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# Portainer Documentation

*Release 1.15.5*

**Portainer.io**

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Portainer is a simple management solution for Docker.

It consists of a web UI that allows you to easily manage your Docker containers, images, networks and volumes.

Contents:



Portainer is built to run on Docker and is really simple to deploy.

Portainer deployment scenarios can be executed on any platform unless specified.

## 1.1 Quick start

Deploying Portainer is as simple as:

```
$ docker run -d -p 9000:9000 --restart always -v /var/run/docker.sock:/var/run/docker.  
↪sock -v /opt/portainer:/data portainer/portainer
```

Voilà, you can now access Portainer by pointing your web browser at `http://DOCKER_HOST:9000`

Ensure you replace `DOCKER_HOST` with the address of the Docker host where Portainer is running.

**Note 1:** The `-v /var/run/docker.sock:/var/run/docker.sock` option is available on Linux environments only.

**Note 2:** The `-v /opt/portainer:/data` option will persist Portainer data in `/opt/portainer` on the host where Portainer is running. You can specify another location on your filesystem.

**Note 3:** If your host is using **SELinux**, you'll need to pass the `--privileged` flag to the Docker run command:

```
$ docker run -d --privileged -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.  
↪sock -v /opt/portainer:/data portainer/portainer
```

You'll then be prompted to specify a new password for the admin account. After specifying your password, you'll be able to connect to the Portainer UI.

## 1.2 Manage a new Docker environment

After your first authentication, Portainer will ask you information about the Docker environment you want to manage.

You'll have the following choices:

- **Not available for Windows native Containers (Windows Server 2016)** - Manage the local engine where Portainer is running (you'll need to bind mount the Docker socket via `-v /var/run/docker.sock:/var/run/docker.sock` on the Docker CLI when running Portainer)
- Manage a remote Docker engine, you'll just have to specify the url to your Docker endpoint, give it a name and TLS info if needed

## 1.3 Declare initial endpoint via CLI

You can specify the initial endpoint you want Portainer to manage via the CLI, use the `-H` flag and the `tcp://` protocol to connect to a remote Docker endpoint:

```
$ docker run -d -p 9000:9000 portainer/portainer -H tcp://<REMOTE_HOST>:<REMOTE_PORT>
```

Ensure you replace `REMOTE_HOST` and `REMOTE_PORT` with the address/port of the Docker engine you want to manage.

You can also bind mount the Docker socket to manage a local Docker engine (**not available for Windows Containers (Windows Server 2016)**):

```
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/
↪portainer -H unix:///var/run/docker.sock
```

## 1.4 Connect to a Swarm cluster

Portainer will automatically detect if your endpoint is part of a Swarm cluster (either Docker Swarm or Swarm mode).

**Note:** Ensure you connect to either a *primary* node when connecting to a Docker Swarm cluster or a *manager* node when connecting to a cluster created with Docker swarm mode.

As simple as:

```
$ docker run -d -p 9000:9000 portainer/portainer -H tcp://<SWARM_MANAGER_IP>:2375
```

Alternatively, if you're using swarm mode, you can also deploy it as a service in your cluster:

```
$ docker service create \
  --name portainer \
  --publish 9000:9000 \
  --constraint 'node.role == manager' \
  --mount type=bind,src=/var/run/docker.sock,dst=/var/run/docker.sock \
  portainer/portainer \
  -H unix:///var/run/docker.sock
```

## 1.5 Connect to a Docker engine with TLS enabled

If your Docker engine is protected using TLS, you'll need to ensure that you have access to CA, the certificate and the public key used to access your Docker engine.

You can upload the required files via the Portainer UI or use the `--tlsverify` flag on the CLI.

