

KUBERNETES SIMPLIFIED

A **VISUAL GUIDE** ON KUBERNETES
BY PAVAN GUDIWADA

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The Book

This Book is a collection of the simplified Kubernetes guides I made in the past few months. I will be improving as I make more guides.

Acknowledgments

- ★ Saiyam Pathak ([@SaiyamPathak](#)) - Your continuous support made this possible.
- ★ Ankit Mehta ([@ankyitm](#)) - Thank you for believing and encouraging me to do more.
- ★ JJ Thompson ([@samjn08](#)) - For the amazing book cover.
- ★ Everyone that supported me and my content.

About the Author

I am an Azure DevOps Engineer and FOSS lover. I Started making these visuals as a challenge to simplify what I learn. The love from the Cloud Native and Kubernetes community was overwhelmingly positive. These days I contribute to [Kubesimplify](#) as an editor and also help the team with managing projects.

I also write blogs and share everything I learn in public. Ankit and I host Community calls about Azure, Kubernetes and cloud in general. I'm always open for a chance to speak in public or contribute to the community.

My content

Twitter - [@pavangudiwada](#)

Linkedin - [pavangudiwada](#)

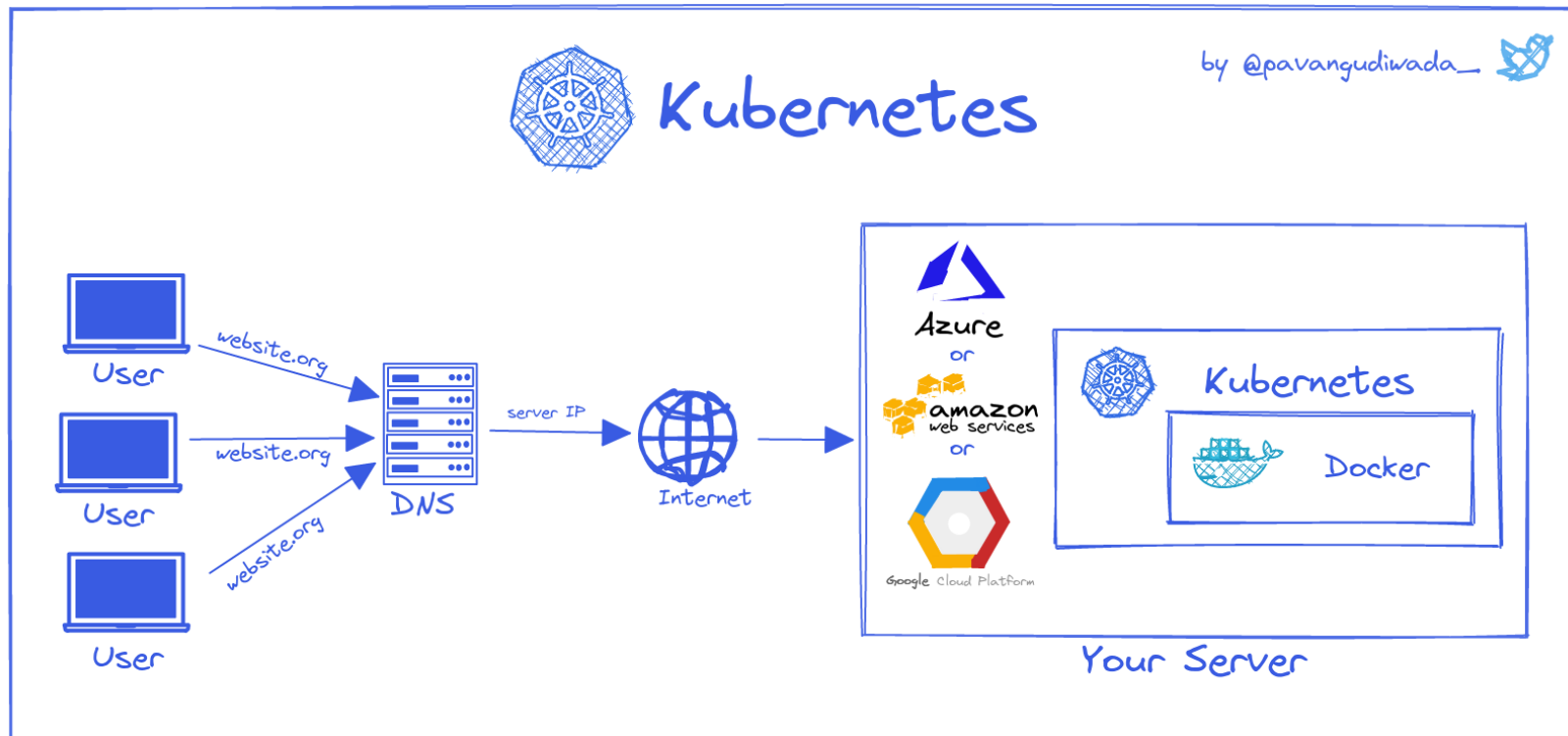
Github - [pavangudiwada](#)

