
DevNation
Kubernetes I Deep Dive
Homework dn.dev/kube-tutorial
Red Hat
Developer
dn.dev/kubemaster1

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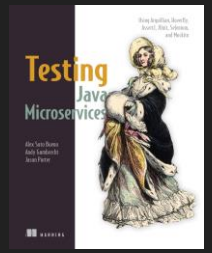
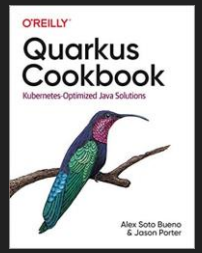
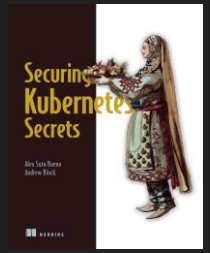
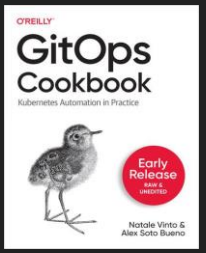
Alex Soto (lordofthejars.com)

- @alexsotob
- asotobue@redhat.com
- Currently Red Hat's Director of Developer Experience
- Featured speaker at technology events around the globe
- A Java Champion since 2017
- Writer, University Professor, Radio collaborator
- A big fan of testing and continuous delivery in 21st century









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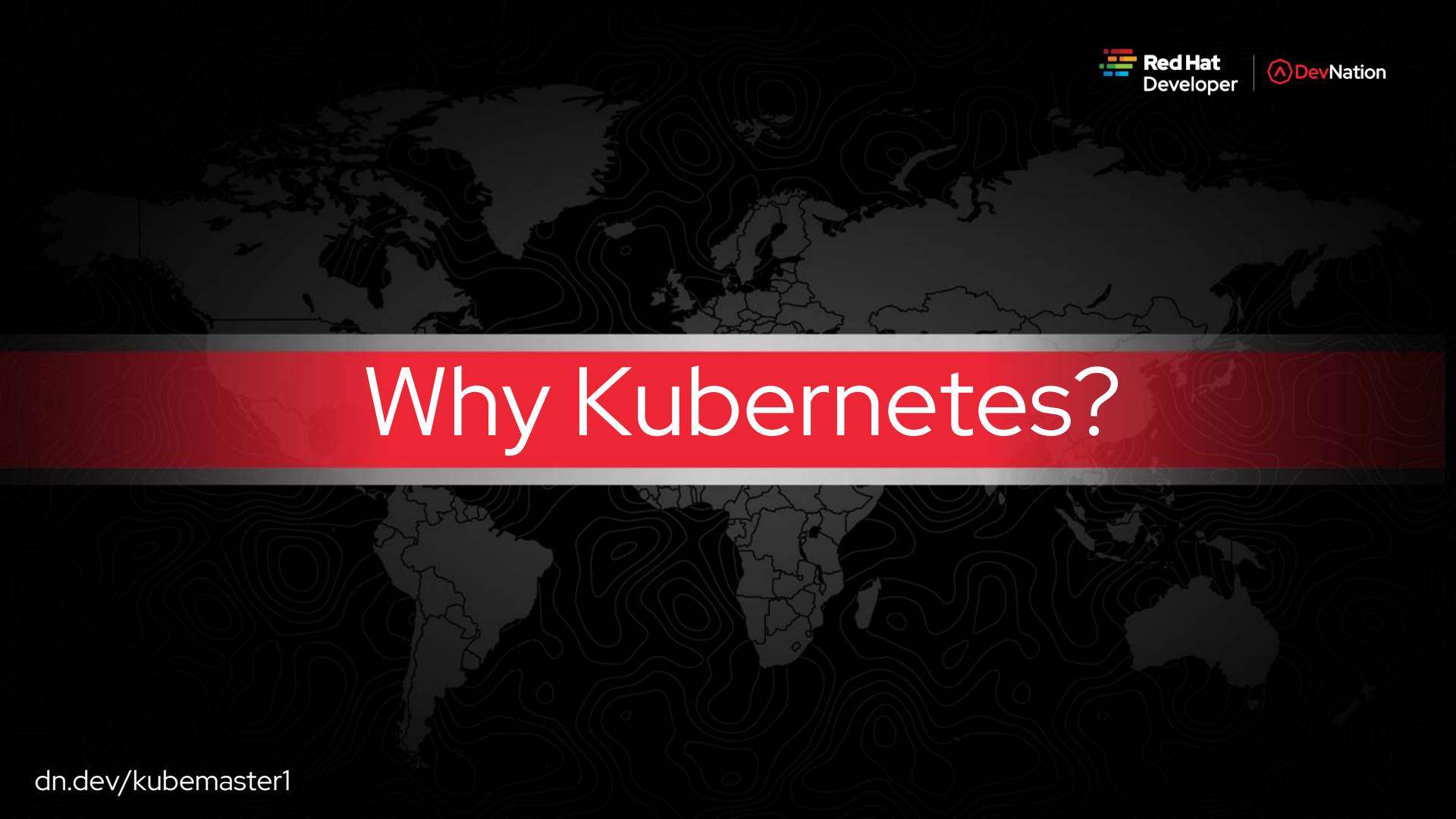
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Why Kubernetes?
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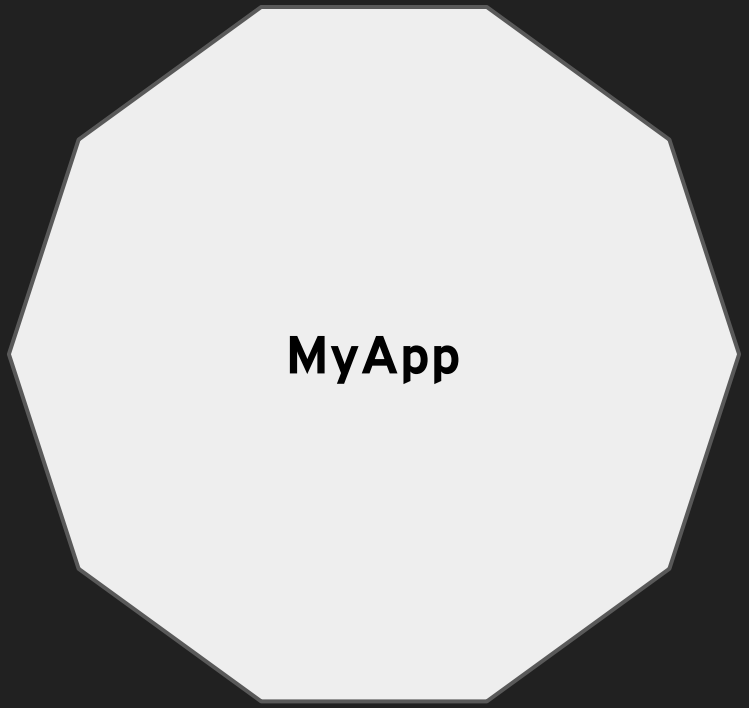
Monolith



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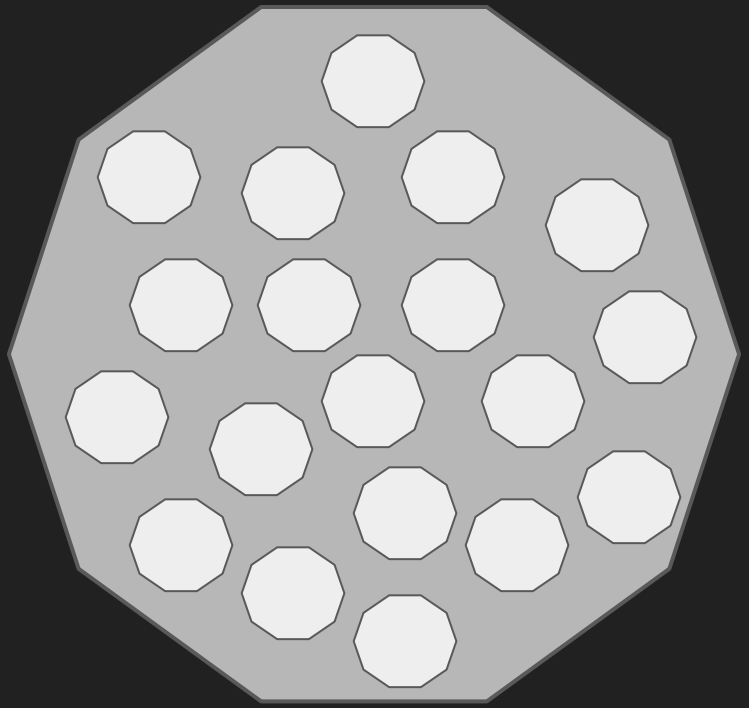
Application Modules



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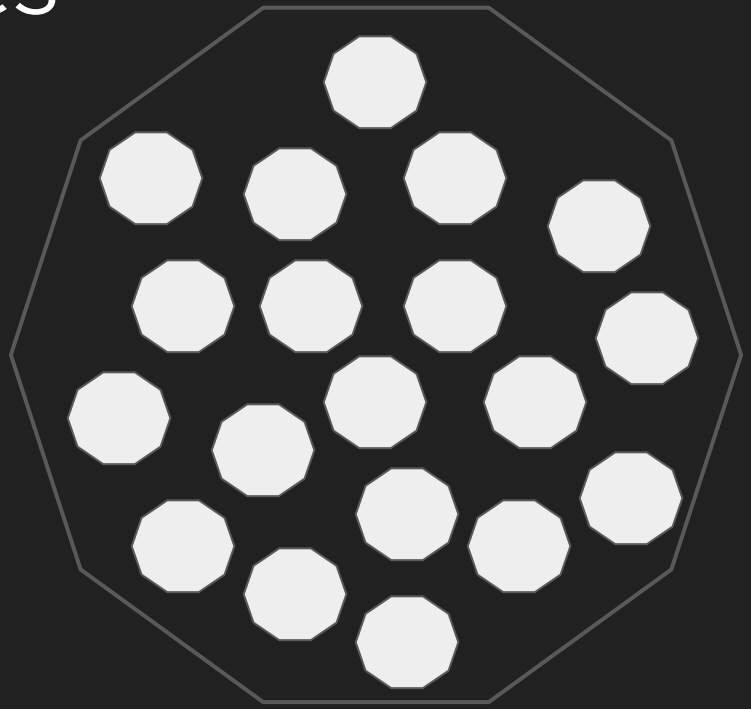
Microservices



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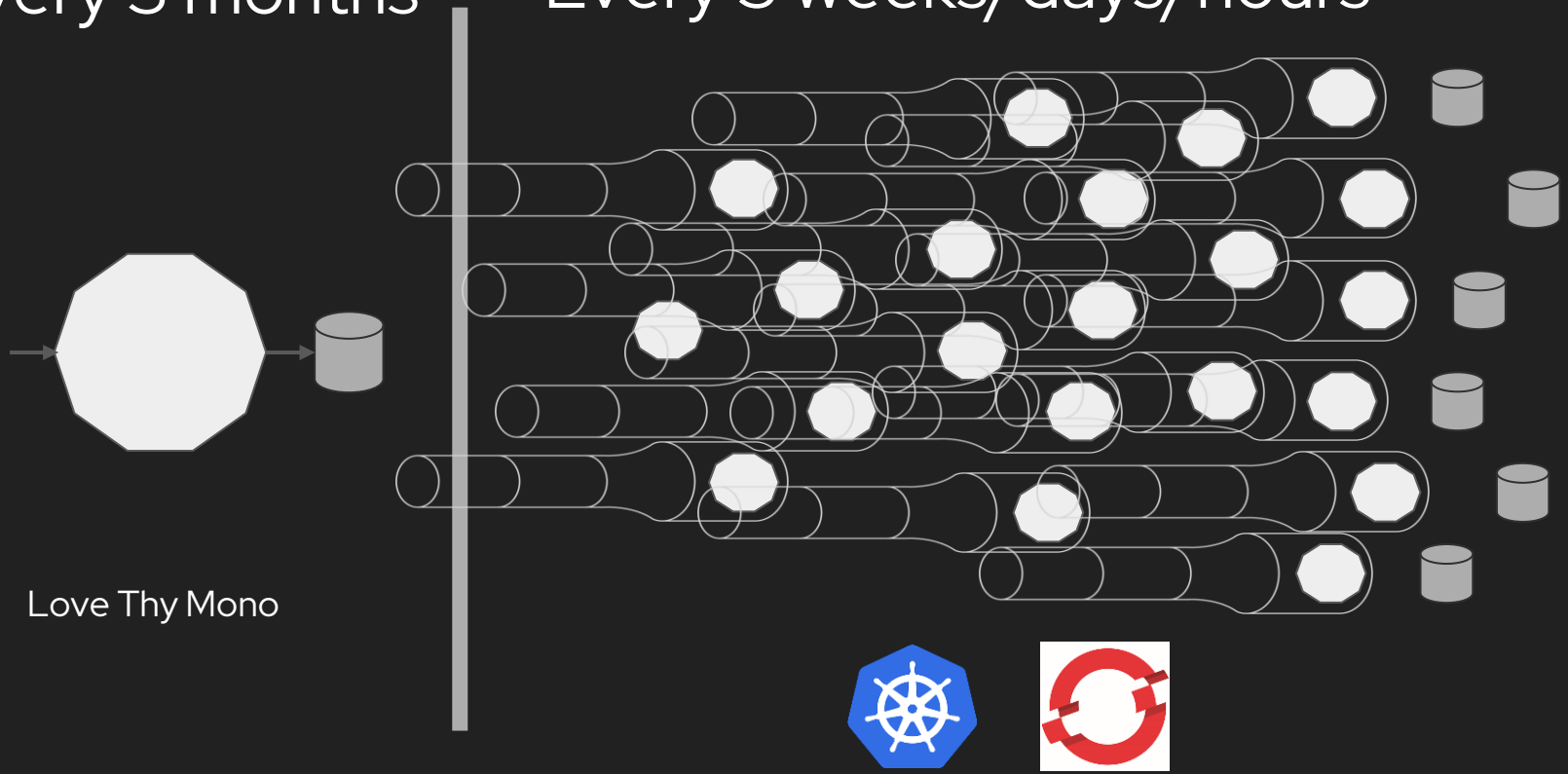
Every 3 months

Every 3 weeks/days/hours



Love Thy Mono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DEVELOPERS

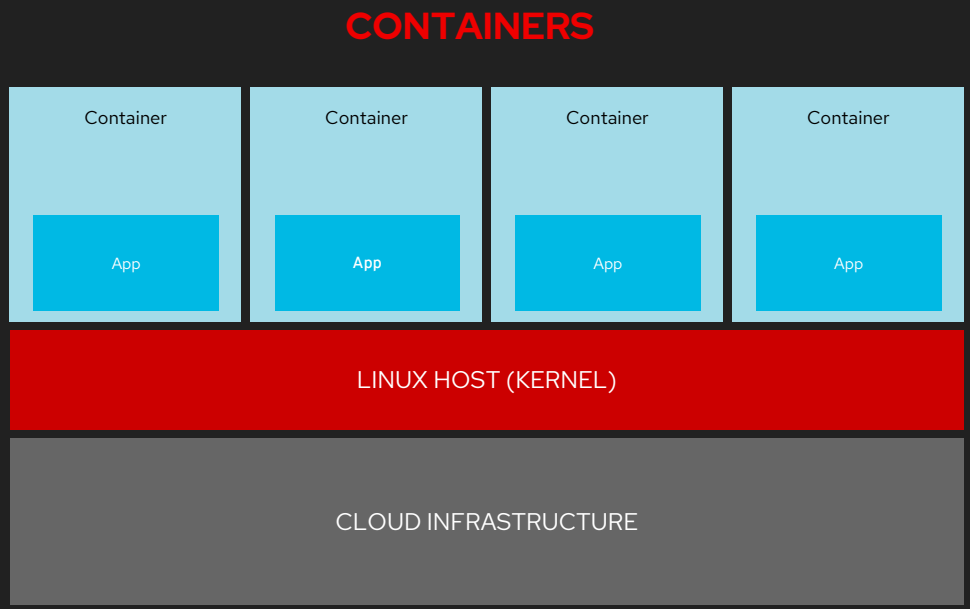
- Cloud-native apps
- Simplified packaging
- Simplified testing

IT OPERATIONS

- Consistent app deploys
- Automated app deploys
- Improved app performance
- Multi-cloud consistency

BUSINESS LEADER

- Enable devops culture
- Enable hybrid cloud
- Reduce vm licensing costs
- Accelerate app-dev cycles



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DevOps Challenges for Multiple Containers

- How to scale?
- How to avoid port conflicts?
- How to manage them on multiple hosts?
- What happens if a host has trouble?
- How to keep them running?
- How to update them?
- Rebuild Container Images?


