Important Docker, Docker Compose, Minikube, and Kubectl Commands

This document provides a comprehensive reference to the most important and frequently used commands for Docker, Docker Compose, Minikube, and Kubectl. Each command is accompanied by a brief description, its syntax, and practical examples to facilitate understanding and quick reference. This guide is intended for developers, system administrators, and anyone working with containerization and Kubernetes.

Docker Commands

`docker run`

Description: Runs a command in a new container. **Syntax:** `docker run [OPTIONS] IMAGE [COMMAND] [ARG...]` **Example:** `docker run -p 80:80 --name my-nginx nginx` (Runs an Nginx container, mapping port 80 of the host to port 80 of the container, and names the container 'my-nginx')

`docker ps`

Description: Lists containers. **Syntax:** `docker ps [OPTIONS]` **Example:** `docker ps -a` (Lists all containers, including stopped ones)

`docker images`

Description: Lists images. **Syntax:** `docker images [OPTIONS]` **Example:** `docker images` (Lists all Docker images)

`docker pull`

Description: Pulls an image or a repository from a registry. **Syntax:** `docker pull [OPTIONS] NAME[:TAG|@DIGEST]` **Example:** `docker pull ubuntu:latest` (Pulls the latest Ubuntu image)

`docker stop`

Description: Stops one or more running containers. **Syntax:** `docker stop [OPTIONS] CONTAINER [CONTAINER...]` **Example:** `docker stop my-nginx` (Stops the container named 'my-nginx')

`docker start`

Description: Starts one or more stopped containers. **Syntax:** `docker start [OPTIONS] CONTAINER [CONTAINER...]` **Example:** `docker start my-nginx` (Starts the container named 'my-nginx')

`docker restart`

Description: Restarts one or more containers. **Syntax:** `docker restart [OPTIONS] CONTAINER [CONTAINER...]` **Example:** `docker restart my-nginx` (Restarts the container named 'my-nginx')

`docker rm`

Description: Removes one or more containers. **Syntax:** `docker rm [OPTIONS] CONTAINER [CONTAINER...]` **Example:** `docker rm my-nginx` (Removes the container named 'my-nginx')

`docker rmi`

Description: Removes one or more images. **Syntax:** `docker rmi [OPTIONS] IMAGE [IMAGE...]` **Example:** `docker rmi ubuntu:latest` (Removes the Ubuntu latest image)

`docker exec`

Description: Runs a command in a running container. **Syntax:** `docker exec [OPTIONS] CONTAINER COMMAND [ARG...]` **Example:** `docker exec -it my-nginx bash` (Executes a bash shell inside the 'my-nginx' container)

`docker build`

Description: Builds an image from a Dockerfile and a context. **Syntax:** `docker build [OPTIONS] PATH | URL | -` **Example:** `docker build -t my-app .` (Builds an image named 'my-app' from the current directory's Dockerfile)

`docker login`

Description: Log in to a Docker registry. **Syntax:** `docker login [OPTIONS] [SERVER]` **Example:** `docker login` (Logs in to Docker Hub)

`docker logout`

Description: Log out from a Docker registry. **Syntax:** `docker logout [SERVER]` **Example:** `docker logout` (Logs out from Docker Hub)

`docker push`

Description: Push an image or a repository to a registry. **Syntax:** `docker push [OPTIONS] NAME[:TAG]` **Example:** `docker push myuser/my-app:latest` (Pushes the 'my-app' image to Docker Hub)

`docker network`

Description: Manage Docker networks. **Syntax:** `docker network [COMMAND]` **Example:** `docker network ls` (Lists all Docker networks)

`docker volume`

Description: Manage Docker volumes. **Syntax:** `docker volume [COMMAND]` **Example:** `docker volume ls` (Lists all Docker volumes)

`docker info`

Description: Display system-wide information. **Syntax:** `docker info [OPTIONS]` **Example:** `docker info` (Displays Docker system information)

`docker version`

Description: Show the Docker version information. **Syntax:** `docker version [OPTIONS]` **Example:** `docker version` (Shows Docker version information)

Docker Compose Commands

`docker compose up`

Description: Builds, (re)creates, starts, and attaches to containers for a service. **Syntax:** `docker compose up [OPTIONS] [SERVICE...]` **Example:** `docker compose up -d` (Starts all services defined in `docker-compose.yml` in detached mode)

`docker compose down`

Description: Stops and removes containers, networks, images, and volumes. **Syntax:** `docker compose down [OPTIONS]` **Example:** `docker compose down` (Stops and removes all services defined in `docker-compose.yml`)

`docker compose build`

Description: Builds or rebuilds services. **Syntax:** `docker compose build [OPTIONS] [SERVICE...]` **Example:** `docker compose build` (Builds images for all services)

`docker compose ps`

Description: Lists containers. **Syntax:** `docker compose ps [OPTIONS] [SERVICE...]` **Example:** `docker compose ps` (Lists all running services)

`docker compose start`

Description: Starts existing containers for a service. **Syntax:** `docker compose start [SERVICE...]` **Example:** `docker compose start web` (Starts the service named `web`)

`docker compose stop`

Description: Stops running containers without removing them. **Syntax:** `docker compose stop [SERVICE...]` **Example:** `docker compose stop web` (Stops the service named `web`)

`docker compose restart`

Description: Restarts containers for a service. **Syntax:** `docker compose restart [SERVICE...]` **Example:** `docker compose restart` (Restarts all services)

`docker compose exec`

Description: Executes a command in a running container. **Syntax:** `docker compose exec [OPTIONS] SERVICE COMMAND [ARGS...]` **Example:** `docker compose exec web bash` (Executes a bash shell inside the `web` service container)

