Docker Swarm

Alternatives:

- Kubernetes
- Mesosphere
- Apache Mesos
- ...

Swarm:

- Native (Docker, Inc.)
- Clusters many Docker hosts into a single large pool
- Simpler management at scale

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Basic Docker Architecture:

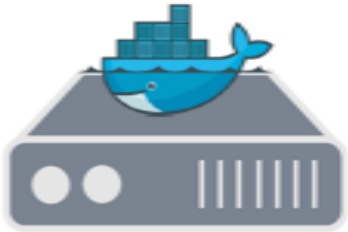
Client-server

Docker client

- Docker Engine client (native)
- 3rd party tools

commands

2375/tcp
(2376 TLS)



Docker daemon

- Docker Engine daemon (native)
- 3rd party tools

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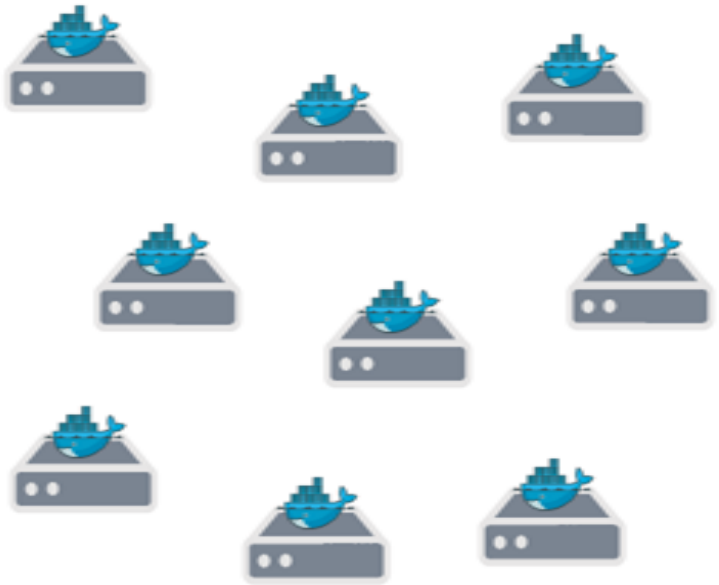
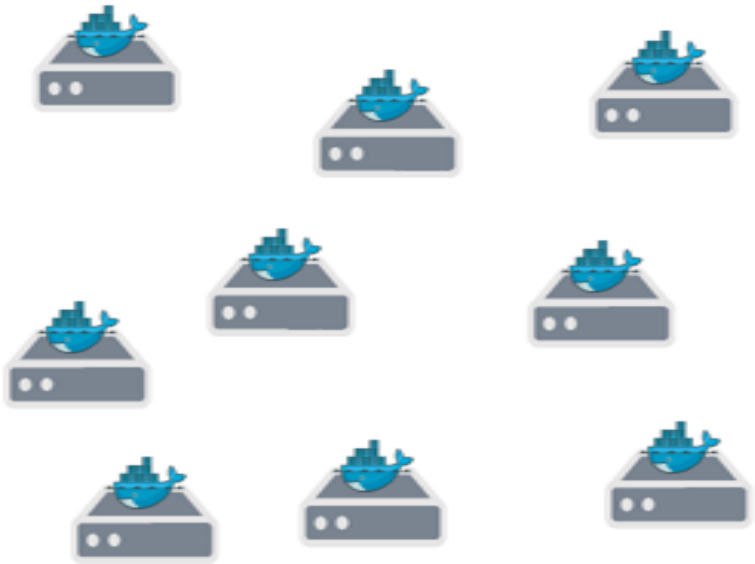
Scaling Challenges