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Meet Kubernetes

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- Greek for “Helmsman,” also the root of the word “Governor” (from latin: gubernator)
- Container orchestrator
- Supports multiple cloud and bare-metal environments
- Inspired by Google’s experience with containers
- Open source, written in Go
- Manage applications, not machines

OPENSHIFT

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Learn more

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History of Microservices

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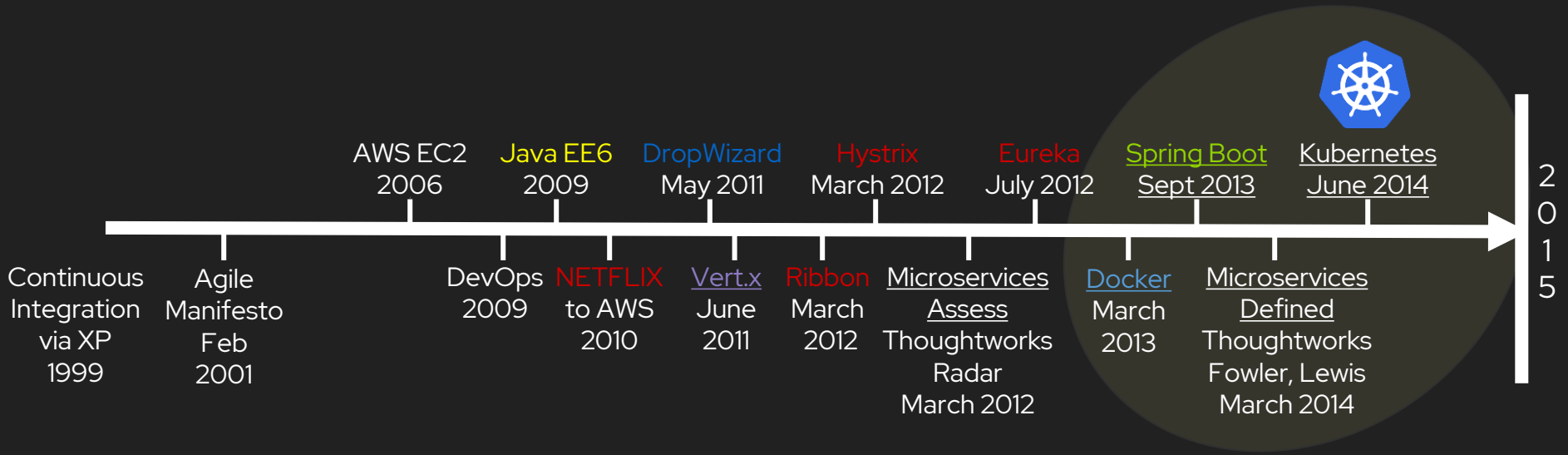

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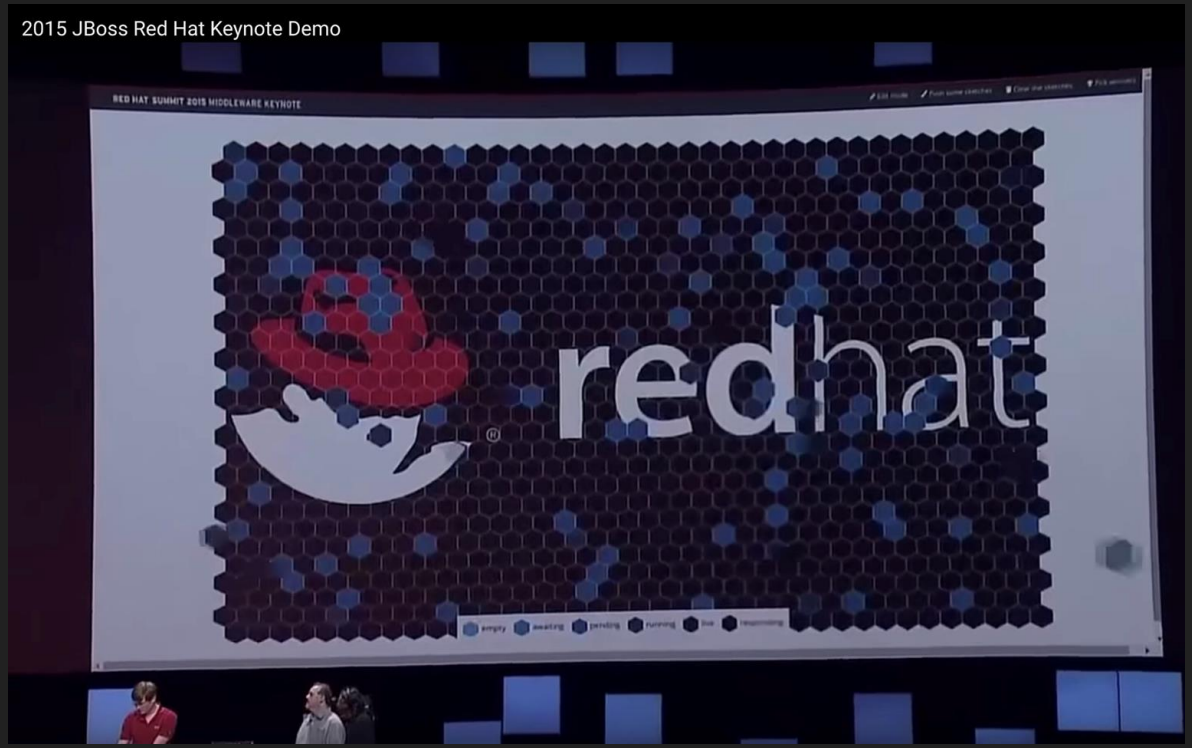

https://www.youtube.com/watch?v=GCtpncA0Ea0&feature=youtu.be&t=1031

2015

Launch 1000+ Containers

Audience Claims a Container

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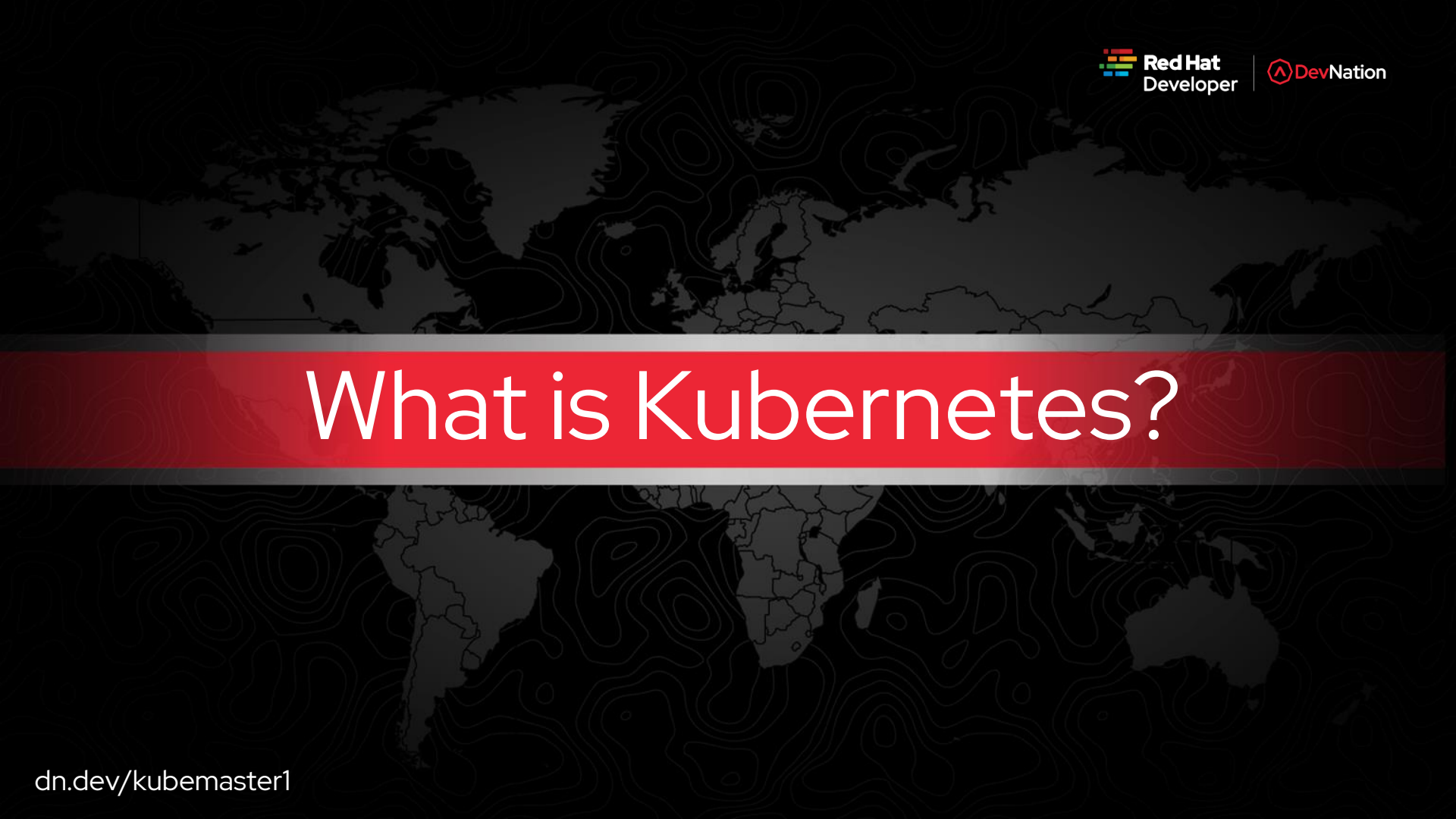
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What is Kubernetes?
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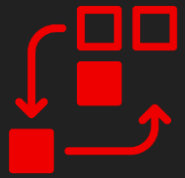
Pod

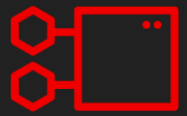
- ✓ 1+ containers
- ✓ Shared IP
- ✓ Shared storage (ephemeral)
- ✓ Shared resources
- ✓ Shared life cycle

ReplicaSet/ Deployment



- ✓ The desired state - replicas, pod template: health checks, resources, image

Service



- ✓ Grouping of pods (acting as one) has stable virtual IP and DNS name

Persistent Volume

- ✓ Network available storage
- ✓ PVs and PVCs

Label

- ✓ Key/value pairs associated with Kubernetes objects (env=production)

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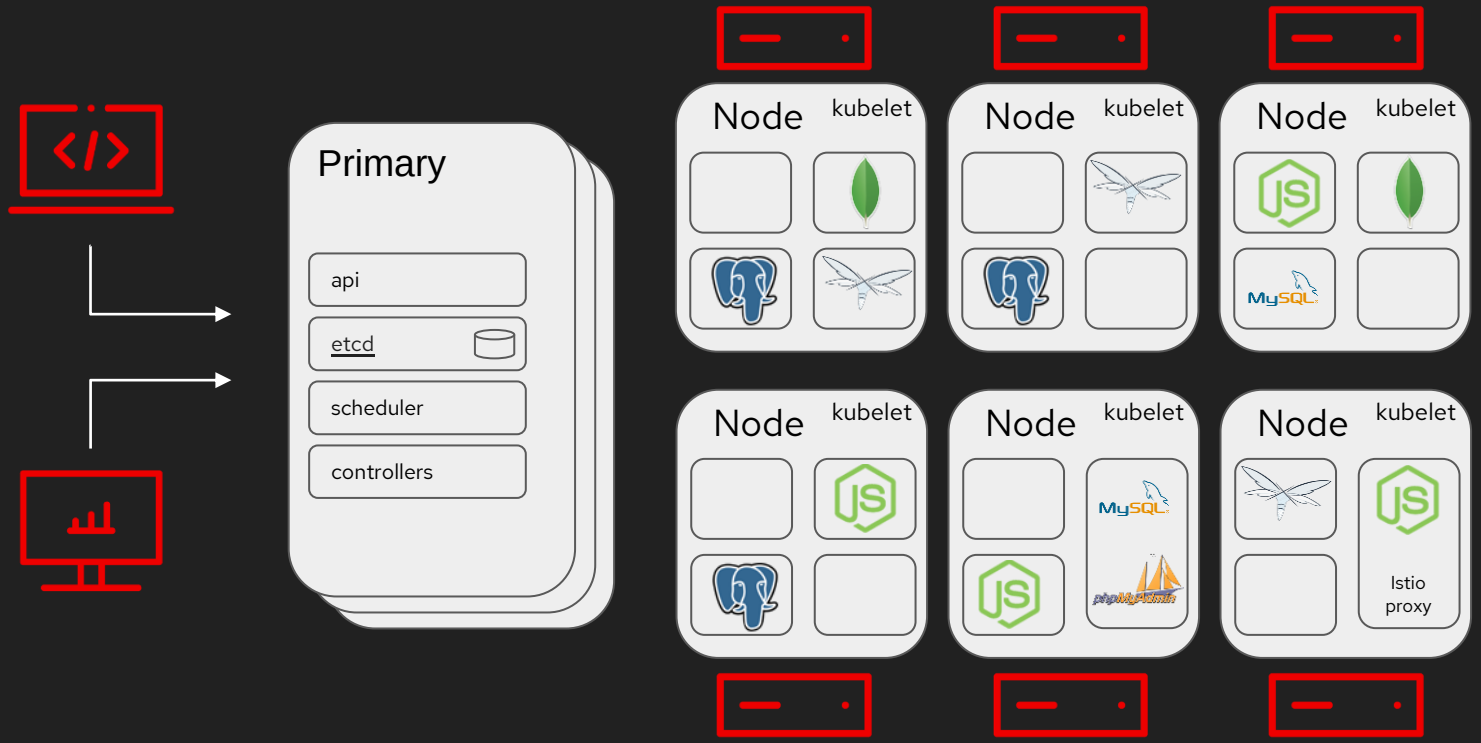
Kubernetes Cluster - Nodes