Hashnode - [pavangudiwada.hashnode.dev](#)

Kubernetes Basics

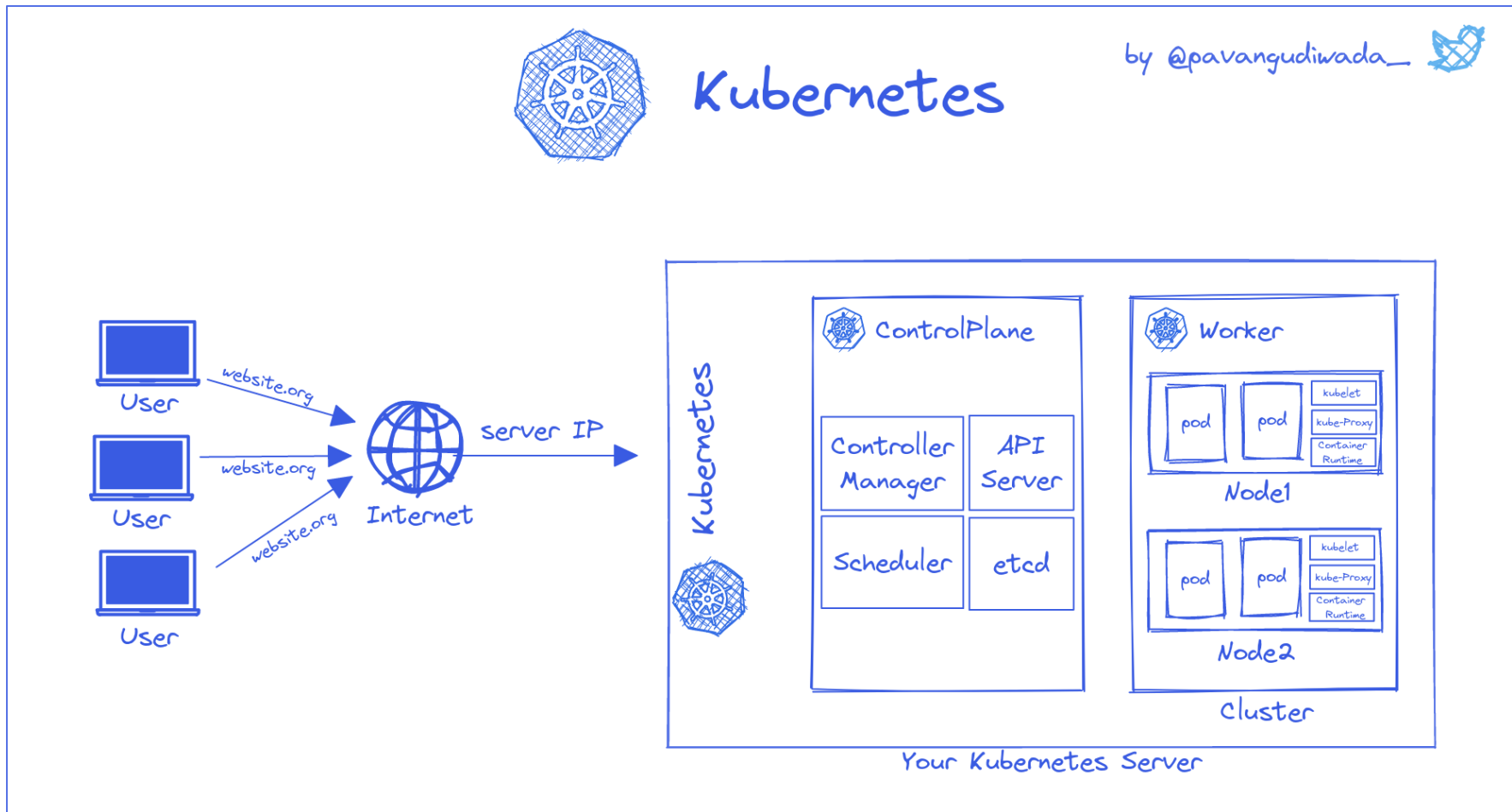
Kubernetes-as-a-Service

- You can self-host your own kubernetes cluster or use one of the Kubernetes-as-a-Service(KaaS) offered by cloud providers.
- When you use KaaS, you don't have to worry about managing the Kubernetes Control Plane.
- If you are a large enterprise and want to achieve a Highly available Kubernetes Cluster, KaaS can benefit you a lot.
- "Docker" is one of the container Runtimes for Kubernetes and you don't have to always use it.



