



# Run Hypriot Docker BirthdayParty#3 app

Hypriot have ported docker:s BirthdayParty#3 app!

## *On Raspberry Pi 2 that will be Master.*

Task 1: Check version for docker and docker-compose.

Step 1: Enter following command: **docker version**, and then press Enter.

To run Docker BirthdayParty#3 app, you need Docker version 1.10 or later.

Step 2: Enter following command: **docker-compose version**, and then press Enter.

To run Docker BirthdayParty#3 app, you need Docker-Compose version 1.6.

If you need update, follow the steps under Task 2, otherwise jump to Task 3.

Task 2: Upgrade docker and docker-compose to latest.

Step 1: Enter following command: **apt-get update && apt-get install --only-upgrade docker-hypriot docker-compose**, and then press Enter. Answer with **Y**, do upgrade.

```
HypriotOS: root@cl-master in ~
$ docker version
Client:
Version:      1.10.3
API version:  1.22
Go version:   go1.4.3
Git commit:   20f81dd
Built:        Thu Mar 10 22:23:48 2016
OS/Arch:     linux/arm

Server:
Version:      1.10.3
API version:  1.22
Go version:   go1.4.3
Git commit:   20f81dd
Built:        Thu Mar 10 22:23:48 2016
OS/Arch:     linux/arm
HypriotOS: root@cl-master in ~
$
```

Step 2: Check version for docker, enter following command: **docker version**, and then press Enter.

Step 3: Check version for docker-compose, enter following command: **docker-compose version**, and then press Enter.

```
HyprIoTOS: root@cl-master in ~  
$ docker-compose version  
docker-compose version 1.6.2, build 4d72027  
docker-py version: 1.7.2  
CPython version: 2.7.9  
OpenSSL version: OpenSSL 1.0.1k 8 Jan 2015  
HyprIoTOS: root@cl-master in ~  
$
```

Task 4: Obtain make.

Step 1: Enter following command: **apt-get install make**, and then press Enter.

Task 3: Obtain labfiles.

```
HyprIoTOS: root@cl-master in ~  
$ git clone https://github.com/jmMeessen/rpi-voting-app.git  
Cloning into 'rpi-voting-app'...  
remote: Counting objects: 142, done.  
remote: Total 142 (delta 0), reused 0 (delta 0), pack-reused 142  
Receiving objects: 100% (142/142), 64.87 KiB | 0 bytes/s, done.  
Resolving deltas: 100% (44/44), done.  
Checking connectivity... done.  
HyprIoTOS: root@cl-master in ~  
$
```

Step 1: Enter following command: **git clone https://github.com/dduportal/rpi-voting-app**, and then press Enter.

Task 5: Pre-build the java application for the worker and copy it locally.

Step 1: Change directory to vote-apps/worker, type in the following command: **cd rpi-voting-app/vote-apps/worker**, and then press Enter.

Step 2: Enter the following command: **make build**, and then press Enter.

Take some time, grab a cup of coffee!

Task 6: Configure and run consul, on master-rpi.

Step 1: Grab IP-address for master-rpi, enter the following command: **ifconfig**, and press Enter.

Step 2: Record IP-configuration for eth0.

Consul is running within docker container.

Step 3: To start the container, enter following command: **docker run -d --net=host --restart=always --name=consul hyprriot/rpi-consul agent -dev -ui -ui-dir=/ui -advertise=<Master IP> -bind=<Master IP> -client=<Master IP>**, and then press Enter.

Switch <Master IP> to IP-address noted before.