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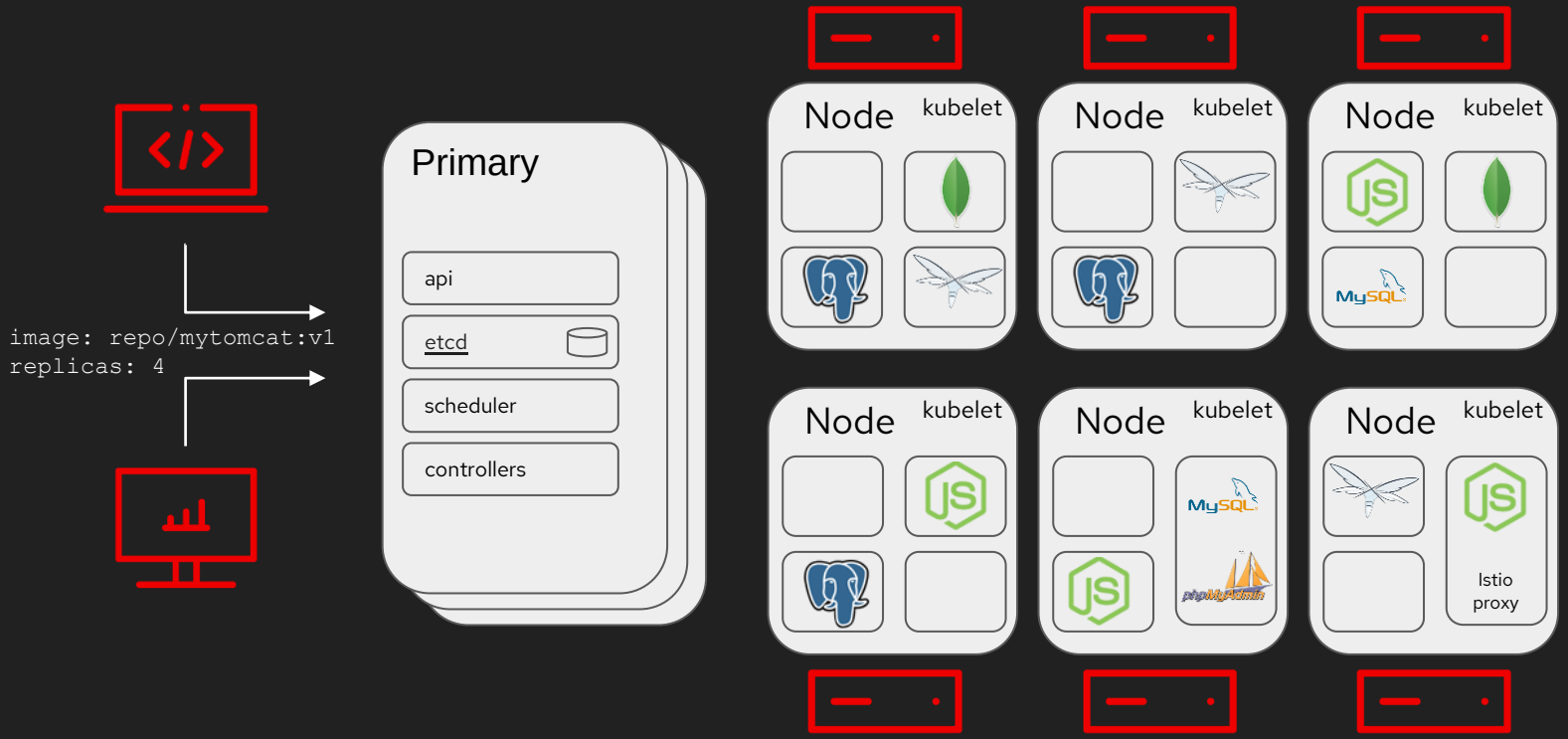
Kubernetes Cluster - Declarative API



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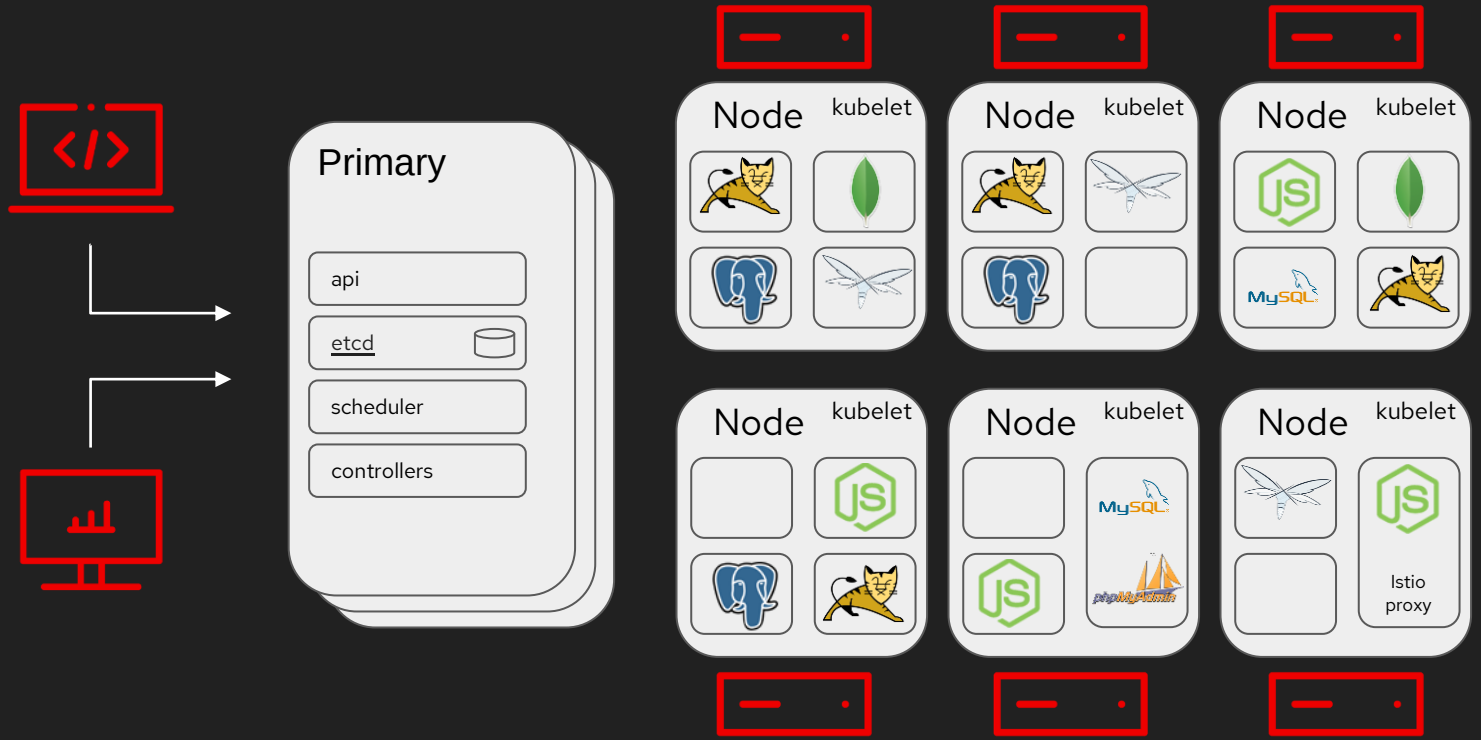
Kubernetes Cluster - 4 Tomcat Instances



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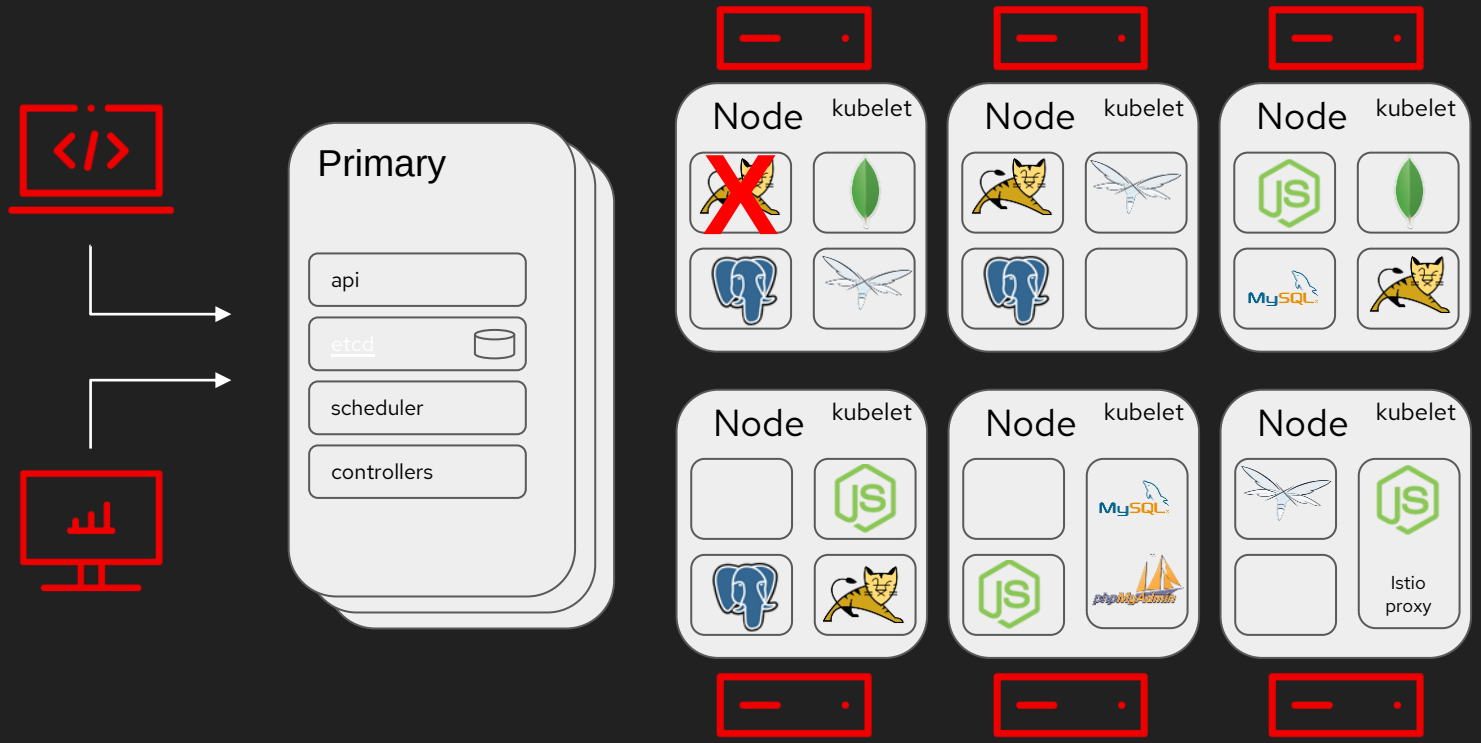
Kubernetes Cluster - Pod Failure



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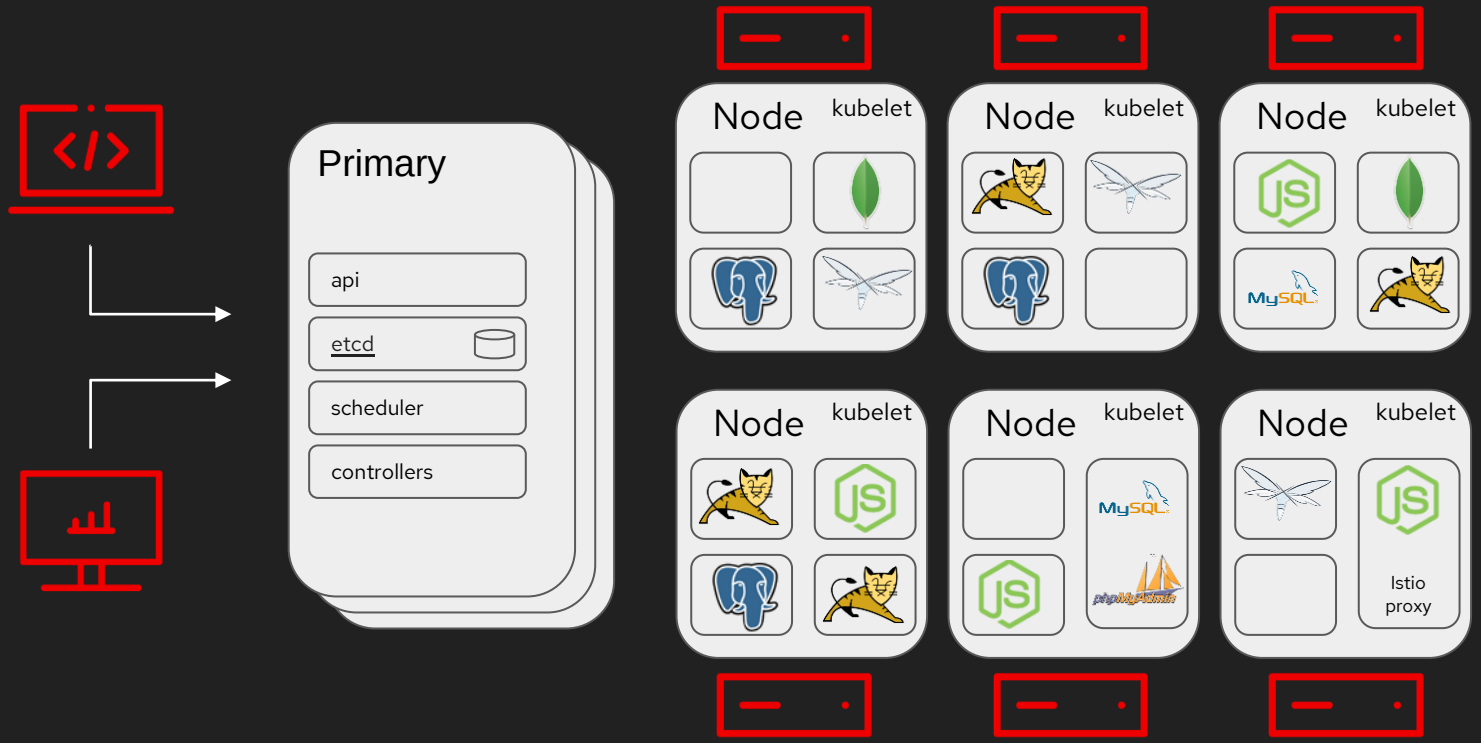
Kubernetes Cluster - Recovery



