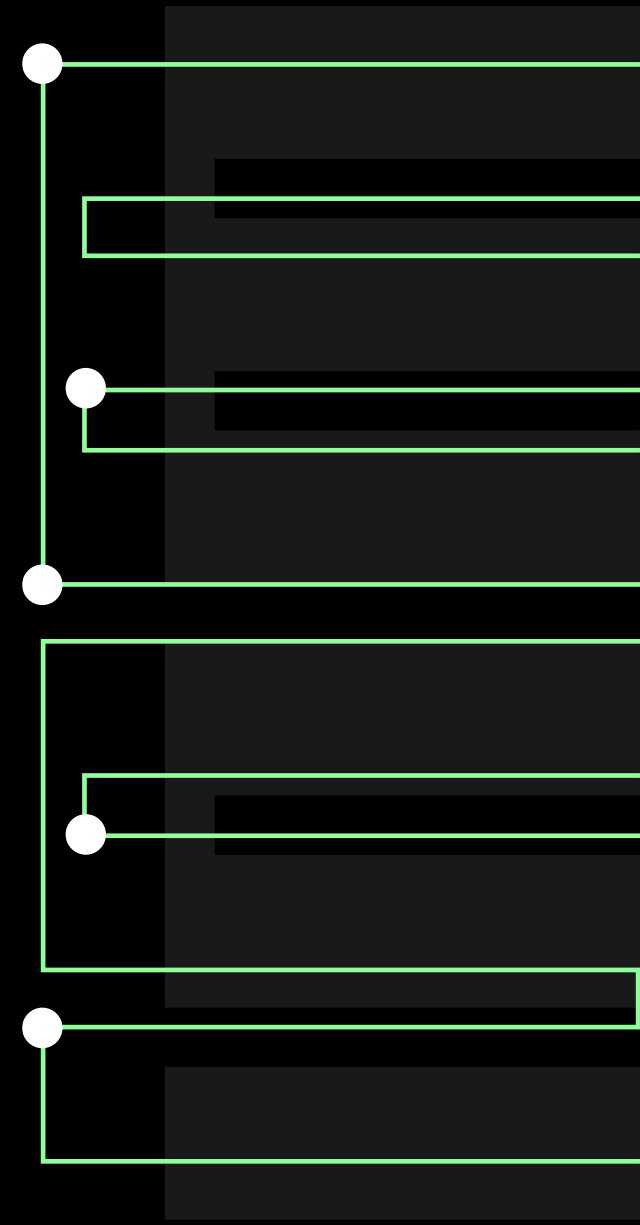
EDGELESS SYSTEMS



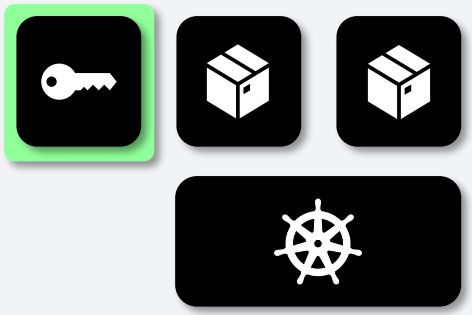
Constellation

Autonomous Confidential Kubernetes

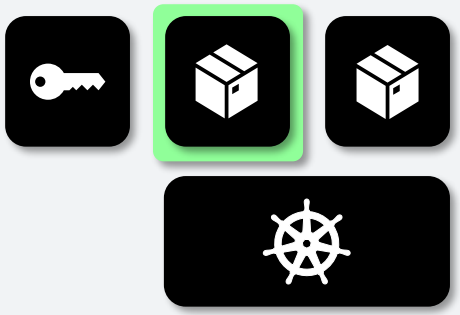
How to securely manage K8s from within K8s

