Cluster Administration

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Lower-level detail relevant to creating or administering a Kubernetes cluster.

The cluster administration overview is for anyone creating or administering a Kubernetes cluster. It assumes some familiarity with core Kubernetes concepts.

Planning a cluster

See the guides in Setup for examples of how to plan, set up, and configure Kubernetes clusters. The solutions listed in this article are called *distros*.

Note:

Not all distros are actively maintained. Choose distros which have been tested with a recent version of Kubernetes.

Before choosing a guide, here are some considerations:

- Do you want to try out Kubernetes on your computer, or do you want to build a high-availability, multi-node cluster? Choose distros best suited for your needs.
- Will you be using **a hosted Kubernetes cluster**, such as Google Kubernetes Engine, or **hosting your own cluster**?
- Will your cluster be **on-premises**, or **in the cloud (IaaS)**? Kubernetes does not directly support hybrid clusters. Instead, you can set up multiple clusters.
- **If you are configuring Kubernetes on-premises**, consider which networking model fits best.
- Will you be running Kubernetes on **"bare metal" hardware** or on **virtual machines (VMs)**?
- Do you **want to run a cluster**, or do you expect to do **active development of Kubernetes project code**? If the latter, choose an actively-developed distro. Some distros only use binary releases, but offer a greater variety of choices.
- Familiarize yourself with the components needed to run a cluster.

Managing a cluster

- Learn how to manage nodes.
    - Read about Node autoscaling.
- Learn how to set up and manage the resource quota for shared clusters.

Securing a cluster

- Generate Certificates describes the steps to generate certificates using different tool chains.
- Kubernetes Container Environment describes the environment for Kubelet managed containers on a Kubernetes node.
- Controlling Access to the Kubernetes API describes how Kubernetes implements access control for its own API.
- Authenticating explains authentication in Kubernetes, including the various authentication options.
- Authorization is separate from authentication, and controls how HTTP calls are handled.
- Using Admission Controllers explains plug-ins which intercepts requests to the Kubernetes API server after authentication and authorization.
- Admission Webhook Good Practices provides good practices and considerations when designing mutating admission webhooks and validating admission webhooks.
- Using Sysctls in a Kubernetes Cluster describes to an administrator how to use the `sysctl` command-line tool to set kernel parameters .
- Auditing describes how to interact with Kubernetes' audit logs.

Securing the kubelet

- Control Plane-Node communication
- TLS bootstrapping
- Kubelet authentication/authorization

Optional Cluster Services

- DNS Integration describes how to resolve a DNS name directly to a Kubernetes service.
- Logging and Monitoring Cluster Activity explains how logging in Kubernetes works and how to implement it.
