Effective Deployment and Management of Kubernetes

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Different ways to install k8s

More of a compilation

No one right way

Pick your poison

YMMV

About me

Full stack developer working with k8s for last 5 years

Built a k8s based PaaS: https://www.shapeblock.com/

Criteria

Infra as code

Provider specific nuances

Can be automated

Community

Lifecycle management

Flavour of Kubernetes

Flavours of k8s

Managed

Unmanaged

Specialized(OKD, Tanzu, Rancher)

eksctl

Also includes azure,gcloud and doctl

infra as code

Best works for managed k8s providers

https://github.com/eksctl-io/eksctl/tree/main/examples

AWS only

Kubeadm

Minimal tool

One step above manual setup

Doesn’t create infra

No lifecycle management

Kops

Helps in creation of unmanaged production grade clusters

Works with any cloud provider(some are in alpha/beta)

High degree of configurability

Useful if you want to tailor your k8s down to the OS/architecture

Not useful for managed K8s clusters

Kubespray

Combination of Ansible + Kubeadm

Doesn’t create infrastructure*

Highly customizable

Not useful for managed K8s clusters

Terraform

Least common denominator for all managed kubernetes providers

Infra as code at its best

Ex: https://aws-ia.github.io/terraform-aws-eks-blueprints/

Better than using the CLI tools if you're on Azure/GCP

Not useful for unmanaged K8s clusters

Some teams not comfortable with HCL

ClusterAPI

Treat your cluster as a Kubernetes resource!

Great community support

Works for both managed and unmanaged Kubernetes clusters

Pure gitops

Hard to debug

Needs a management cluster to work(but how to manage this cluster?!)

Honourable mentions

More like: I have heard good things about it, but haven’t tried yet.

Rancher

UI+CLI to manage clusters and apps in clusters

Provisions RKE

Only unmanaged clusters

Crossplane

Similar to clusterAPI

Lot of semantics added in

Provisions and manages other resources too

https://www.youtube.com/watch?v=IzBWIhYC5_E

Pulumi

Infra as code similar to Tf, but without all the HCL madness

Works with both managed and unmanaged Kubernetes

Smaller community

Testing Kubernetes waters

Aka all this is complex, show me something simpler

Microk8s

Canonical backed Kubernetes distribution

Production grade

Easy to install, upgrade

K3s

Suse backed lightweight Kubernetes

Production grade

https://github.com/alexellis/k3sup

Takeaways

TLDR;

Not a solved problem

Use managed Kubernetes provider if possible

You need infra as code even if you are the only developer

No need of fancy gitops unless you are managing > 10 clusters

Smaller Kubernetes distros like Microk8s and k3s are just as good as the big 3

Obvious but not followed often: if you have to choose between 2, pick the one with a bigger community

Fin

Questions