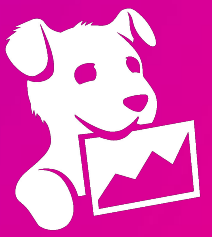
A One-Way Valve to netkit: Migrating Cilium's Datapath Transparently at Scale



CiliumCon
NORTH AMERICA



DATADOG

A One-Way Valve to netkit: Migrating Cilium's Datapath Transparently at Scale



Hadrien Patte

@HadrienPatte

Netkit ?

Netkit ?

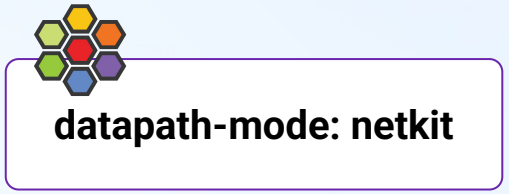
ISOVALENT
now part of cisco

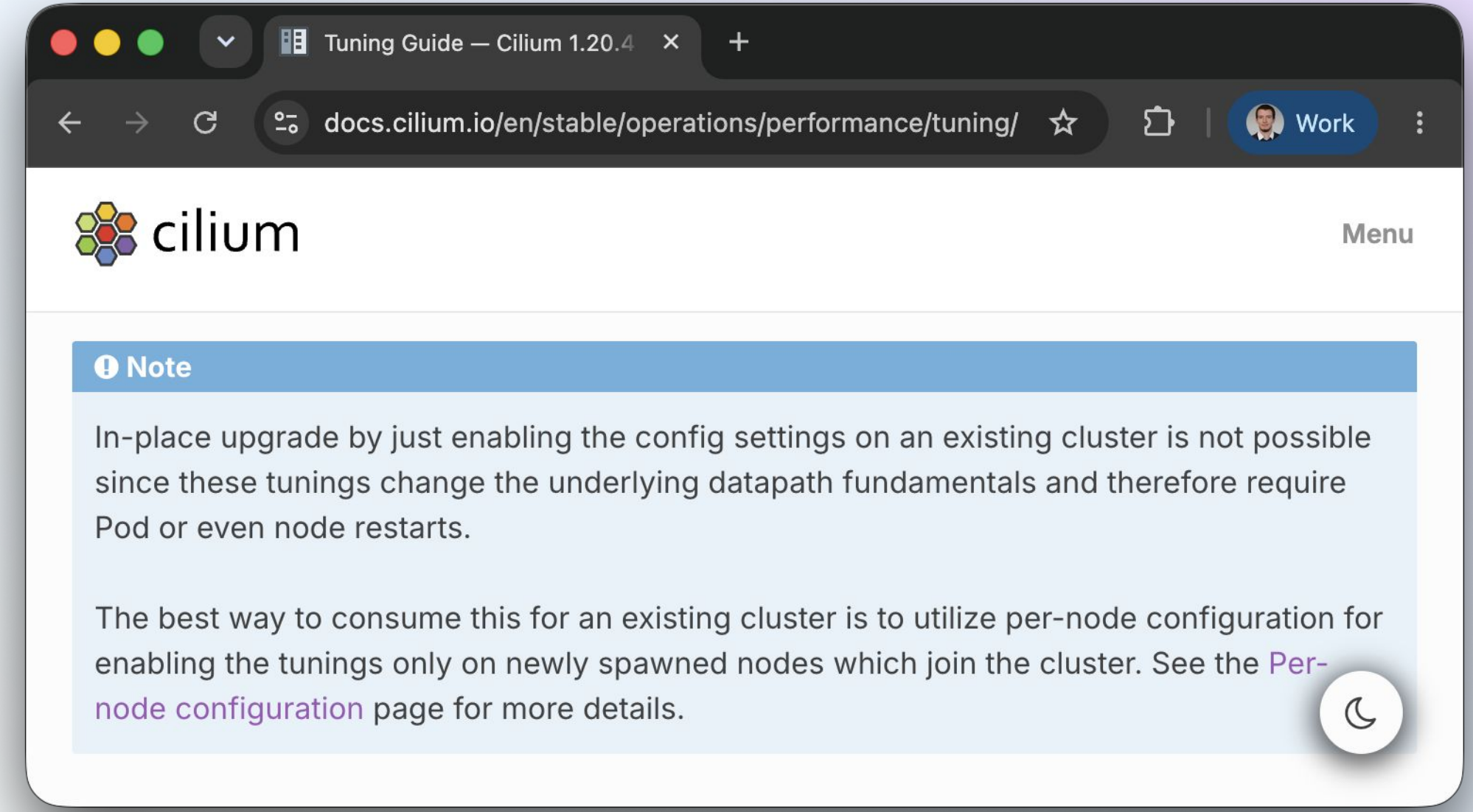
Cilium netkit: The Final Frontier in Container Networking Performance



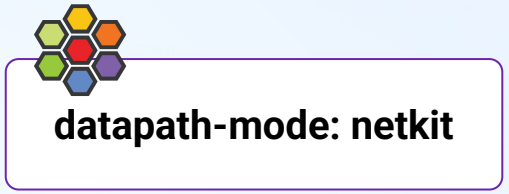
Nico Vibert | Published: July 9, 2024 | Updated: July 31, 2024 | eBPF, Networking for Kubernetes

Netkit ?




Tuning Guide — Cilium 1.20.4
docs.cilium.io/en/stable/operations/performance/tuning/
Work
cilium
Menu
Note
In-place upgrade by just enabling the config settings on an existing cluster is not possible since these tunings change the underlying datapath fundamentals and therefore require Pod or even node restarts.
The best way to consume this for an existing cluster is to utilize per-node configuration for enabling the tunings only on newly spawned nodes which join the cluster. See the Per-node configuration page for more details.

Netkit ?



Netkit ?



datapath-mode: netkit



datapath-mode: veth

Netkit ?

datapath-mode: netkit



datapath-mode: veth

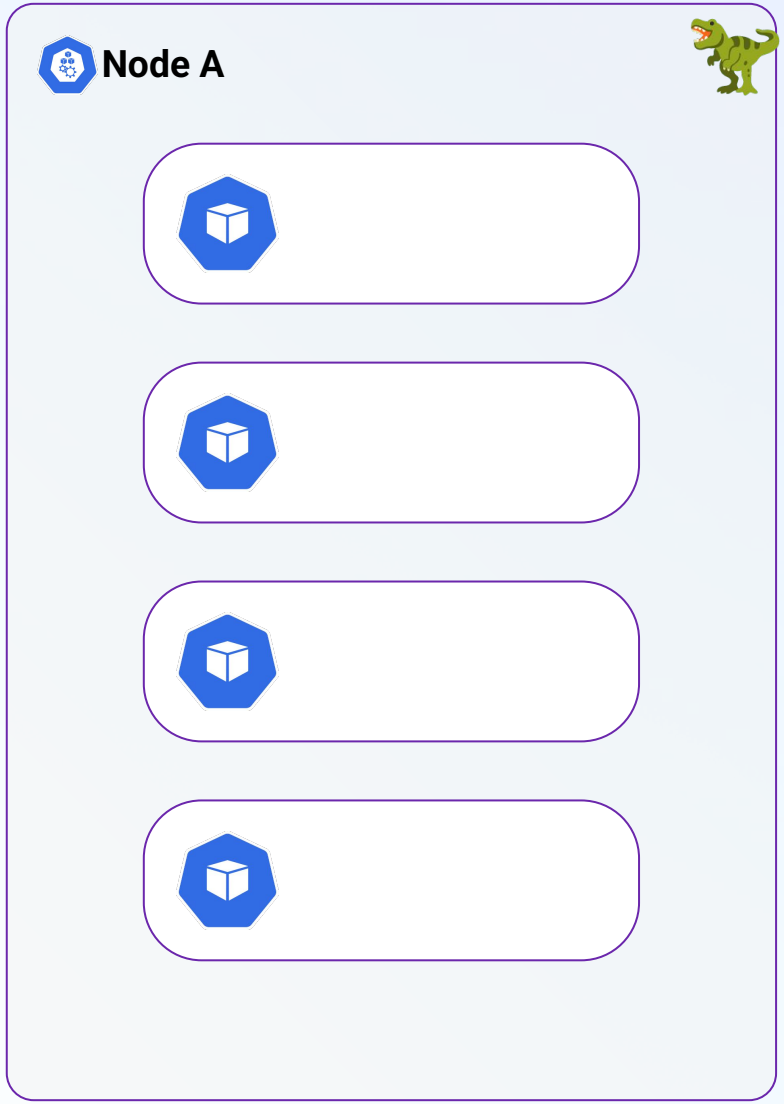
Netkit ?