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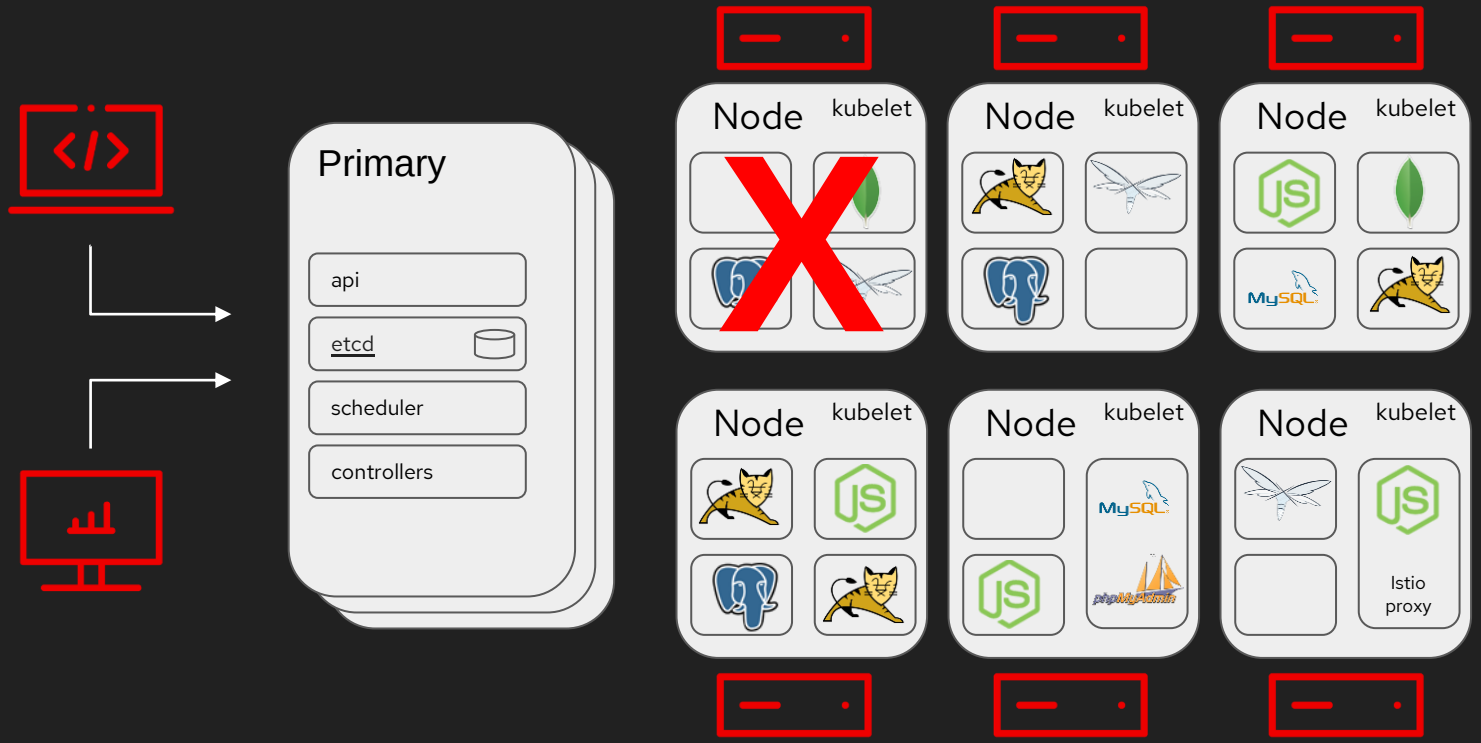
Kubernetes Cluster - Node Failure



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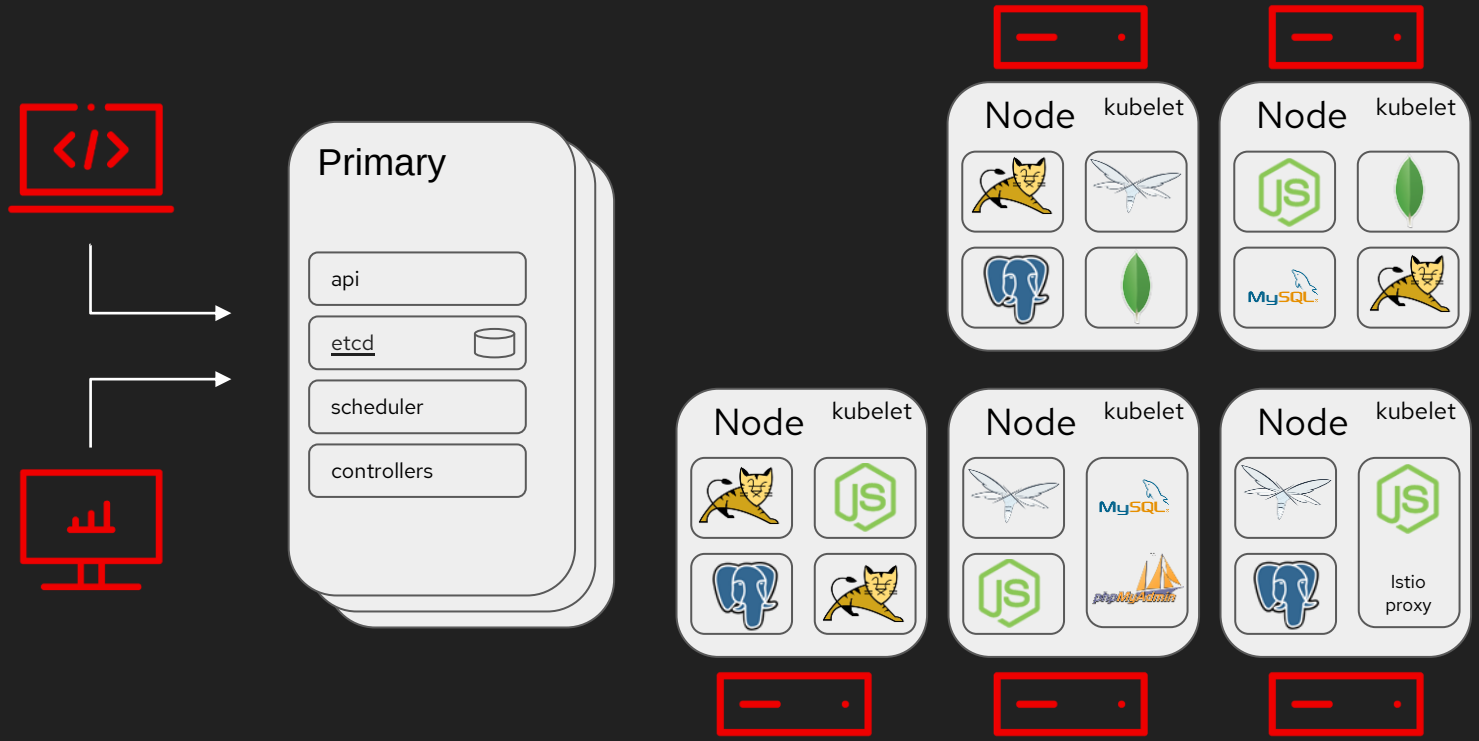
Kubernetes Cluster - Pods Replaced



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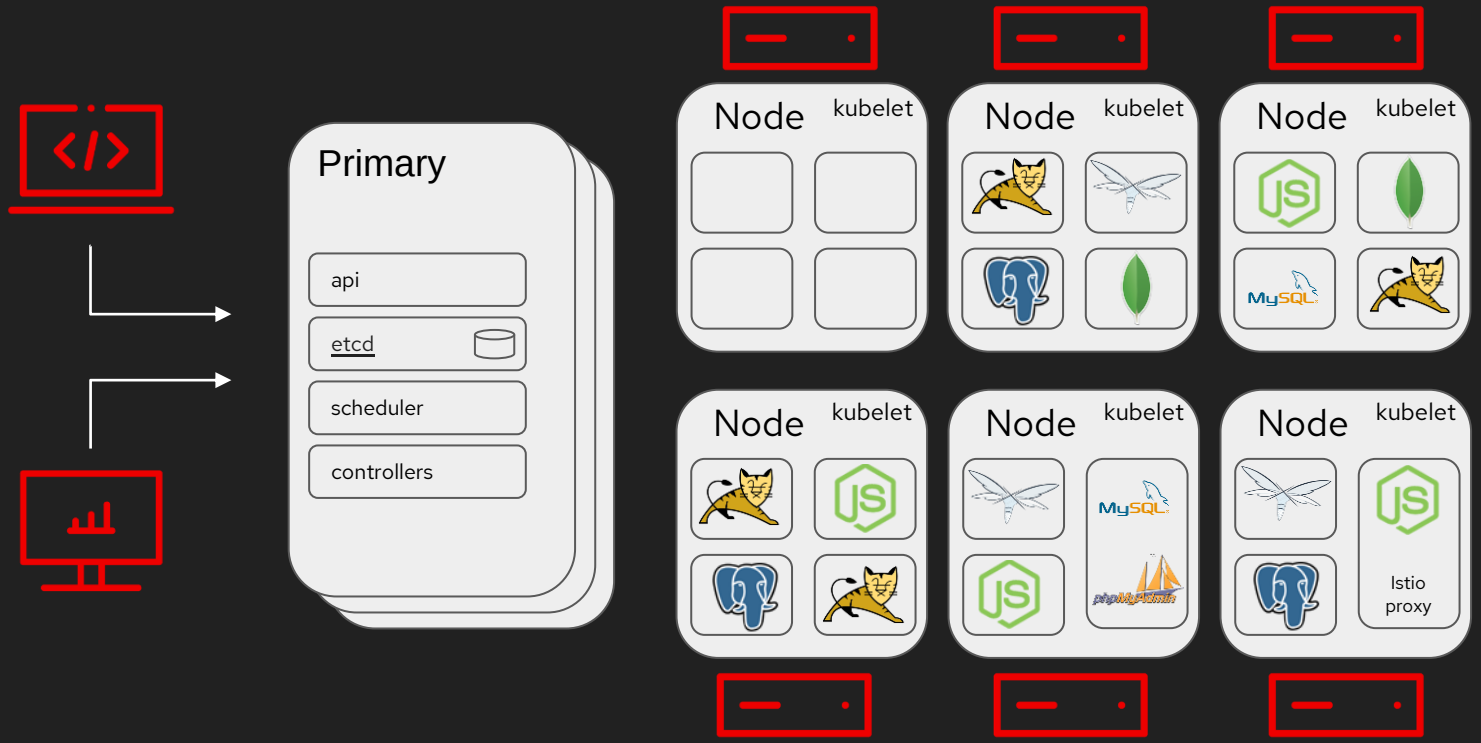
Kubernetes Cluster - New Node



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Free Resources
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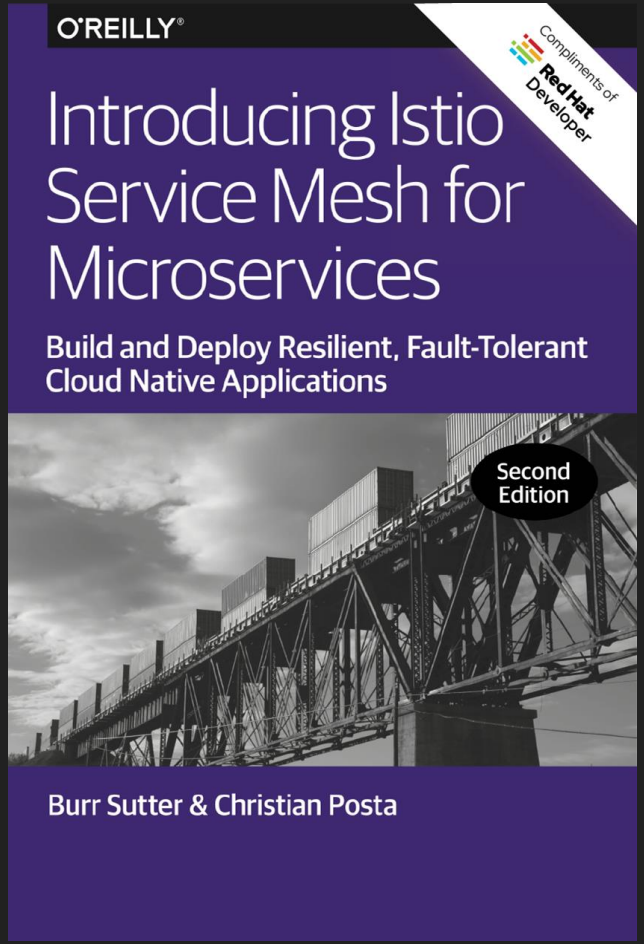

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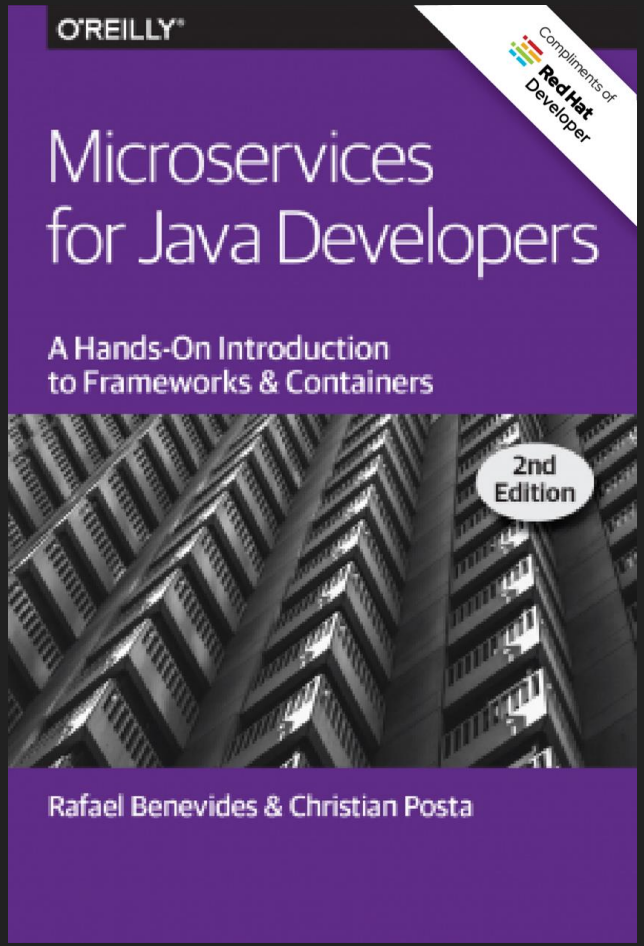

