Basic

Swarm is Docker's in built containers orchestrator solution, its main purpose is to manage containers in a computer cluster, i.e. a set of connected computers that work together.
Swarm comes built into the Docker Engine, you don't need to install anything to get started.

In Docker, there are many layers of encapsulation: the OS kernel, containers, tasks that encapsulate containers as units of work, services or Pods that represent application components, and stacks-(collection of services) that represent full applications.

docker swarm commands

docker swarm init	Initialize a swarm
docker swarm join --token<manager-token> 10.1.0.2:2377	Join an existing swarm as manager node
docker swarm join --token<worker-token> 10.1.0.2:2377	Join a swarm as a worker node
docker swarm leave	Leave the swarm

docker stack commands

docker stack deploy nodeapp -c docker-com-pose.yml	deploy the stack using docker-compose file , Swarm does not support the build option if defined in the Compose file(but docker compose up uses it).
docker stack ls	shows all stacks along with list of services in the stack
docker stack services <st-ack-name>	list the services in the stack.
docker stack ps <stack-name>	list all the tasks in the stack.
docker stack rm <stack-name>	removes the stack.

Manage Docker stacks(is a collection of services that make up an application in a specific environment).

docker service commands

docker service create --replicas 5 -p 80:80 --name web nginx	create docker service directly (similar to docker run command)
docker service logs [OPTIONS] SERVICE|TASK	Fetch the logs of a service or task, in option you can use -f,--d-etails etc
docker service ls	list all the services
docker service ps [OPTIONS] SERVICE [SERVICE...]	List the tasks of one or more services
docker service rm SERVICE [SERVICE...]	Remove one or more services
docker service scale SERVIC-E=REPLICAS [SERVICE=REP-LICAS...]	Scale one or multiple replicated services
docker service update [OPTIONS] SERVICE	Update a service

Manage services.Services in the swarm mode are actually object (when compared to the docker compose services where they are actual running services)

docker node commands

docker node ls	List nodes in the swarm
docker node ps	List tasks running on one or more nodes, defaults to current node
docker node rm [OPTIONS] NODE [NODE...]	Remove one or more nodes from the swarm
docker node demote NODE [NODE...]	Demote one or more nodes from manager in the swarm
docker node promote NODE [NODE...]	Promote one or more nodes to manager in the swarm

Common Terms/Key concepts

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Node	is a physical or virtual machine (running an instance of the Docker Engine.)
Manager nodes	perform swarm management and orchestration duties. By default manager nodes are also worker nodes.
Worker nodes	execute tasks.
Cluster	one or more nodes grouped together.
Swarm	is a type of cluster in docker terminology.
Docker Swarm	(not part of docker engine)is a separate product which you can use to cluster multiple Docker hosts. Prior to Docker version 1.12 it was the only native Docker option for clustering hosts, and it needed a lot of additional setup for distributed state, service discovery and security.
Swarm Mode	With Docker 1.12,(is built into Docker Engine) To run a cluster you just need to install Docker on multiple machines, run docker swarm init to switch to Swarm Mode and docker swarm join to add more nodes to the cluster. State, discovery and security are all included with zero setup.
Stack	is a collection of services that make up an application in a specific environment.
service	it defines the blueprint about which image to use and which commands to execute,ports,networks,replicas,etc inside future running containers.
task	in swarm model,task is actually invoked inside a container.When service is created the swarm manager starts a task(or its replicas) inside various containers.

Swarm service diagram
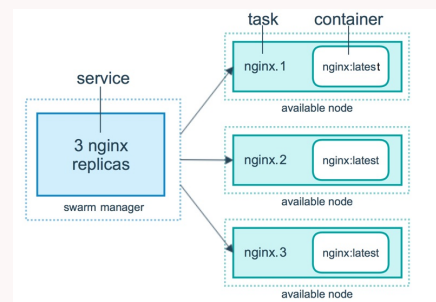
Application
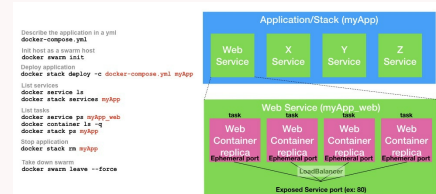
similar commands

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Init host as a swarm manager node:
docker swarm init
Deploy applic ation
docker stack deploy -c docker -co mpo se.yml myApp
List services:
docker service ls
docker stack services myApp
List tasks:
docker service ps myApp_web
docker container ls -q
docker stack ps myApp
Stop applic ation
docker stack rm myApp
Take down swarm
docker swarm leave --force
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