The different flavors of confidential computing

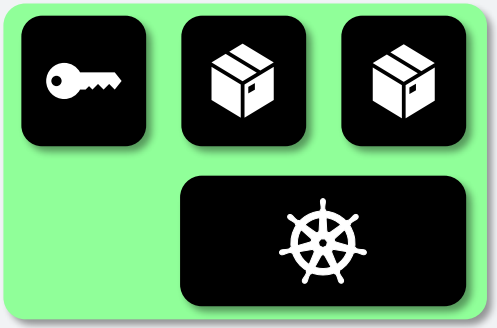
Level 1
Protect keys



Level 2
Protect single containers/apps



Level 3
Protect entire deployments



Challenges with Level 3

UX

Orchestration

Scalability

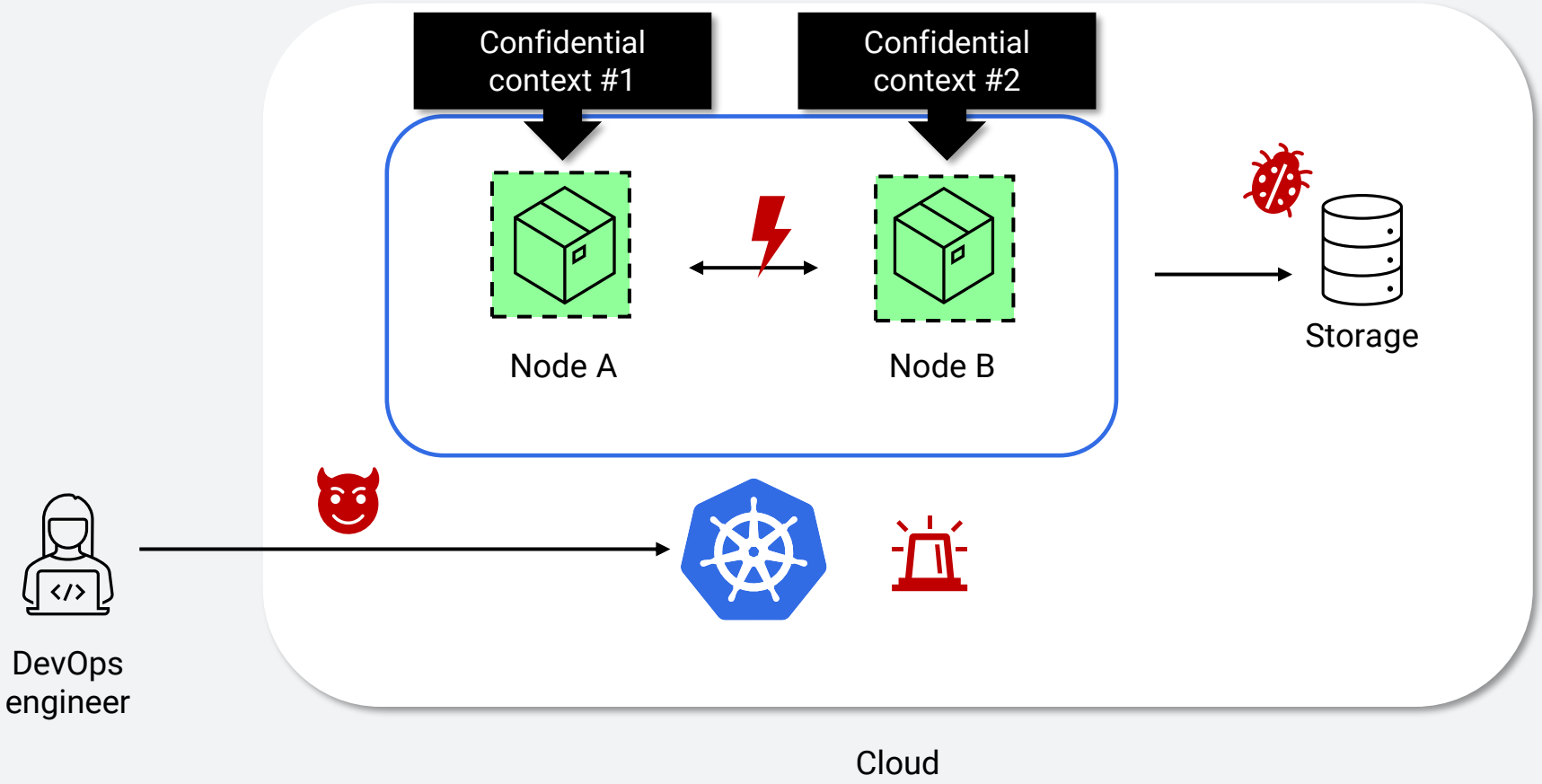
Attestation

I/O

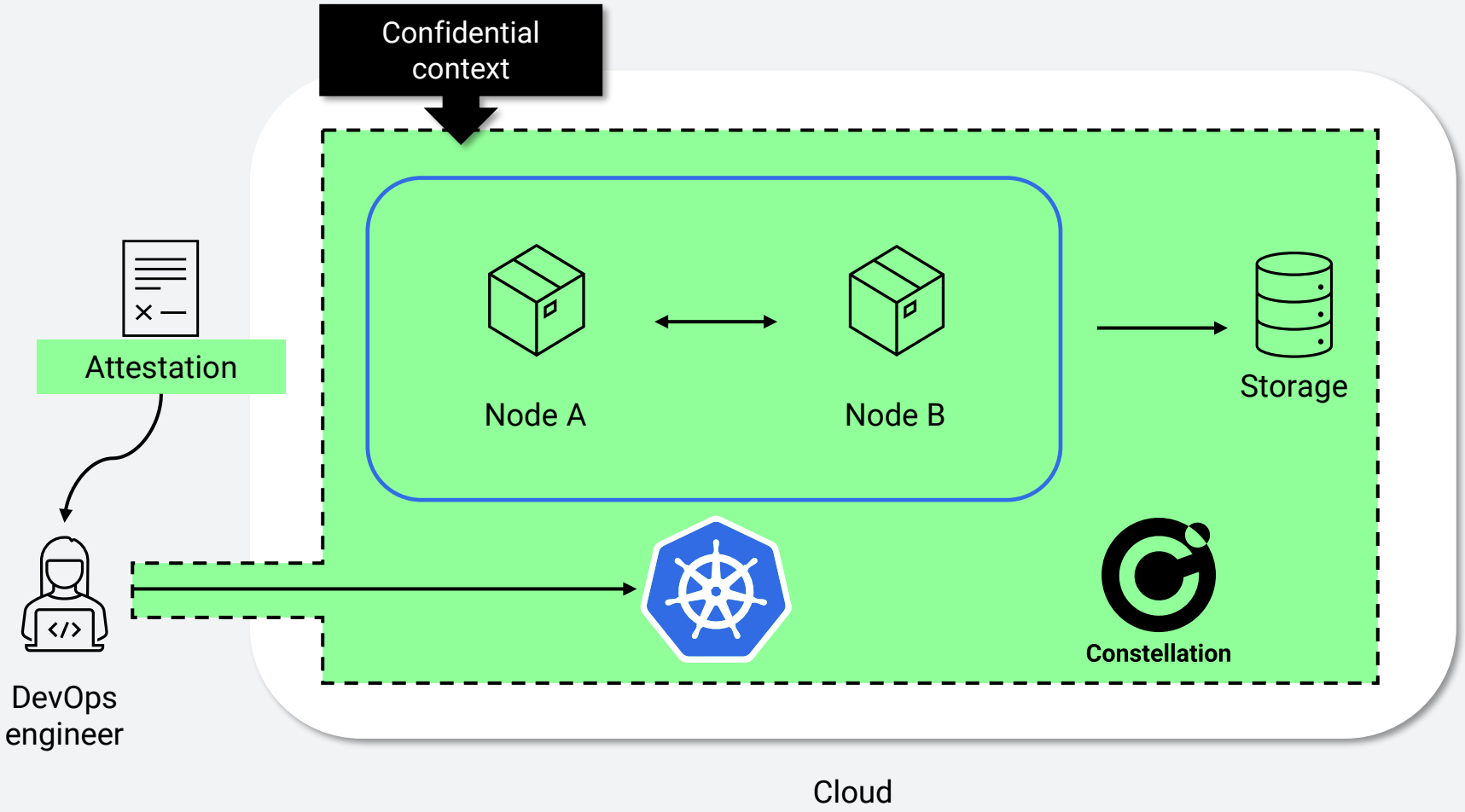
Day-2 Ops

Managed Services

From a Confidential VM…



… to a Confidential Cluster



Keeping the UX simple…

```
constellation create <cloud> <initial size>
constellation init

kubectl [scale anything!]
```

… by addressing the challenges below