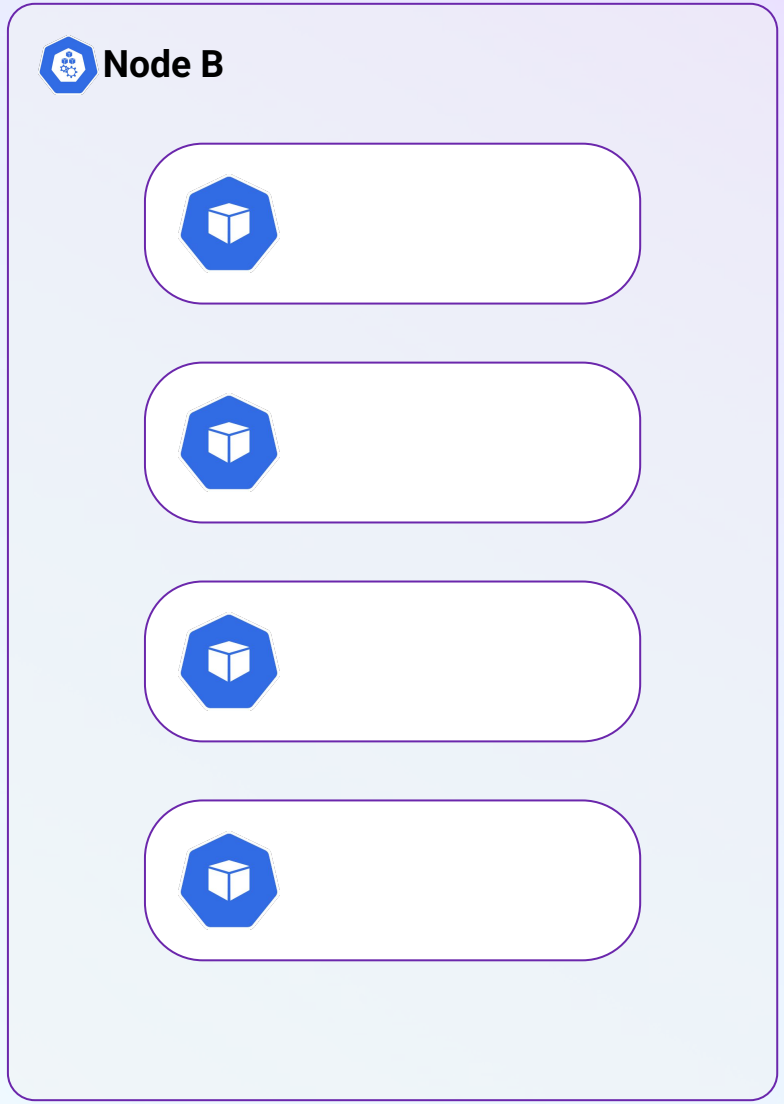
datapath-mode: netkit

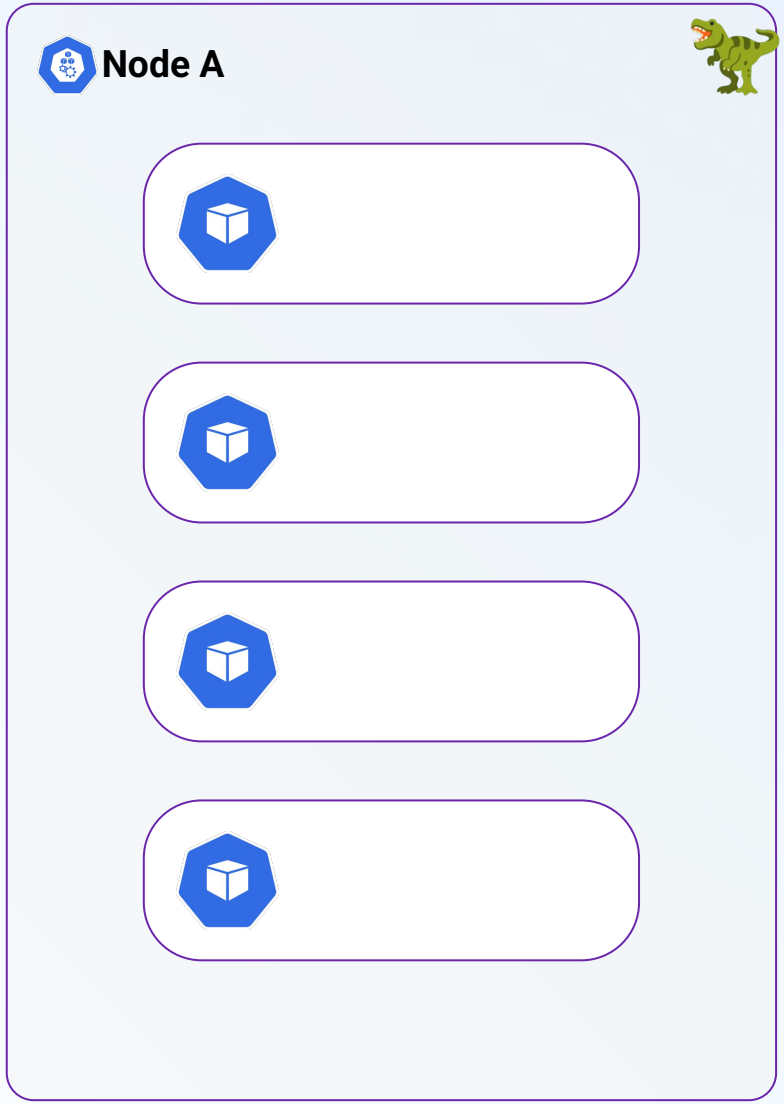


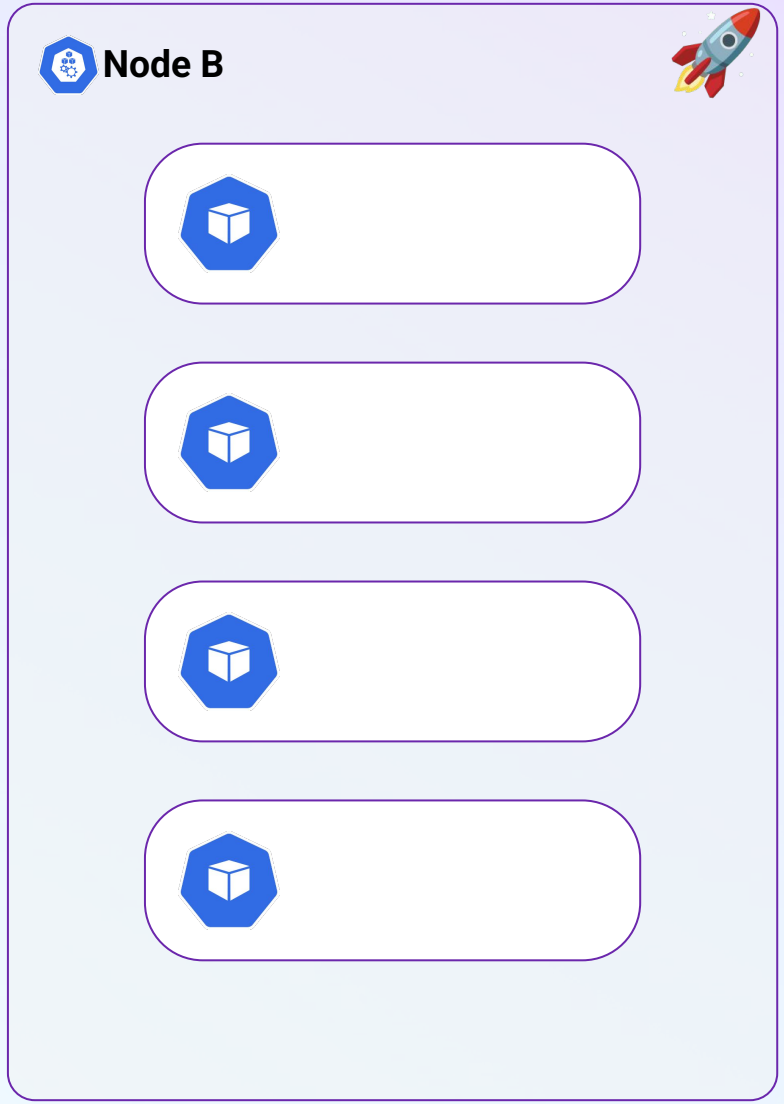
datapath-mode: veth

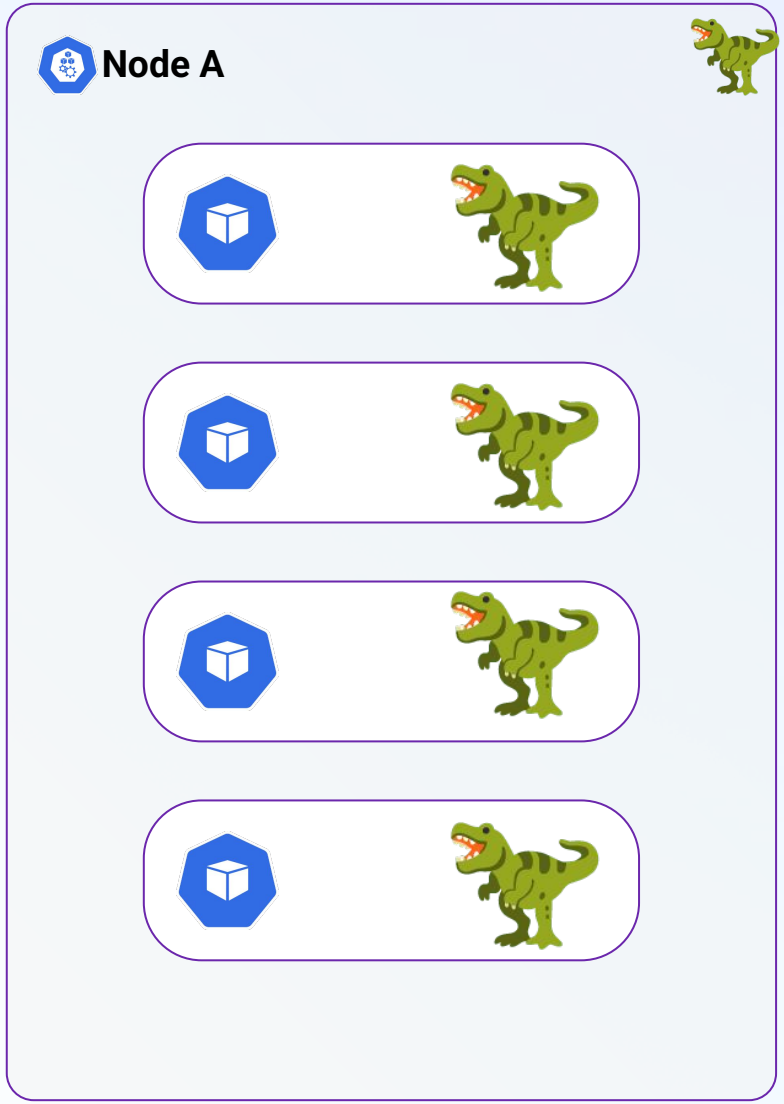


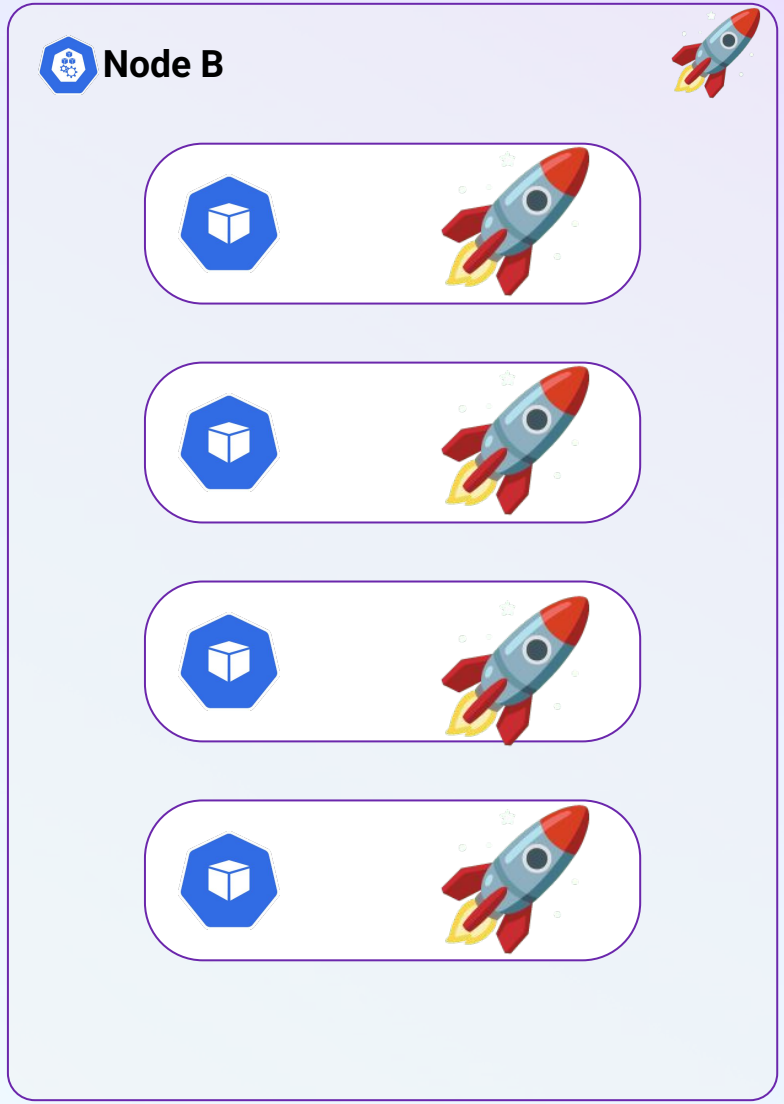

Node A

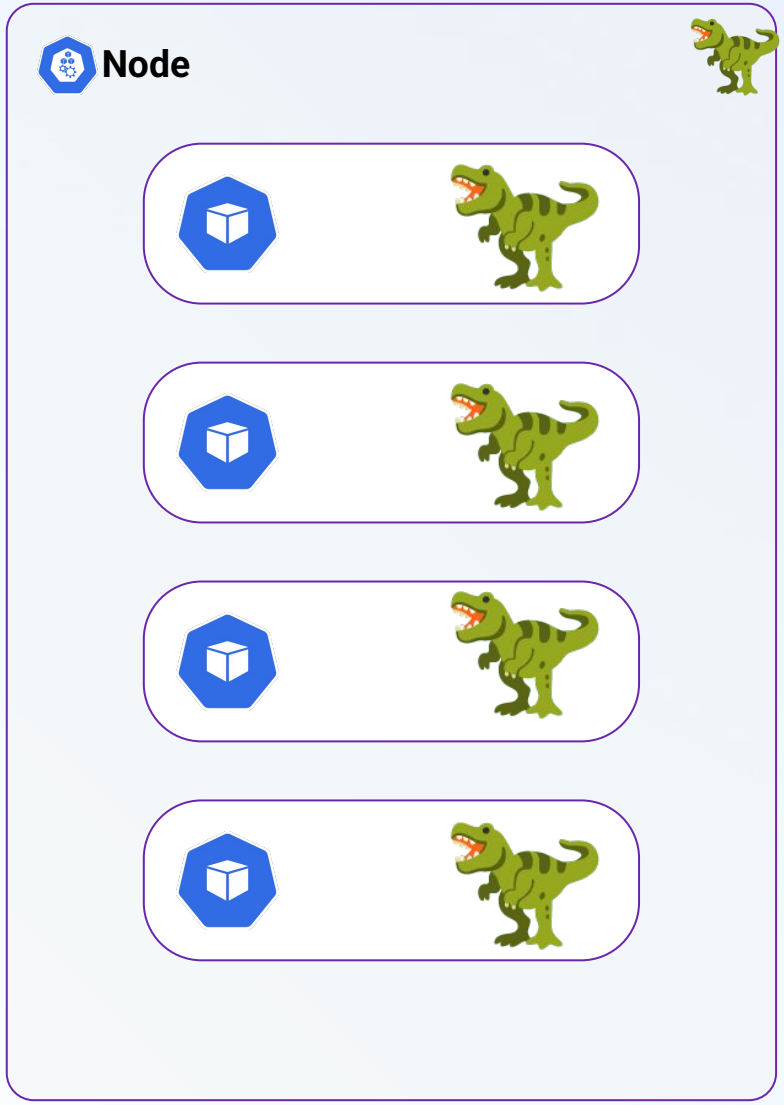

