



Presents



Bridging the gap to Next Generation IT

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presents a crash course in



kubernetes

What is Kubernetes?

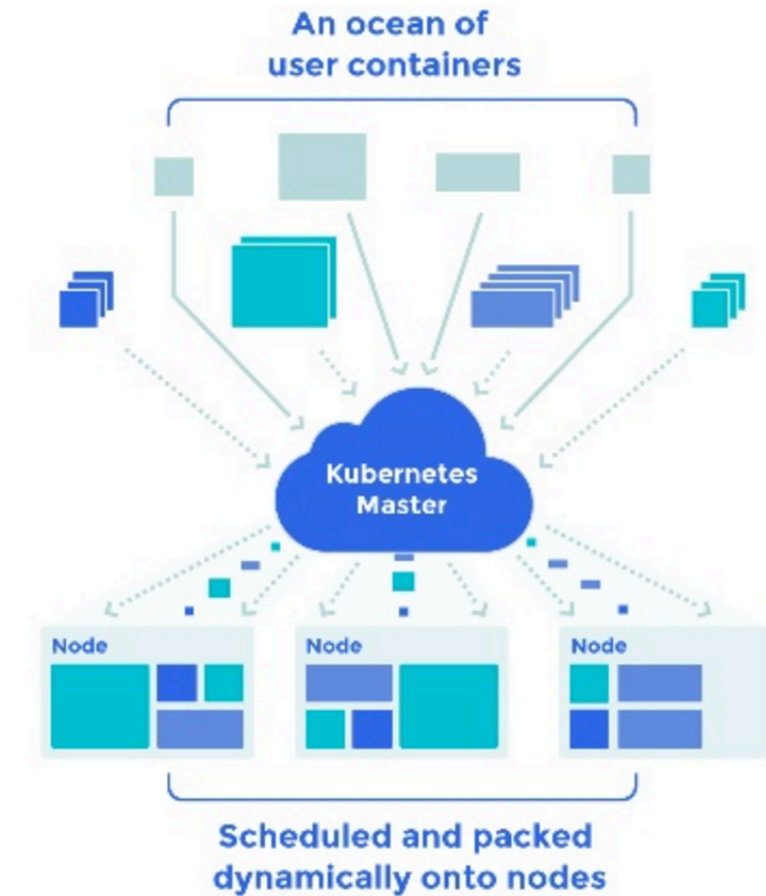
- An open source automation framework for deploying, managing, and scaling **applications**
- Created and used by Google
- A hybrid of Borg and Omega which are internal Google systems
- API-driven in its entirety
- Master / Minion deployment