Portainer will try to use the following paths to the files specified previously (on Linux, see the configuration section for details about Windows):

- CA: /certs/ca.pem
- certificate: /certs/cert.pem
- public key: /certs/key.pem

You must ensure these files are present in the container using a bind mount:

```
$ docker run -d -p 9000:9000 -v /path/to/certs:/certs portainer/portainer -H tcp://
↳<DOCKER_HOST>:<DOCKER_PORT> --tlsverify
```

You can also use the `--tlscacert`, `--tlscert` and `--tlskey` flags if you want to change the default path to the CA, certificate and key file respectively:

```
$ docker run -d -p 9000:9000 -v /path/to/certs:/certs portainer/portainer -H tcp://
↳<DOCKER_HOST>:<DOCKER_PORT> --tlsverify --tlscacert /certs/myCa.pem --tlscert /
↳certs/myCert.pem --tlskey /certs/myKey.pem
```

## 1.6 Persist Portainer data

By default, Portainer will store its data inside the container in the `/data` folder on Linux (`C:\data` on Windows, this can be changed via CLI, see configuration).

You'll need to persist Portainer data to keep your changes after restart/upgrade of the Portainer container. You can use a bind mount to persist the data on the Docker host folder:

```
$ docker run -d -p 9000:9000 -v /path/on/host/data:/data portainer/portainer
```

On Windows:

```
$ docker run -d -p 9000:9000 -v C:\ProgramData\Portainer:C:\data portainer/portainer
```

If you deployed Portainer as a Docker Swarm service:

```
$ docker service create \
  --name portainer \
  --publish 9000:9000 \
  --constraint 'node.role == manager' \
  --mount type=bind,src=/var/run/docker.sock,dst=/var/run/docker.sock \
  --mount type=bind,src=/path/on/host/data,dst=/data \
  portainer/portainer \
  -H unix:///var/run/docker.sock
```

## 1.7 Secure Portainer using SSL

By default, Portainer's web interface and API is exposed over HTTP. This is not secured, it's recommended to enable SSL in a production environment.

To do so, you can use the following flags `--ssl`, `--sslcert` and `--sslkey`:

```
$ docker run -p 443:9000 -v ~/local-certs:/certs portainer/portainer --ssl --sslcert /
↳certs/portainer.crt --sslkey /certs/portainer.key
```

You can use the following commands to generate the required files:

```
$ openssl genrsa -out portainer.key 2048
$ openssl ecparam -genkey -name secp384r1 -out portainer.key
$ openssl req -new -x509 -sha256 -key portainer.key -out portainer.crt -days 3650
```

Note that [Certbot](#) could be used as well to generate a certificate and a key.

## 1.8 Without Docker

Portainer binaries are available on each release page: [Portainer releases](#)

Download and extract the binary to a location on disk:

```
$ cd /opt
$ wget https://github.com/portainer/portainer/releases/download/1.15.5/portainer-1.15.5-
↳ 5-linux-amd64.tar.gz
$ tar xvpfz portainer-1.15.5-linux-amd64.tar.gz
```

Then just use the portainer binary as you would use CLI flags with Docker.

**Note:** Portainer will try to write its data into the `/data` folder by default. You must ensure this folder exists first.

```
$ mkdir /data
$ cd /opt/portainer
$ ./portainer
```

You can use the `-p` flag to serve Portainer on another port:

```
$ ./portainer -p :8080
```

You can change the folder used by Portainer to store its data with the `-d` flag:

```
$ ./portainer -d /opt/portainer-data
```

Portainer can be easily tuned using CLI flags.

### 2.1 Disable authentication

To disable Portainer internal authentication mechanism, start Portainer with the `--no-auth` flag:

```
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/  
↳portainer --no-auth
```

### 2.2 Admin password

Portainer allows you to specify an encrypted password from the command line for the admin account. You need to generate the encrypted password first.

You can generate an encrypted password with the following command:

```
$ htpasswd -nb -B admin <password> | cut -d ":" -f 2
```

or if your system does not provide `htpasswd` you can use a docker container with the command:

```
$ docker run --rm httpd:2.4-alpine htpasswd -nbB admin <password> | cut -d ":" -f 2
```

To specify the admin password from the command line, start Portainer with the `--admin-password` flag:

```
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/  
↳portainer --admin-password '$2y$05$qFHA1NAH0A.6oCDe1/4W.ueCWC/  
↳iTfBMXIHBI97QYfMWlMCJ7N.a6'
```

You can also store the password inside a file and use the `--admin-password-file` flag:

```
$ echo -n mypassword > /tmp/portainer_password
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/
↳portainer -v /tmp/portainer_password:/tmp/portainer_password --admin-password-file /
↳tmp/portainer_password
```