Node B

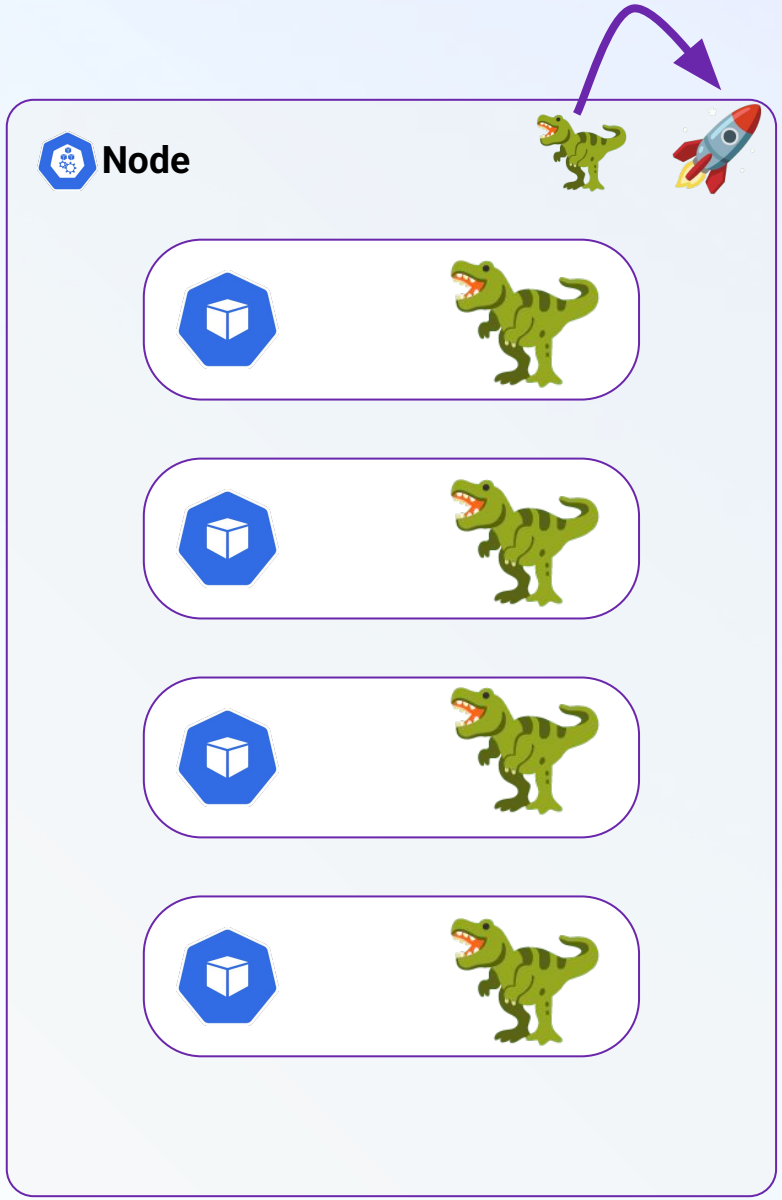

Node A

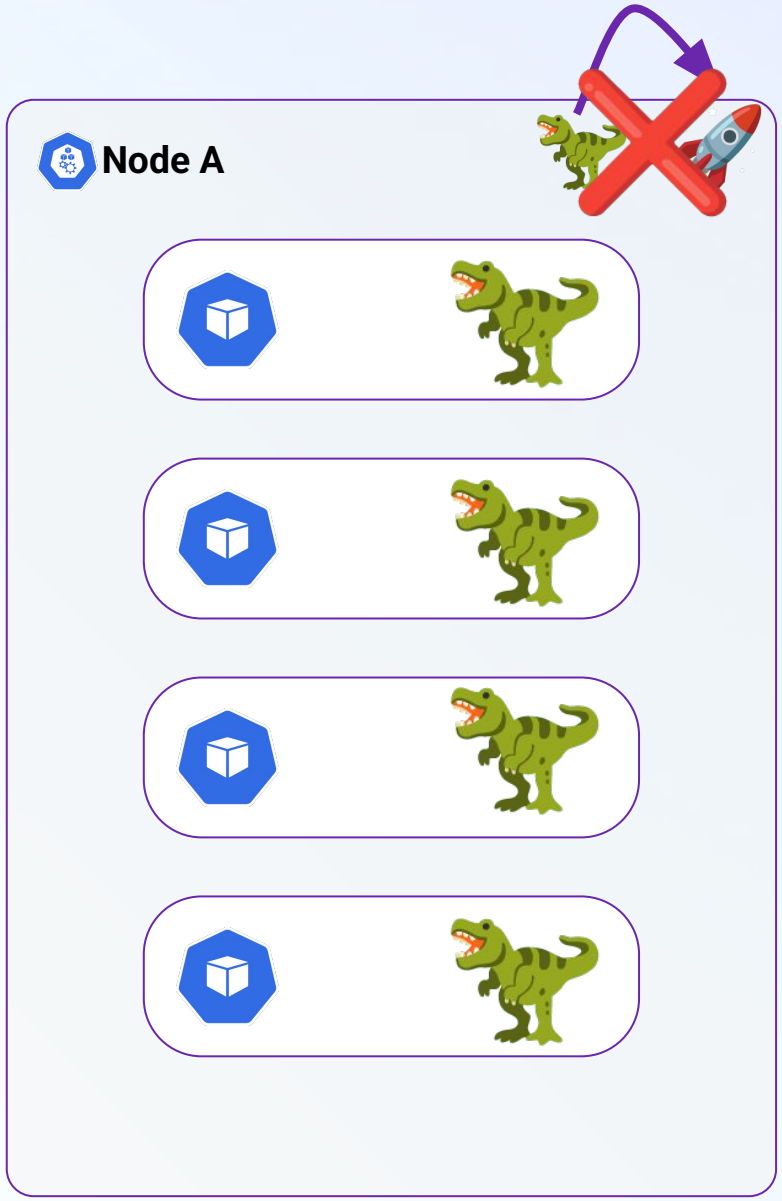

Node B

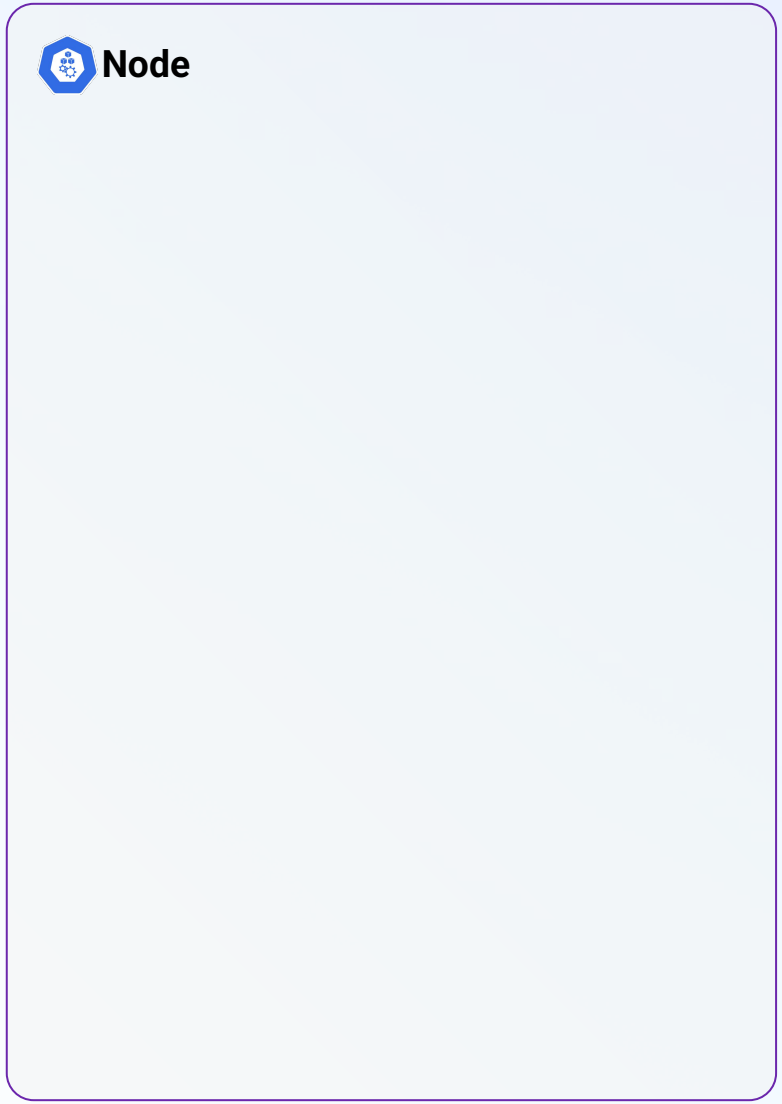

Node A


Node B

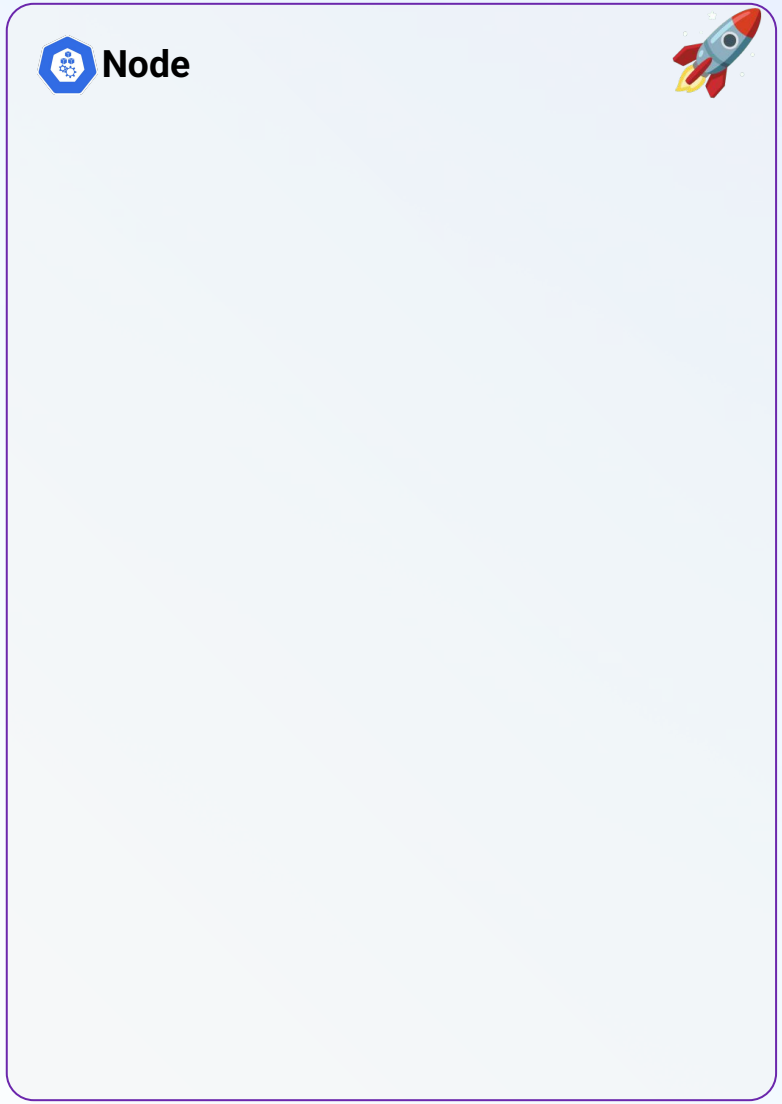

Node


Node

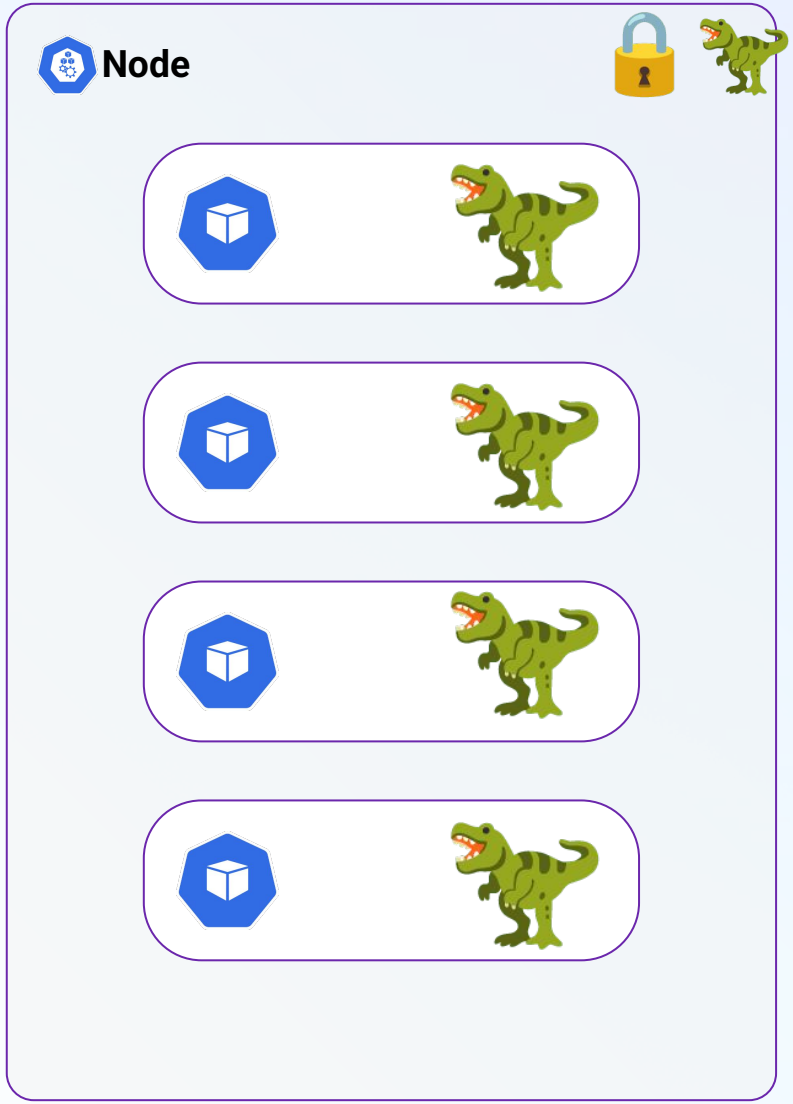

Node A



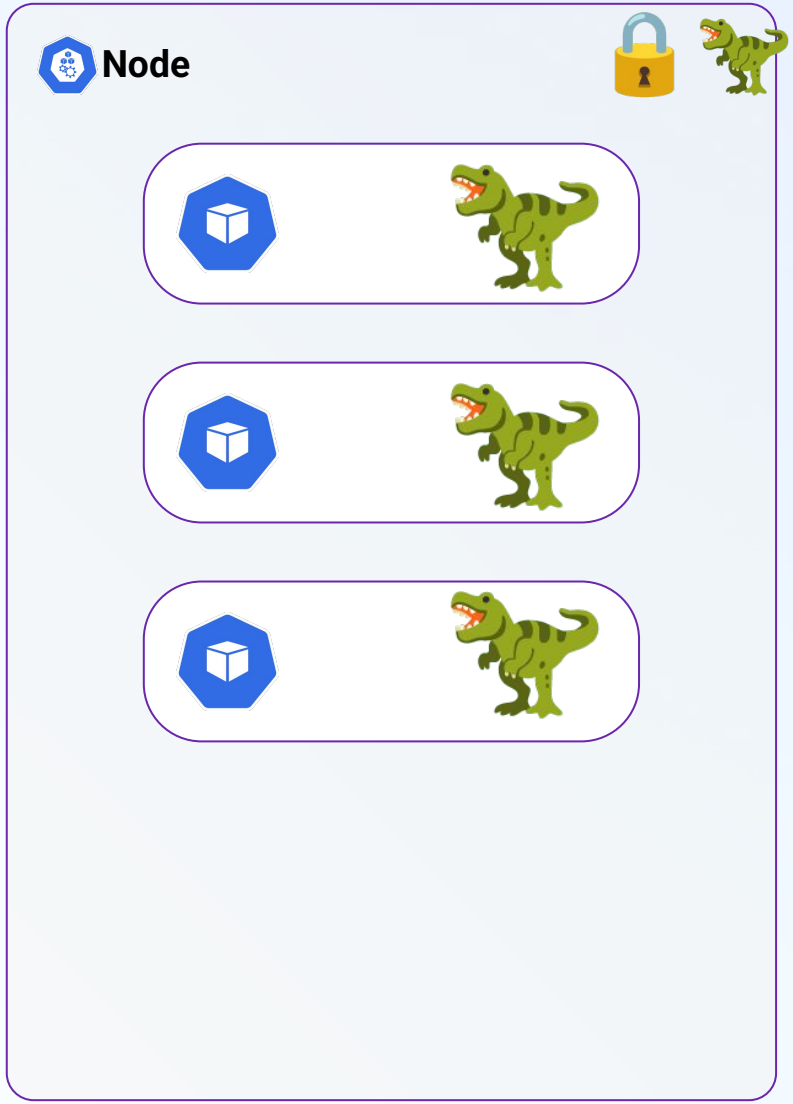