`docker compose logs`

Description: Displays log output from services. **Syntax:** `docker compose logs [OPTIONS] [SERVICE...]` **Example:** `docker compose logs -f` (Follows log output for all services)

`docker compose config`

Description: Validates and views the Compose file. **Syntax:** `docker compose config [OPTIONS]` **Example:** `docker compose config` (Shows the validated configuration)

Minikube Commands

`minikube start`

Description: Starts a local Kubernetes cluster. **Syntax:** `minikube start [OPTIONS]` **Example:** `minikube start` (Starts the Minikube cluster)

`minikube stop`

Description: Stops the local Kubernetes cluster. **Syntax:** `minikube stop` **Example:** `minikube stop` (Stops the Minikube cluster)

`minikube delete`

Description: Deletes the local Kubernetes cluster. **Syntax:** `minikube delete` **Example:** `minikube delete` (Deletes the Minikube cluster)

`minikube status`

Description: Gets the status of the local Kubernetes cluster. **Syntax:** `minikube status` **Example:** `minikube status` (Checks the status of the Minikube cluster)

`minikube dashboard`

Description: Enables the Kubernetes dashboard. **Syntax:** `minikube dashboard` **Example:** `minikube dashboard` (Opens the Kubernetes dashboard in the browser)

`minikube ip`

Description: Retrieves the IP address of the Minikube cluster. **Syntax:** `minikube ip` **Example:** `minikube ip` (Displays the IP address of the Minikube cluster)

`minikube addons enable`

Description: Enables a Minikube addon. **Syntax:** `minikube addons enable <addon-name>` **Example:** `minikube addons enable ingress` (Enables the ingress addon)

`minikube addons disable`

Description: Disables a Minikube addon. **Syntax:** `minikube addons disable <addon-name>` **Example:** `minikube addons disable ingress` (Disables the ingress addon)

`minikube ssh`

Description: Logs into the Minikube VM using SSH. **Syntax:** `minikube ssh` **Example:** `minikube ssh` (Connects to the Minikube VM via SSH)

`minikube service`

Description: Returns the URL of a service running in the Minikube cluster. **Syntax:** `minikube service <service-name>` **Example:** `minikube service my-service` (Gets the URL for the service named `my-service`)

Kubectl Commands

`kubectl get`

Description: Displays one or many resources. **Syntax:** `kubectl get [RESOURCE] [NAME] [OPTIONS]` **Example:** `kubectl get pods` (Lists all pods in the current namespace) **Example:** `kubectl get nodes` (Lists all nodes in the cluster) **Example:** `kubectl get services` (Lists all services in the current namespace)

`kubectl describe`

Description: Show details of a specific resource or group of resources. **Syntax:** `kubectl describe [RESOURCE] [NAME] [OPTIONS]` **Example:** `kubectl describe pod my-pod` (Shows detailed information about the pod named `my-pod`)

`kubectl apply`

Description: Apply a configuration to a resource by filename or stdin. **Syntax:** `kubectl apply -f FILENAME` **Example:** `kubectl apply -f my-deployment.yaml` (Applies the configuration defined in `my-deployment.yaml`)

`kubectl delete`

Description: Delete resources by filename, stdin, resources and names, or resources and label selector. **Syntax:** `kubectl delete [RESOURCE] [NAME] [OPTIONS]` **Example:** `kubectl delete pod my-pod` (Deletes the pod named `my-pod`) **Example:** `kubectl delete -f my-deployment.yaml` (Deletes resources defined in `my-deployment.yaml`)

`kubectl exec`

Description: Execute a command in a container. **Syntax:** `kubectl exec [POD] [COMMAND] [OPTIONS]` **Example:** `kubectl exec -it my-pod -- bash` (Executes a bash shell inside the container of `my-pod`)

`kubectl logs`

Description: Print the logs for a container in a pod. **Syntax:** `kubectl logs [POD] [CONTAINER] [OPTIONS]` **Example:** `kubectl logs my-pod` (Displays logs for the pod named `my-pod`)

`kubectl create`

Description: Create a resource from a file or from stdin. **Syntax:** `kubectl create -f FILENAME` **Example:** `kubectl create deployment my-app --image=nginx` (Creates a deployment named `my-app` with the Nginx image)

`kubectl expose`

Description: Expose a replication controller, service, deployment or pod as a new Kubernetes service. **Syntax:** `kubectl expose [RESOURCE] [NAME] [OPTIONS]` **Example:** `kubectl expose deployment my-app --port=80 --type=NodePort` (Exposes the `my-app` deployment as a NodePort service on port 80)

`kubectl scale`

Description: Set a new size for a replication controller, deployment, or replicaset. **Syntax:** `kubectl scale --replicas=REPLICAS [RESOURCE] [NAME]` **Example:** `kubectl scale --replicas=3 deployment/my-app` (Scales the `my-app` deployment to 3 replicas)

`kubectl config`

Description: Modify kubeconfig files. **Syntax:** `kubectl config [COMMAND]` **Example:** `kubectl config view` (Displays the current kubeconfig configuration)

`kubectl cluster-info`

Description: Display cluster info. **Syntax:** `kubectl cluster-info` **Example:** `kubectl cluster-info` (Displays information about the cluster)

`kubectl top`

Description: Display resource (CPU/Memory/Storage) usage. **Syntax:** `kubectl top [RESOURCE] [NAME] [OPTIONS]` **Example:** `kubectl top nodes` (Displays CPU and memory usage for nodes) **Example:** `kubectl top pods` (Displays CPU and memory usage for pods)