This works well with Swarm & Docker secrets too:

```
$ echo -n mypassword | docker secret create portainer-pass -
$ docker service create \
  --name portainer \
  --secret portainer-pass \
  --publish 9000:9000 \
  --constraint 'node.role == manager' \
  --mount type=bind,src=/var/run/docker.sock,dst=/var/run/docker.sock \
  nenadilic84/portainer:test \
  --admin-password-file '/run/secrets/portainer-pass' \
  -H unix:///var/run/docker.sock
```

**Note:** This will automatically create an administrator account called **admin** with the specified password.

## 2.3 Hiding specific containers

**Deprecation notice:** the `-l` flag is deprecated and will be removed in future versions. Use the settings section in Portainer UI to manage hidden containers.

Portainer allows you to hide containers with a specific label by using the `-l` flag.

For example, take a container started with the label `owner=acme` (note that this is an example label, you can define your own labels):

```
$ docker run -d --label owner=acme nginx
```

To hide this container, simply add the `-l owner=acme` option on the CLI when starting Portainer:

```
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/
↳portainer -l owner=acme
```

Note that the `-l` flag can be repeated multiple times to specify multiple labels:

```
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/
↳portainer -l owner=acme -l service=secret
```

## 2.4 Use your own logo

**Deprecation notice:** the `--logo` flag is deprecated and will be removed in future versions. Use the settings section in Portainer UI to change the logo.

You do not like our logo? Want to make Portainer more corporate? Don't worry, you can easily switch for an external logo (it must be exactly 155px by 55px) using the `--logo` flag:

```
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/
↳portainer --logo "https://www.docker.com/sites/all/themes/docker/assets/images/
↳brand-full.svg"
```

## 2.5 Use your own templates

**Deprecation notice:** the `--templates` flag is deprecated and will be removed in future versions. Use the settings section in Portainer UI to change templates.

Portainer allows you to rapidly deploy containers using App Templates.

By default [Portainer templates](#) will be used but you can also define your own templates.

Add the `--templates` flag and specify the external location of your templates when starting Portainer:

```
$ docker run -d -p 9000:9000 -v /var/run/docker.sock:/var/run/docker.sock portainer/
↳portainer --templates http://my-host.my-domain/templates.json
```

For more information about hosting your own template definitions see [Templates](#)

## 2.6 Use an external endpoint source

Portainer gives you the option to define all the endpoints available in the UI from a JSON file.

You just need to start Portainer with the `--external-endpoints` flag and specify the path to the JSON file in the container.

Note: when using the external endpoint management, endpoint management will be disabled in the UI.

```
$ docker run -d -p 9000:9000 -v /tmp/endpoints:/endpoints portainer/portainer --
↳external-endpoints /endpoints/endpoints.json
```

For more information about the endpoint definition format see [External endpoints](#)

## 2.7 Available flags

The following CLI flags are available:

- `--host, -H`: Docker daemon endpoint
- `--bind, -p`: Address and port to serve Portainer (default: `:9000`)
- `--data, -d`: Directory where Portainer data will be stored (default: `/data` on Linux, `C:\data` on Windows)
- `--tlsverify`: TLS support (default: `false`)
- `--tlscacert`: Path to the CA (default: `/certs/ca.pem` on Linux, `C:\certs\ca.pem` on Windows)
- `--tlscert`: Path to the TLS certificate file (default: `/certs/cert.pem`, `C:\certs\cert.pem` on Windows)
- `--tlskey`: Path to the TLS key (default: `/certs/key.pem`, `C:\certs\key.pem` on Windows)
- `--no-analytics`: Disable analytics (default: `false`)
- `--no-auth`: Disable internal authentication mechanism (default: `false`)
- `--external-endpoints`: Enable external endpoint management by specifying the path to a JSON endpoint source in a file
- `--sync-interval`: Time interval between two endpoints synchronization requests expressed as a string, e.g. `30s`, `5m`, `1h...` as supported by the [time.ParseDuration method](#) (default: `60s`)