New node



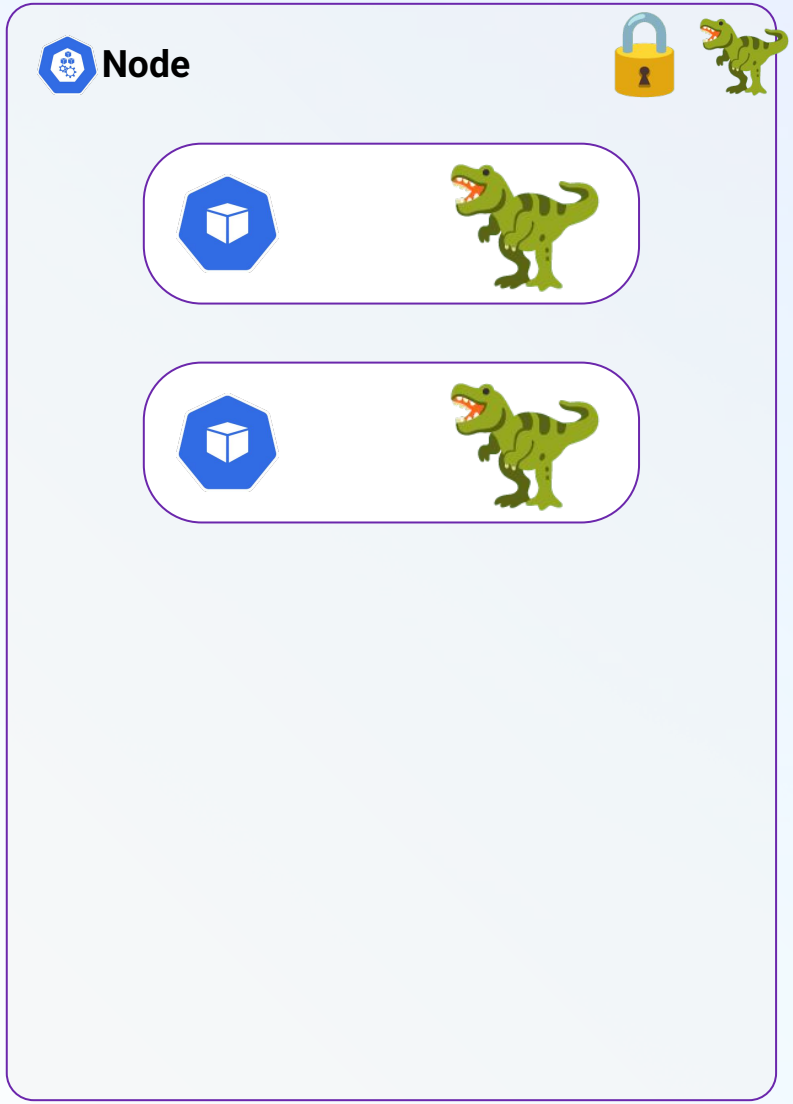
New node



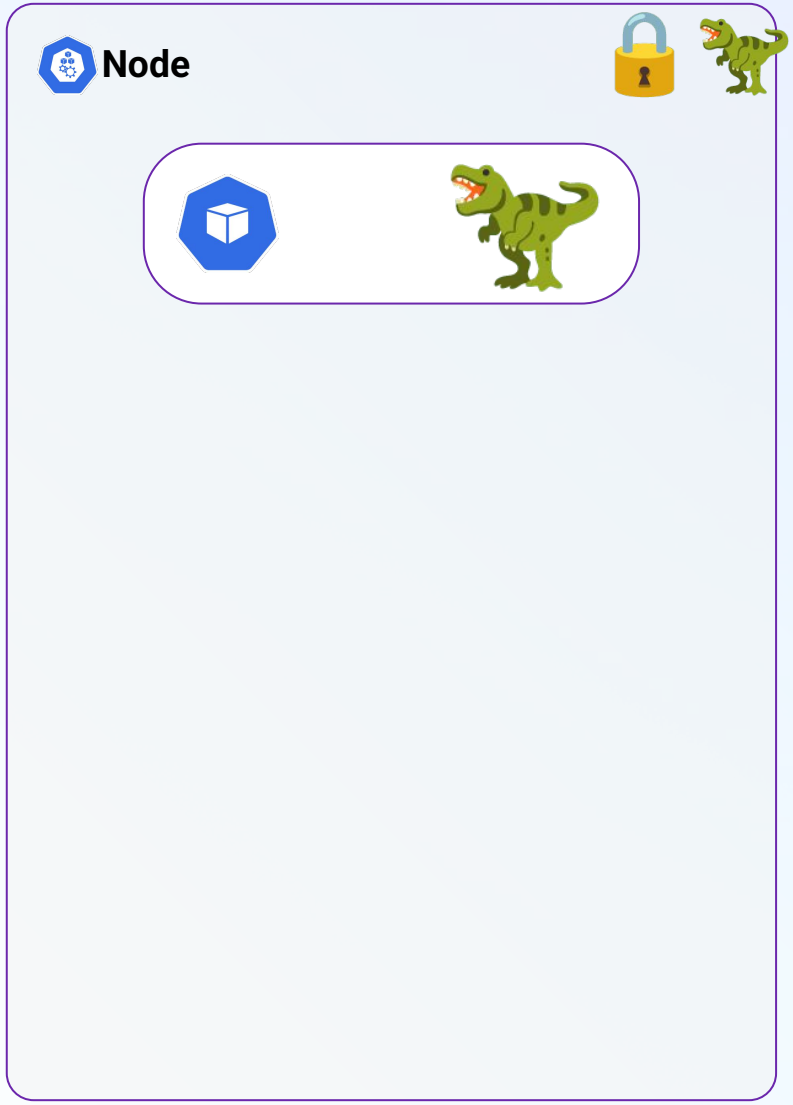
Live node



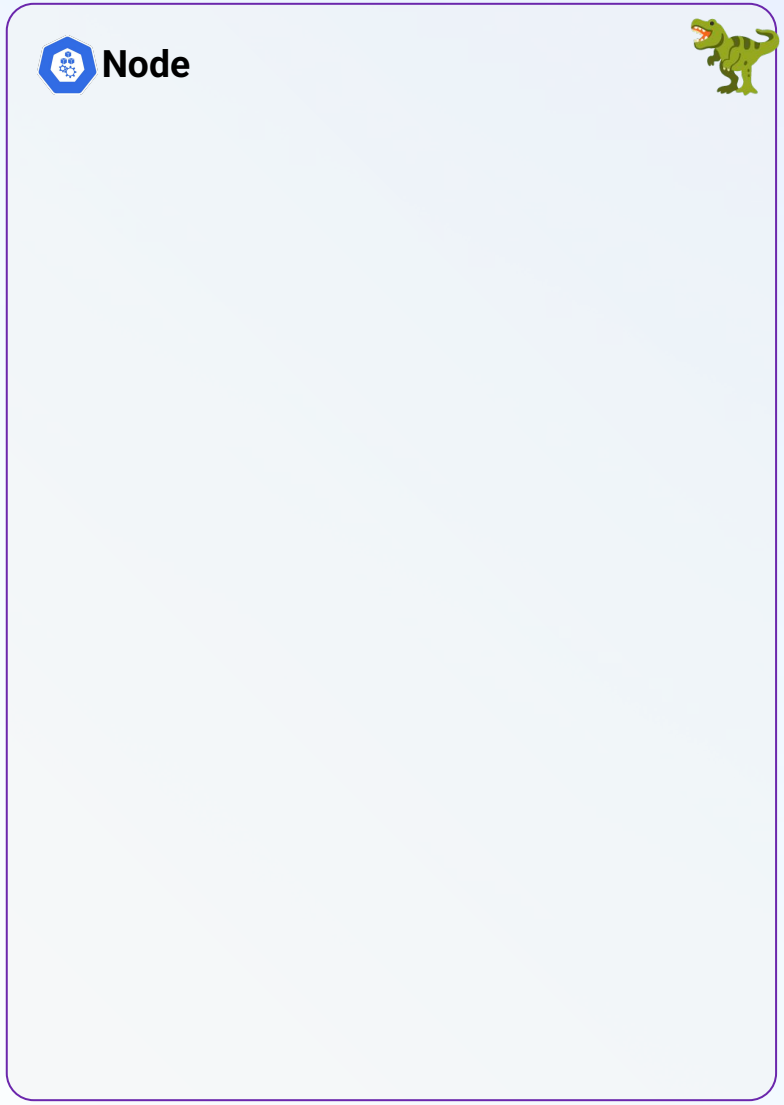
Live node



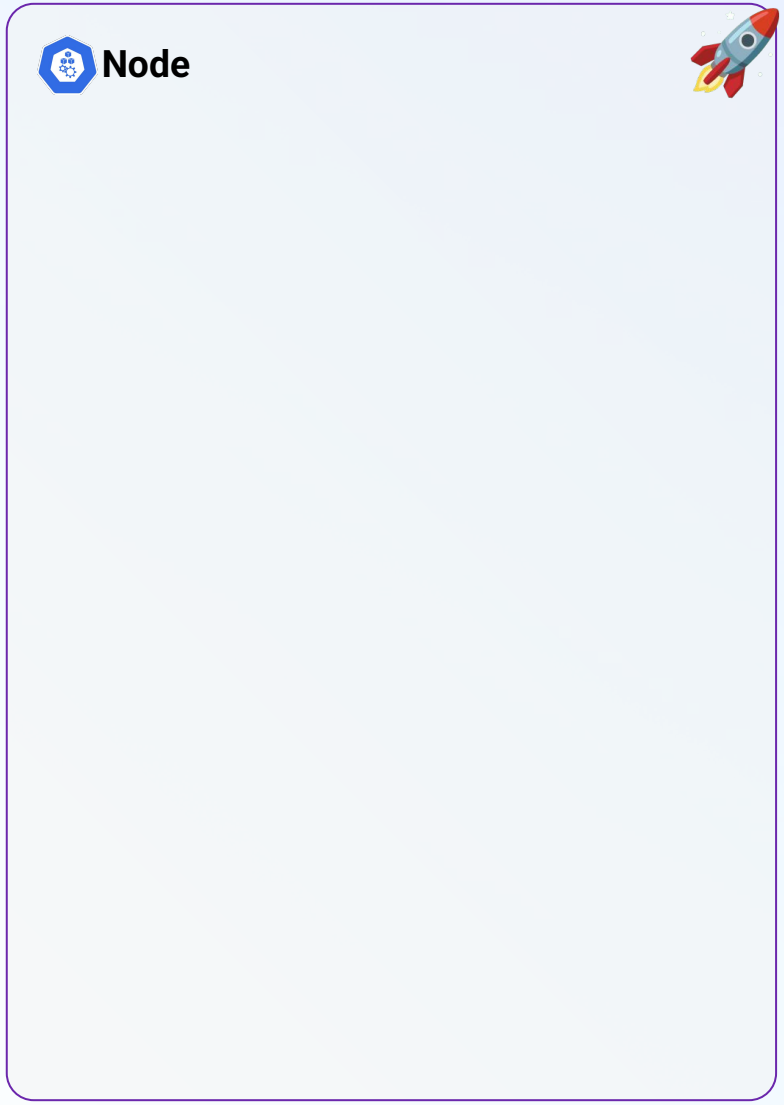
Live node



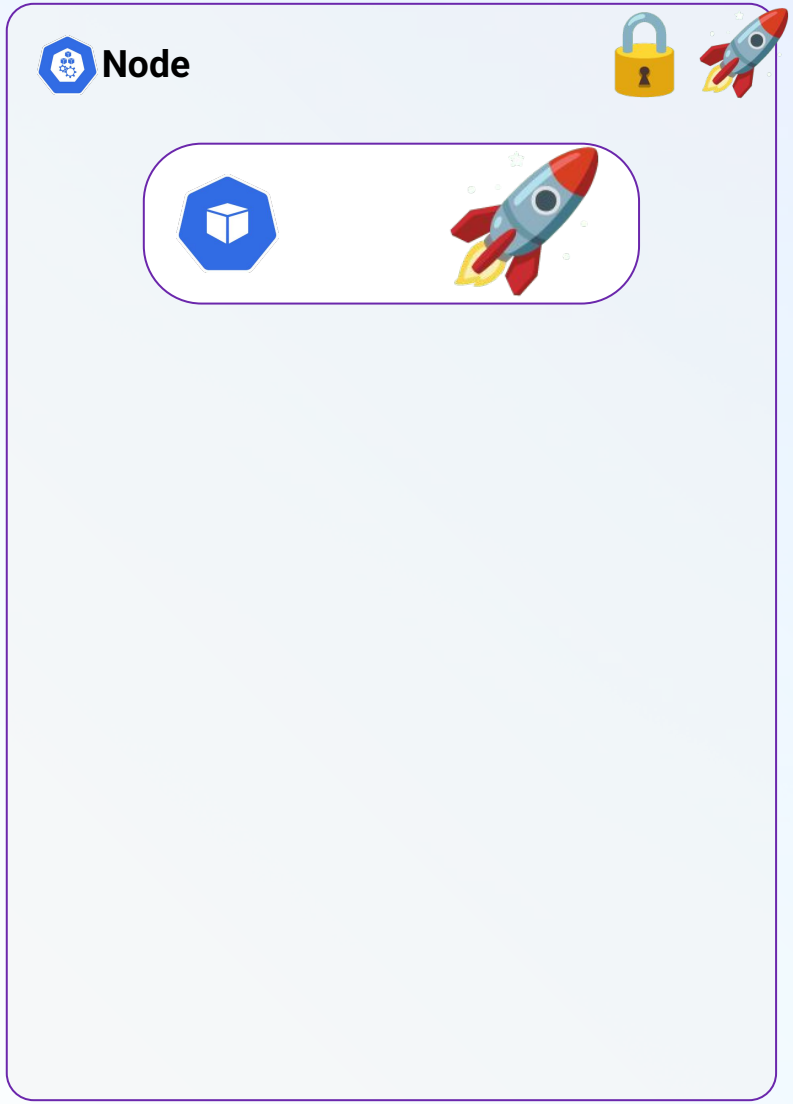
Live node



Live node



Live node



