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OpenBlocks IoT Family
Docker Set-up Guide

Version 3.1.0

Plat'Home Co., Ltd.

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Table of contents

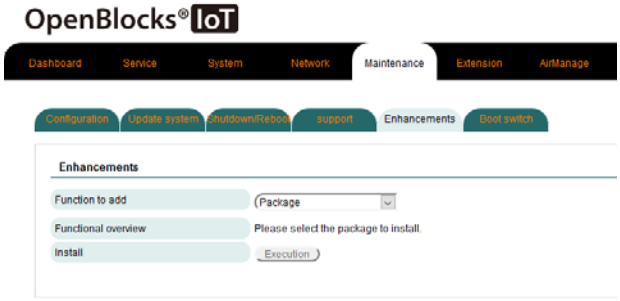
Chapter 1 General

This manual describes how to use Docker (container-based virtualization OSS) that can be installed in the OpenBlocks IoT Family, including web user interface (hereinafter referred to as "WEB UI").

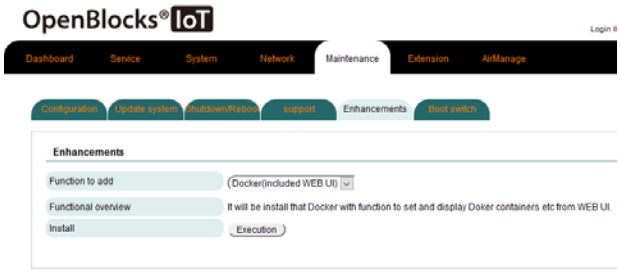
Chapter 2 Docker setup

2-1. Installing Docker, including WEB UI

At the time of shipment from our factory, Docker and WEB UI for Docker are not installed in this product. To install Docker and WEB UI for Docker, using the **[Maintenance]-[Enhancements]** tab.



When choosing the **[Maintenance]-[Enhancements]** tab, it is possible to choose a package for extensions.



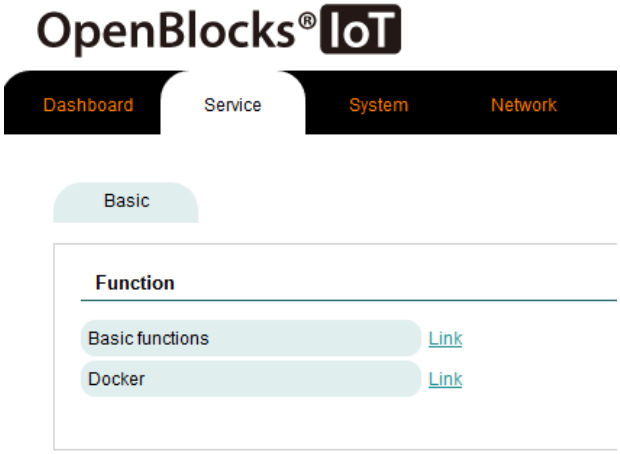
From the pull-down menu showing a list of packages to be installed, choose "Docker (Included WEB UI)."
Press the Execution button to install the program.

After completing installation, the unit will require rebooting to make the installation effective. Choose the Shutdown/Reboot tab from the Maintenance tab to reboot the unit.

While installing Docker, certain drivers will be compiled, which takes additional time. A button to check the installation status will appear. Press this button to check on the progress of installation.

2-2. Using Docker from WEB UI

When the Docker (including WEB UI) package has been installed, link for Docker will be displayed in the **[Service]-[Basic]** tab of WEB UI.



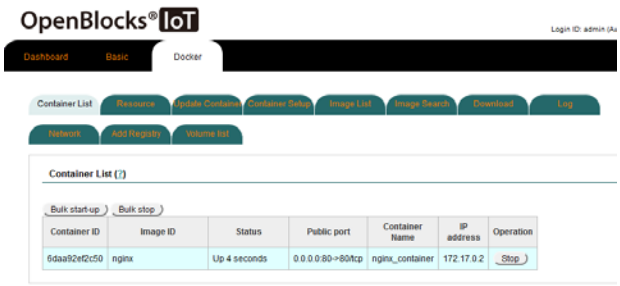
Choose the **[Service]-[Basic]** tab and click on the Docker link from the Basic tab. The root tab will be switched to display the **[Dashboard]**, **[Basic]** and **[Docker]** tabs for service.

*Links and root tabs for service that appear in the **[Service]-[Basic]** tab may differ, depending on the packages installed from the **[Maintenance]-[Enhancements]** tab.

2-3 Docker container list

Use the **[Docker]-[Container List]** tab to check the status of a container that has been activated at least once, and also to control startup, stop, etc.