- `--admin-password`: Admin password in the form `admin:<hashed_password>`
- `--admin-password-file`: Path to the file containing the password for the admin user
- `--ssl`: Secure Portainer instance using SSL (default: `false`)
- `--sslcert`: Path to the SSL certificate used to secure the Portainer instance (default: `/certs/portainer.crt`, `C:\certs\portainer.crt` on Windows)
- `--sslkey`: Path to the SSL key used to secure the Portainer instance (default: `/certs/portainer.key`, `C:\certs\portainer.key` on Windows)

## 2.8 Deprecated flags

The following CLI flags are deprecated and should not be used anymore:

- `--hide-label`, `-l`: Hide containers with a specific label in the UI
- `--logo`: URL to a picture to be displayed as a logo in the UI, use Portainer logo if not specified
- `--templates`, `-t`: URL to templates (apps) definitions (default: `https://raw.githubusercontent.com/portainer/templates/master/templates.json`)

Portainer exposes an HTTP API that you can use to automate everything you do via the Portainer UI.

### 3.1 Documentation

The API documentation is available on [Swaggerhub](#) and you can also find some examples [here](#).



---

## External endpoints

---

External endpoint definitions are written in JSON.

It must consist of an array with every endpoint definition consisting of one element.

```
[
  {
    "Name": "my-first-endpoint",
    "URL": "tcp://myendpoint.mydomain:2375"
  },
  {
    "Name": "my-second-endpoint",
    "URL": "tcp://mysecondendpoint.mydomain:2375",
    "TLS": true,
    "TLSSkipVerify": true,
    "TLSCACert": "/tmp/ca.pem",
    "TLSCert": "/tmp/cert.pem",
    "TLSKey": "/tmp/key.pem"
  }
]
```

### 4.1 Endpoint definition format

An endpoint element must be a valid JSON object.

Example:

```
{
  "Name": "my-secure-endpoint",
  "URL": "tcp://myendpoint.mydomain:2375",
  "TLS": true,
  "TLSCACert": "/tmp/ca.pem",
  "TLSCert": "/tmp/cert.pem",
  "TLSKey": "/tmp/key.pem"
}
```

```
"TLSKey": "/tmp/key.pem"
}
```

It is composed of multiple fields, some mandatory and some optional.

#### 4.1.1 Name

Name of the endpoint. Used to check if an endpoint already exists in the database during a synchronization request. It will also be displayed in the UI.

This field is **mandatory**.

#### 4.1.2 URL

How to reach the endpoint.

Protocol **must** be specified, only `tcp://` and `unix://` are supported at the moment. Any definition not using one of these 2 protocols will be skipped.

This field is **mandatory**.

#### 4.1.3 TLS

Specify this field to true if you need to use TLS to connect to the endpoint. Defaults to `false`. When applying the true value to this field, Portainer will expect the `TLSCACertPath`, `TLSCertPath` and `TLSKeyPath` fields to be defined too.

This field is **optional**.

#### 4.1.4 TLSSkipVerify

Specify this field to true if you want to skip server verification. Defaults to `false`.

This field is **optional**.

#### 4.1.5 TLSCACert

Path to the CA used to connect to the endpoint.

This field is **optional**.

#### 4.1.6 TLSCert

Path to the certificate used to connect to the endpoint.

This field is **optional**.

#### 4.1.7 TLSKey

Path to the key used to connect to the endpoint.

This field is **optional**.

## 4.2 Endpoint synchronization

When using the `--external-endpoints` flag, Portainer will read the specified JSON file at startup and automatically create the endpoints.

Portainer will then read the file based on the interval defined in `--sync-interval` (every 60s by default) and will automatically do the following:

- For each endpoint in the database, it will automatically merge any configuration found in the file using the endpoint name as the comparison key
- If an endpoint exists in the database but is not present in the file, it will be removed from the database
- If an endpoint exists in the file but not in the database it will be created in the database

When using external endpoint management, endpoint management via the UI will be disabled to avoid any possible configuration overwrite (the endpoints view is still accessible but will only display the list of endpoints without giving the possibility to create/update endpoints). A simple warning message will be displayed in the endpoints view.



Template definitions are written in JSON.