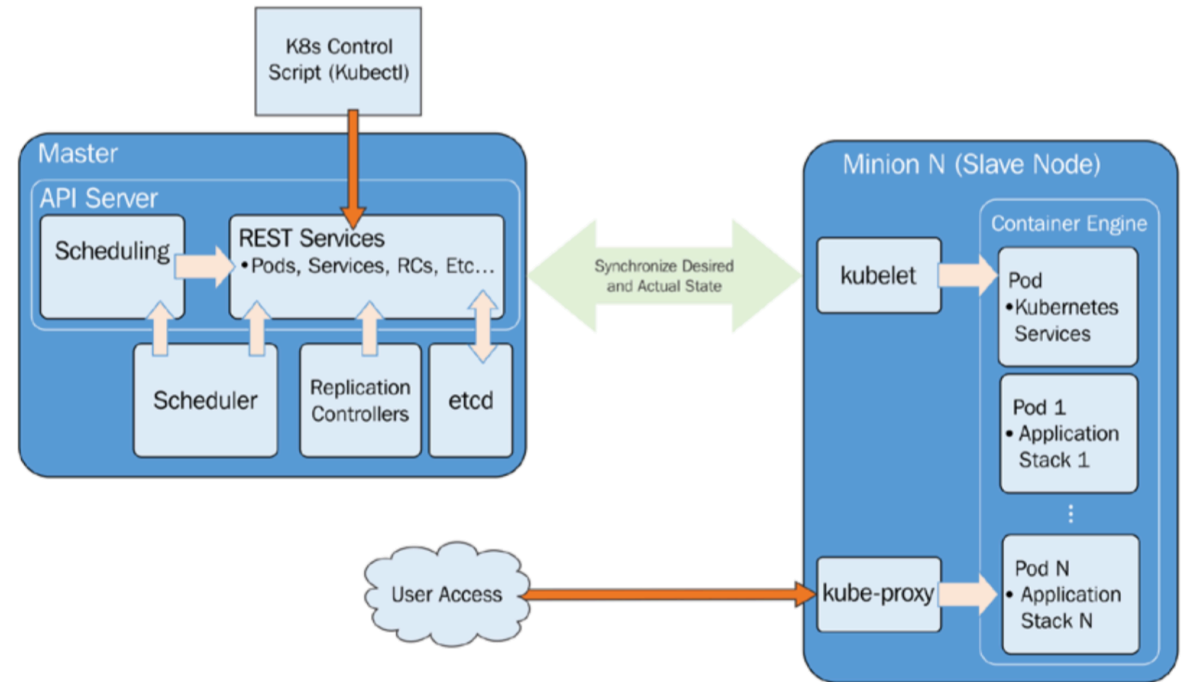
Kubernetes Components

- **Clusters** – group of nodes in a flat network
- **Pods** – colocation of applications that share volumes and networks ideal for run-once jobs
- **Replication Controllers** – ensures desired state of a set of pods based on user-defined template based on labels and status updates
- **Services** – cluster-wide service discovery, basic load balancing, addressing services (name, port)
- **Labels** – similar to tags (environment=production, role=frontend etc.)