```
constellation create <cloud> <initial size>
constellation init

kubectl [scale anything!]
```

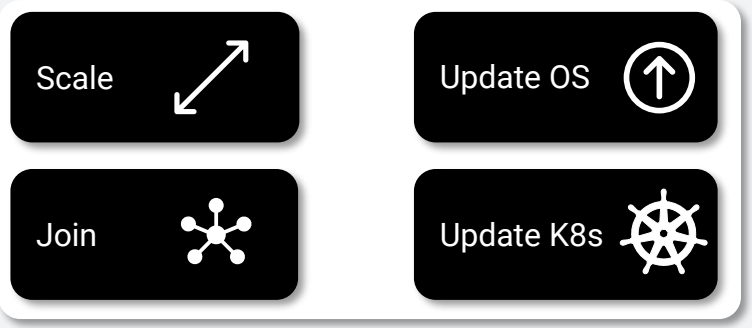
Fully “measured” node OS + Whole-cluster attestation + Supply chain security + Disk and network encryption overlay + Cloud abstraction + Confidential recovery

What about “managed” and day-2 operations?

MANAGE K8S FROM WITHIN K8S

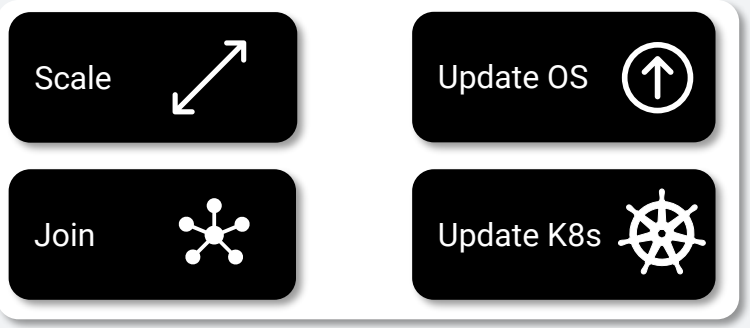
Cluster management strategies

On prem
Manually managed



Admin in control

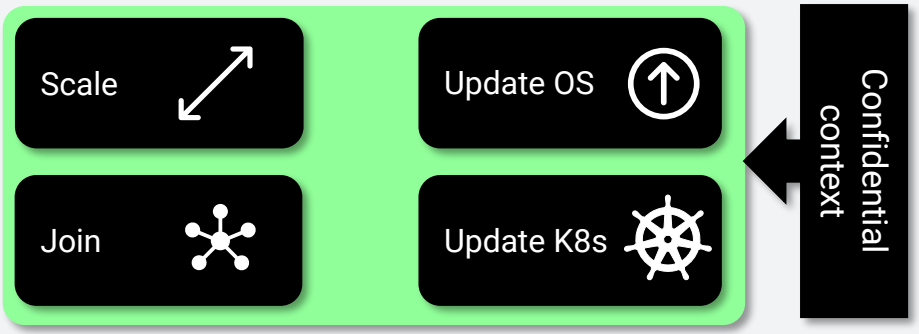
Fully managed
Automatically managed by CSP