It must consist of an array with every template definition consisting of one element.

## 5.1 Container template definition format

A template element must be a valid *JSON* object.

Example of a container template:

```
{
  "type": "container",
  "title": "Nginx",
  "description": "High performance web server",
  "logo": "https://cloudinovasi.id/assets/img/logos/nginx.png",
  "image": "nginx:latest",
  "ports": [
    "80/tcp",
    "443/tcp"
  ]
}
```

It is composed of multiple fields, some mandatory and some optionals.

### 5.1.1 type

Template type, either *container* or *stack*.

This field is **mandatory**.

### 5.1.2 title

Title of the template.

This field is **mandatory**.

### 5.1.3 description

Description of the template.

This field is **mandatory**.

### 5.1.4 image

The Docker image associated to the template. The image tag **must** be included.

This field is **mandatory**.

### 5.1.5 logo

URL of the template's logo.

This field is **optional**.

### 5.1.6 registry

The registry where the Docker image is stored. If not specified, Portainer will use the Dockerhub as the default registry.

This field is **optional**.

### 5.1.7 command

The command to run in the container. If not specified, the container will use the default command specified in its Dockerfile.

This field is **optional**.

Example:

```
{  
  "command": "/bin/bash -c \"echo hello\" && exit 777"  
}
```

### 5.1.8 env

A JSON array describing the environment variables required by the template. Each element in the array must be a valid JSON object.

An input will be generated in the templates view for each element in the array.

Depending on the value in *type* field, the view will display a different input. For example, when using the value *container* for the *type* field, the UI will display a dropdown with all the running containers. The container hostname will then be inserted as a value in the environment variable.

Supported types:

- *container*

This field is **optional**.

Element format:

```
{
  "name": "the name of the environment variable, as supported in the container image_
  ↪(mandatory)",
  "label": "label for the input in the UI (mandatory)",
  "type": "only container is available at the moment (optional)",
  "set": "pre-defined value for the variable, will not generate an input in the UI_
  ↪(optional)"
}
```

Example:

```
{
  "env": [
    {
      "name": "MYSQL_ROOT_PASSWORD",
      "label": "Root password"
    },
    {
      "name": "MYSQL_USER",
      "label": "MySQL user",
      "set": "myuser"
    },
    {
      "name": "MYSQL_PASSWORD",
      "label": "MySQL password",
      "set": "mypassword"
    }
  ]
}
```

### 5.1.9 network

A string corresponding to the name of an existing Docker network.

Will auto-select the network (if it exists) in the templates view.

This field is **optional**.

Example:

```
{
  "network": "host"
}
```

### 5.1.10 volumes

A JSON array describing the associated volumes of the template. Each element in the array must be a valid JSON object that has a required container property.

For each element in the array, a Docker volume will be created and associated when starting the container. If a bind property is defined it will be used as the source of a bind mount.

This field is **optional**.

Example:

```
{
  "volumes": [
    {
      "container": "/etc/nginx"
    },
    {
      "container": "/usr/share/nginx/html",
      "bind": "/var/www"
    }
  ]
}
```

### 5.1.11 ports

A JSON array describing the ports exposed by template. Each element in the array must be a valid JSON string specifying the port number in the container and the protocol.

Each port will be automatically bound on the host by Docker when starting the container.

This field is **optional**.

Example:

```
{
  "ports": ["80/tcp", "443/tcp"]
}
```

### 5.1.12 privileged

Should the container be started in privileged mode. Boolean, will default to false if not specified.

This field is **optional**.

```
{
  "privileged": true
}
```

### 5.1.13 interactive

Should the container be started in foreground (equivalent of `-i -t` flags). Boolean, will default to false if not specified.

This field is **optional**.

```
{
  "interactive": true
}
```

### 5.1.14 restart\_policy

Restart policy associated to the container. Value must be one of the following:

- no
- unless-stopped
- on-failure
- always

This field is **optional**. Will default to always if not specified.

```
{
  "restart_policy": "unless-stopped"
}
```

### 5.1.15 note

Usage / extra information about the template. This will be displayed inside the template creation form in the Portainer UI.

Supports HTML.