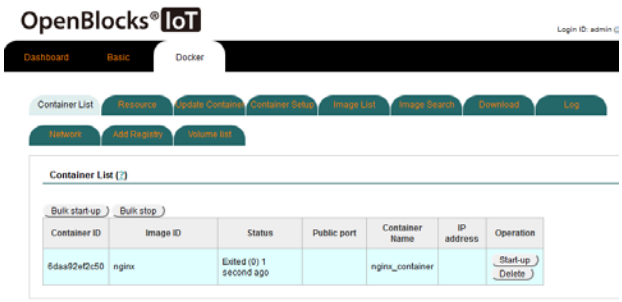
■If a container is in operation



If a container is in operation, it can be stopped. Press the Stop button corresponding to the container to be stopped.

The public port and IP address of each container in operation will be displayed.

■If a container is stopped



If a container is stopped, it can be started up or deleted.

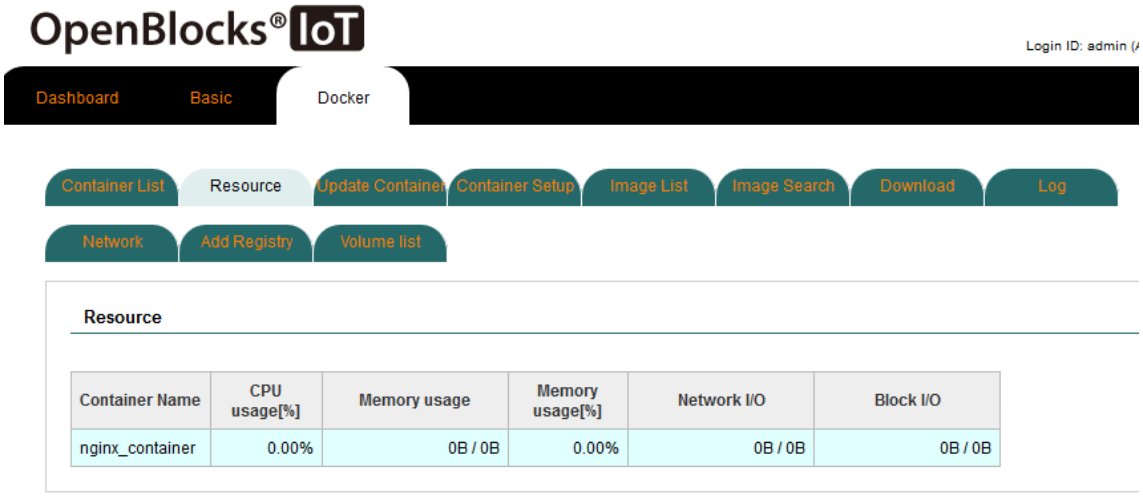
To start up a container, press the Start-up button corresponding to it.

To delete a container, press the Delete button corresponding to it.

2-4. Displaying Docker container resources

It is possible to check the resource status of any container that has been started up at least once by choosing the **[Docker]-[Resource]** tab. Containers not in operation will be displayed in the list but as they are stopped, resources will not be used.

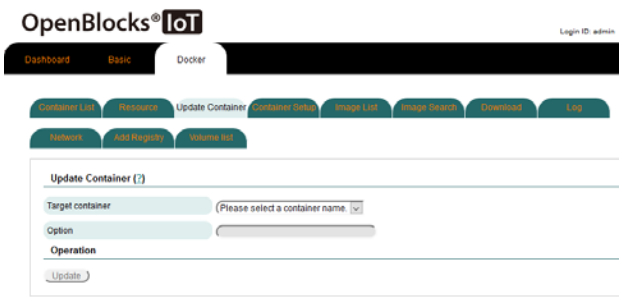
Please check the resources for resource tuning of individual containers.



2-5. Updating Docker container resources setup

It is possible to perform container resources setup using the **[Docker]-[Update Container]** tab.

For this item, it is assumed that resources are limited should any container that may affect the host or other containers be used.



Choose the container whose resource setup is to be updated from the pull-down menu.

After choosing the target container, it will be possible to choose the Option field and the Update button.

Enter an option to change resource and press the Update button to apply.

For this function, Docker update commands are used internally.

Therefore, only enter a resource control option from the Docker update commands in the Option field.

Ex.)