CSP in control

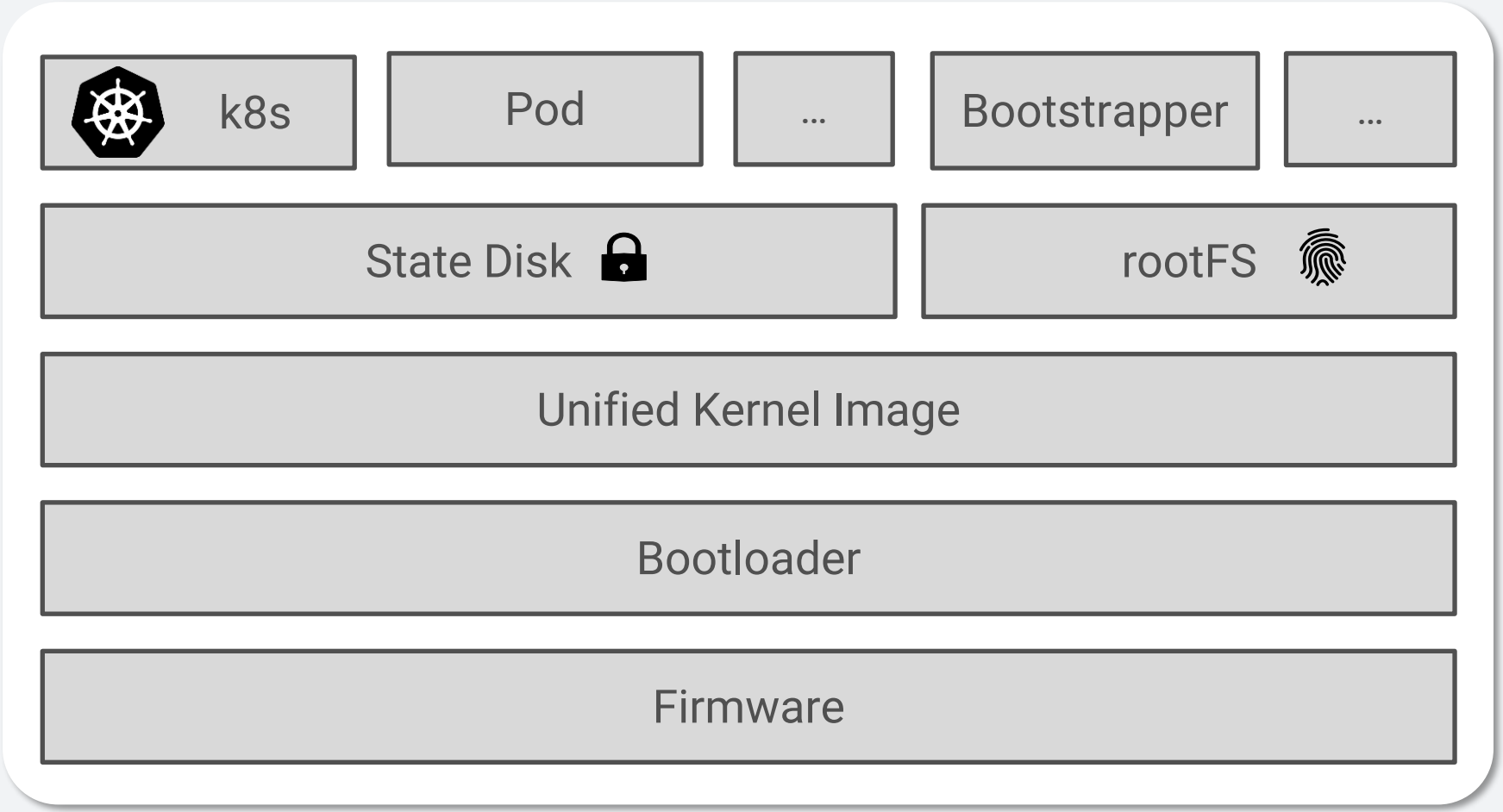
… meeting in the middle

In cluster
Autonomously managed

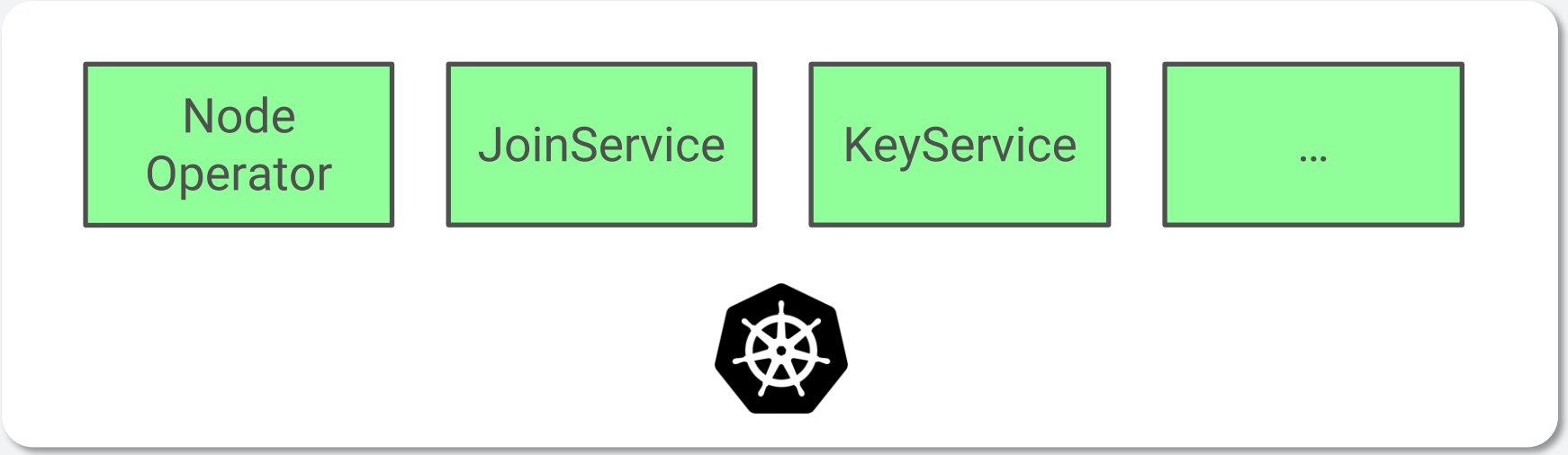


