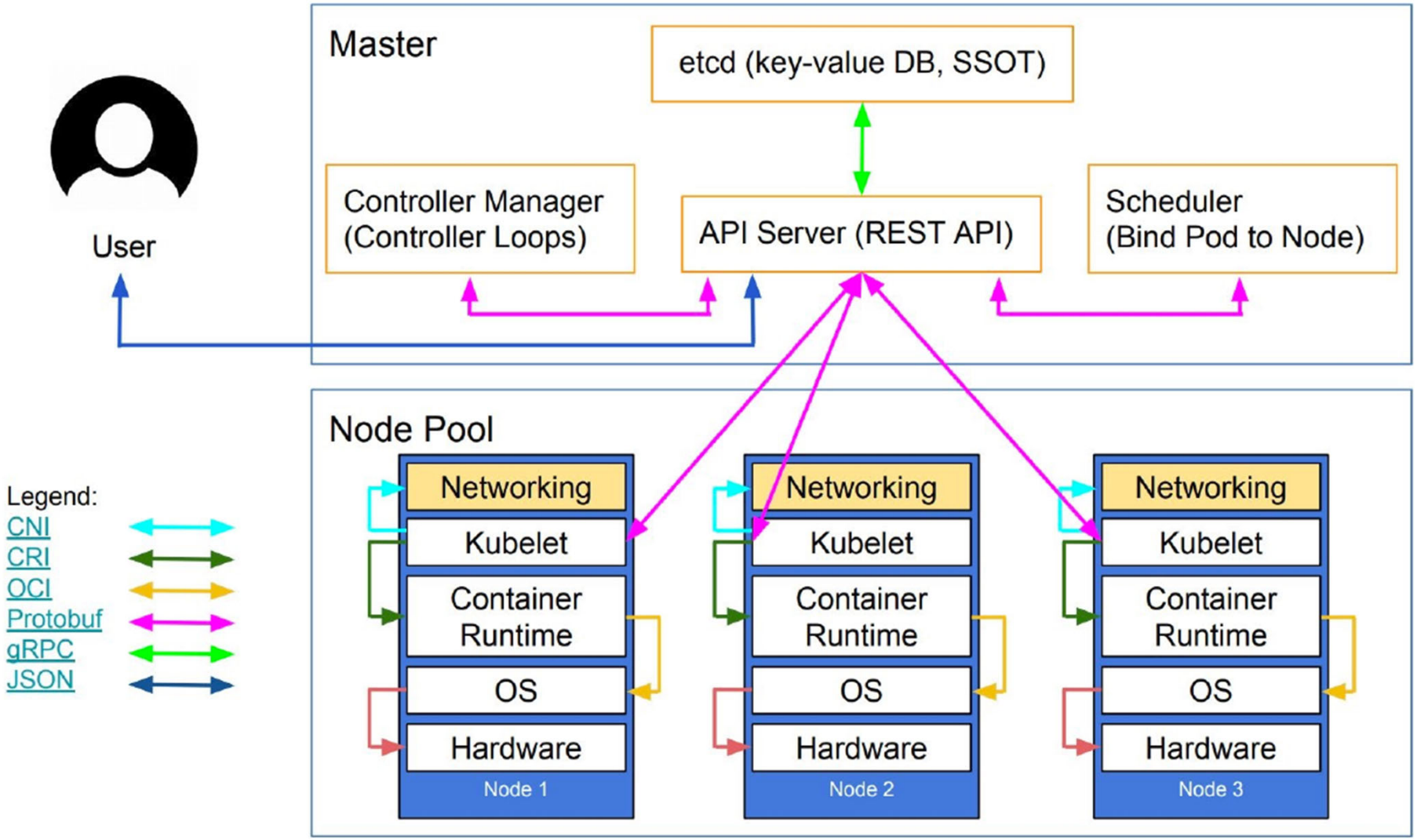
@Luminous Moonlight

Presented by linxuyalun

https://github.com/jamiehannaford/what-happens-when-k8s