■To limit the maximum size of memory up to 50 megabytes

●Example with a docker update command

```
# docker update --memory 50M --memory-swap 100M nginx_container
```

●Example of making an entry in the Option field

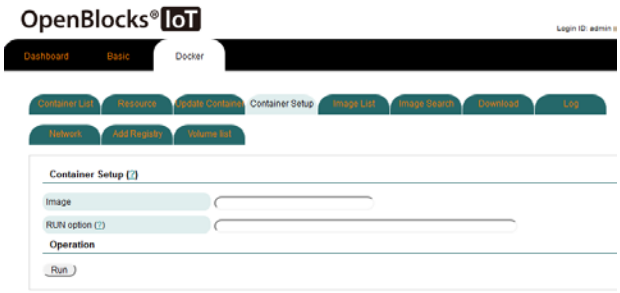
```
--memory 50M --memory-swap 100M
```

For further details of Docker update commands, please refer to the following page:

http://docs.docker.jp/engine/reference/commandline/update.html

2-6 Initial startup of Docker container

It is possible to create and startup a container using the **[Docker]-[Container Setup]** tab.
If a target image is not present in the local environment, it will be automatically obtained from the Docker Hub.
*To use an image in a private registry server, obtain it in advance by using the Download tab.



■Image

Designate an image name of a container to create and start up.

■RUN option

Designate a Docker run command option. The detach option (-d) will automatically be added internally.

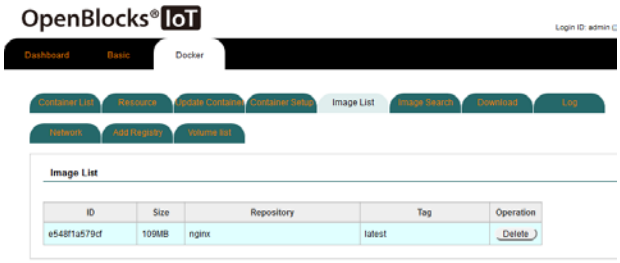
After installation and rebooting, Docker will always be activated. WEB UI may reboot Docker, etc. in certain saving event actions.
For this reason, apply the detach option ("docker run -d") and the always restart policy ("docker run --restart=always") option to the container to use for operations.
In terms of container management, it is also recommended to use the container name option ("--name <container name>".

For further details of Docker run commands, please refer to the following page:

http://docs.docker.jp/engine/reference/commandline/run.html

2-7 Checking Docker local images

It is possible to check a list of Docker container images that are locally present by choosing the **[Docker]-[Image List]** tab.

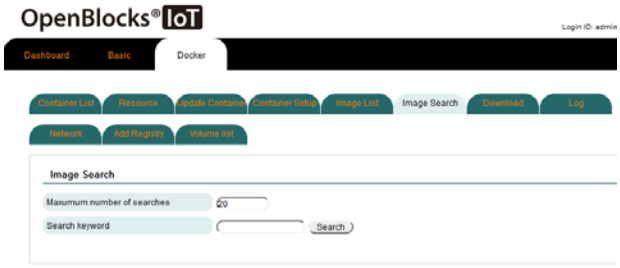


A list of images that are sources of containers will be displayed.

Regardless of being in use or not in use, the Delete button will be displayed. However, it is not possible to delete any image in use. For this reason, to delete a container, delete the container using the target image in the Container List tab in advance.

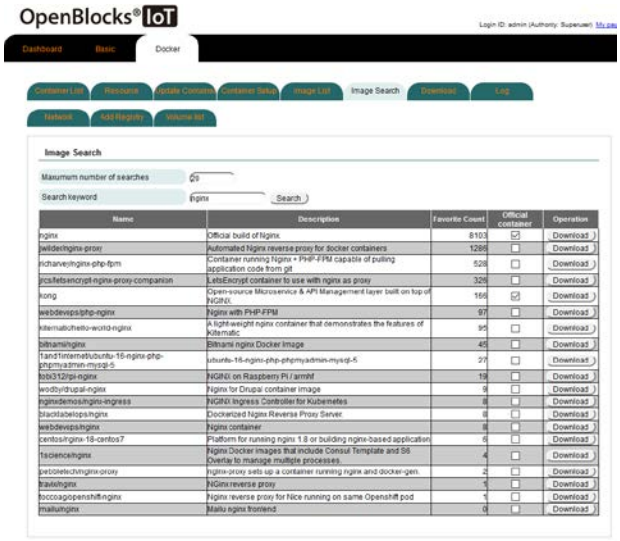
2-8 Searching for Docker images

It is possible to search for a container image available from the Docker Hub by choosing the **[Docker]-[Image Search]** tab.



Enter a string subject to be searched in the Search keyword field and press the Search button to perform search.

The maximum number of searches is 100.