Admin & cluster in control

Constellation Node

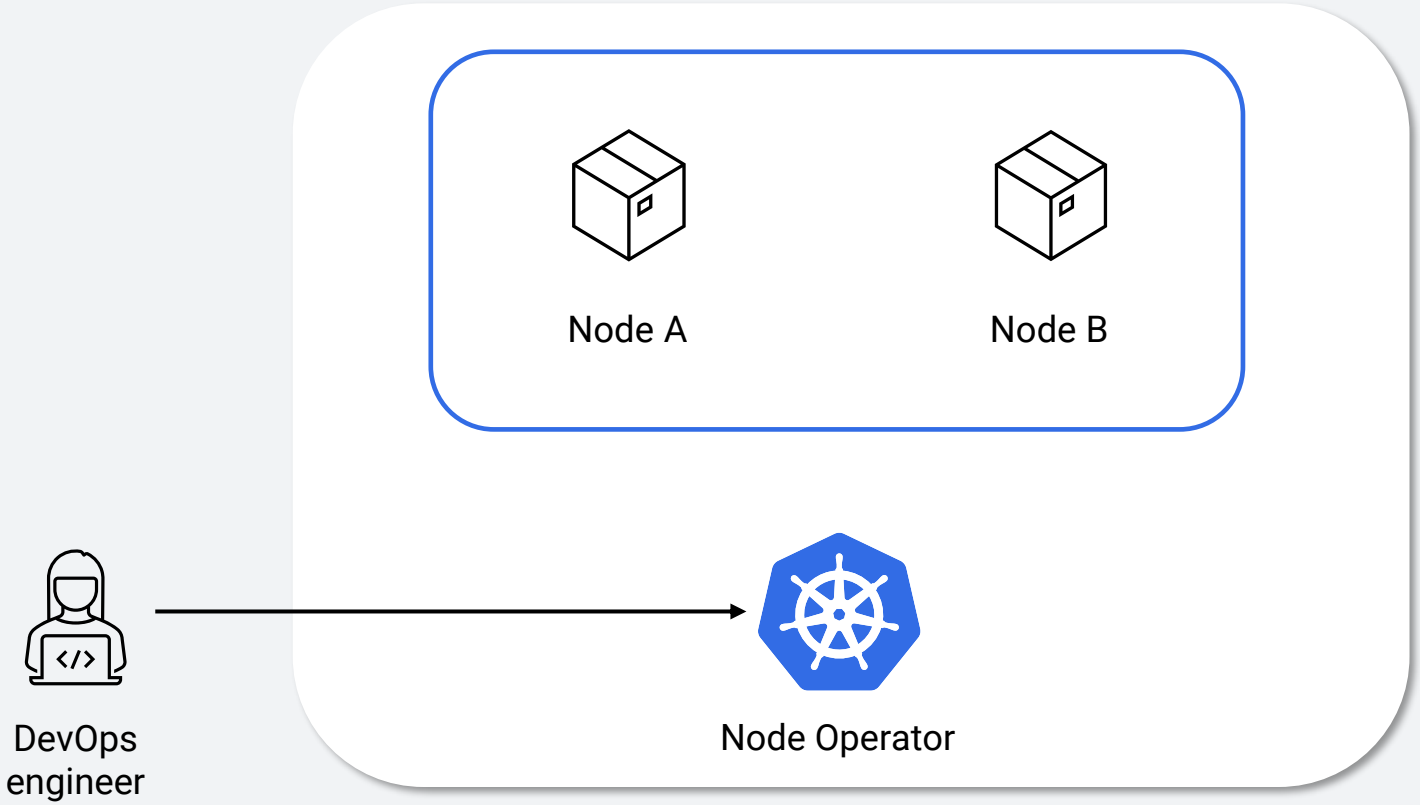


Constellation Services

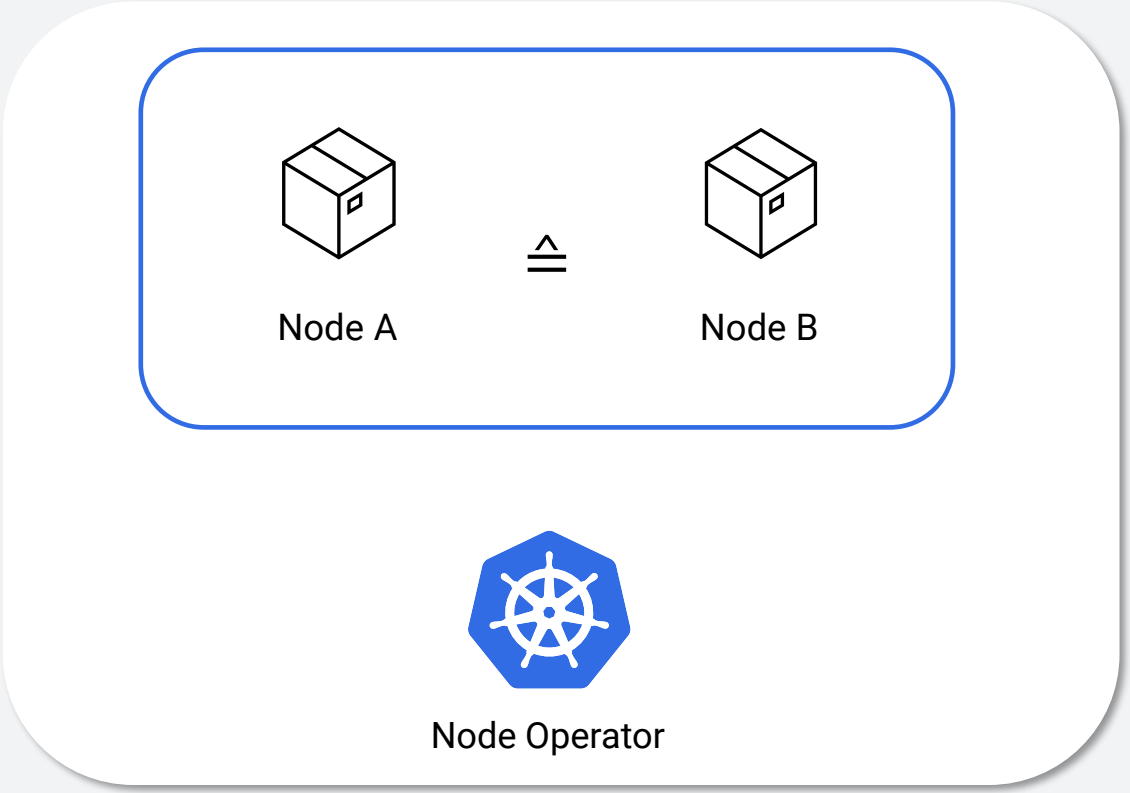