2020-11-11

Kubernetes' high-level component architecture

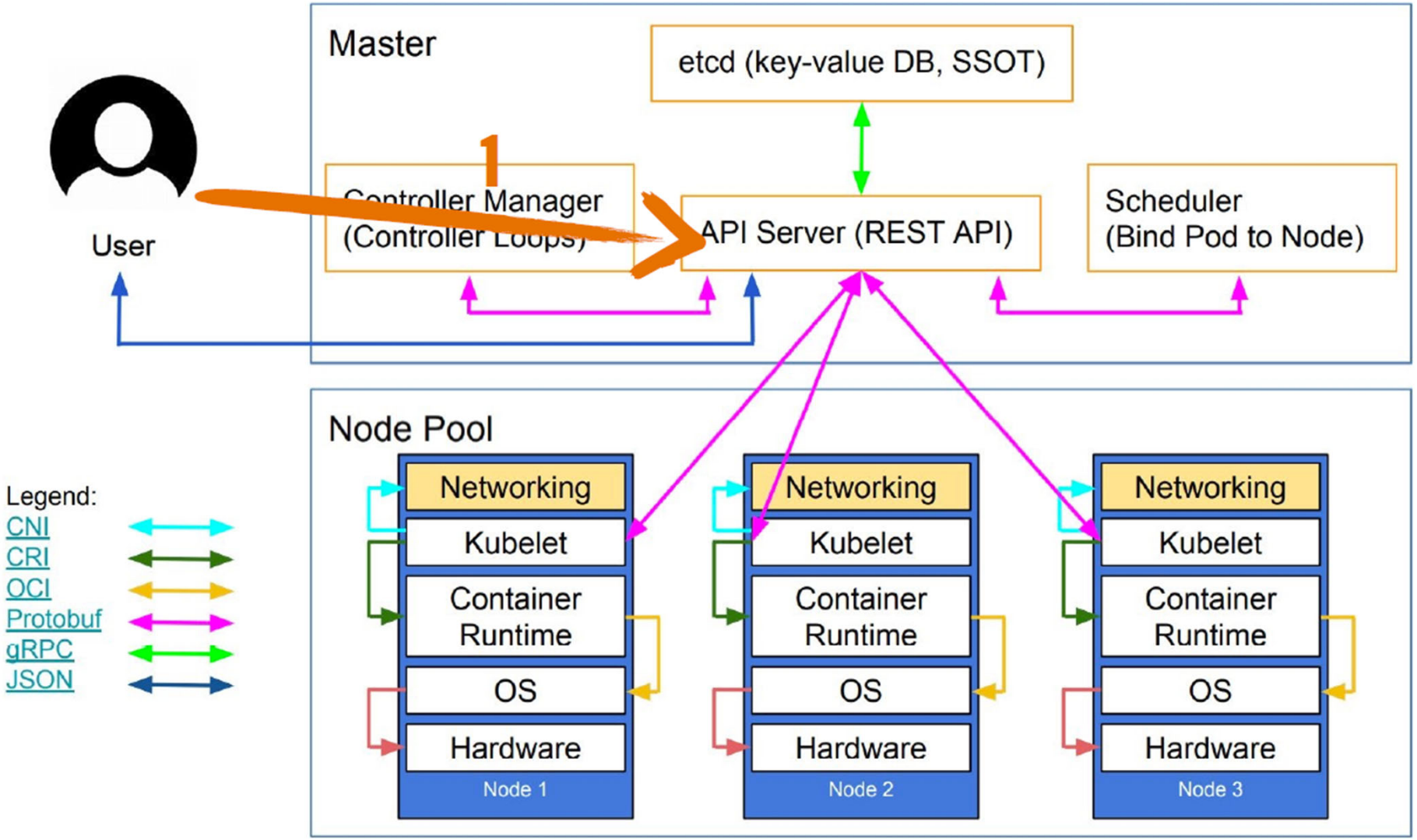


What happen when ...