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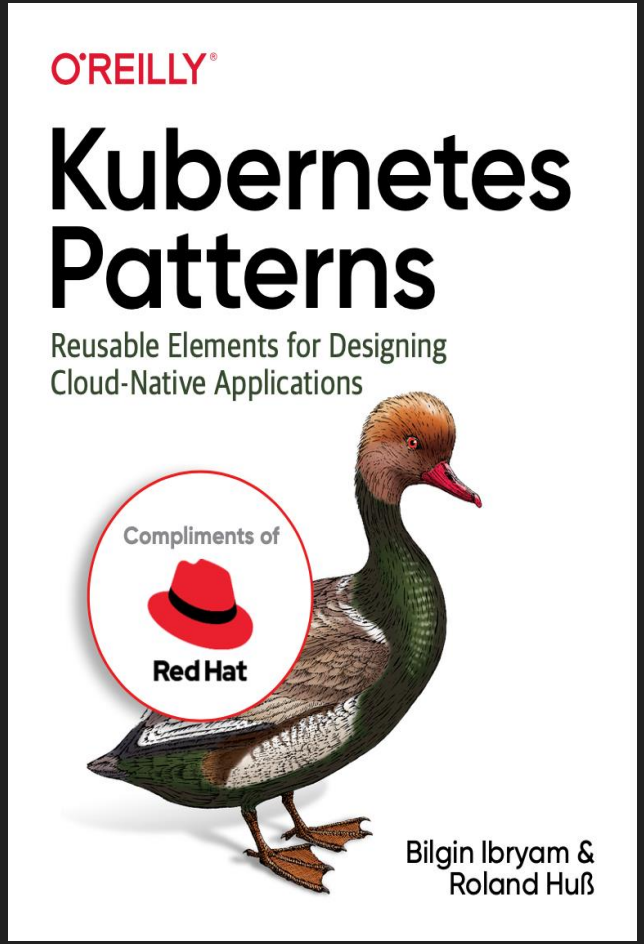

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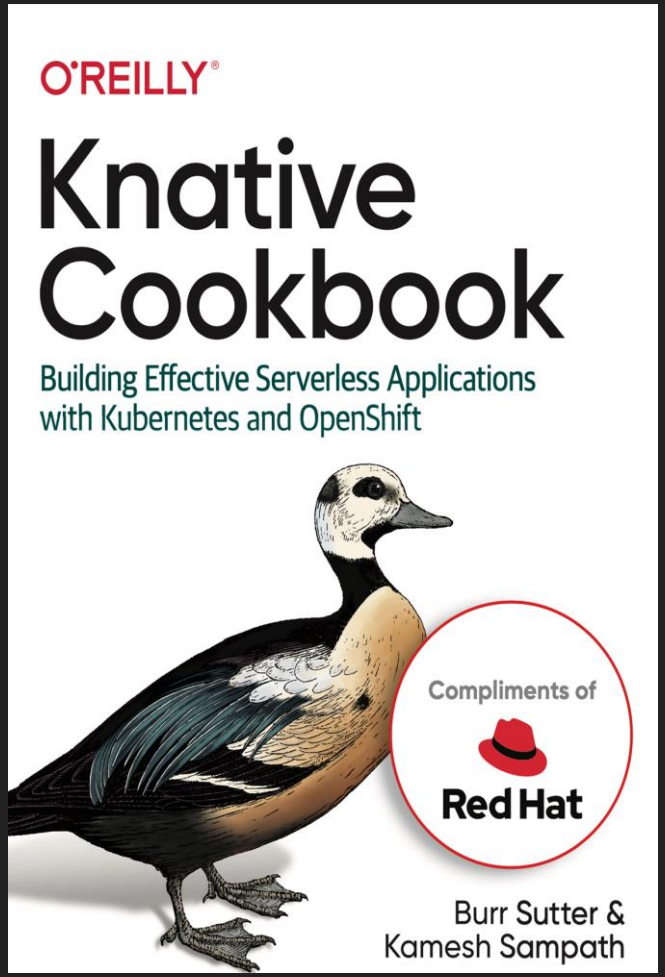

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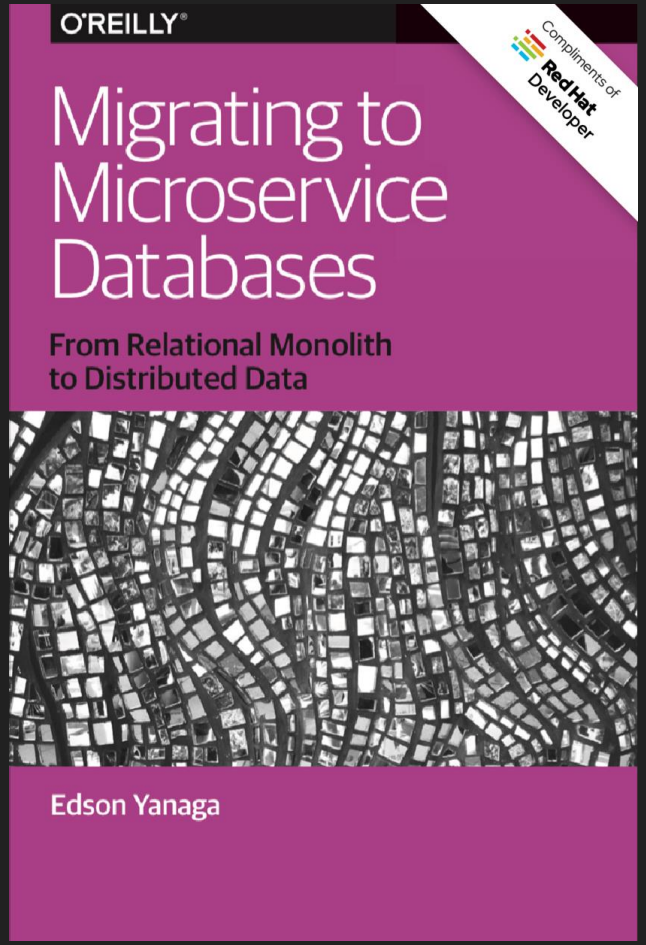

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The End
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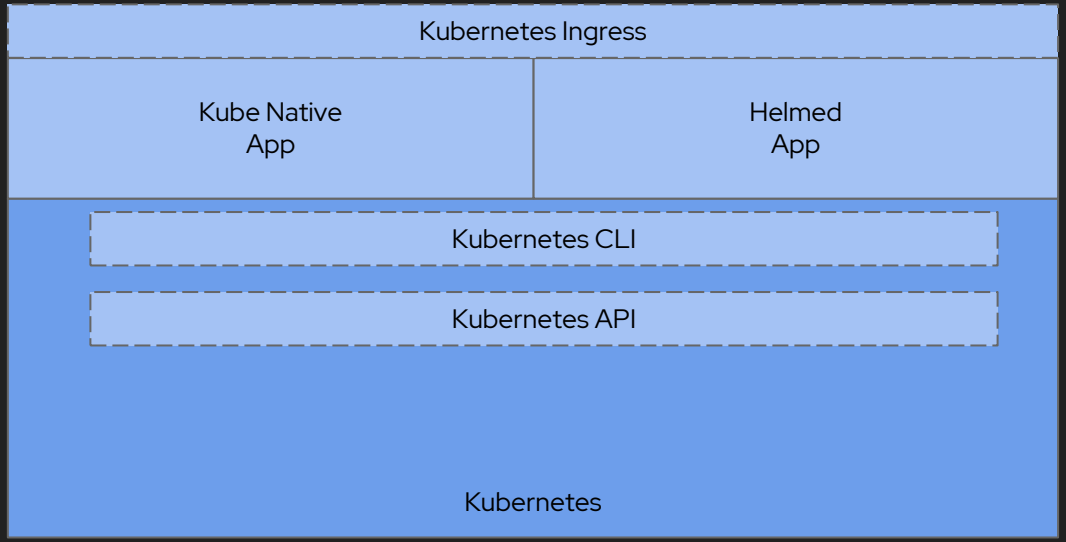
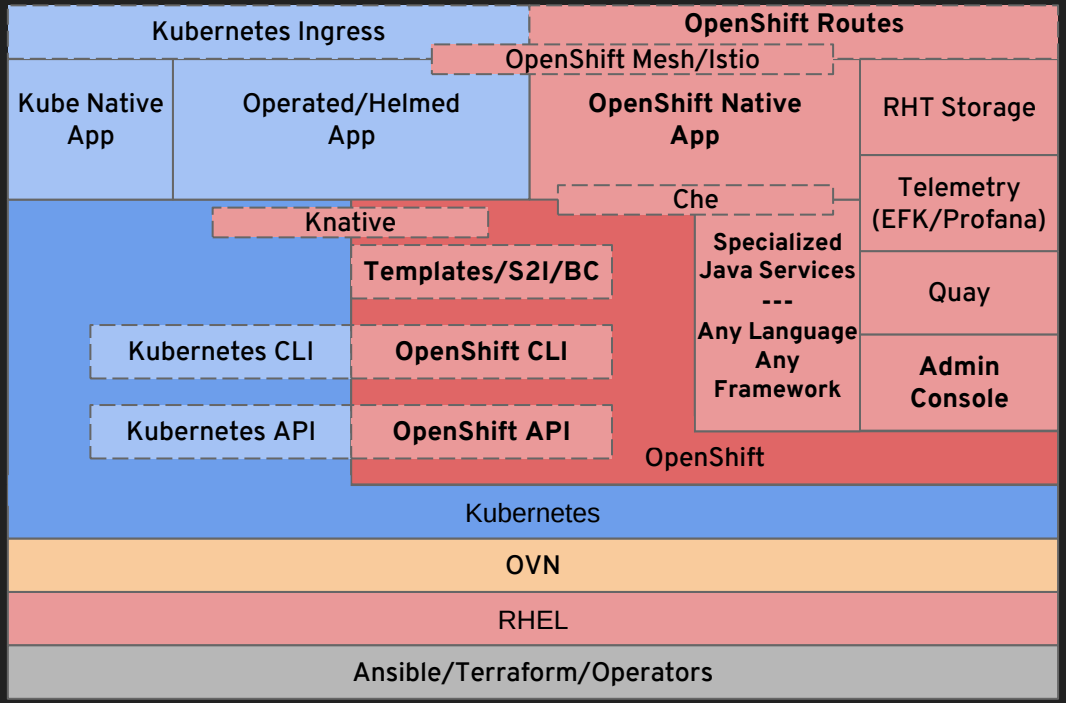
Backup Content

	Kubernetes	OpenShift
Multi-container, multi-host scheduling	✓	✓
Self-service provisioning	✓	✓
Service discovery	✓	✓
Persistent Storage	✓	✓
Multi-tenancy		✓
Networking (SDN)		✓
Image Registry		✓
Image Build Tools		✓
Metrics		✓
Log Aggregation		✓
Ingress		✓
UX: Console, Service Catalog, "oc"		✓
Secured by Default		✓


Kubernetes Ingress
Kube Native App
Helmed App
Kubernetes CLI
Kubernetes API
Kubernetes


Kubernetes Ingress
OpenShift Routes
OpenShift Mesh/Istio
Kube Native App
Operated/Helmed App
OpenShift Native App
RHT Storage
Che
Telemetry (EFK/Profana)
Knative
Specialized Java Services

Any Language Any Framework
Templates/S2I/BC
Quay
Kubernetes CLI
OpenShift CLI
Admin Console
Kubernetes API
OpenShift API
OpenShift
Kubernetes
OVN
RHEL
Ansible/Terraform/Operators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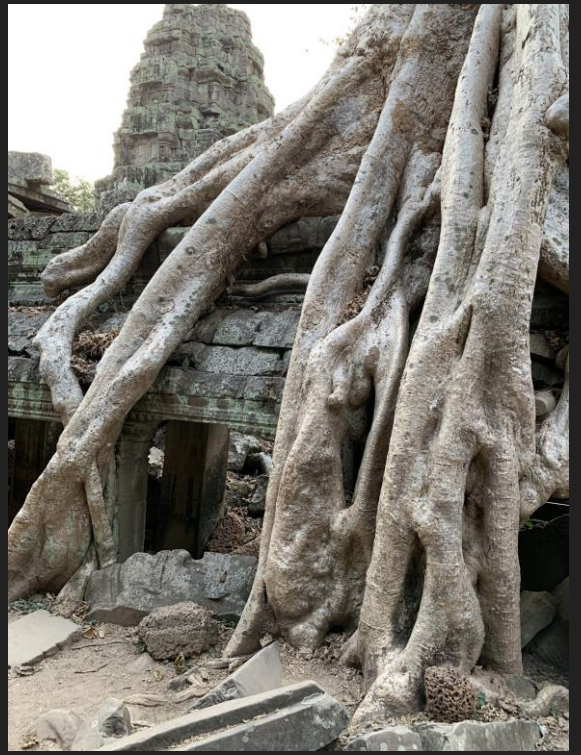
Strangler Strategy



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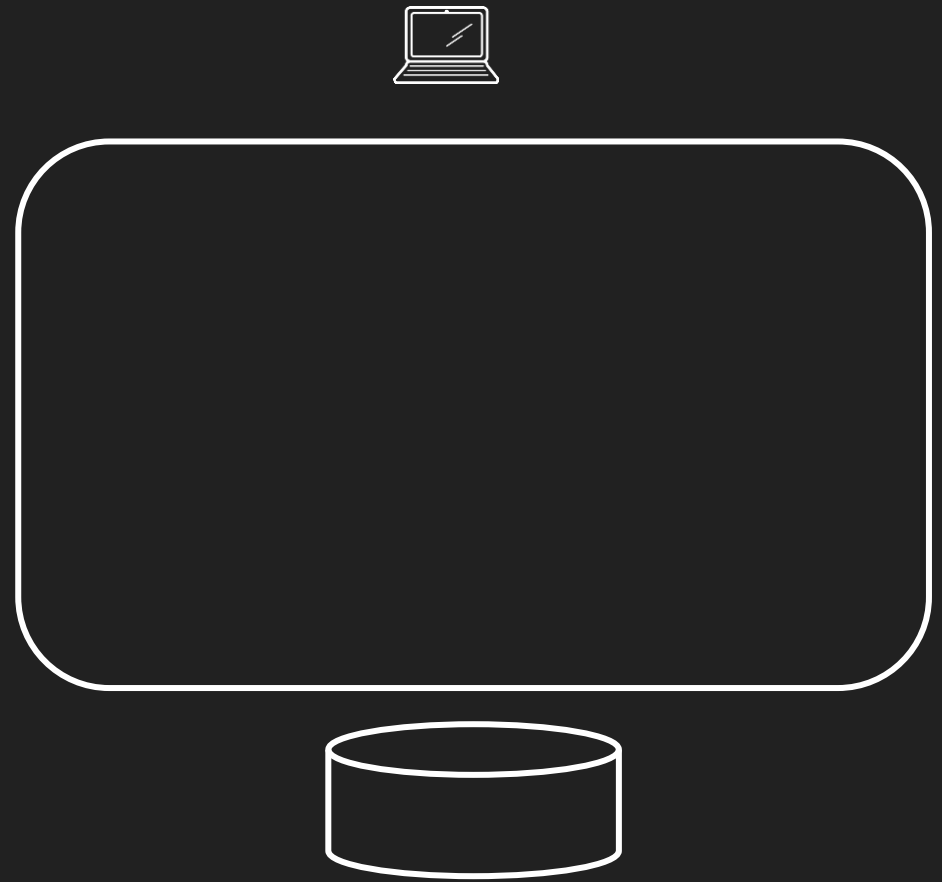
Application on Whiteboard