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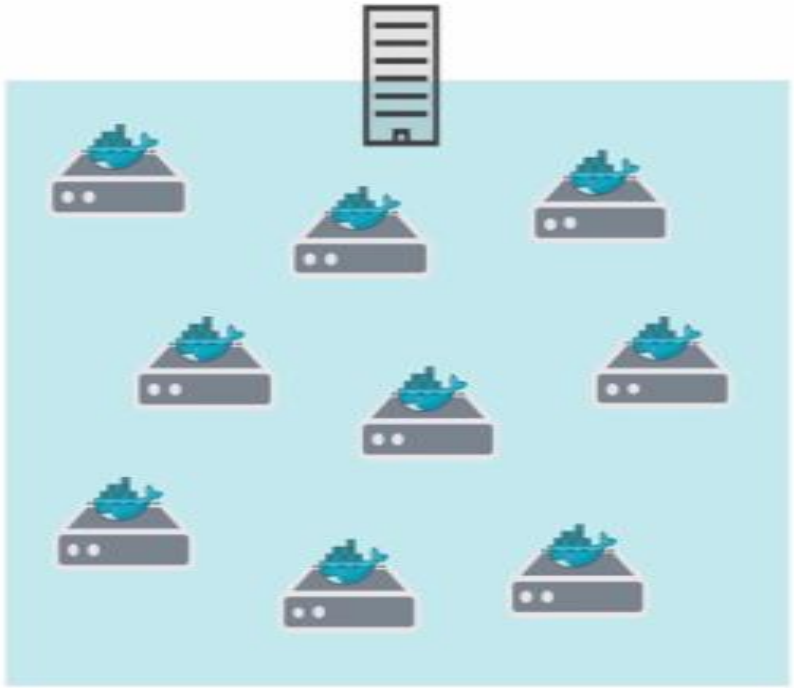
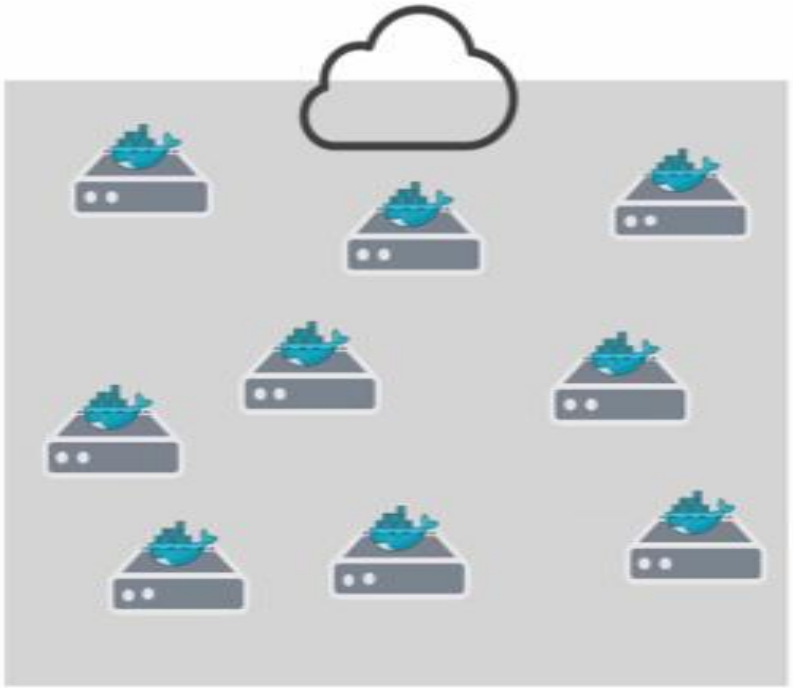
Scaling Challenges