Imagine I want to deploy a Deployment to a Kubernetes cluster. I'd probably type something like this in my terminal:

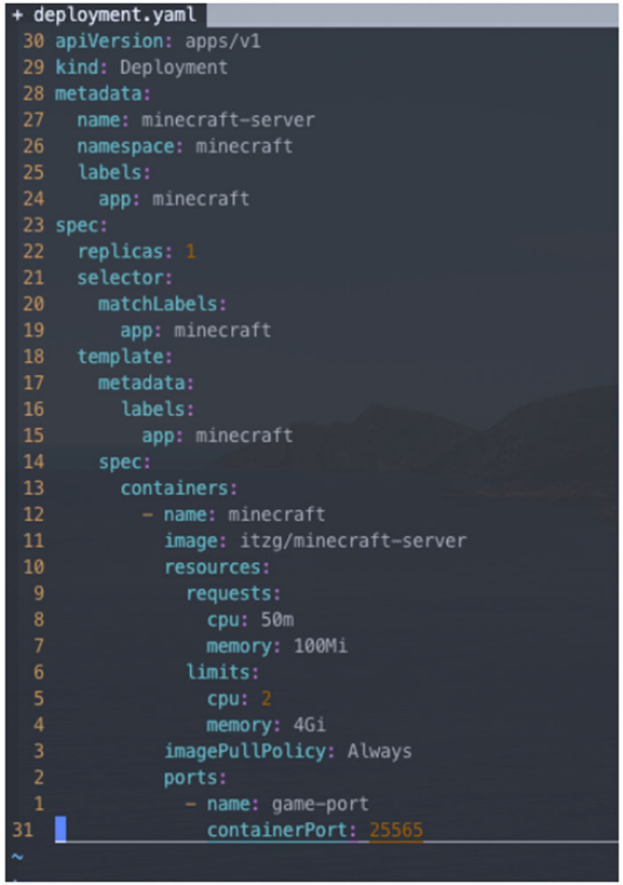
```
kubectl apply -f deployment.yaml
```