Autonomous Join

Updates

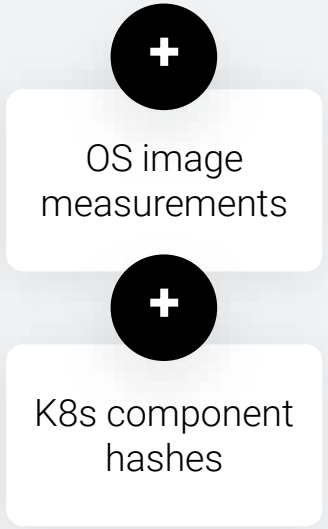


Treat your nodes like cattle, not pets

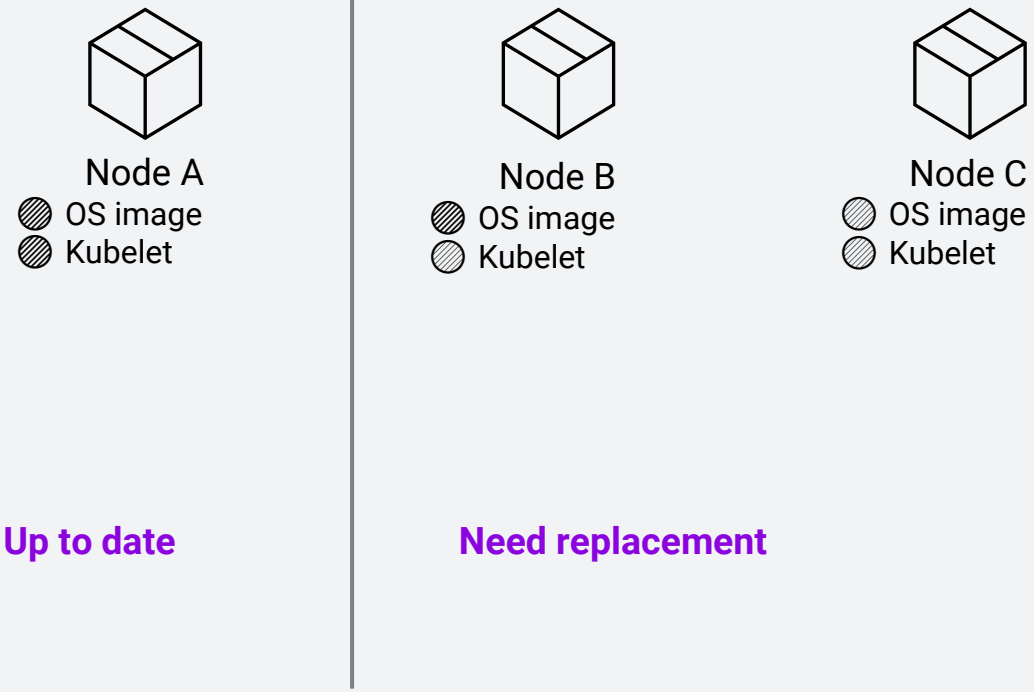