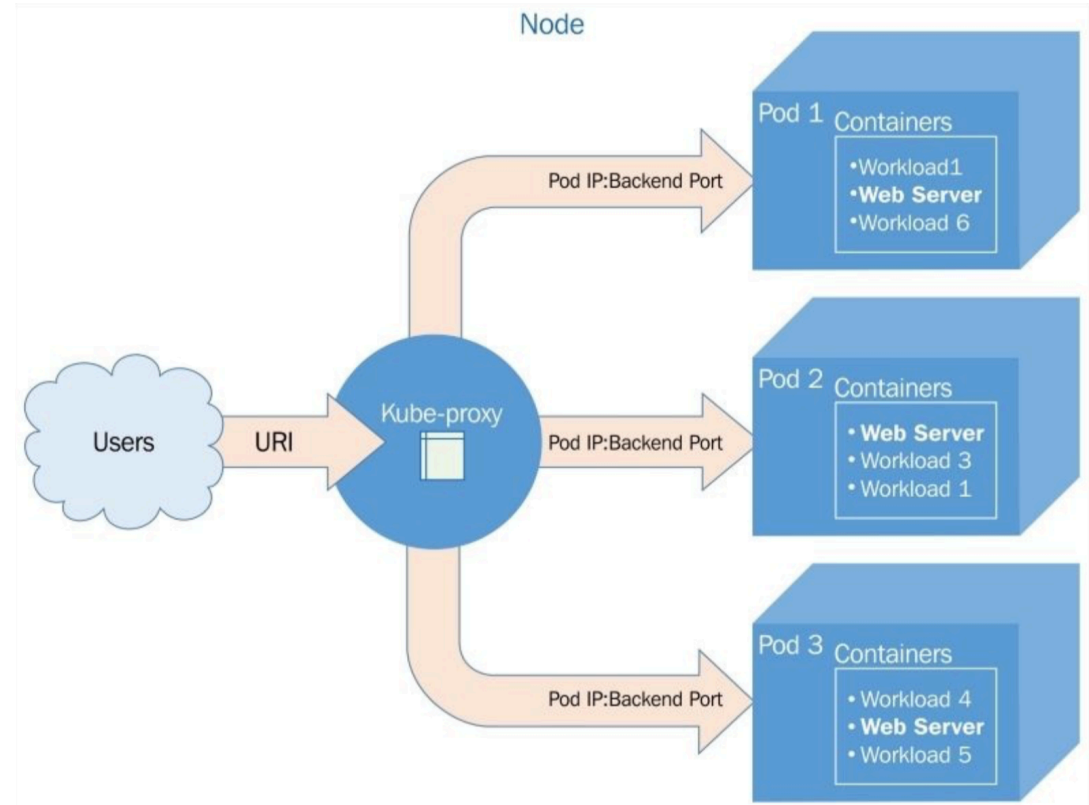
The Kubernetes Control Plane

- **etcd** – distributed, consistent key-value store for shared configuration and service discovery
- **Kubernetes API Server** – talks to etcd and presents RESTful API to manage services and pods
- **Scheduler** – watches API server for unscheduled pods and deploys them to healthy nodes
- **Controller Manager** – cluster-level functions in a single process



Kubernetes Nodes

- **Docker** – container runtime for deploying and managing the apps controlled via the API by the Kubelet
- **Kubelet** – runs on each node to expose resource utilization and health status. Watches API server for pods to be scheduled
- **Proxy** – network access to the outside environment using TCP/UDP forwarding



What does Kubernetes solve?

- Application-centric architecture
- Centralized key-value store
- Distributed architecture across physical, virtual, and cloud environments
- Continuous state management per application
- Co-locating ad hoc jobs and long-running services
- Composable infrastructure
- Same infrastructure from dev to prod



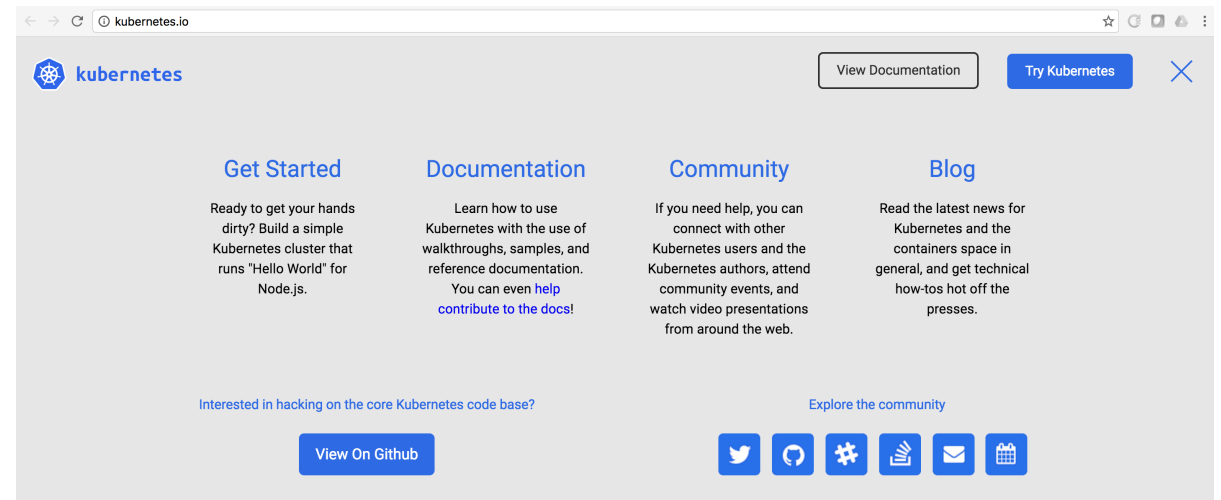
Kubernetes Challenges You Will Face

- Application readiness
- Staff expertise – we are all catching up
- Reliable network and services stack (DNS etc.) to handle volatility
- People, Process, Technology in that order



How to find out more about Kubernetes

- **kubernetes.io** – the authoritative source for releases, docs, and more
- **Kubernetes Up and Running** by Kelsey Hightower (available Dec 25, 2016)
- Meetups
- Lots of content on YouTube
- @KelseyHightower on Twitter



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Thank you from the team at Turbonomic!