Kubernetes' high-level component architecture

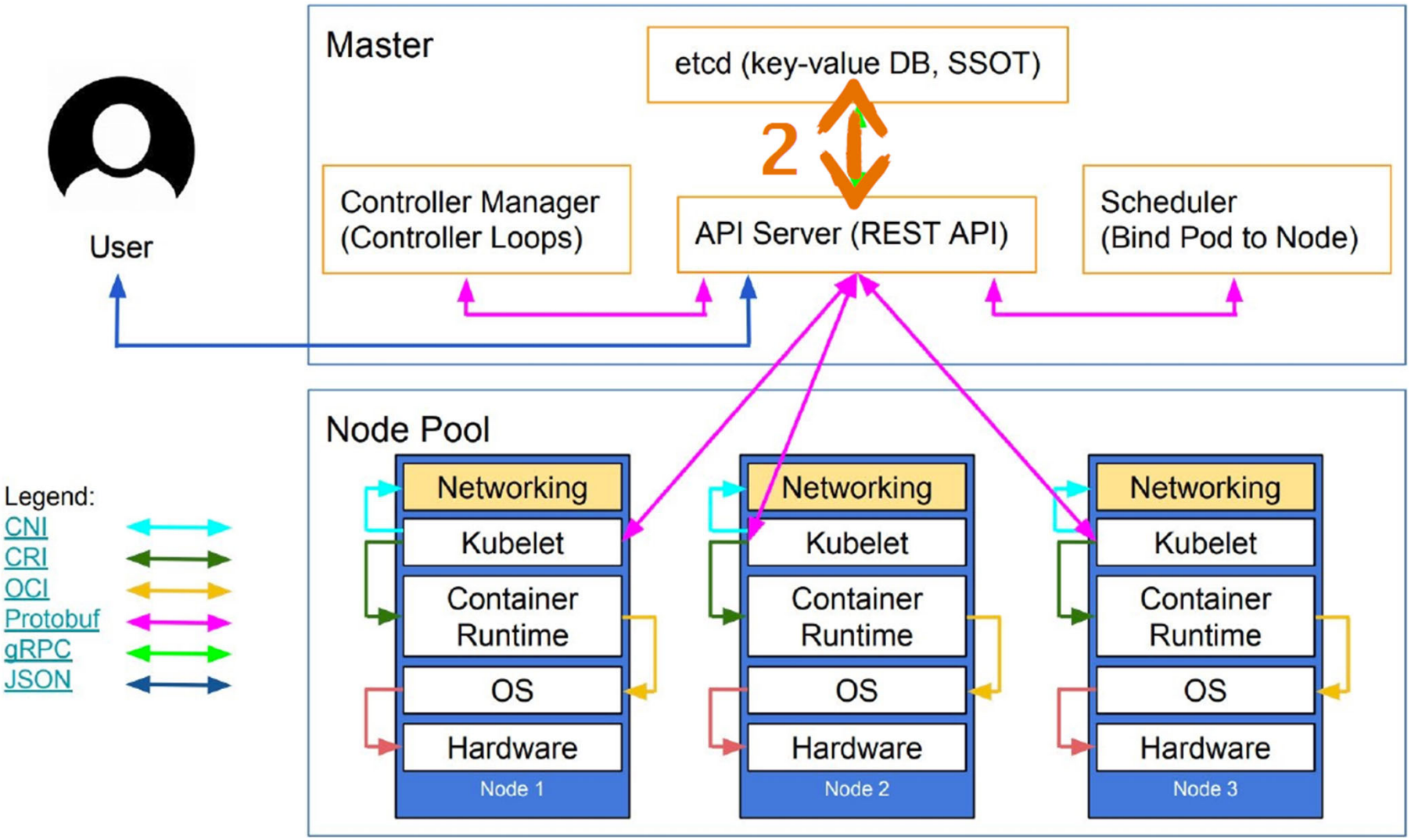


Kubectl

- API Groups: Group, Version, Resource;
- Validate `kubeconfig`;
- Generate and send Request.

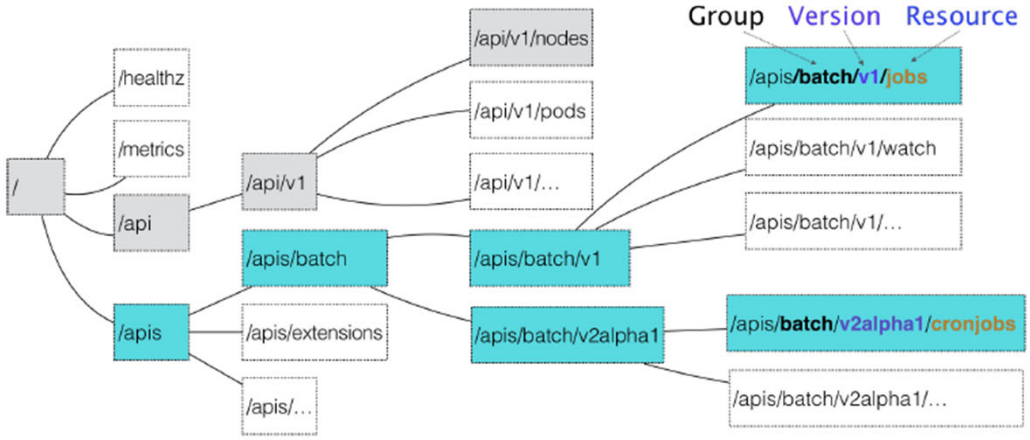


Kubernetes' high-level component architecture



Apiserver

- Authentication & Authorization
- Convert;
- Admission & Validation;
- Call Etcd Api;
- Key format `<namespace>/<name>`