Updates: Apply declarative configuration

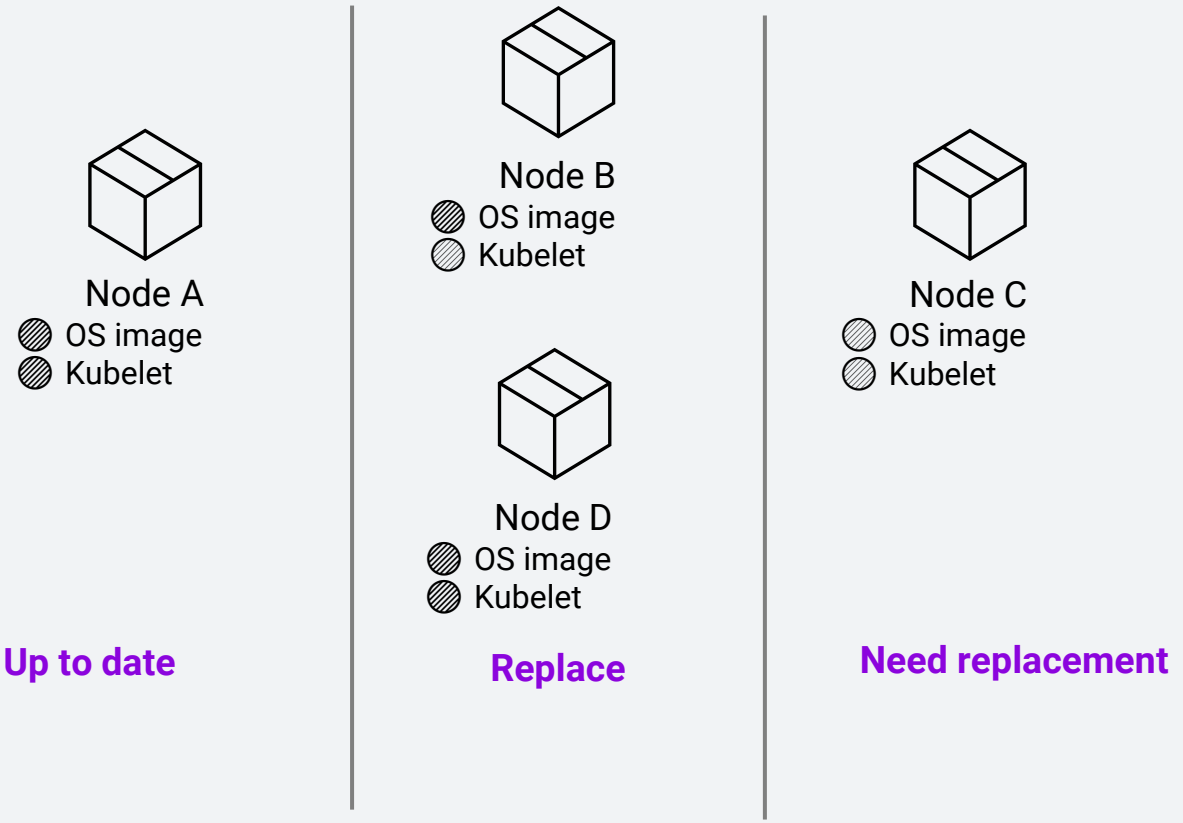
```
kubernetesVersion: 1.26.1
nodeImageReference: ami-063a9ea2ff5685f7f
```