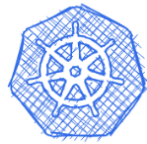
Inside KaaS

- Regardless of you using Kubernetes-as-a-Service, your data is sent to a server configured with Kubernetes.
- There can be one or more nodes in a cluster. You can also use a single node as your Control Plane and worker Node.
- If you are learning Kubernetes locally, you can use a single node cluster to practice. Eg: [Minikube](#).



Kubernetes Nodes

Node Basics



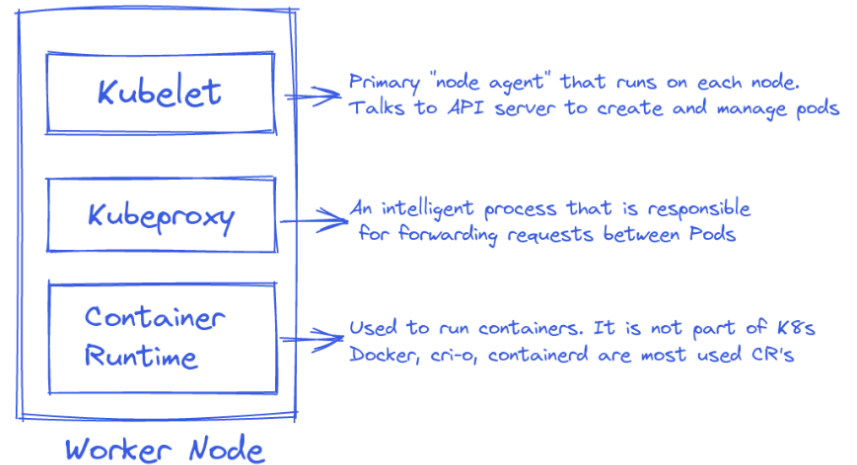
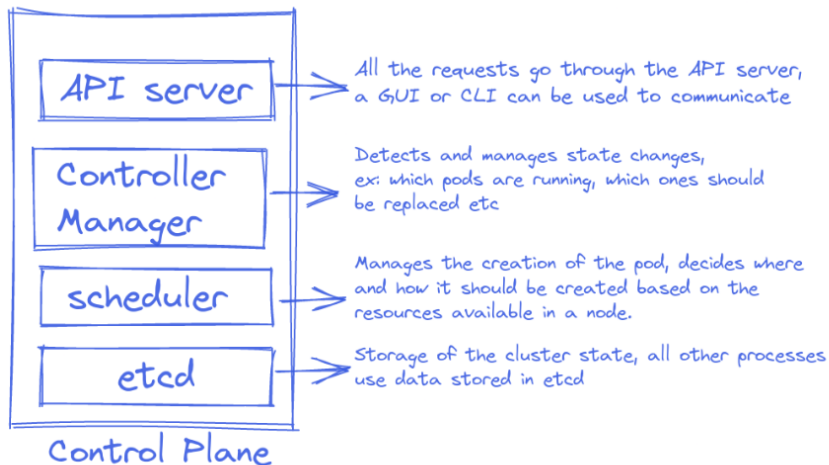
Kubernetes Nodes

What is a Node?

- * It's a physical or virtual machine with Kubernetes installed.
- * Node manages all the pods with containers in them.
- * A group of nodes is called a cluster.
- * There are two types of nodes: control plane and Worker node.
- * You can create and modify Node objects using kubectl.