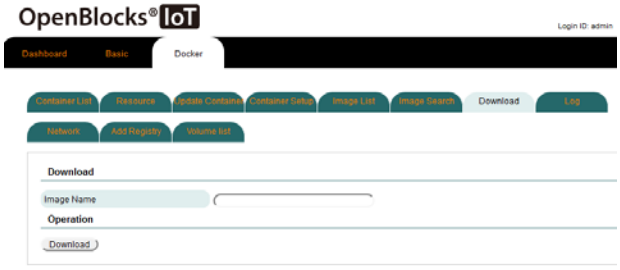
The screen shot on the left is an example of searching for an "nginx" image.

Press the Download button to download target file.

2-9. Downloading Docker images

It is possible to download container images available in the Docker Hub or on a private registry server by choosing the **[Docker]-[Download]** tab.

If a container image to be downloaded is on a private registry server, login information for the target server will be required in advance. Set up the login information in the Add Registry tab.



Designate the name of an image to download. For an image with a specific tag, enter ":tag name" in the Image Name field.

After entering the image name, press the Download button to download target image.

When the download button is pressed, a button to show the status will be displayed. Press this button to check the progress of downloading, if downloading a large-sized image.

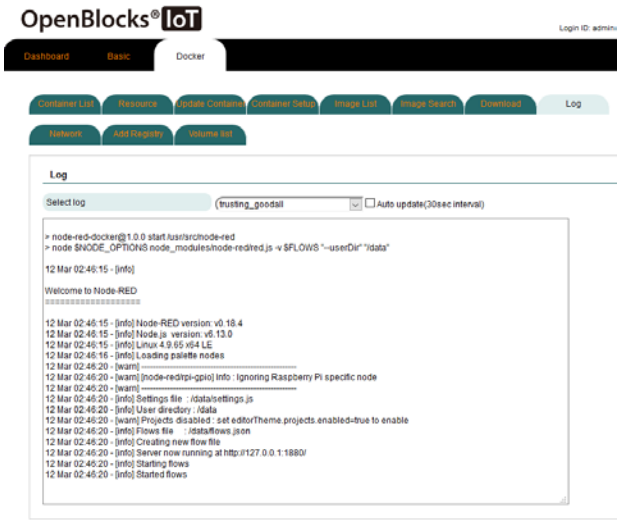
2-10 Checking Docker container logs

It is possible to check the log outputted from the container in use by choosing the **[Docker]-[Log]** tab.

If a container is deleted, the log for this container will also be deleted, and therefore cannot be checked from this procedure.

Choose a container whose log is to be checked from the pull-down menu.

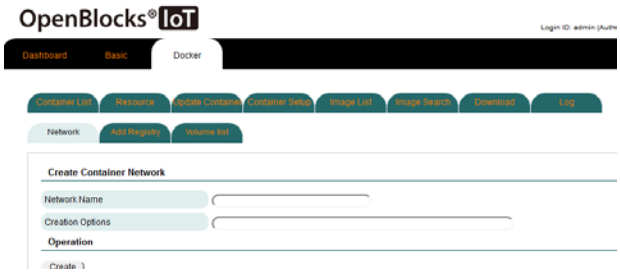
If a container is selected, a field to show the log will appear.



A range of the log starting from the final log of the target container will be displayed.

2-11. Network setup of Docker containers

To use a created container in a network other than the default network, it is possible to create a network and setup a connection/disconnection with the container by choosing the **[Docker]-[Network]** tab.

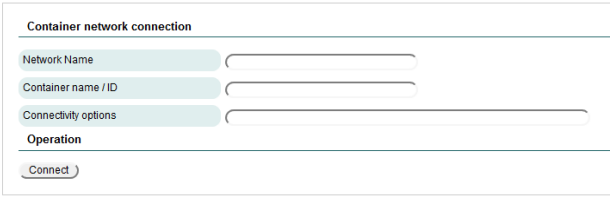


When the Network tab is chosen, the screen on the left will be displayed.

■Create Container Network

(docker network create command)

Designate the name of the network to be created in the Network Name field, enter options in the Creation Options and press the Create button to generate a network.



■Container network connection

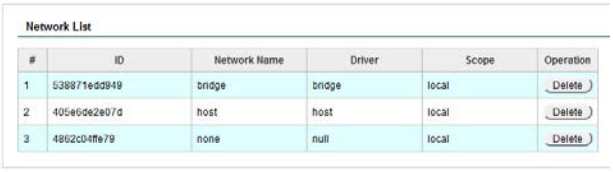
(docker network connect command)

Designate the name of the network to be connected in the Network Name field, enter options in the Connectivity options field and then press the Connect button to connect the network.