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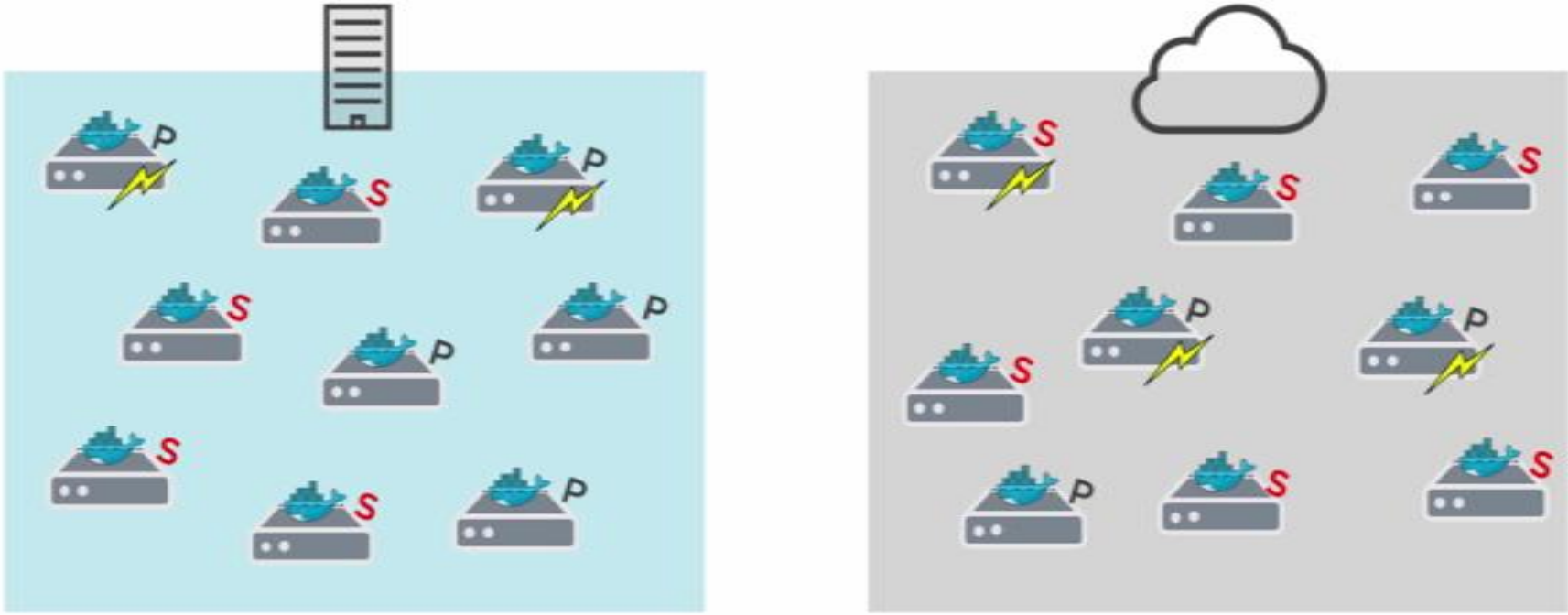
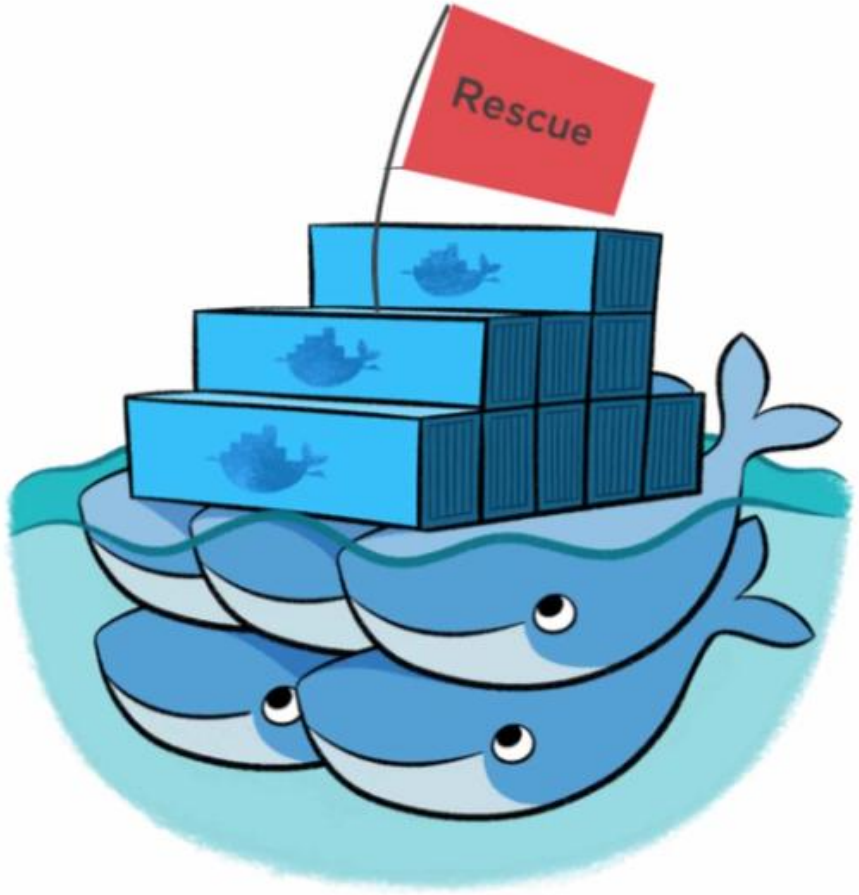
Scaling Challenges