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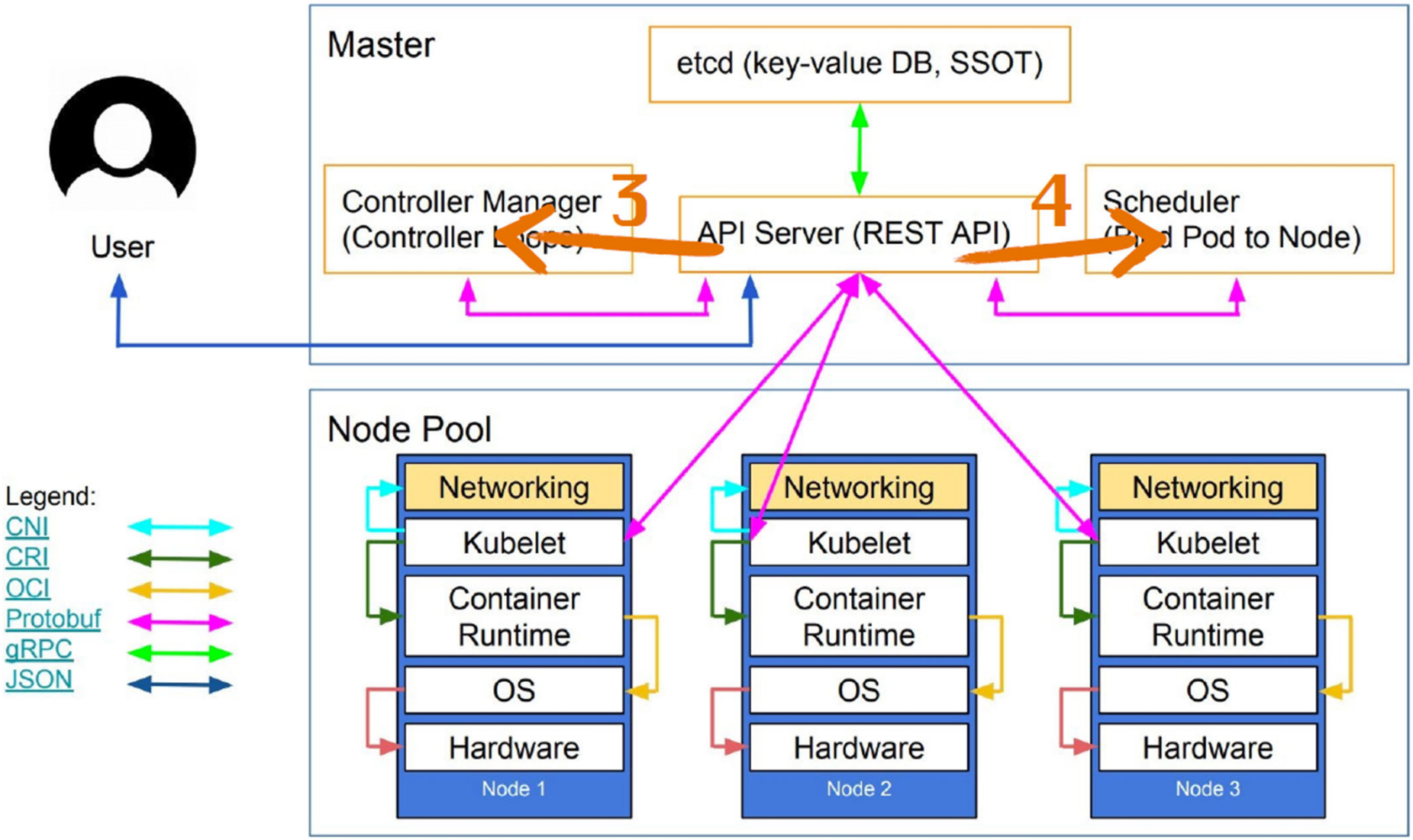
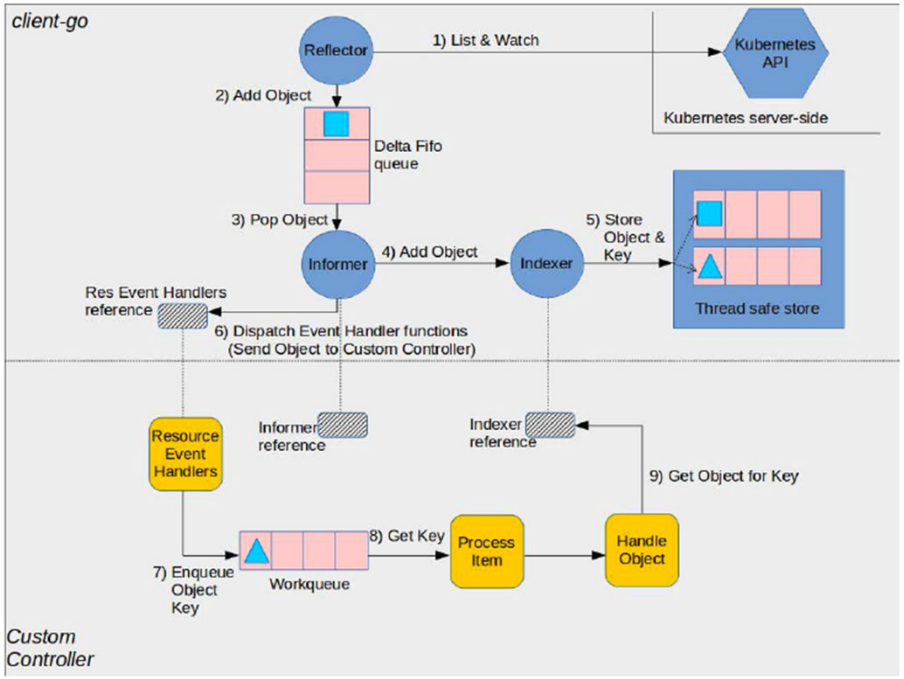