Whiteboard had 3 Tiers

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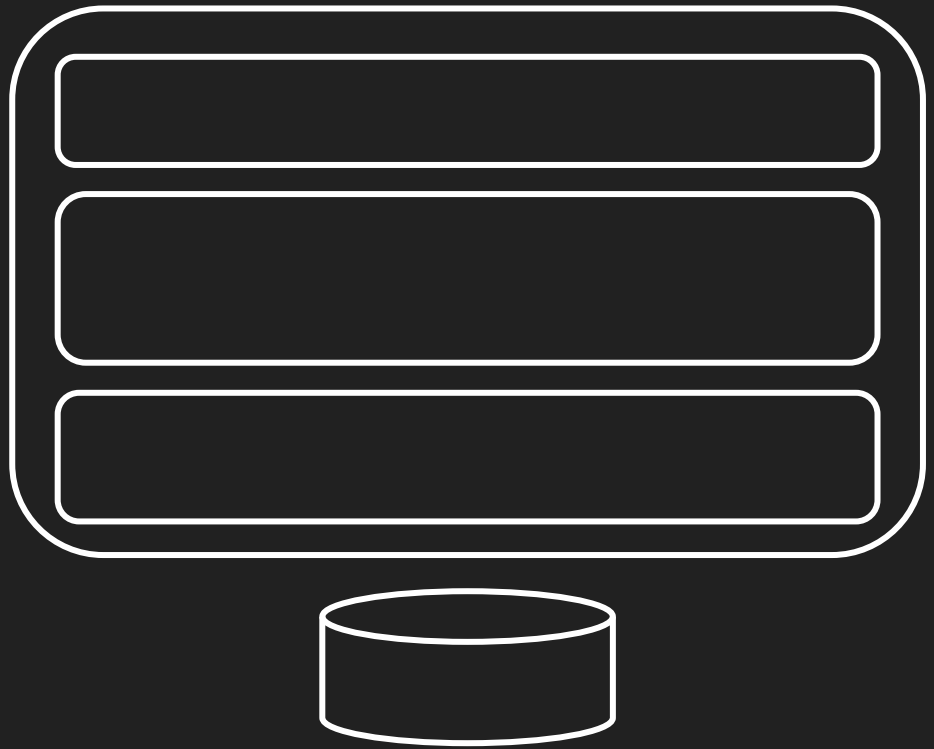

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UI, Logic, Data

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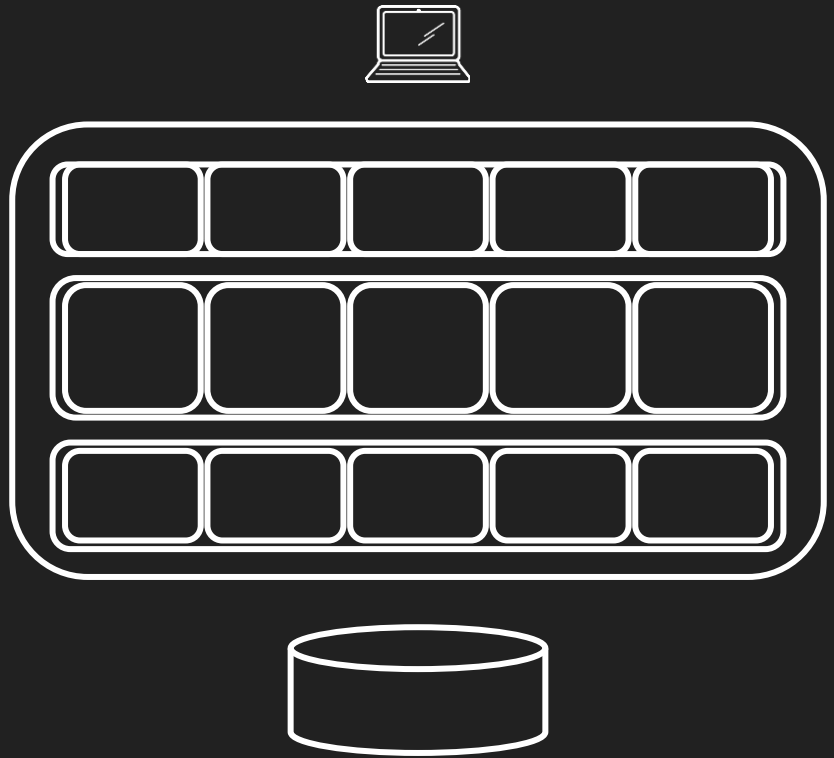

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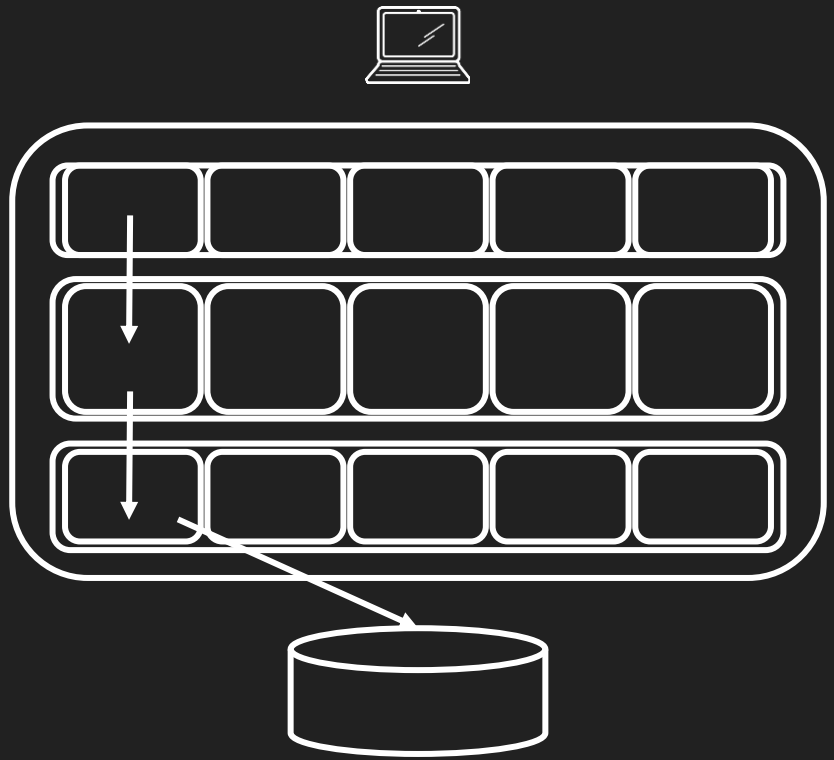
Clean Architecture



Real Life: Non-Majestic Monolith

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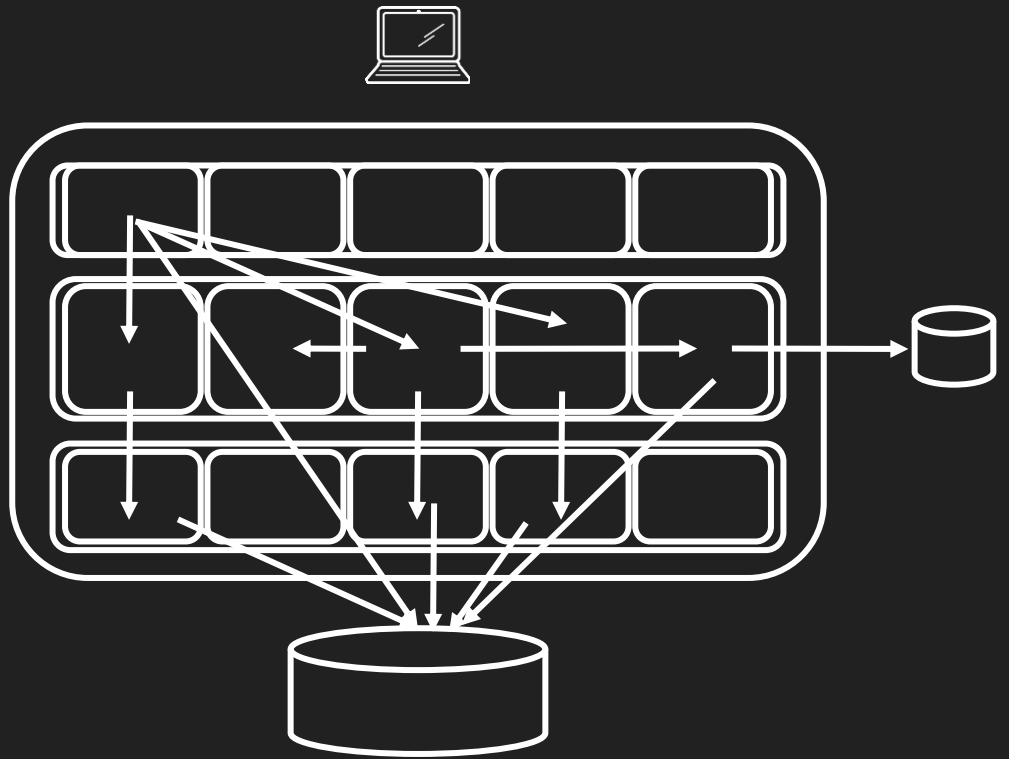

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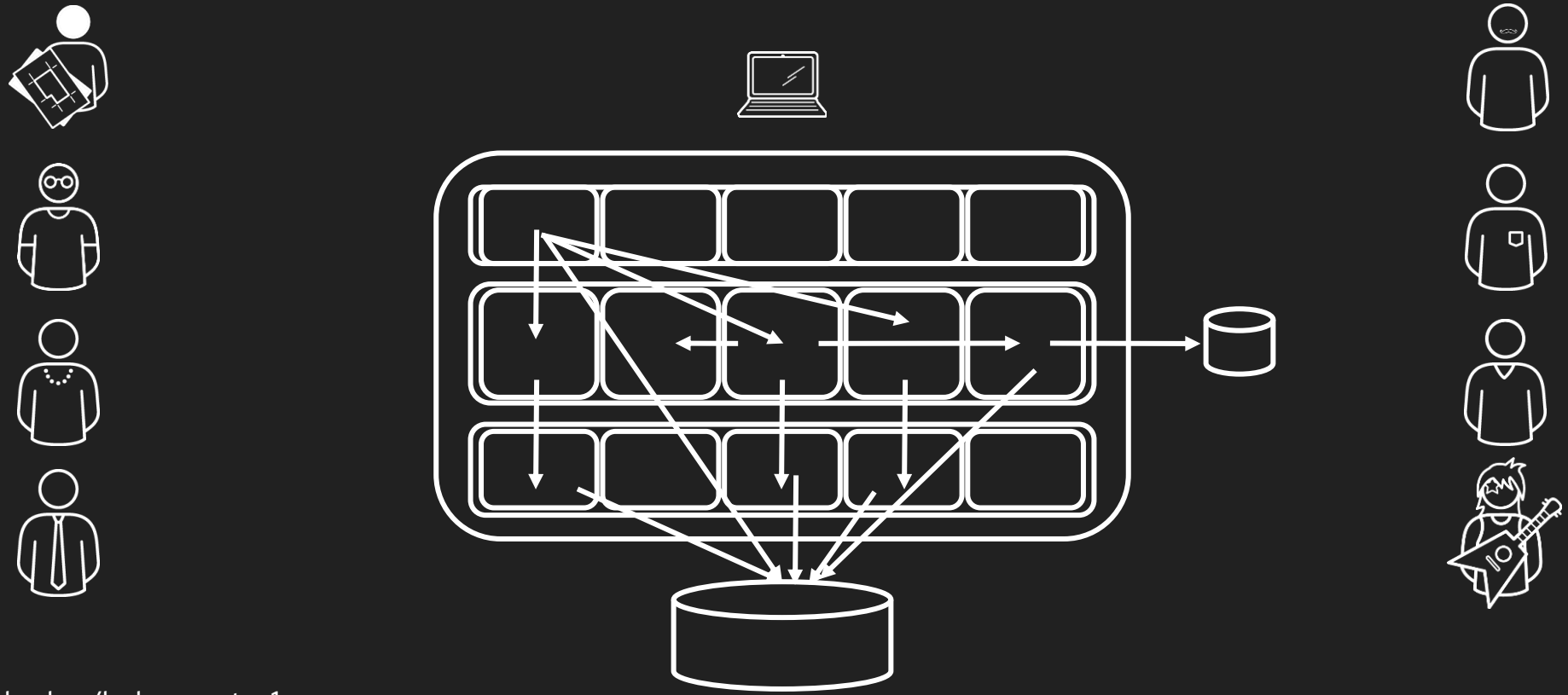
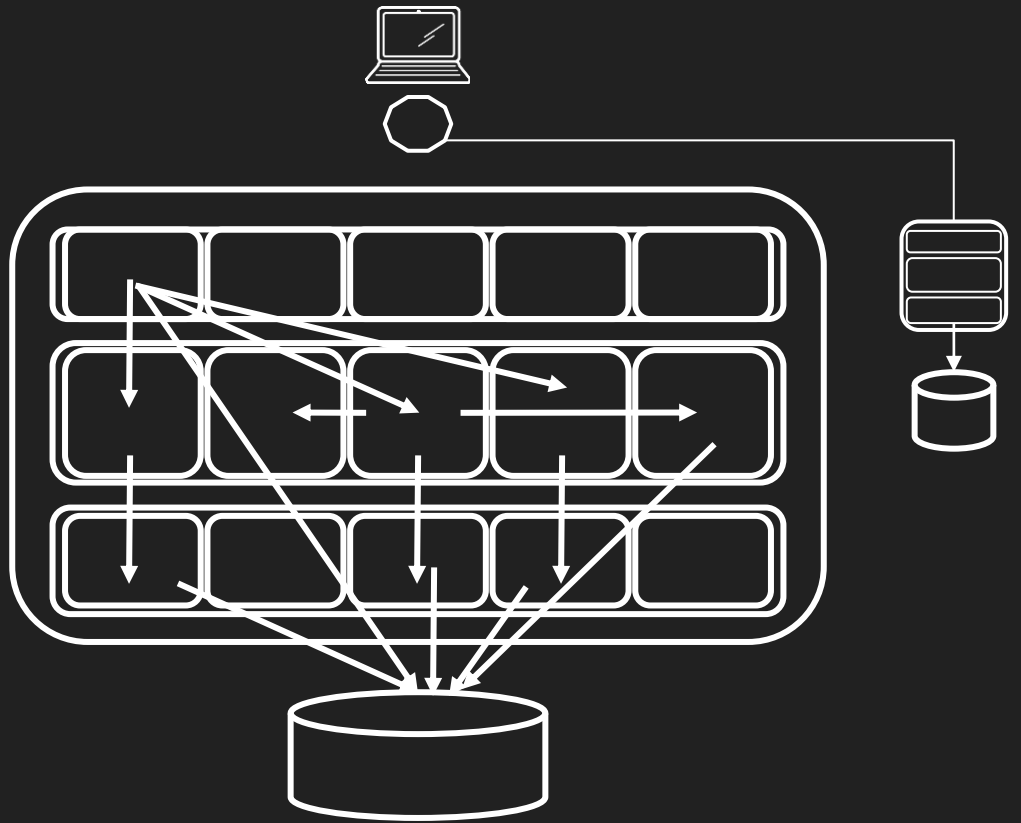
Large Team