On prem Cloud P Prod S Staging Fast storage



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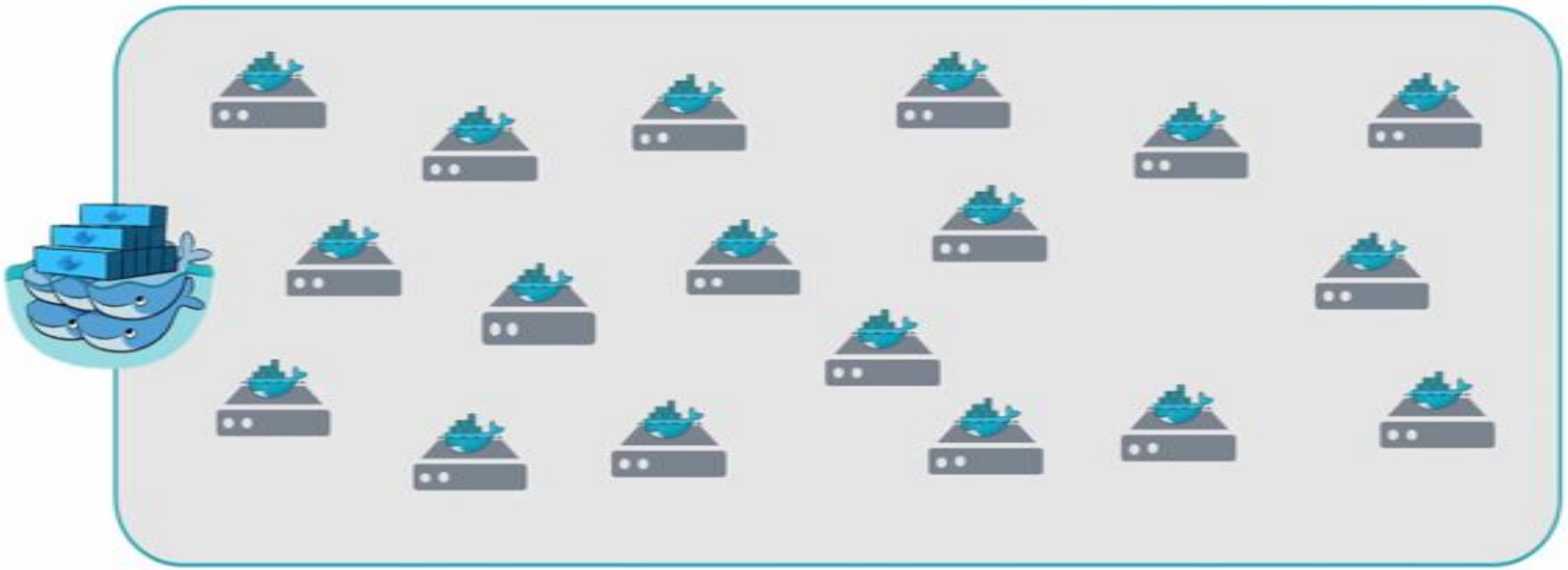
Scaling Challenges



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Scaling Challenges

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Architecture & Terminology

Discovery service

Swarm manager

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Discovery service

- Key-value store
- Stores cluster state and config
- Needed for the cluster to operate properly