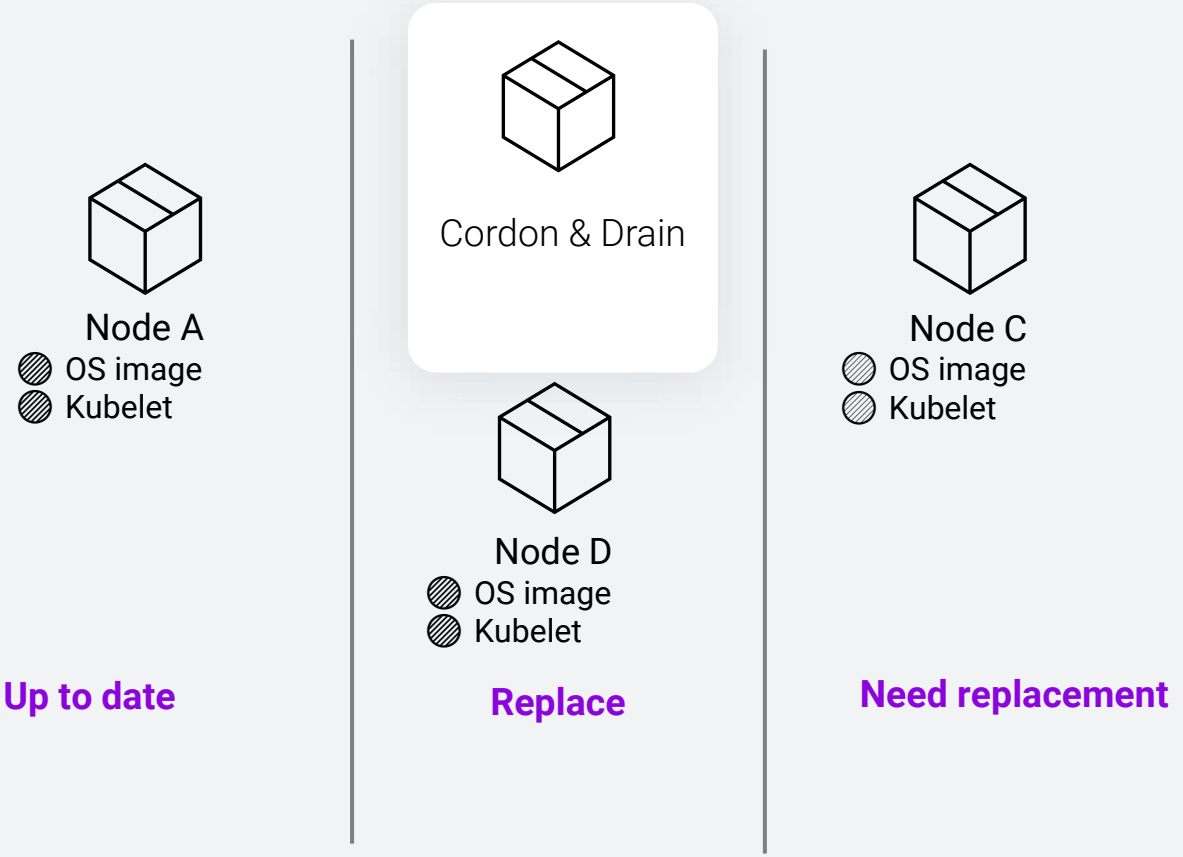
Updates: Node operator reconciles



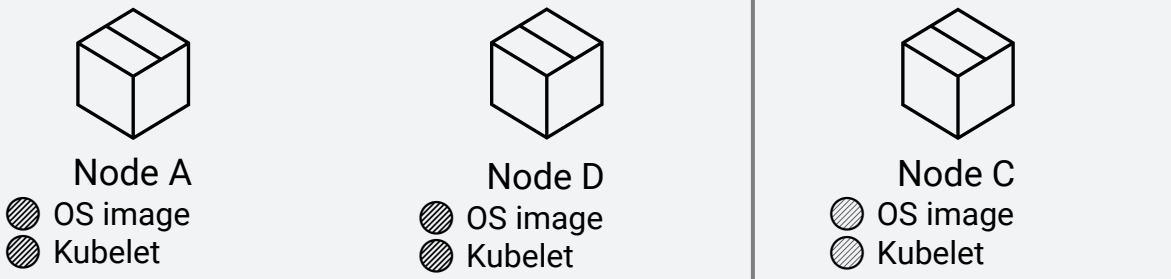
Updates: Node operator reconciles



Updates: Node operator reconciles



Updates: Node operator reconciles

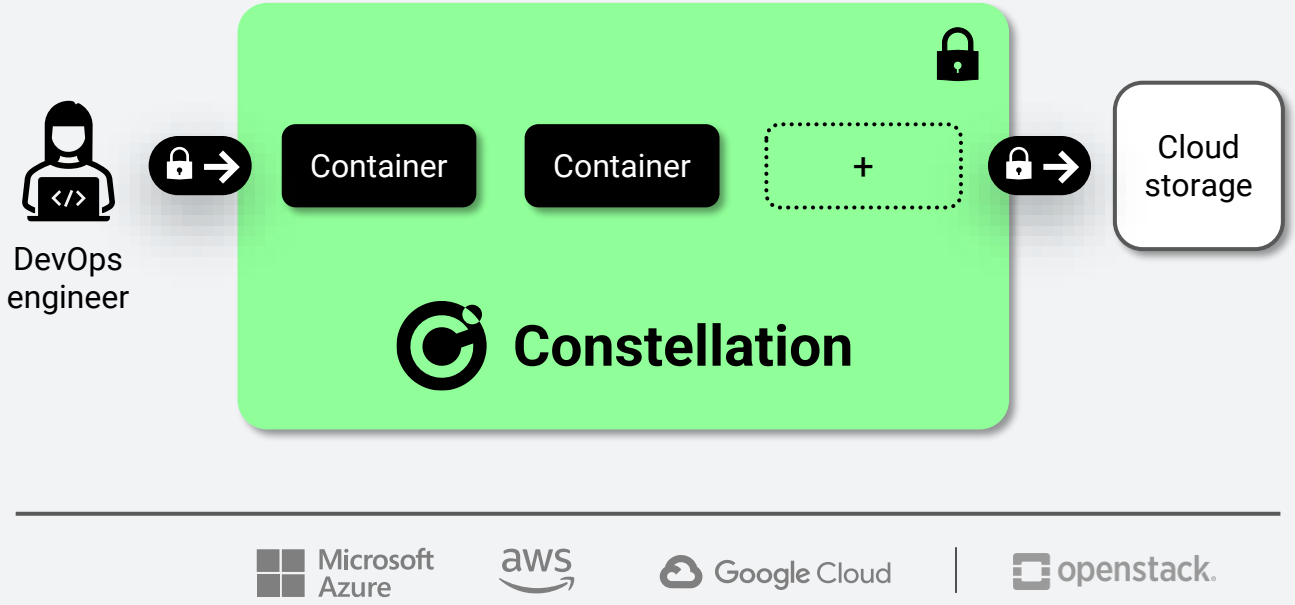


Up to date

Need replacement

CONCLUSION

Constellation



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Thanks!

- Check it out on GitHub: https://github.com/edgelesssys/constellation
  - Create you first confidential Kubernetes today
  - Leave a ★ :-)
- Get in touch via @malt3 & @m1ghtymo
  - Or join us @ https://discord.gg/rH8QTH56JN