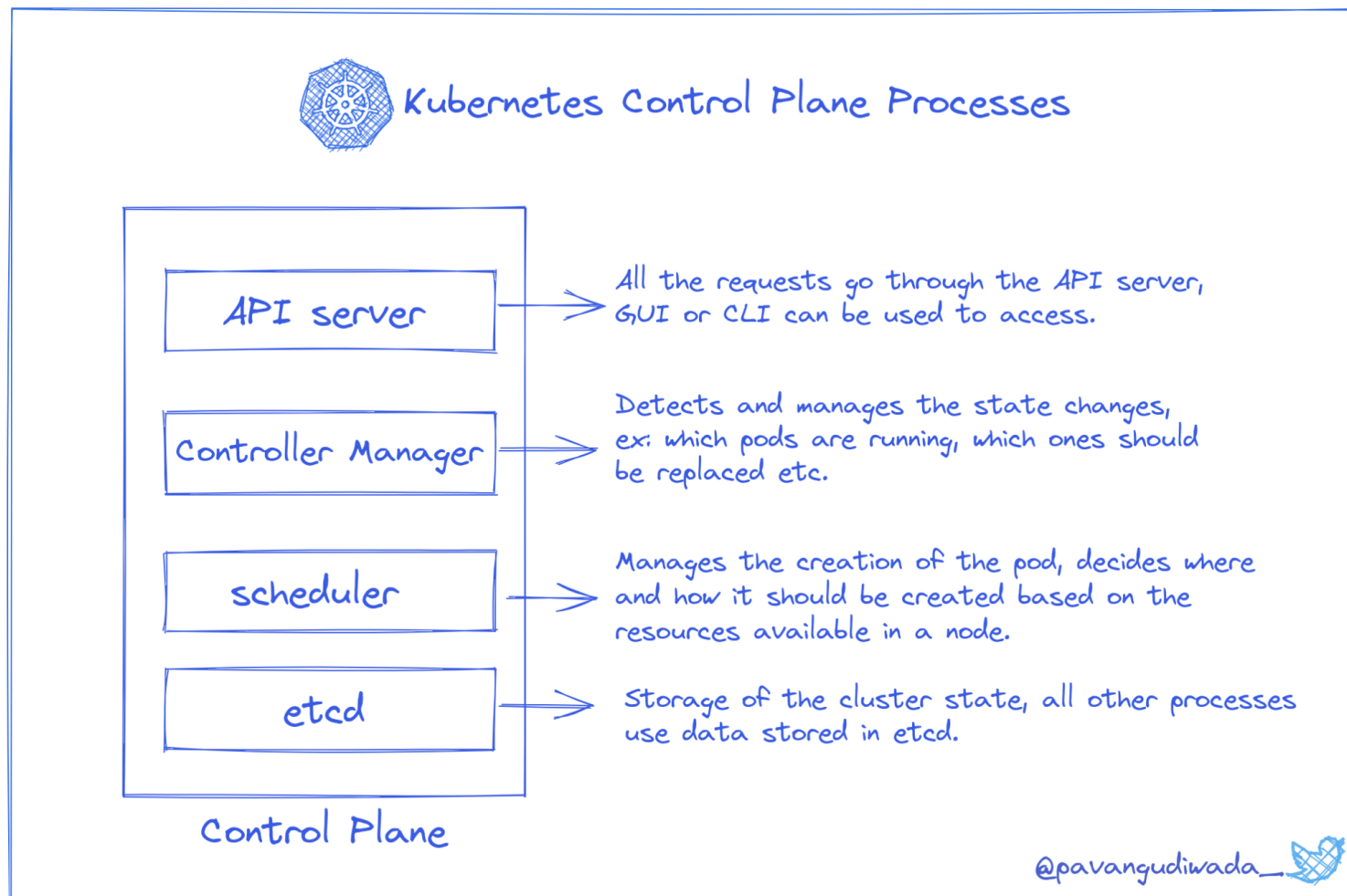
Useful Commands

<code>kubectl top node</code>	Node resource usage
<code>kubectl get nodes</code>	Displays all the nodes
<code>kubectl delete node <Node-Name></code>	Delete a node
<code>kubectl describe node <Node-Name></code>	Node status and details