Swarm manager

- Cluster admin
- Accepts Docker commands
- Executes commands on the cluster

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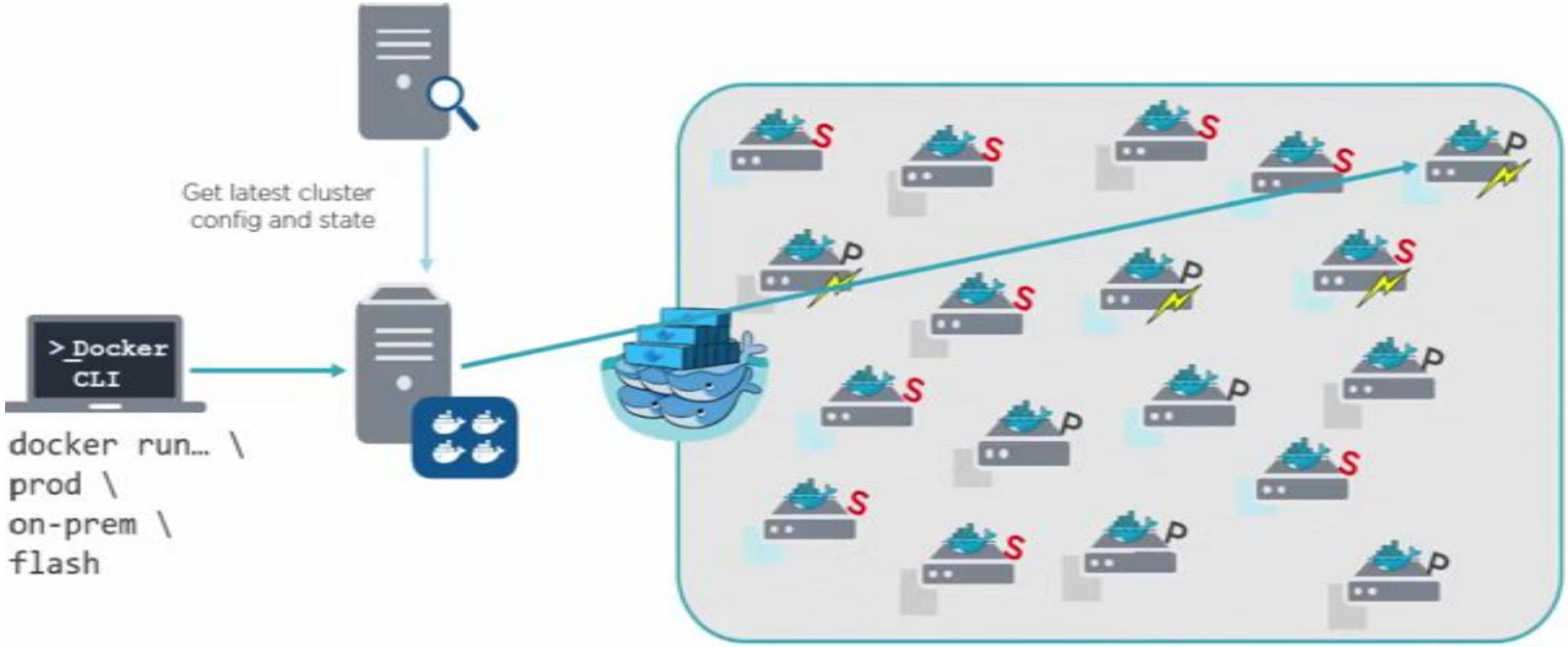

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Swarm Discovery Service

Supports a pluggable backend

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Filtering & Scheduling

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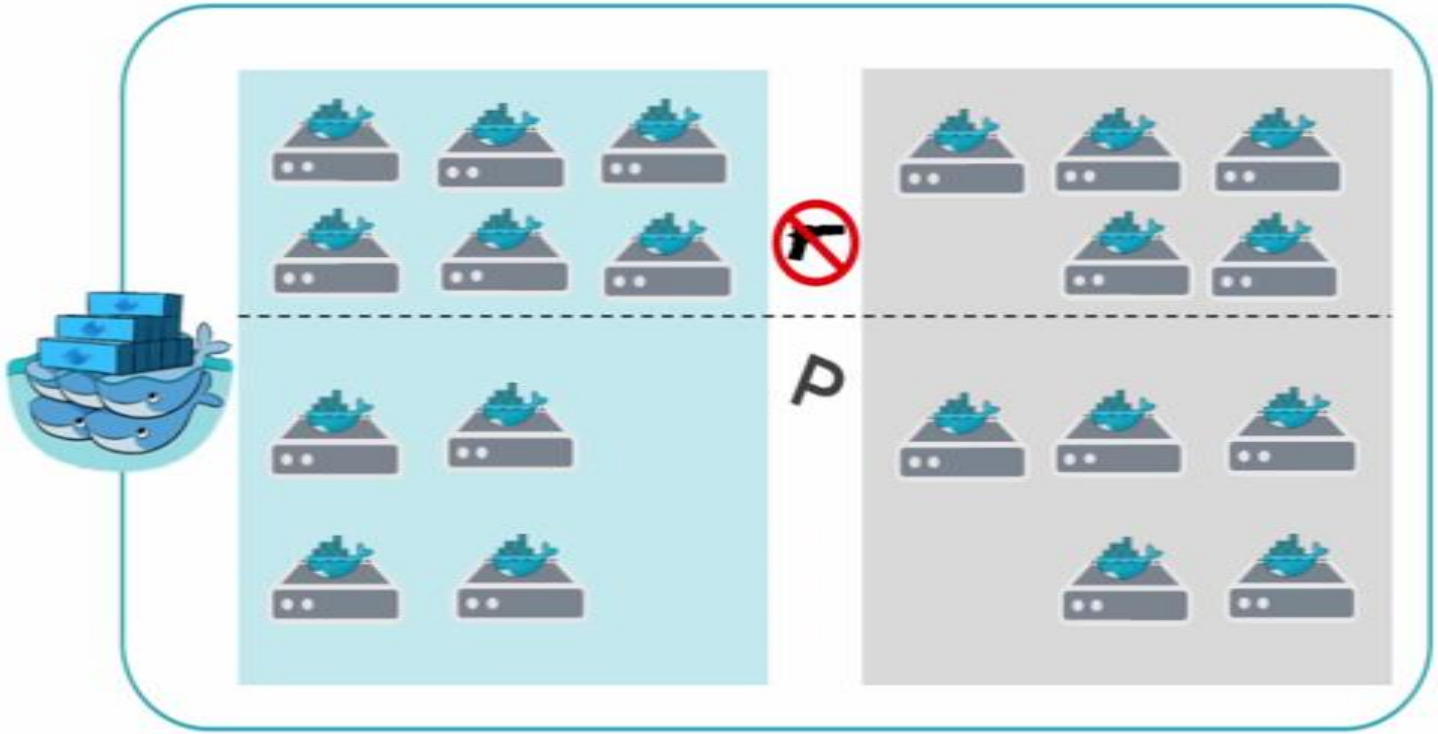
Filtering & Scheduling