Strangle



~~Strangle~~ Hug

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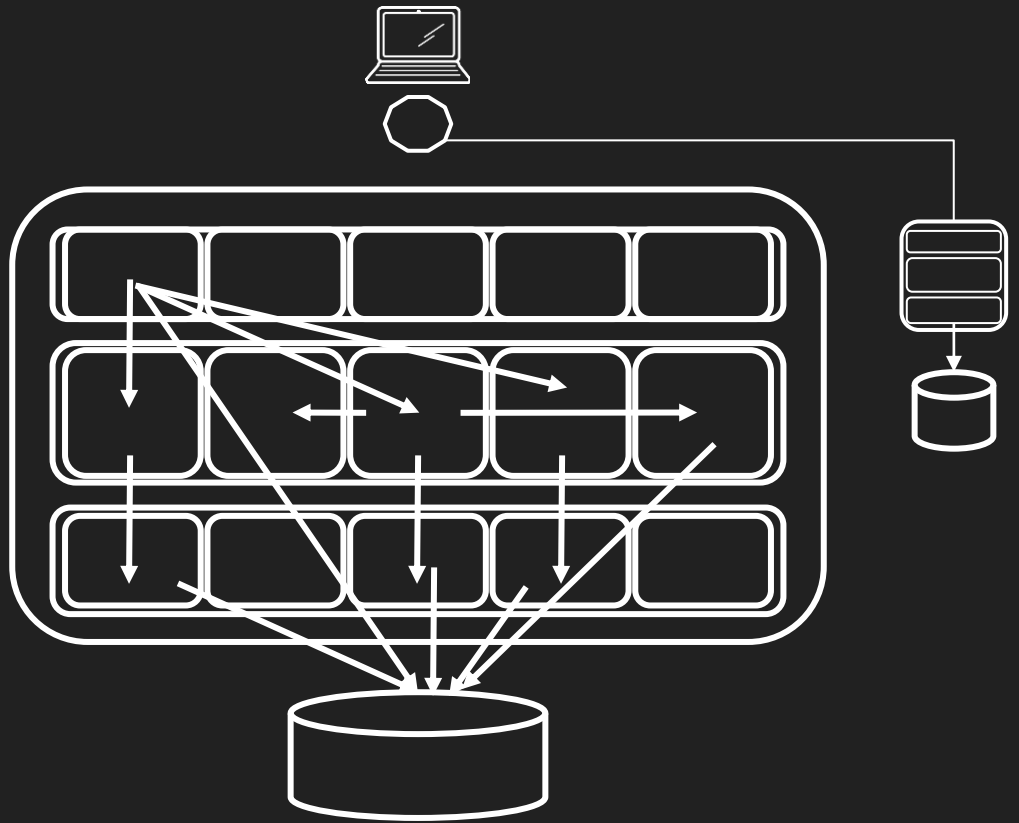

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Friend Hug

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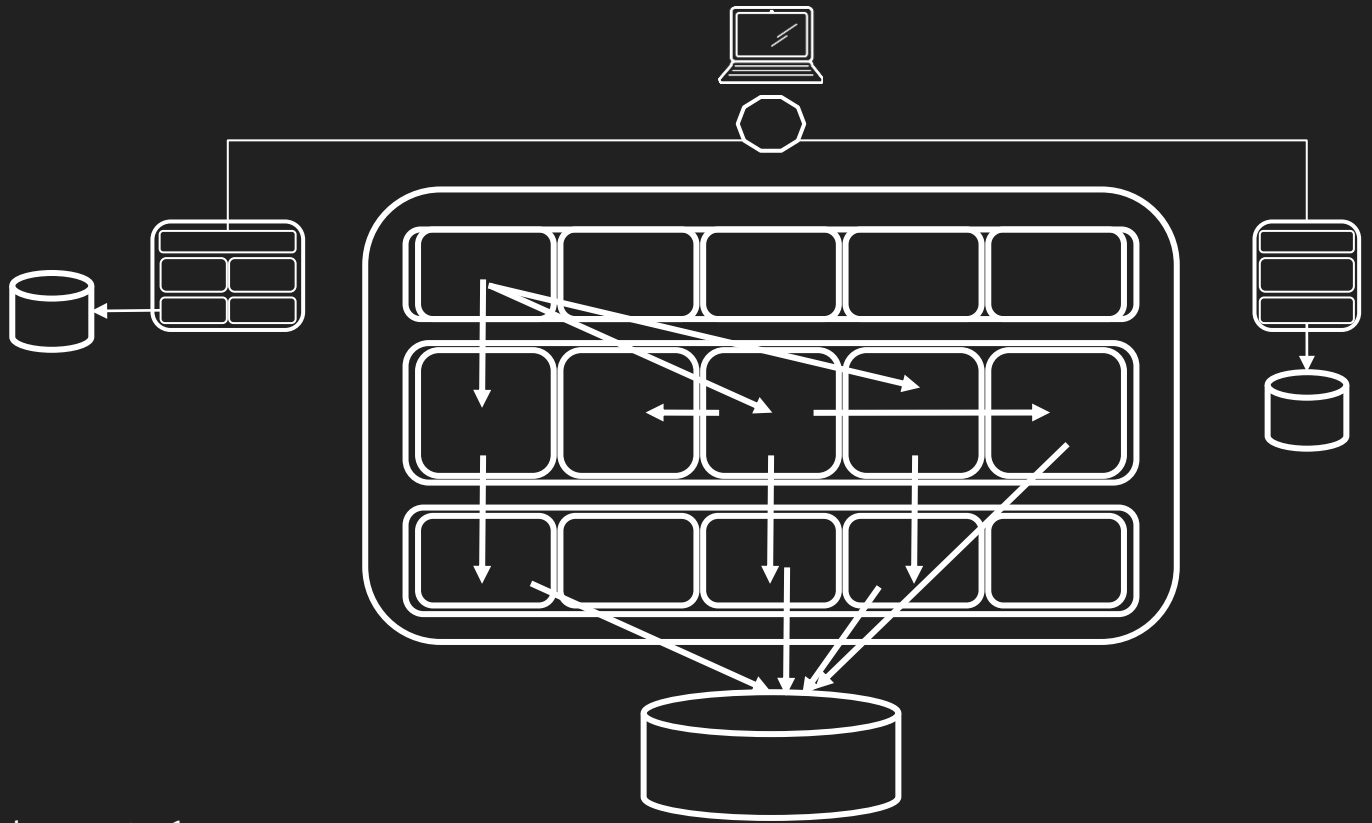

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Family Hug

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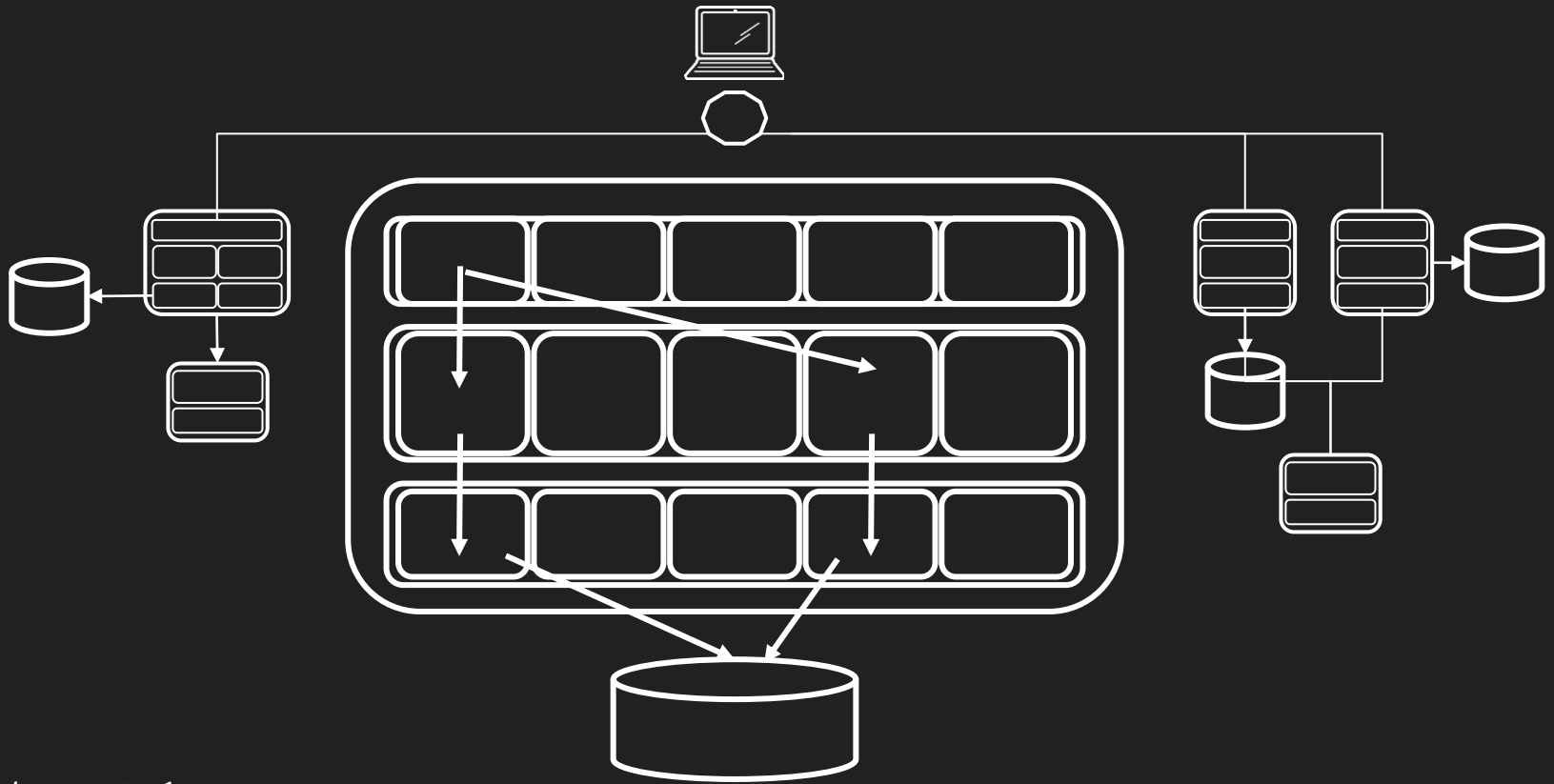

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Bear Hug

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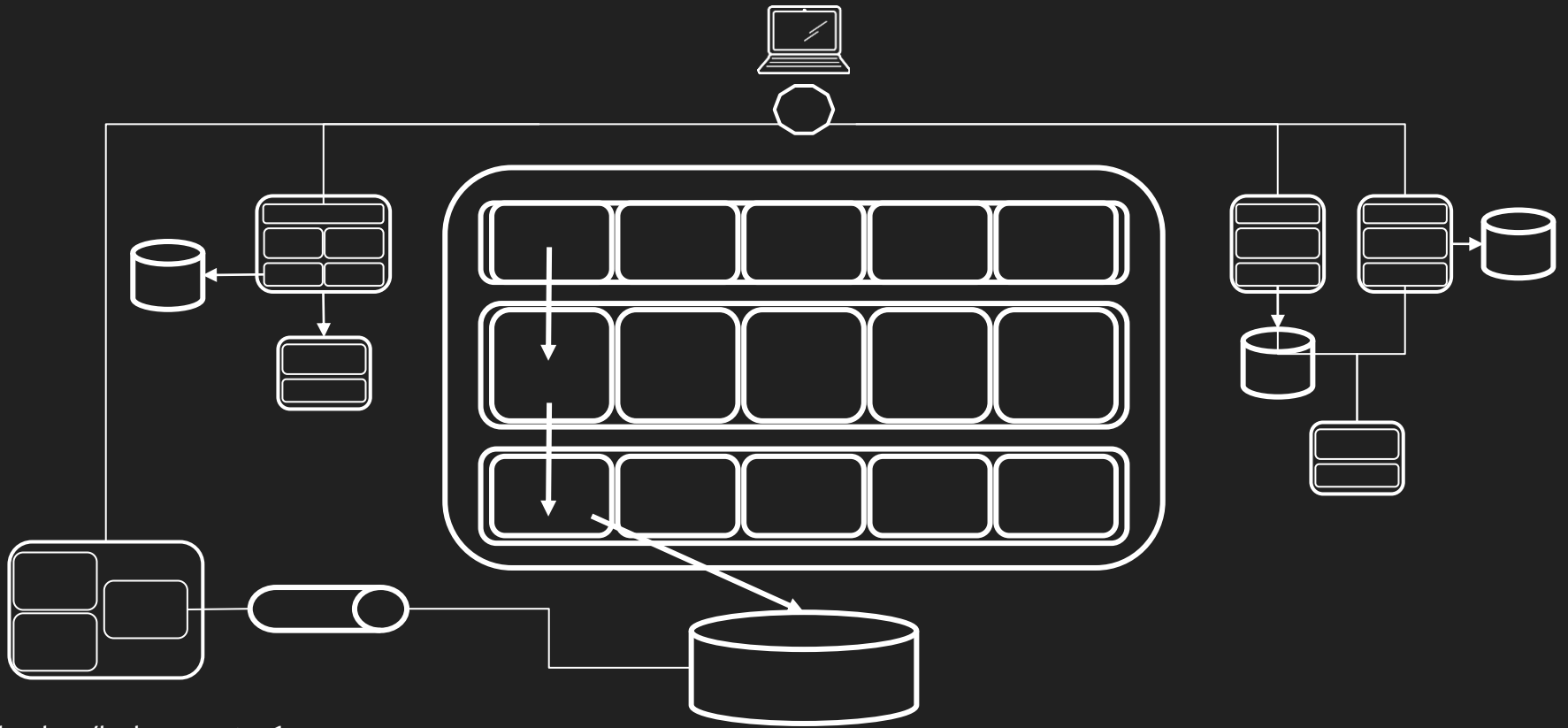