Live node

Building the valve

Building the valve

Has 🦖 pods	Has 🚀 pods	Has both	Has no pods

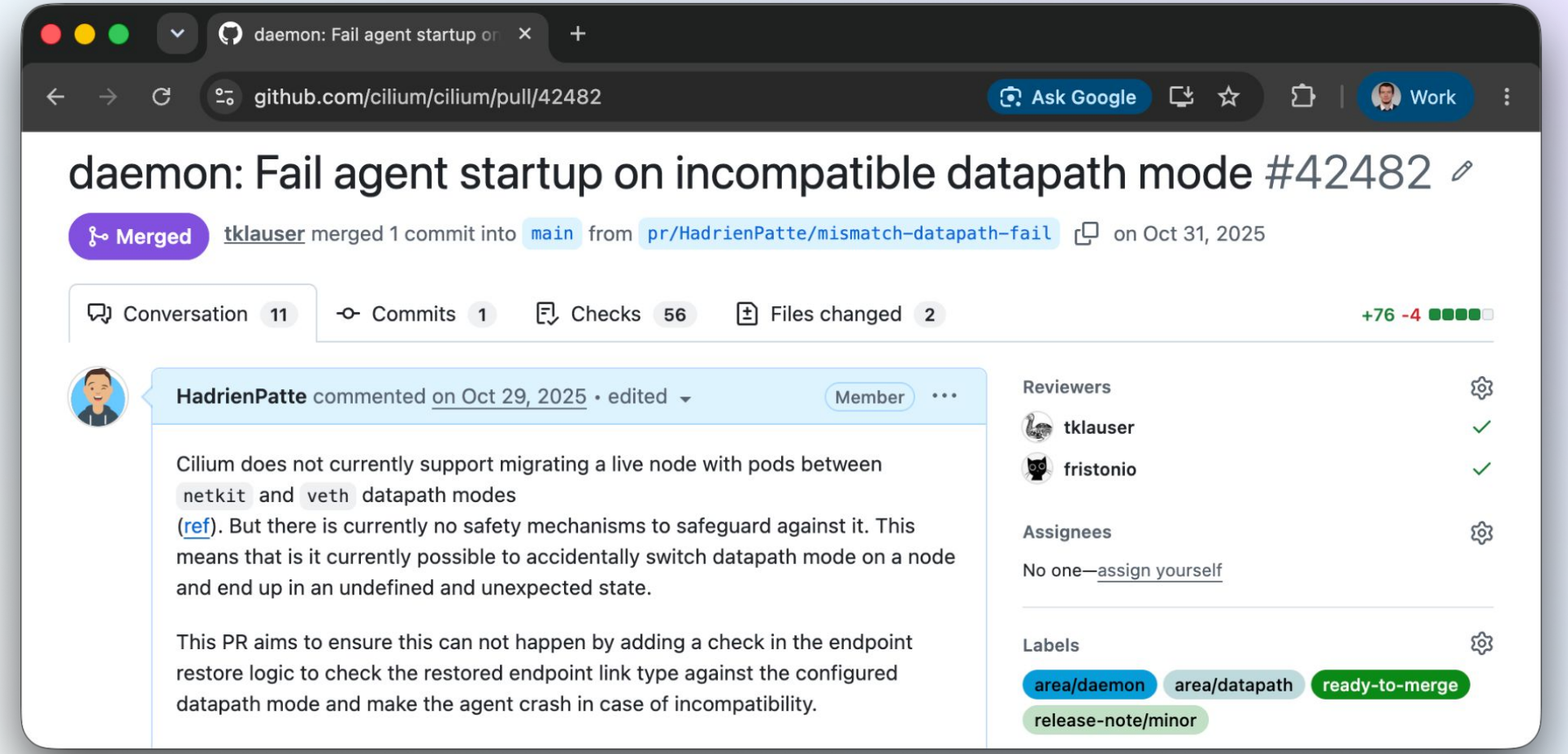
Building the valve

	Has 🦖 pods	Has 🚀 pods	Has both	Has no pods
Prefer 🦖				
Prefer 🚀				

Building the valve

	Has 🦖 pods	Has 🚀 pods	Has both ❌	Has no pods
Prefer 🦖			❌	