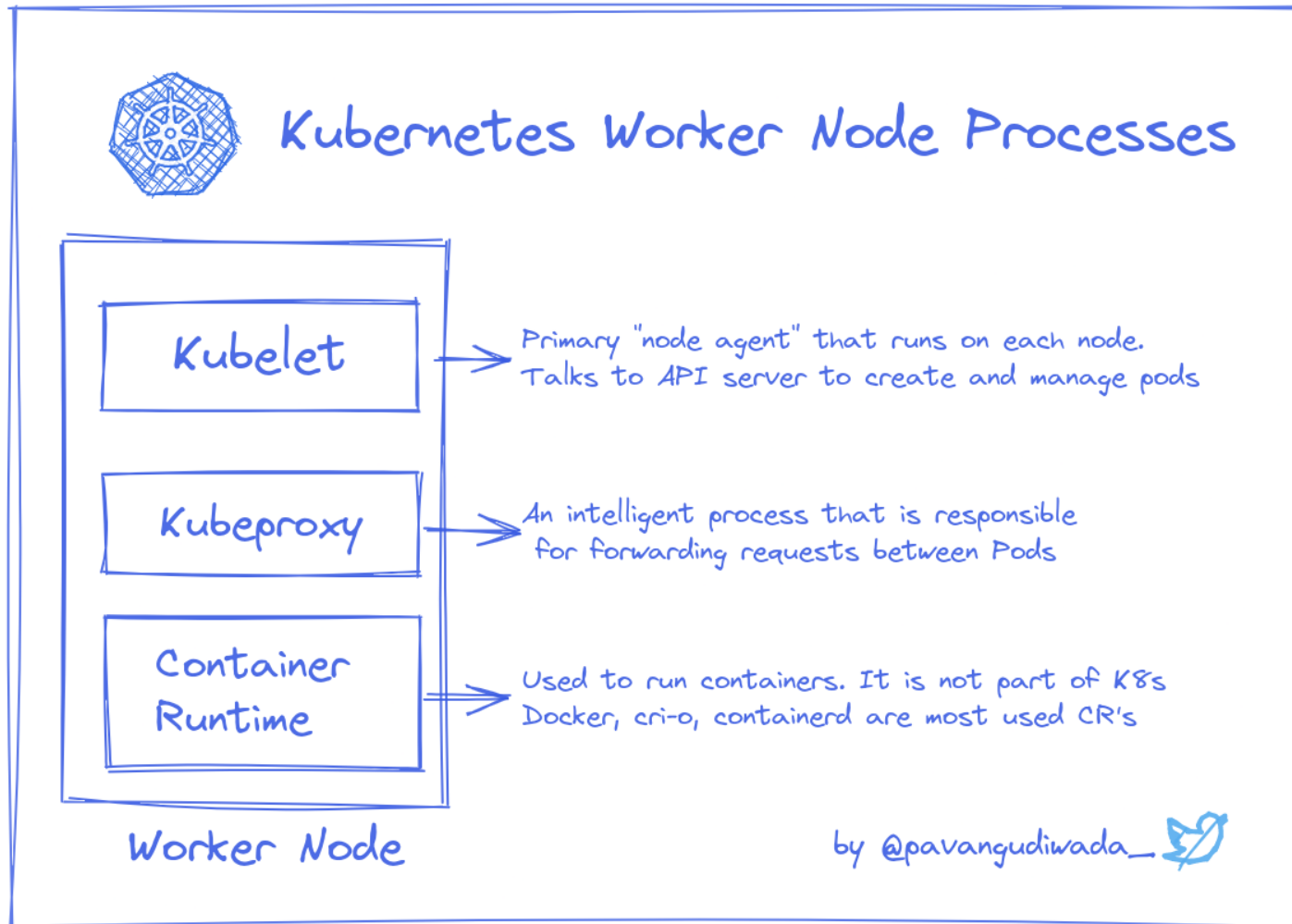
Control Plane Processes

- Control plane manages your cluster and all of your worker nodes.
- You will create a control plane and then connect your worker nodes to it.
- More than one Control Planes can be used to achieve a Highly Available cluster.