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"Refactor"

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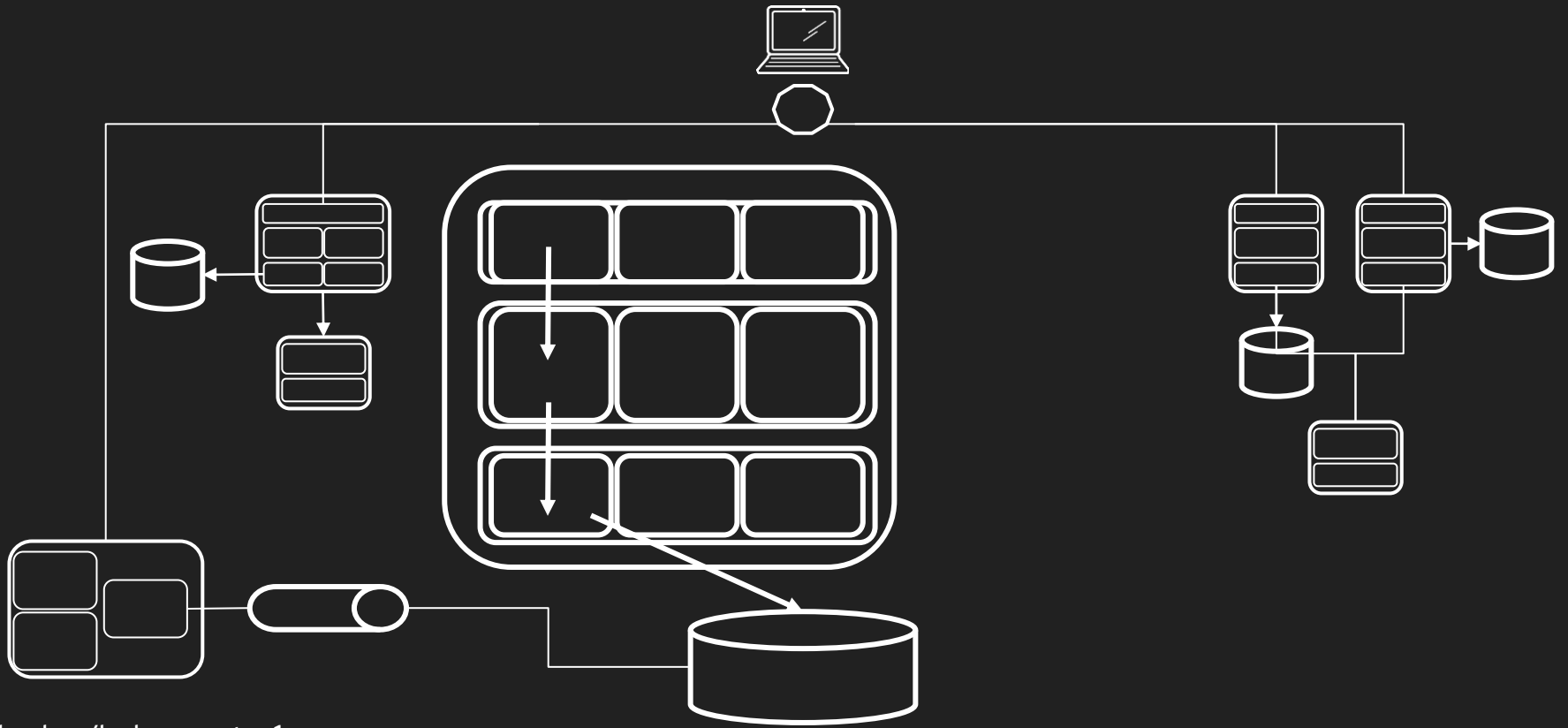

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Squeeze

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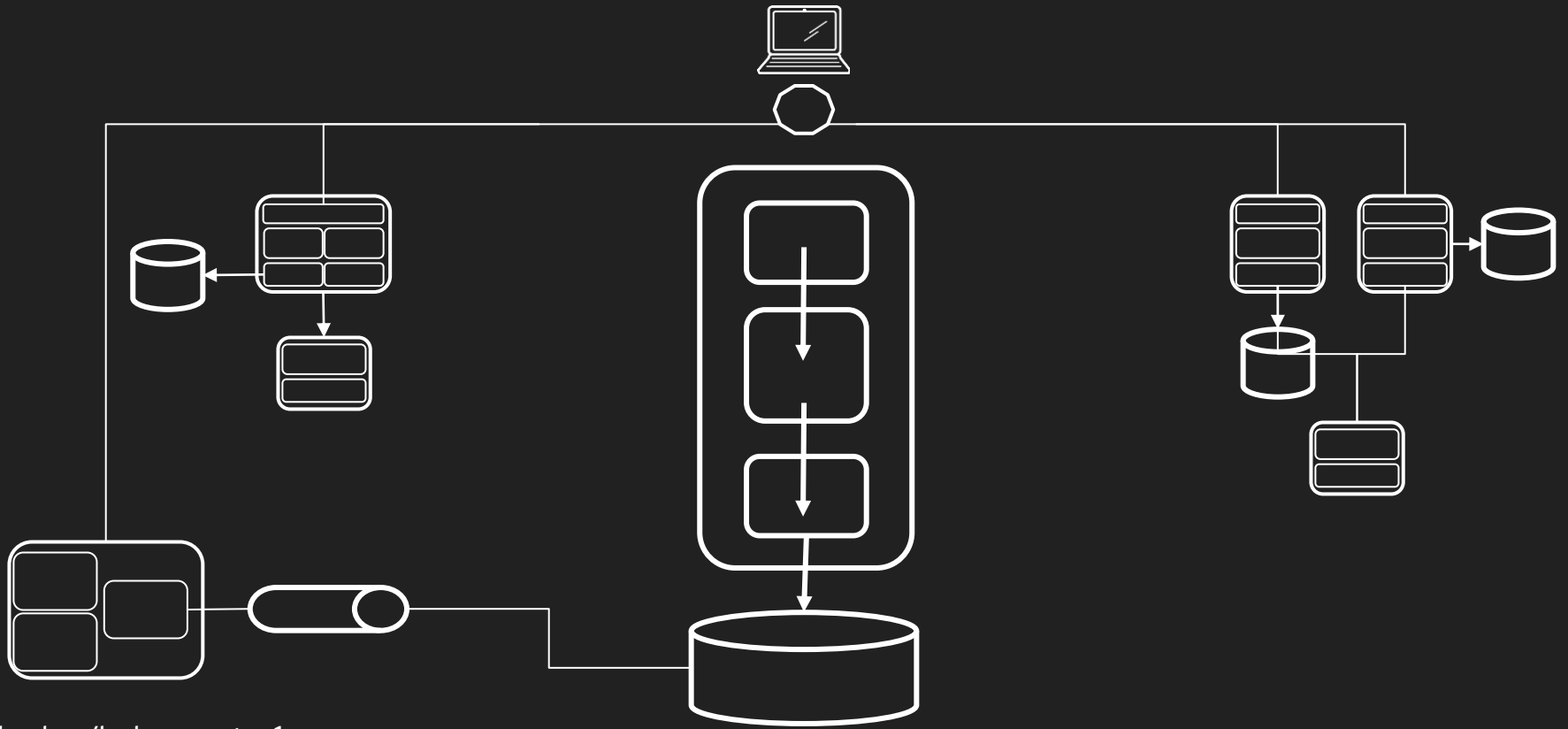

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Streamline

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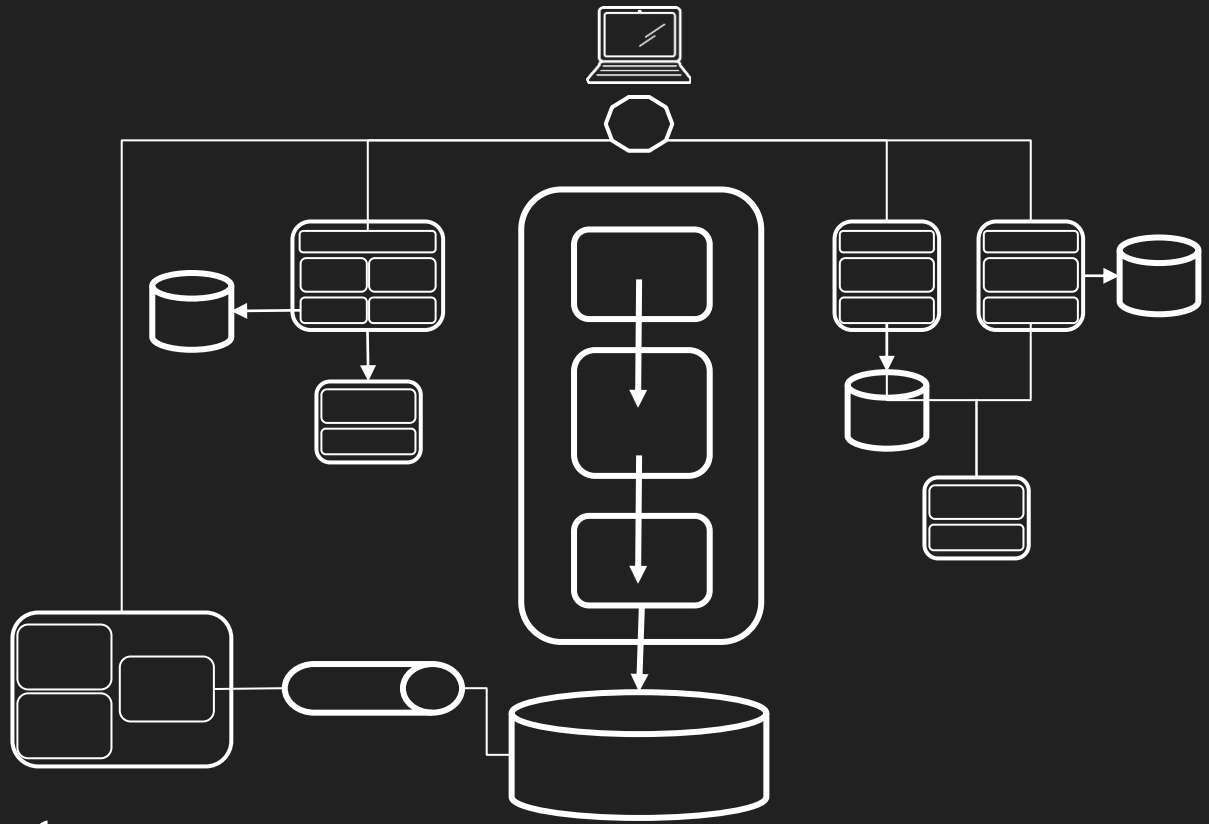

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Embrace Others

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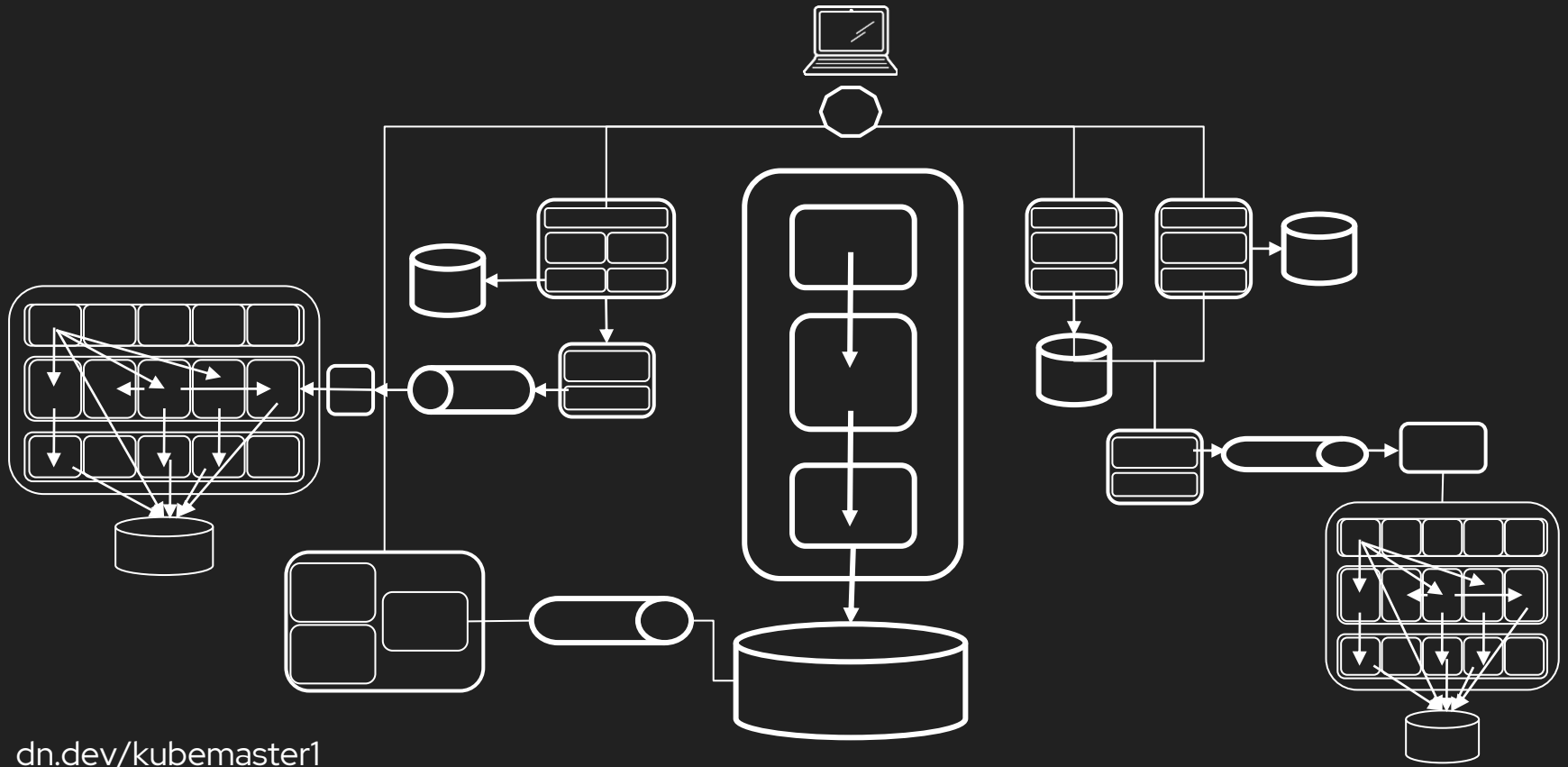

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