Prefer 🚀			❌	

Building the valve



Building the valve

	Has 🦖 pods	Has 🚀 pods	Has both ❌	Has no pods
Prefer 🦖			❌	
Prefer 🚀			❌	

Building the valve

	Has 🦖 pods	Has 🚀 pods	Has both ❌	Has no pods
Prefer 🦖	🦖		❌	
Prefer 🚀	🦖		❌	

Building the valve

	Has 🦖 pods	Has 🚀 pods	Has both ❌	Has no pods
Prefer 🦖	🦖	🚀	❌	
Prefer 🚀	🦖	🚀	❌	

Building the valve

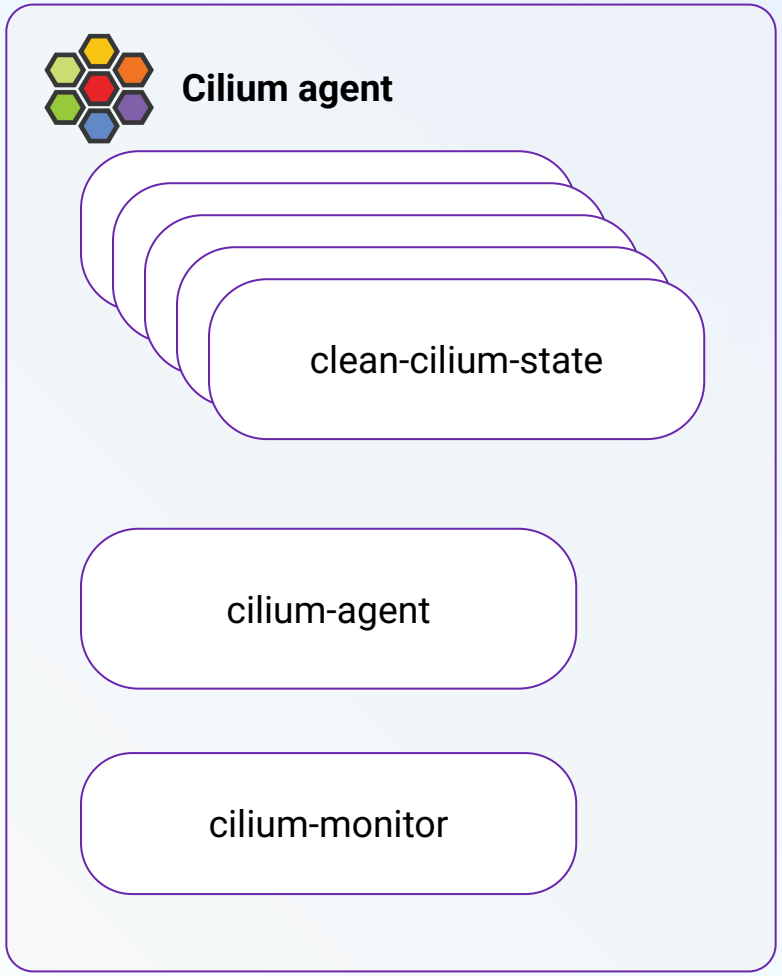
	Has 🦖 pods 	Has 🚀 pods 	Has both 	Has no pods
Prefer 🦖	🦖	🚀		
Prefer 🚀	🦖	🚀		

Building the valve

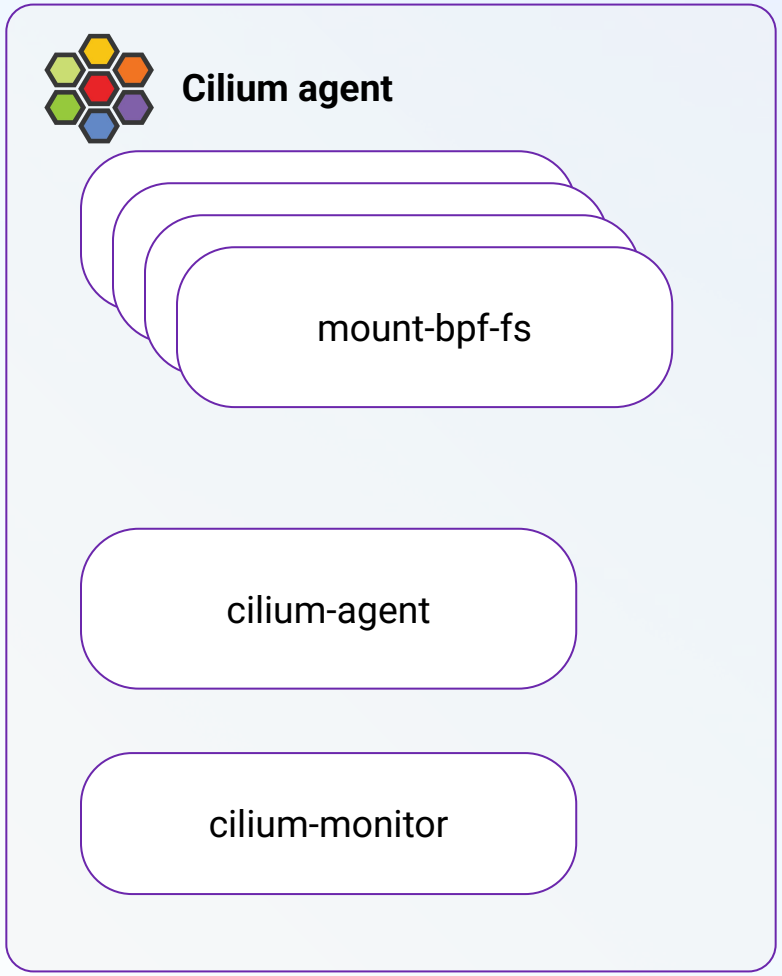
	Has 🦖 pods 🔒	Has 🚀 pods 🔒	Has both ❌	Has no pods
Prefer 🦖	🦖	🚀	❌	🦖
Prefer 🚀	🦖	🚀	❌	🚀