■Disconnect Container Network

(docker network create command)

Designate the name of the network name to be disconnected in the Network Name field as well as the name of the container and then press the Disconnect button to disconnect the network.



■Network List

A list of networks that are present as Docker networks will be displayed. To delete a network that was created, press the Delete button.

It may not be possible to delete some networks due to the limitations of Docker.

For further details of Docker network-related commands, please refer to the following pages:

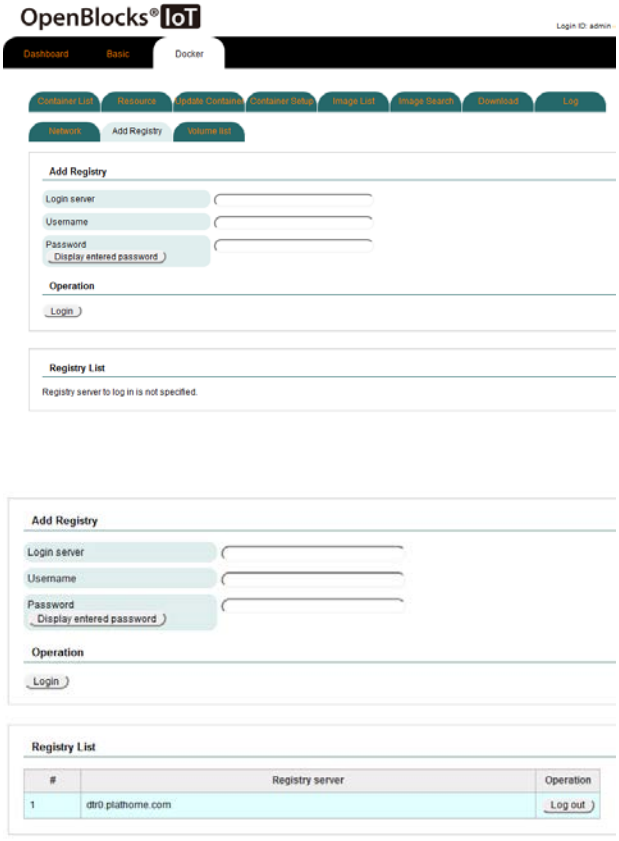
■Docker network create command
http://docs.docker.jp/engine/reference/commandline/network_create.html

■Docker network connect command
http://docs.docker.jp/engine/reference/commandline/network_connect.html

■Docker network disconnect command
http://docs.docker.jp/engine/reference/commandline/network_disconnect.html

2-12 Authentication setup for private registry servers

To use a container not to be disclosed to a third party, it is possible to use a private registry server. If this is the case, it is necessary to setup authentication information. This information can be setup in the **[Docker]-[Add Registry]** tab.



Setup information on a private registry server to log into.

■Login server

Enter the FQDN or IP address of the private registry server to log into.

■Username

Enter the username used for logging in.

■Password

Enter the password for logging in.

If successfully logged into the registry, the registry will be added to the registry list as shown to the left.

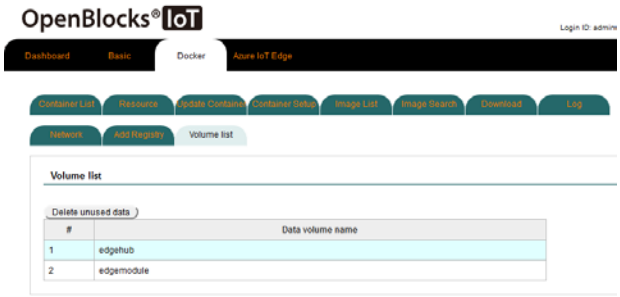
To log out from a target registry server, press the Log out button.

When pressing the Login button, the login procedure will actually be applied. Therefore, use this procedure in an environment where a network connection can be established with the private registry server.

2-14 Displaying and deleting volume lists

Some containers may remain on storage even after such containers or their images have been deleted. In this case, it is necessary to intentionally delete such volumes.

It is possible to check the list of disk volumes and delete them by choosing the **[Docker]-[Volume list]** tab.



A list of volumes present will be displayed.

Press the Delete unused data button to delete unnecessary volumes.

*This function to delete unused data will delete data judged unnecessary by Docker DAEMON.

As there is a risk that this action may delete containers not in use, perform this procedure when the container needed is in operation.

Chapter 3 Others

3-1 Conjunction with Azure IoT Edge

Azure IoT Edge uses Docker. WEB UI for Azure IoT Edge does not support any direct control function of containers. If planning to use Azure IoT Edge, consider the possibilities of using this function.

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