Stage 1 Stage 2



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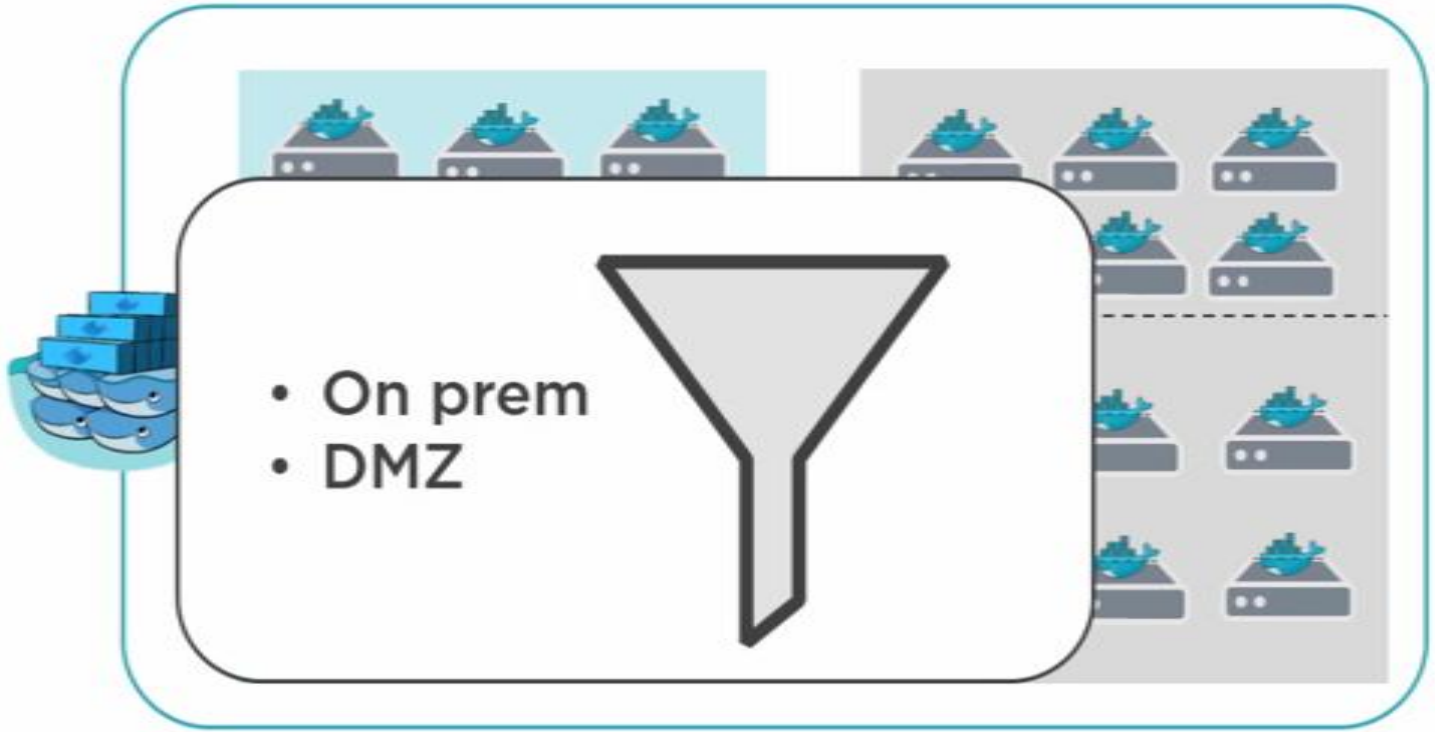
On prem Cloud P Prod DMZ