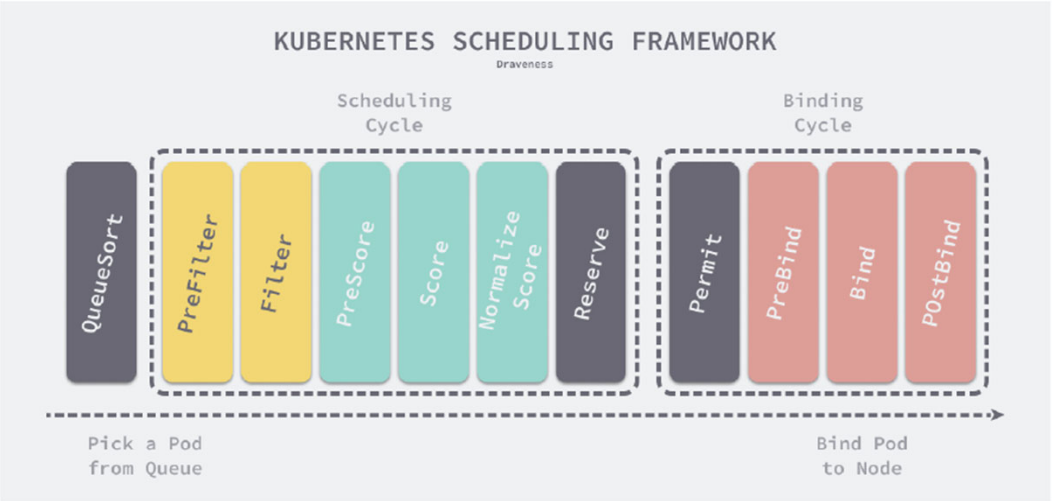
Control loops: Controller Manager

- Controller: current -> desired
  - Deployment Controller
  - Replicaset Controller
- Informer:
  - Reflector;
  - DeltaFIFO;
  - Indexer;
  - Workqueue;



Control loops: Scheduler

- Listen and reconcile;
- Scheduling Cycle;
- Binding Cycle;
  - Send to apiserver;
  - Update etcd.