This field is **optional**.

```
{
  "note": "You can use this field to specify extra information. <br/> It supports <b>
  ↪HTML</b>."
}
```

### 5.1.16 platform

Supported platform. This field value must be set to **linux** or **windows**. This will display a small platform related icon in the Portainer UI.

This field is **optional**.

```
{
  "platform": "linux"
}
```

### 5.1.17 categories

An array of categories that will be associated to the template. Portainer UI category filter will be populated based on all available categories.

This field is **optional**.

```
{
  "categories": ["webserver", "open-source"]
}
```

## 5.2 Stack template definition format

A template element must be a valid JSON object.

Stack templates can only be deployed inside Swarm clusters via `docker stack deploy`. Portainer is not compatible with `docker-compose` at the moment.

Example of a stack template:

```
{
  "type": "stack",
  "title": "CockroachDB",
  "description": "CockroachDB cluster",
  "note": "Deploys an insecure CockroachDB cluster, please refer to <a href=\"https://www.cockroachlabs.com/docs/stable/orchestrate-cockroachdb-with-docker-swarm.html\" >CockroachDB documentation</a> for production deployments.",
  "categories": ["database"],
  "platform": "linux",
  "logo": "https://cloudinovasi.id/assets/img/logos/cockroachdb.png",
  "repository": {
    "url": "https://github.com/portainer/templates",
    "stackfile": "stacks/cockroachdb/docker-stack.yml"
  }
}
```

It is composed of multiple fields, some mandatory and some optional.

### 5.2.1 type

Template type, either *container* or *stack*.

This field is **mandatory**.

### 5.2.2 title

Title of the template.

This field is **mandatory**.

### 5.2.3 description

Description of the template.

This field is **mandatory**.

### 5.2.4 repository

A JSON object describing the public git repository from where the stack template will be loaded. It indicates the URL of the git repository as well as the path to the Compose file inside the repository.

Element format:

```
{
  "url": "URL of the public git repository (mandatory)",
  "stackfile": "Path to the Compose file inside the repository (mandatory)",
}
```

Example:

```
{
  "url": "https://github.com/portainer/templates",
  "stackfile": "stacks/cockroachdb/docker-stack.yml"
}
```

This field is **mandatory**.

### 5.2.5 logo

URL of the template's logo.

This field is **optional**.

### 5.2.6 env

A JSON array describing the environment variables required by the template. Each element in the array must be a valid JSON object.

An input will be generated in the templates view for each element in the array. Depending on the object properties, different types of inputs can be generated (text input, select).

This field is **optional**.

Element format:

```
{
  "name": "the name of the environment variable, as supported in the container image_
↪ (mandatory)",
  "label": "label for the input in the UI (mandatory unless set is present)",
  "description": "a short description for this input, will be available as a tooltip_
↪ in the UI (optional)",
  "set": "pre-defined value for the variable, will not generate an input in the UI_
↪ (optional)",
  "select": "an array of possible values, will generate a select input (optional)"
}
```

Example:

```
{
  "env": [
    {
      "name": "MYSQL_ROOT_PASSWORD",
      "label": "Root password",
      "description": "Password used by the root user."
    },
    {
      "name": "ENV_VAR_WITH_DEFAULT_VALUE",
      "set": "some_value"
    }
  ],
}
```

```
{
  "name": "ENV_VAR_WITH_SELECT_VALUE",
  "label": "An environment variable",
  "select": [
    {
      "text": "Yes, I agree",
      "value": "Y"
    },
    {
      "text": "No, I disagree",
      "value": "N"
    },
    {
      "text": "Maybe",
      "value": "YN"
    }
  ],
  "description": "Some environment variable."
}
```

### 5.2.7 note

Usage / extra information about the template. This will be displayed inside the template creation form in the Portainer UI.

Supports HTML.

This field is **optional**.

```
{
  "note": "You can use this field to specify extra information. <br/> It supports <b>↔HTML</b>."
}
```

### 5.2.8 platform

Supported platform. This field value must be set to **linux** or **windows**. This will display a small platform related icon in the Portainer UI.

This field is **optional**.

```
{
  "platform": "linux"
}
```

### 5.2.9 categories

An array of categories that will be associated to the template. Portainer UI category filter will be populated based on all available categories.