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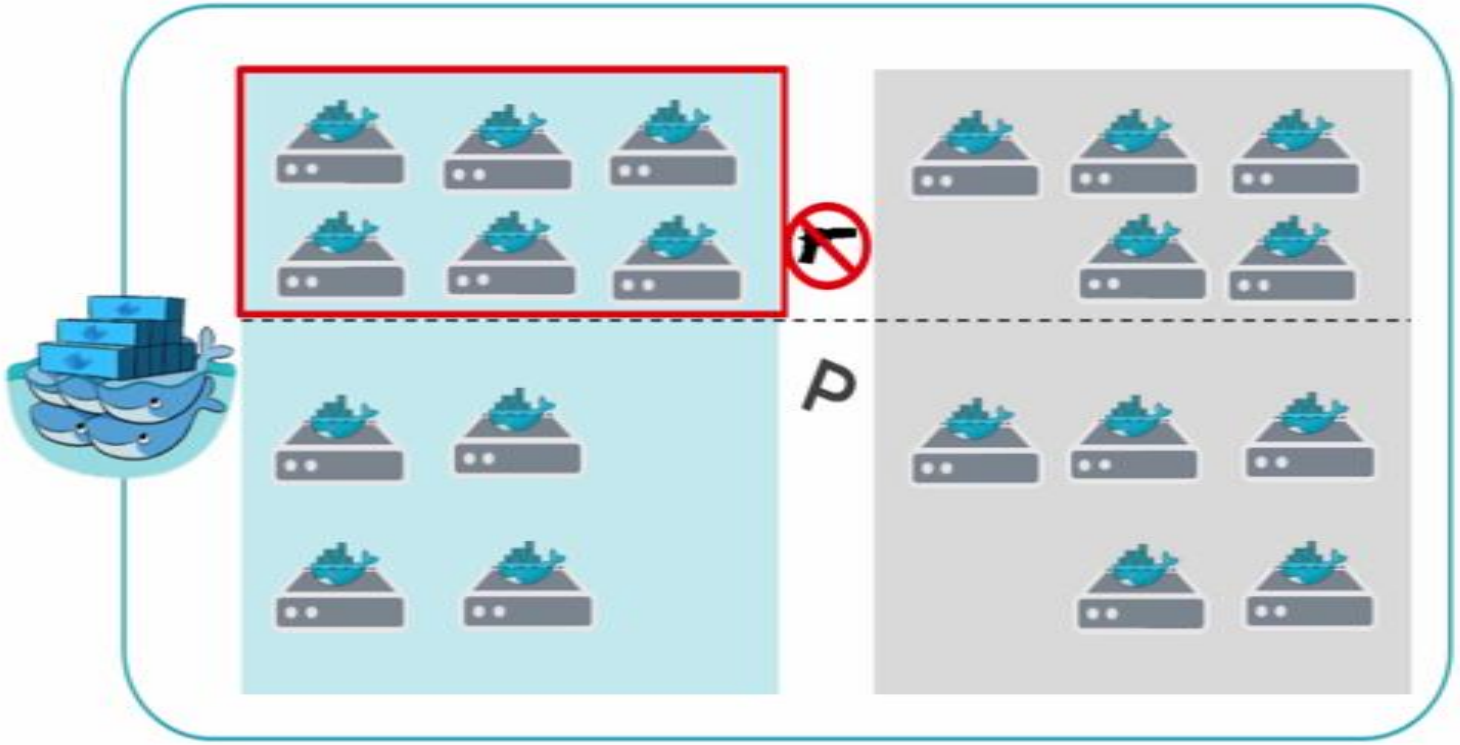
On prem Cloud Prod DMZ