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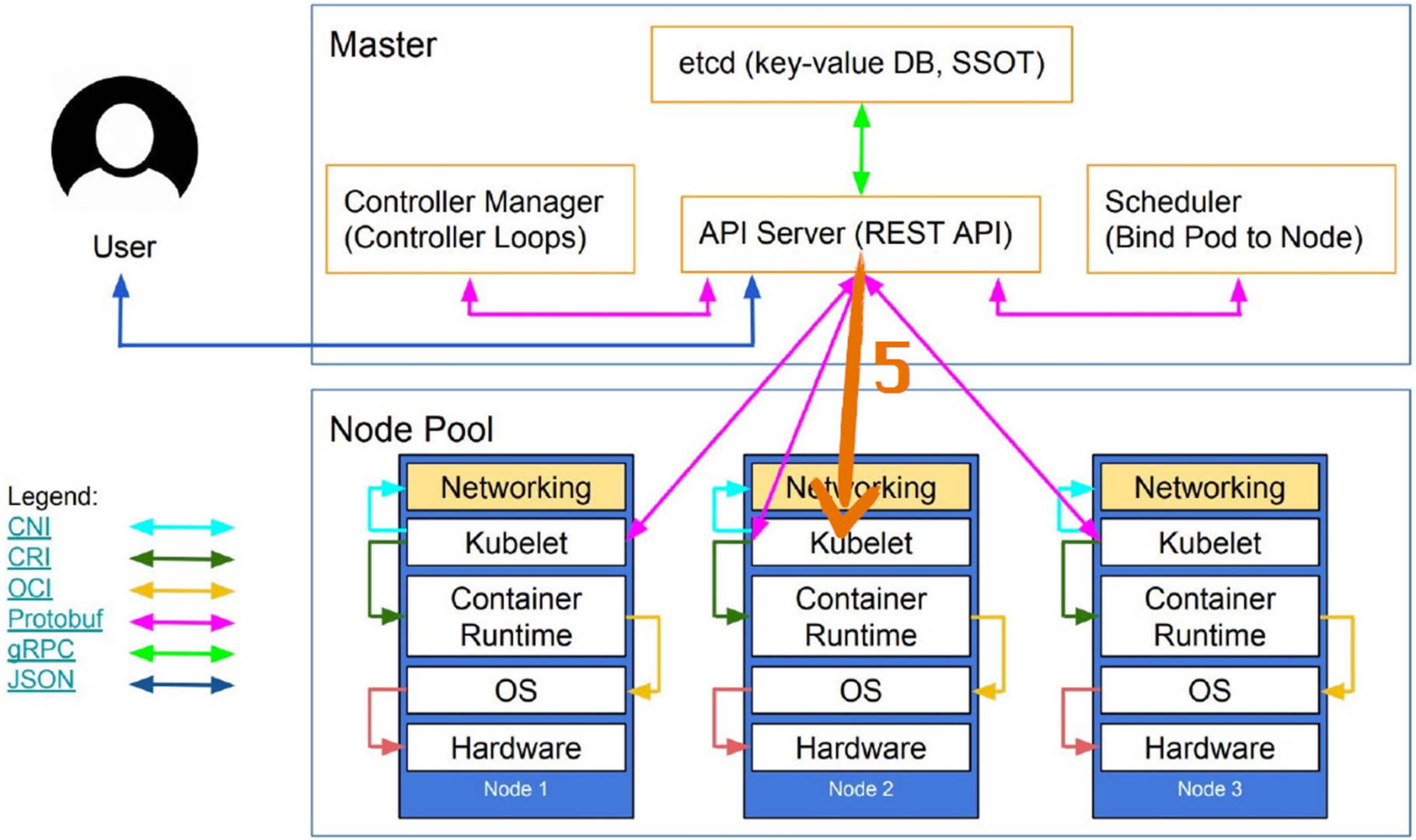
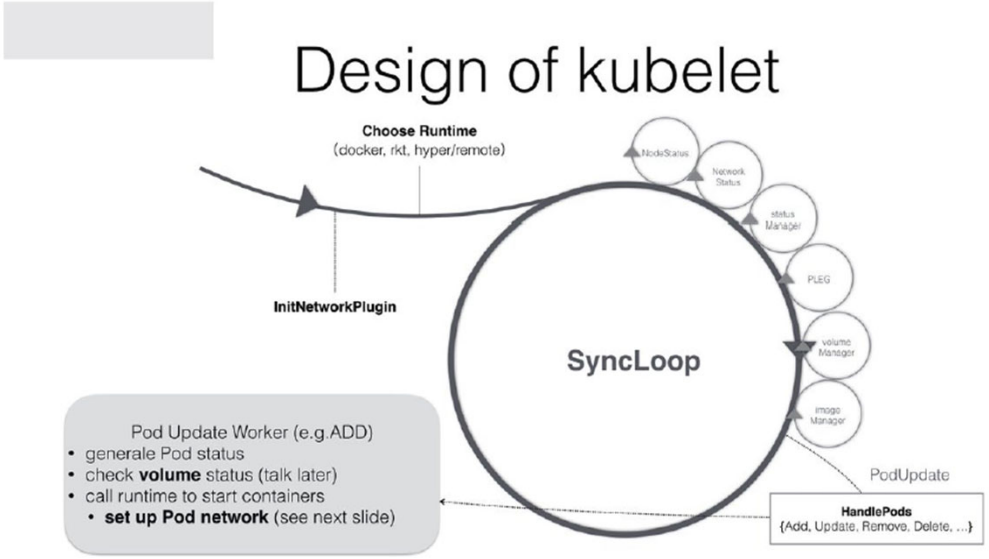