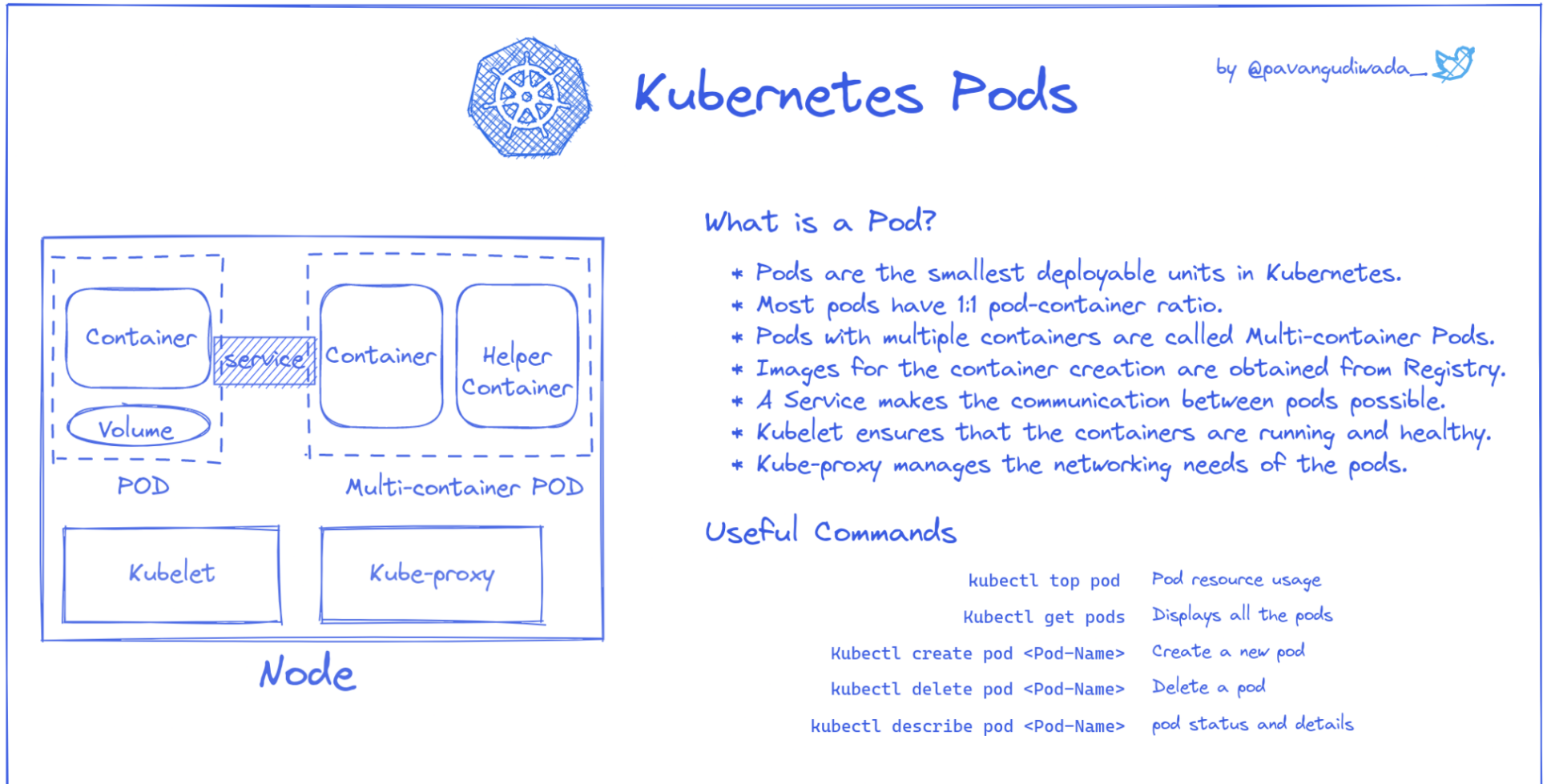
Worker Node Processes

- Your applications are scheduled on the worker node by the "Scheduler".
- Networking inside the cluster is done using a Cluster Network Interface. Eg: [Calico](#).