This field is **optional**.

```
{  
  "categories": ["webserver", "open-source"]  
}
```

## 5.3 Build and host your own templates

You can build your own container that will use [Nginx](#) to serve the templates definitions.

Clone the [Portainer templates repository](#), edit the templates file, build and run the container:

```
$ git clone https://github.com/portainer/templates.git portainer-templates  
$ cd portainer-templates  
# Edit the file templates.json  
$ docker build -t portainer-templates .  
$ docker run -d -p "8080:80" portainer-templates
```

Now you can access your templates definitions at <http://docker-host:8080/templates.json>.

You can also mount the `templates.json` file inside the container, so you can edit the file and see live changes:

```
$ docker run -d -p "8080:80" -v "${PWD}/templates.json:/usr/share/nginx/html/  
↪templates.json" portainer-templates
```



Use the following instructions and guidelines to contribute to the Portainer project.

## 6.1 Build Portainer locally

### 6.1.1 Requirements

Ensure you have [Docker](#), [Node.js](#)  $\geq 0.8.4$ , and [yarn](#).

### 6.1.2 Build

Checkout the project and go inside the root directory:

```
$ git clone https://github.com/portainer/portainer.git
$ cd portainer
```

Install dependencies with yarn:

```
$ yarn
```

Build the app locally:

```
$ grunt build
```

Start a watched build process:

```
$ grunt run-dev
```

Access Portainer at <http://localhost:9000>

---

**Tip:** The frontend application will be updated when you save your changes to any of the sources (`app/**/*.js`, `assets/css/app.css` or `index.html`). Just refresh the browser.

---

---

**Important:** Do not forget to [lint](#) your code:

```
$ grunt lint
```

---

## 6.2 Contribution guidelines

Please follow the contribution guidelines on [the repository](#).

Information about supported platforms and Docker versions.

### 7.1 Docker

Portainer is compatible with the following versions of Docker:

- Docker > 1.9

Portainer has partial support for the following versions of Docker:

- Docker 1.9

Portainer is **not** compatible with the following versions of Docker:

- Docker < 1.9

### 7.2 Swarm

Portainer is compatible with the following versions of Docker Swarm standalone:

- Docker Swarm  $\geq$  1.2.3

**Note:** this is not related to Docker Swarm mode, see [https://docs.docker.com/swarm/swarm\\_at\\_scale/deploy-app/](https://docs.docker.com/swarm/swarm_at_scale/deploy-app/)

### 7.3 Supported platforms

Portainer can be deployed on the following platforms:

- Linux amd64
- Linux arm

- Linux arm64
- Linux ppc64le
- Linux s390x
- Windows amd64
- Darwin amd64

## 8.1 How can I setup Portainer on Windows Server 2016 ?

Have a look at the [Airdesk blog post](#) for instructions.

## 8.2 How can I play with Portainer outside of the public demo?

You can deploy Portainer as a stack in [Play-with-Docker](#).

## 8.3 How can I configure my reverse proxy to serve Portainer?

Here is a working configuration for Nginx (tested on 1.11) to serve Portainer at *myhost.mydomain/portainer*:

```
upstream portainer {
    server ADDRESS:PORT;
}

server {
    listen 80;

    location /portainer/ {
        proxy_http_version 1.1;
        proxy_set_header Connection "";
        proxy_pass http://portainer/;
    }

    location /portainer/api/websocket/ {
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection "upgrade";
        proxy_http_version 1.1;
        proxy_pass http://portainer/api/websocket/;
    }
}
```

```
}  
}
```

Replace ADDRESS : PORT with the Portainer server/container details.

