UCP System requirements

Estimated reading time: 5 minutes

> **These are the docs for UCP version 2.2.18**
>
> To select a different version, use the selector below.
>
> 2.2.18 ▾

Docker Universal Control Plane can be installed on-premises or on the cloud. Before installing, be sure your infrastructure has these requirements.

Hardware and software requirements

You can install UCP on-premises or on a cloud provider. Common requirements:

- Docker Enterprise Edition (https://docs.docker.com/install/) version 17.06 or higher
- Linux kernel version 3.10 or higher
- A static IP address

Minimum requirements

- 8GB of RAM for manager nodes or nodes running DTR
- 4GB of RAM for worker nodes
- 3GB of free disk space

Recommended production requirements

- 16GB of RAM for manager nodes or nodes running DTR
- 4 vCPUs for manager nodes or nodes running DTR
- 25-100GB of free disk space

Windows container images are typically larger than Linux ones and for that reason, you should consider provisioning more local storage for Windows nodes and for DTR setups that will store Windows container images.

When planning for host storage, workflows based around `docker pull` through UCP will result in higher storage requirements on manager nodes, since `docker pull` through UCP results in the image being pulled on all nodes.

Also, make sure the nodes are running an operating system support by Docker EE (https://success.docker.com/Policies/Compatibility_Matrix).

For highly-available installations, you also need a way to transfer files between hosts.

> **Workloads on manager nodes**
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> These requirements assume that manager nodes don't run regular workloads. If you plan to run additional workloads on manager nodes, you may need to provision more powerful nodes. If manager nodes become overloaded, the swarm may experience issues.

Ports used

When installing UCP on a host, make sure the following ports are open:

Hosts	Direction	Port	Purpose
managers, workers	in	TCP 443 (configurable)	Port for the UCP web UI and API
managers	in	TCP 2376 (configurable)	Port for the Docker Swarm manager. Used for backwards compatibility
managers, workers	in	TCP 2377 (configurable)	Port for communication between swarm nodes
workers	out	TCP 2377 (configurable)	Port for communication between swarm nodes
managers, workers	in, out	UDP 4789	Port for overlay networking
managers, workers	in, out	TCP, UDP 7946	Port for gossip-based clustering
managers, workers	in	TCP 12376	Port for a TLS proxy that provides access to UCP, Docker Engine, and Docker Swarm
managers	in	TCP 12379	Port for internal node configuration, cluster configuration, and HA
managers	in	TCP 12380	Port for internal node configuration, cluster configuration, and HA
managers	in	TCP 12381	Port for the certificate authority
managers	in	TCP 12382	Port for the UCP certificate authority
managers	in	TCP 12383	Port for the authentication storage backend

Hosts	Direction	Port	Purpose
managers	in	TCP 12384	Port for the authentication storage backend for replication across managers
managers	in	TCP 12385	Port for the authentication service API
managers	in	TCP 12386	Port for the authentication worker
managers	in	TCP 12387	Port for the metrics service

For overlay networks with encryption to work, you need to ensure that IP protocol 50 (ESP) traffic is allowed.

Also, make sure the networks you're using allow the UCP components enough time to communicate before they time out.

Component	Timeout (ms)	Configurable
Raft consensus between manager nodes	3000	no
Gossip protocol for overlay networking	5000	no
etcd	500	yes
RethinkDB	10000	no
Stand-alone swarm	90000	no

Time Synchronization

In distributed systems like Docker UCP, time synchronization is critical to ensure proper operation. As a best practice to ensure consistency between the engines in a UCP swarm, all engines should regularly synchronize time with a Network Time Protocol (NTP) server. If a server's clock is skewed, unexpected behavior may cause poor performance or even failures.

Compatibility and maintenance lifecycle

Docker EE is a software subscription that includes three products:

- Docker Engine with enterprise-grade support,
- Docker Trusted Registry,
- Docker Universal Control Plane.

Learn more about compatibility and the maintenance lifecycle for these products:

- Compatibility Matrix (https://success.docker.com/Policies/Compatibility_Matrix)

- Maintenance Lifecycle (https://success.docker.com/Policies/Maintenance_Lifecycle)

Version compatibility

UCP 2.2 requires minimum versions of the following Docker components:

- Docker Engine 17.06 or higher
- DTR 2.3 or higher

Where to go next

- UCP architecture (https://docs.docker.com/datacenter/ucp/2.2/guides/architecture/)
- Plan your installation (https://docs.docker.com/datacenter/ucp/2.2/guides/admin/install/plan-installation/)

UCP (https://docs.docker.com/glossary/?term=UCP), architecture (https://docs.docker.com/glossary/?term=architecture), requirements (https://docs.docker.com/glossary/?term=requirements), Docker EE (https://docs.docker.com/glossary/?term=Docker%20EE)