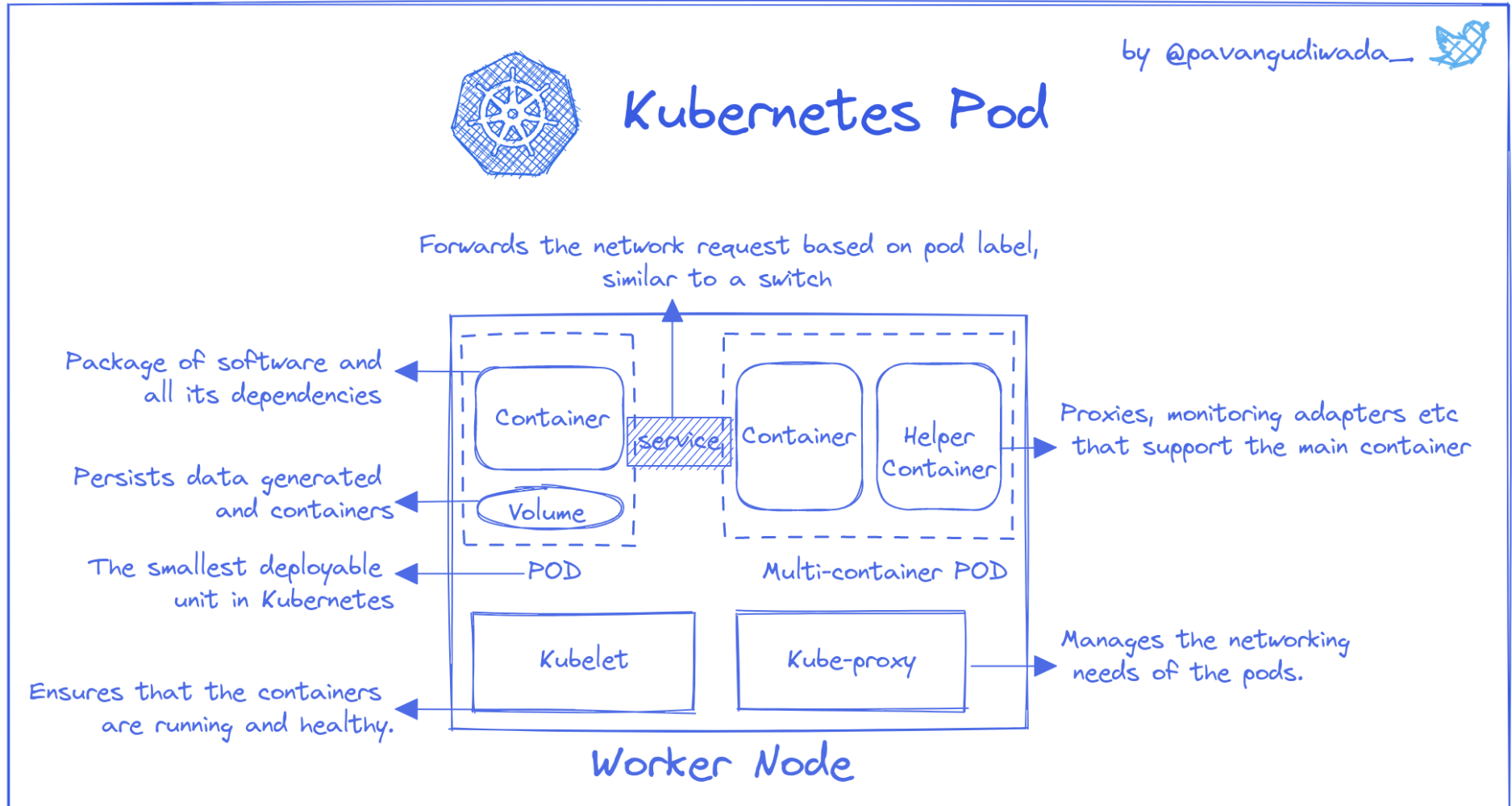
Kubernetes Pods

Pod



Pod components

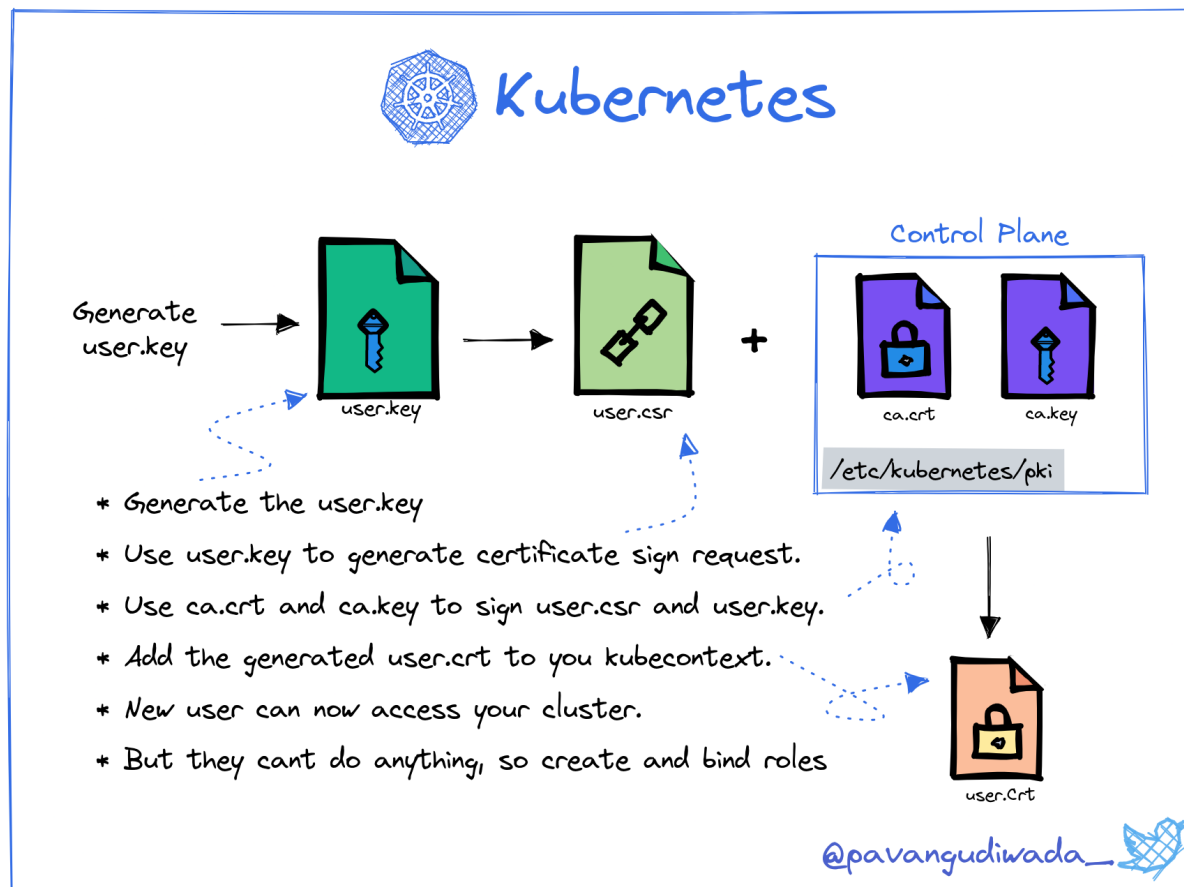
- A Kubernetes Pod can have multiple containers that run before the main container is started.
- They can be used to check the health, initialize volumes etc.