Integrating the valve

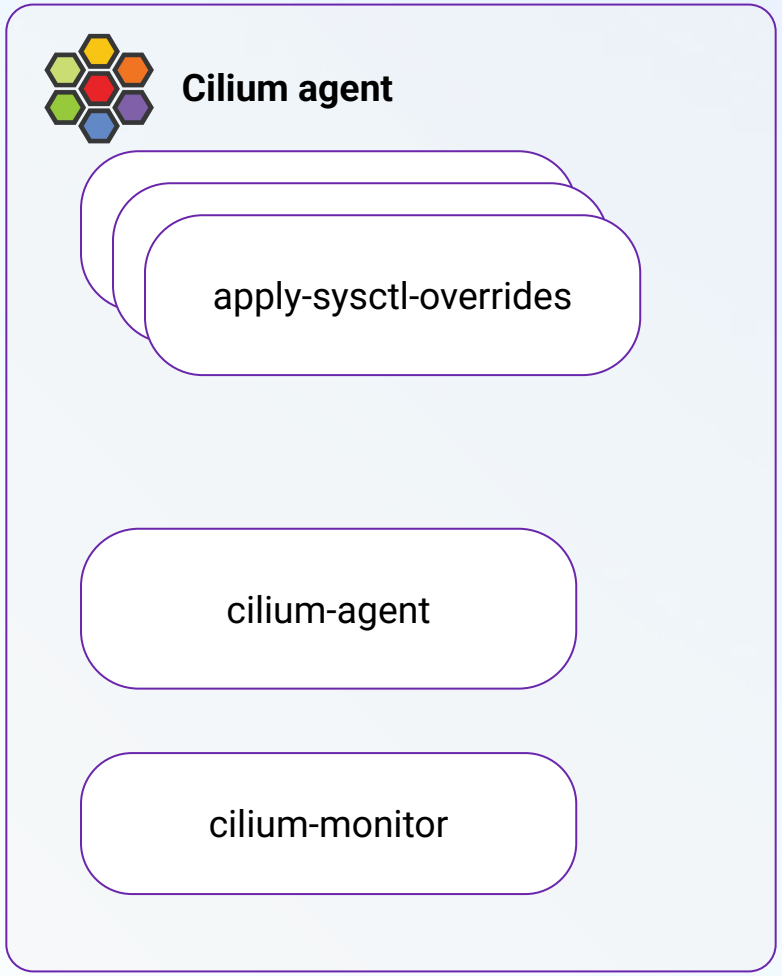
Integrating the valve



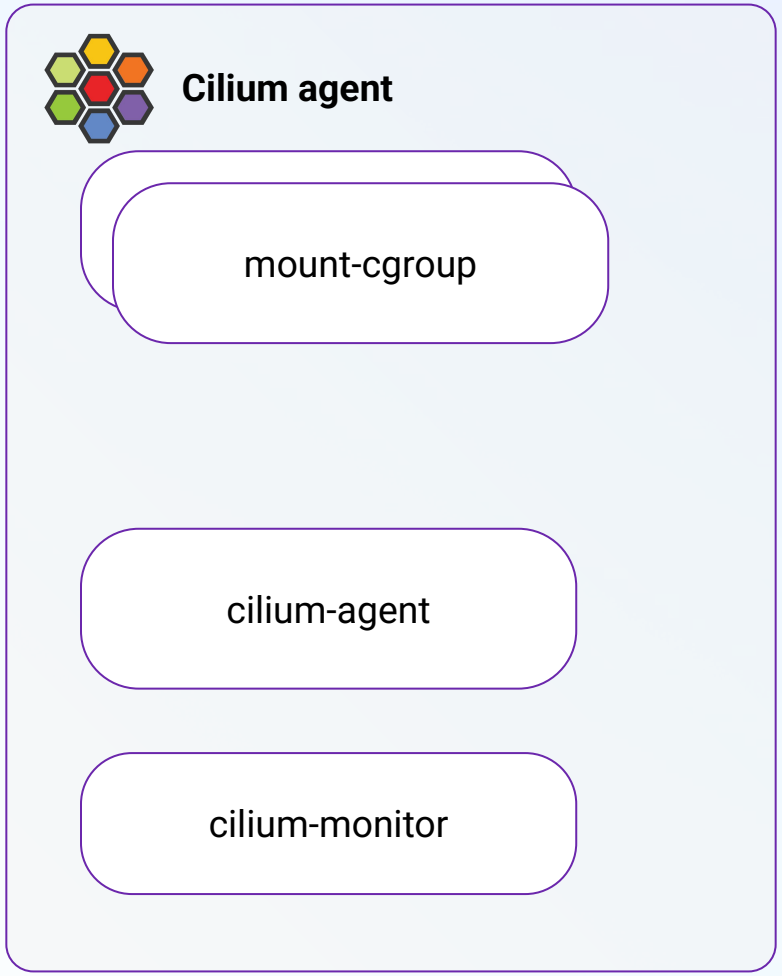
Integrating the valve



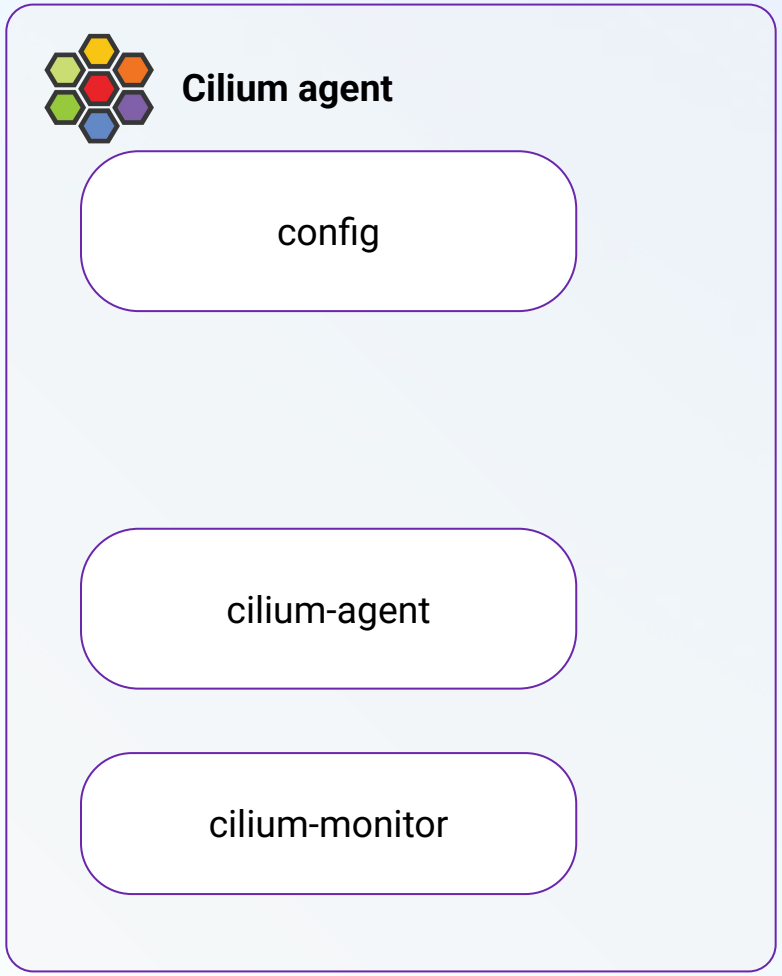
Integrating the valve



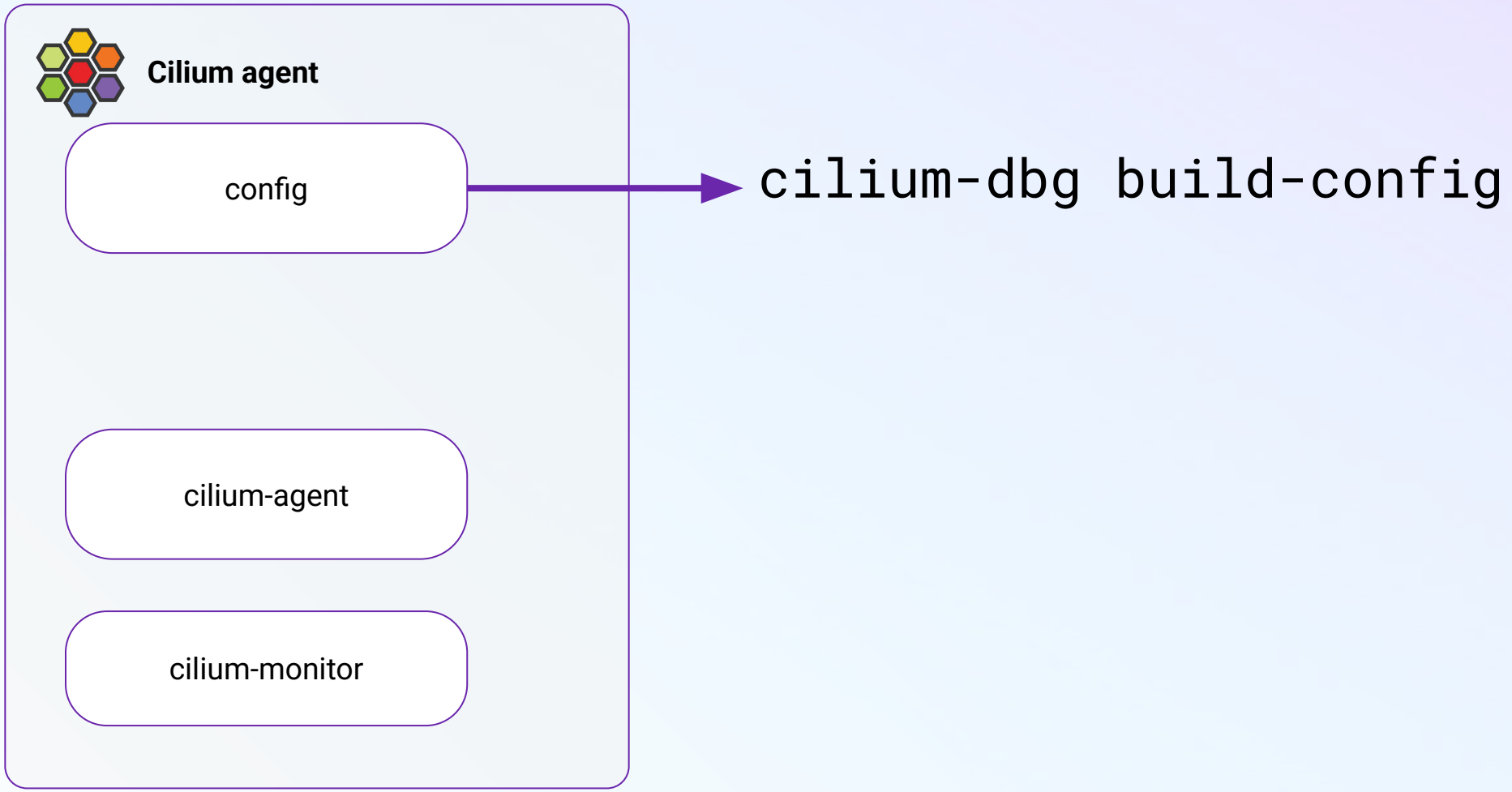
Integrating the valve



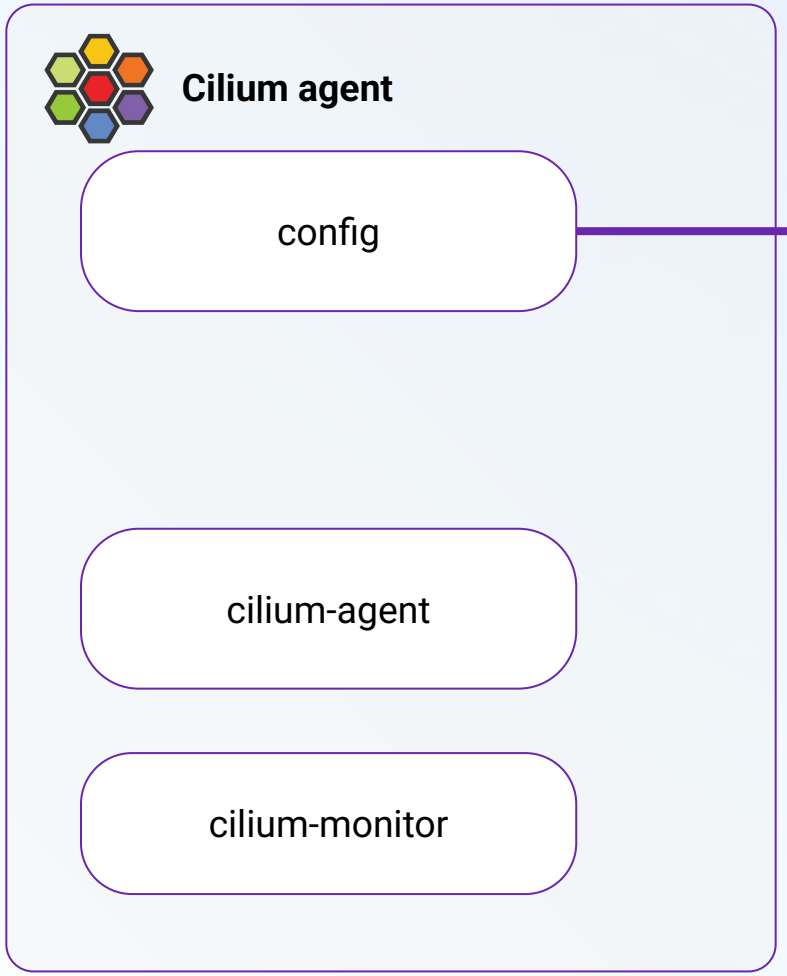
Integrating the valve



Integrating the valve



Integrating the valve




```
cilium-dbg build-config

valve.sh
```

The valve

valve.sh

```
if ip -o link show type veth | grep -q ': lxc'; then mode=veth
elif ip -o link show type netkit | grep -q ': lxc'; then mode=netkit
{{- if eq .Values.cilium.preferedDatapathMode "preferNetkit" }}
else mode=netkit
{{- else }}
else mode=veth
{{- end }}
fi
echo "$mode" > /etc/cilium-agent-config/node-overrides/datapath-mode
```

The valve

valve.sh

```
if ip -o link show type veth | grep -q ': lxc'; then mode=veth
elif ip -o link show type netkit | grep -q ': lxc'; then mode=netkit
{{- if eq .Values.cilium.preferedDatapathMode "preferNetkit" }}
else mode=netkit
{{- else }}
else mode=veth
{{- end }}
fi
echo "$mode" > /etc/cilium-agent-config/node-overrides/datapath-mode
```



What’s next

What's next

`datapath-mode: auto` (cilium/cilium#43062)

What's next

`datapath-mode: auto` (cilium/cilium#43062)

Mixed datapath nodes

Thanks!

Blog: https://www.datadoghq.com/blog/engineering/
We're hiring! https://www.datadoghq.com/careers/

@HadrienPatte

Feedback

A One-Way Valve to netkit: Migrating Cilium's Datapath Transparently at Scale

DATADOG