## 8.4 How can I configure my reverse proxy to serve Portainer using HAProxy?

Here is a working configuration for HAProxy to serve Portainer at *portainer.127.0.0.1.xip.io*:

```
global  
    maxconn          10000  
    daemon  
    ssl-server-verify none  
    tune.ssl.default-dh-param 2048  
  
defaults  
    mode             http  
    log              global  
    option           httplog  
    option           dontlognull  
    option           http-server-close  
    option           forwardfor          except 127.0.0.0/8  
    option           redispatch  
    retries          30  
    timeout http-request 300s  
    timeout queue    1m  
    timeout connect  10s  
    timeout client   1m  
    timeout server   1m  
    timeout http-keep-alive 10s  
    timeout check    10s  
    maxconn          10000  
  
userlist users  
    group all  
    group demo  
    group haproxy  
  
listen stats  
    bind          *:2100  
    mode          http  
    stats         enable  
    maxconn       10  
    timeout client 10s  
    timeout server 10s  
    timeout connect 10s  
    timeout       queue    10s  
    stats         hide-version  
    stats         refresh 30s  
    stats         show-node  
    stats         realm Haproxy\ Statistics  
    stats         uri /  
    stats         admin if TRUE
```

```

frontend www-http
  bind      *:80
  stats    enable
  mode     http
  option   http-keep-alive

  acl portainer  hdr_end(host)  -i portainer.127.0.0.1.xip.io

  use_backend  portainer      if portainer

backend portainer
  stats    enable
  option   forwardfor
  option   http-keep-alive
  server  portainer  127.0.0.1:9000 check

```

**Note:** http-keep-alive must be set for both frontend and backend

## 8.5 Exposed ports in the container view redirects me to 0.0.0.0, what can I do?

In order for Portainer to be able to redirect you to your Docker host IP address and not the 0.0.0.0 address, you will have to change the configuration of your Docker daemon and add the `--ip` option.

Have a look at the [Docker documentation](#) for more details.

Note that you will have to restart your Docker daemon for the changes to be taken in effect.

## 8.6 I restarted Portainer and lost all my data, why?

Portainer data is stored inside the Docker container. If you want to keep the data of your Portainer instance after reboot/upgrade, you'll need to persist the data. See [Deployment](#)

## 8.7 I am getting the error “Your session has expired” on login and cannot login. What’s wrong?

When running Portainer inside a container, it will use your Docker engine system time to calculate the authentication token expiry time. A timedrift in your Docker system time might occur when using computer/VM hibernation. You need to ensure that your Docker engine system time is the same as your machine system time and if not, restart your Docker engine.

As simple way to check your Docker system time is to use `docker info` or if the information is not available `docker run busybox date`.

Users of Docker for Windows can also fix this by navigating to hyper-v-management -> virtual machines -> right-click on MobyLinuxVM -> settings -> integration services and enabling the time sync checkbox in the services list.

## 8.8 How can I access the Docker API on port 2375 on Windows?

On some Windows setup, Docker is listening on the local loopback address and cannot be accessed from within the Portainer container. You can use `netsh` to create a port redirection, and then use the newly created IP address to connect from Portainer.

Create a redirection from the loopback address on port 2375 to a newly created address **10.0.75.1** on port 2375 (DOS/Powershell command):

```
> netsh interface portproxy add v4tov4 listenaddress=10.0.75.1 listenport=2375_
↪connectaddress=127.0.0.1 connectport=2375
```

You'll then be able to use **10.0.75.1:2375** as the URL of your endpoint.

## 8.9 How can I use Portainer behind a proxy?

When using Portainer behind a proxy, some features requiring access to the Internet (such as Apps Templates) might be unavailable.

When running Portainer as a container, you can specify the `HTTP_PROXY` and `HTTPS_PROXY` env var to specify which proxy should be used.

Example:

```
$ docker run -d -p 9000:9000 -e HTTP_PROXY=my.proxy.domain:7777 portainer/portainer
```

## 8.10 How can I upgrade my version of Portainer?

If you're running Portainer as a container, it's simply a matter of Docker image version. Just stop your existing Portainer container, pull the latest `portainer/portainer` image and create a new Portainer container (using the same options you used to create the previous one).

If you're running Portainer as a service in a Swarm cluster, you can issue the following command to update the image (assuming your Docker service is called `portainer`):

```
$ docker service update --image portainer/portainer:latest portainer
```

If you're running Portainer outside of Docker, download and extract the new binaries and restart the Portainer binary using the same options you used before.

## 8.11 How can I manage a remote Dokku host with Portainer?

Have a look at [this gist](#) for instructions.