Kubernetes RBAC

Certificate Creation

- Kubernetes uses Certificates to authenticate users. This is called Role Based Access Control(RBAC).
- When a control plane is initialized the Certificate Authority generated certificates are stored and used to validate users.

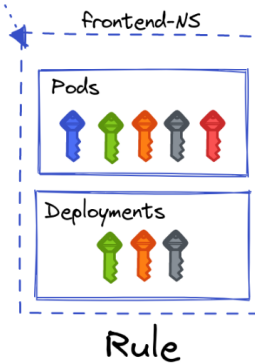


Role

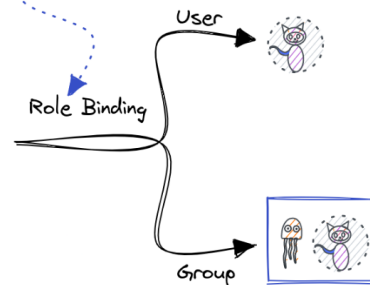
Kubernetes Role

What is it?

- * Role is part of RBAC, it is a collection of rules.
- * It is limited to one or more namespaces.
- * "Verbs" are the actions that a user can perform.
- * "Rule" is a collection of objects and verbs.
- * Assign the role to a user or group using "Role Binding".



+ frontenddev
Role



ClusterRole

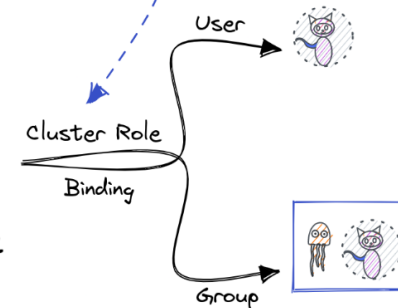
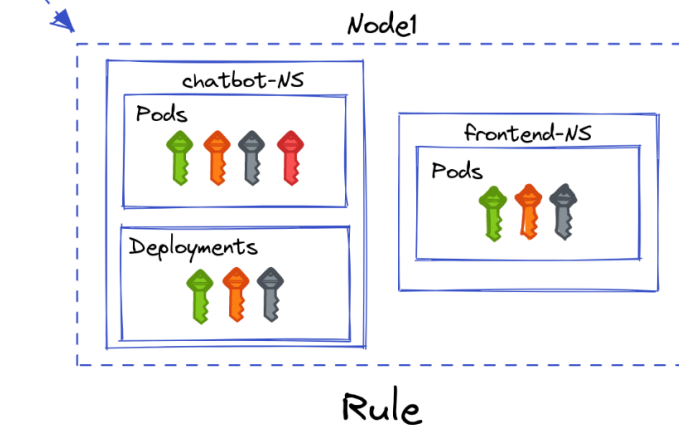


Kubernetes ClusterRole

What is it?

- * ClusterRole is part of RBAC, it is a collection of rules.
- * It is cluster-scoped and can include one or more nodes.
- * "Verbs" are the actions that a user can perform.
- * "Rule" is a collection of objects and verbs.
- * Assign a ClusterRole to a user or group using "ClusterRole Binding".

Verbs



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- ★ Website - [Kubesimplify.com](https://kubesimplify.com)
- ★ Youtube channel - [Kubesimplify](https://www.youtube.com/channel/UCv8v8v8v8v8v8v8v8v8v8v8)
- ★ Github - [Kubesimplify](https://github.com/kubesimplify)
- ★ Discord - [Kubesimplify](https://discord.com/invite/kubesimplify)

Contact Me

If you would like to have such visuals created for your product, reach out to me here -

- ★ Email - pavangudiwada@proton.me
- ★ Twitter - [@pavangudiwada](https://twitter.com/pavangudiwada)
- ★ LinkedIn - [pavangudiwada](https://www.linkedin.com/in/pavangudiwada)