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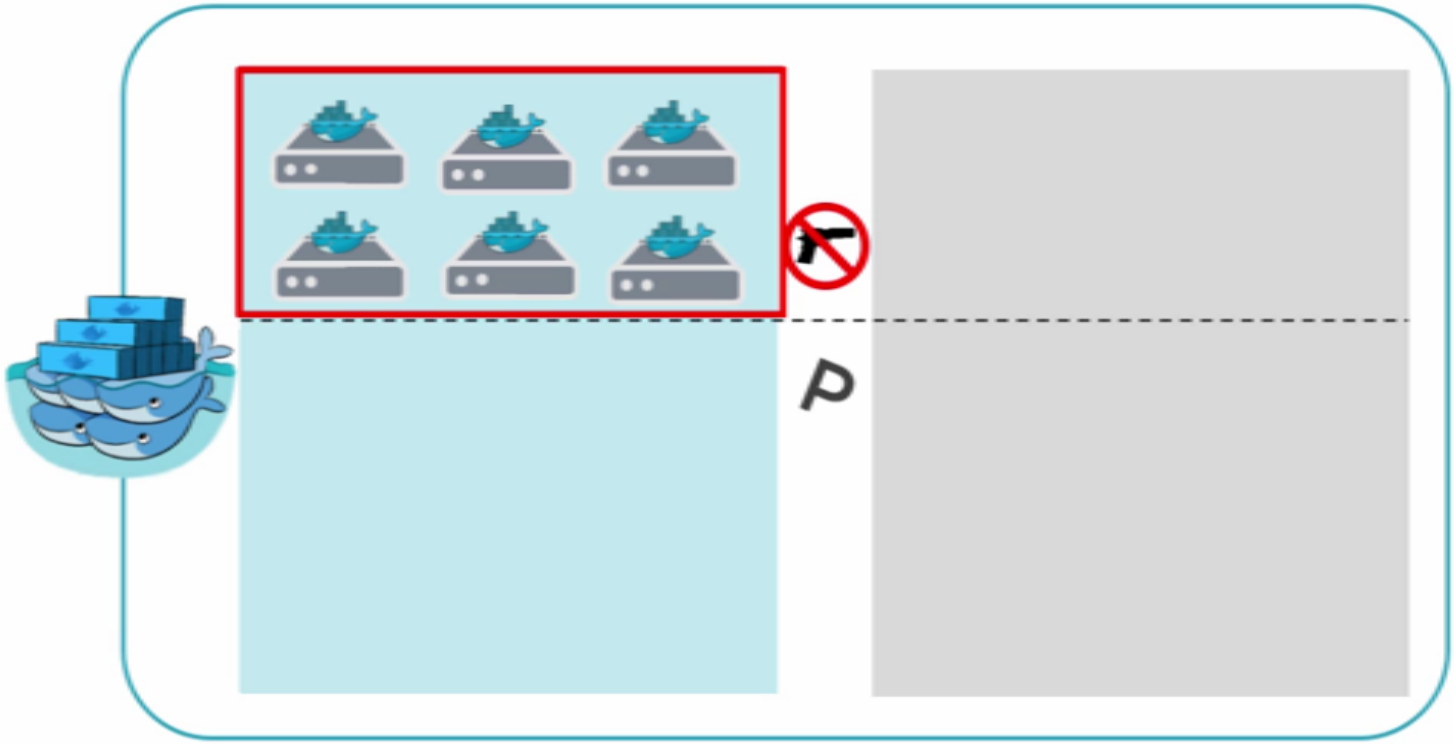
On prem Cloud P Prod DMZ



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On prem Cloud P Prod DMZ

Filtering

Affinity

Run new containers on the same nodes as existing containers or images

Constraint

Standard: Data returned from `docker info` command

Custom: Labels assigned to Engine daemons

Resource

Run new containers on nodes with particular resources free

Scheduling

Random

Spread

Binpack

Scheduling Strategies

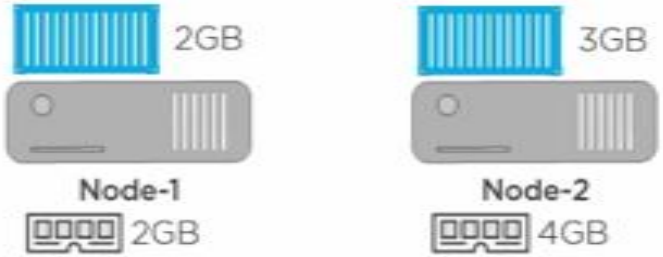
Binpack

CPU and RAM aware

Stopped containers are considered

Starts on the smallest node
(reserves larger nodes for large containers)

Additional nodes only used if you specify CPU or RAM requirements



Spread

CPU and RAM aware

Stopped containers are considered

Attempts to balance containers evenly
(unless CPU or RAM constraints override)