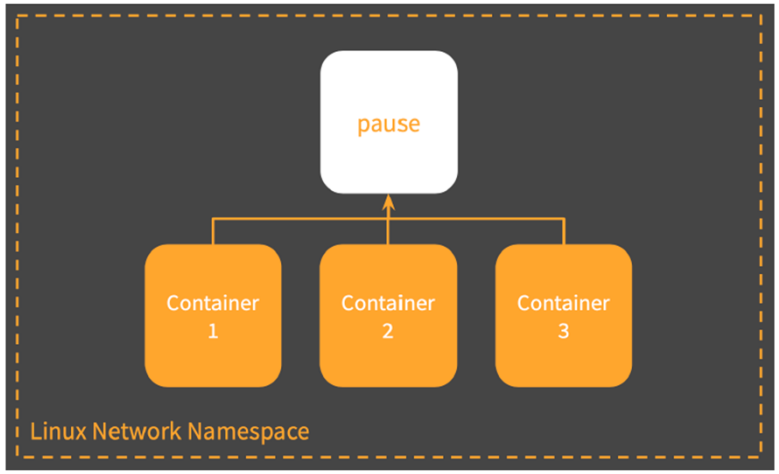
Kubelet: Pod Sync

- Kubelet is a Special Controller;
- Create a Pod:
  - Generates a PodStatus;
  - Cgroup;
  - Create data directories;
  - Attach Volumn;
  - Run Container Runtime



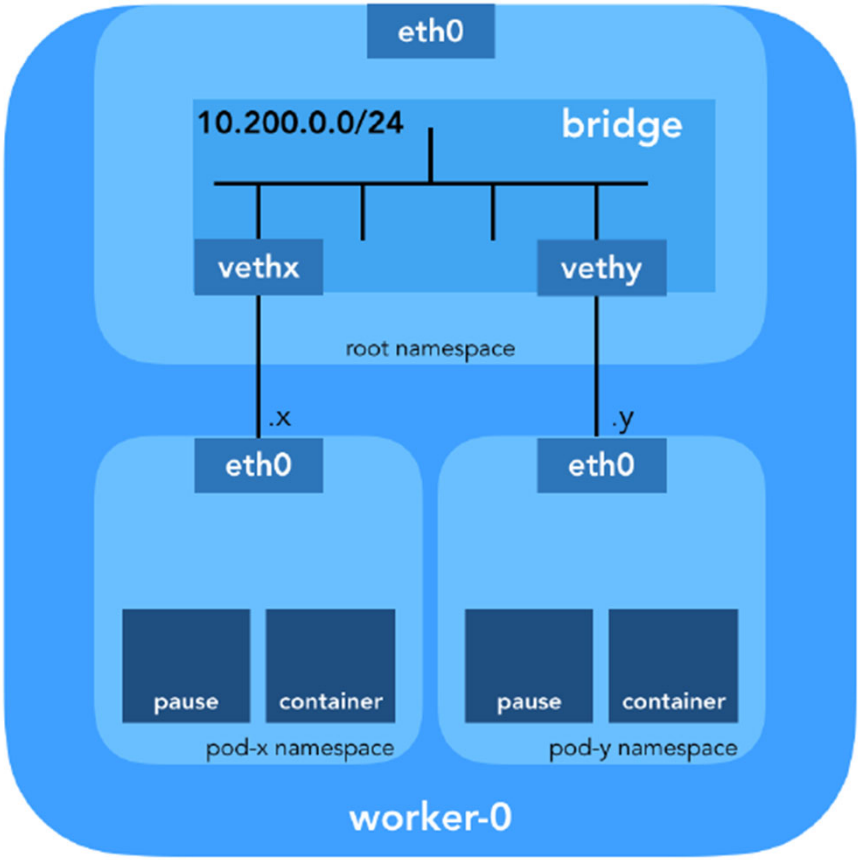
Kubelet: CRI

- CRI Abstraction;
- Pause Container:
  - Share namespace;
  - Init Process.



Kubelet: CRI

- CNI Abstraction;
- Linux Bridge;
- Veth Pair;
- Assign an IP to pause container;
- `resolv.conf` for DNS.



Container Startup

- Pull the image;
- Create the container;
- Start the container.