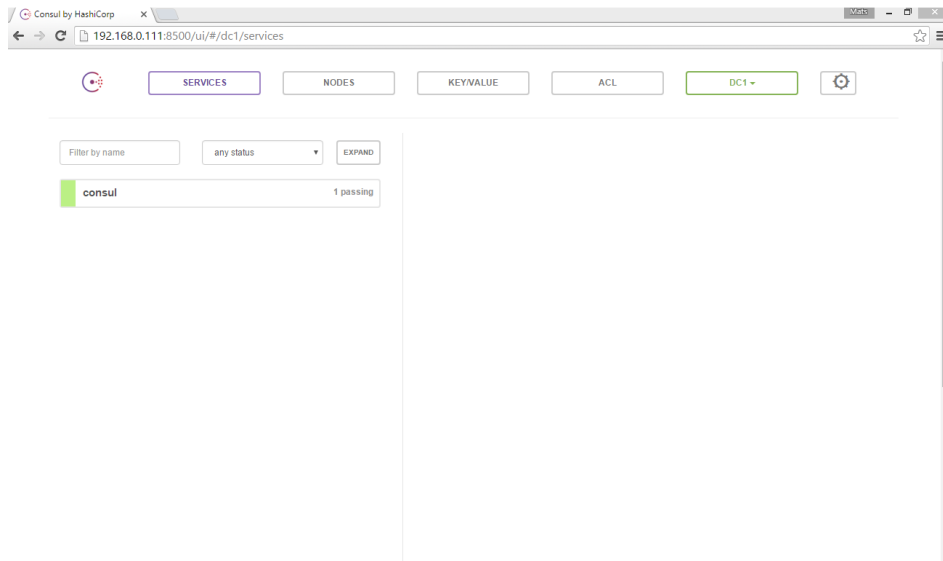
```
HyprriotOS: root@cl-master in ~/rpi-voting-app/vote-apps on master
$ docker run -d --net=host --restart=always --name=consul hyprriot/rpi-consul agent -dev -ui -ui-dir=/ui -advertise=192.168.0.111 -bind=192.168.0.111 -client=192.168.0.111
Unable to find image 'hyprriot/rpi-consul:latest' locally
latest: Pulling from hyprriot/rpi-consul

a3ed95caeb02: Pull complete
c6df1955d644: Pull complete
Digest: sha256:513951e139a73724e45abcc07e90d5f301edd83a752ce7c4dea9bb3627323197
Status: Downloaded newer image for hyprriot/rpi-consul:latest
fd5b17fa315e652160747e096836ea5de854ff966b66c311317f7eabe04b4c0e
HyprriotOS: root@cl-master in ~/rpi-voting-app/vote-apps on master
$
```

Step 4: Check if Consul is running, enter following command: **docker logs consul**, and then press Enter.

Step 5: Connect from client, in web browser enter: **http://<Master IP>:8500**, and then press Enter.

Switch <Master IP> to IP-address noted before.



### ***On Raspberry Pi 2:s that will be nodes.***

Task 1: Check version for docker and docker-compose.

Step 1: Enter following command: **docker version**, and then press Enter.

To run Docker BirthdayParty#3 app, you need Docker version 1.10 or later.

Step 2: Enter following command: **docker-compose version**, and then press Enter.

To run Docker BirthdayParty#3 app, you need Docker-Compose version 1.6.

If you need update, follow the steps under Task 2, otherwise jump to Task 3.

Task 2: Upgrade docker and docker-compose to latest.

Step 1: Enter following command: **apt-get update && apt-get install --only-upgrade docker-hypriot docker-compose**, and then press Enter. Answer with **Y**, do upgrade.

```

HyprIoTOS: root@cl-master in ~
$ docker version
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API version:  1.22
Go version:   go1.4.3
Git commit:   20f81dd
Built:        Thu Mar 10 22:23:48 2016
OS/Arch:     linux/arm
HyprIoTOS: root@cl-master in ~
$

```

Step 2: Check version for docker, enter following command: **docker version**, and then press Enter.

Step 3: Check version for docker-compose, enter following command: **docker-compose version**, and then press Enter.

```

HyprIoTOS: root@cl-master in ~
$ docker-compose version
docker-compose version 1.6.2, build 4d72027
docker-py version: 1.7.2
CPython version: 2.7.9
OpenSSL version: OpenSSL 1.0.1k 8 Jan 2015
HyprIoTOS: root@cl-master in ~
$

```

Task 3: On each of your node, configure DOCKER\_OPTS in the file /etc/default/docker.

Step 1: Enter the following command: **nano /etc/default/docker**, and then press Enter.

Step 2: Add following items to the line with DOCKER\_OPTS:

**-H tcp://0.0.0.0:2375**

**--cluster-store consul://<Master IP>:8500 --cluster-advertise=eth0:2375**

-H tcp://0.0.0.0:2375 lets Docker listening to HTTP, will run remote commands.

Switch <Master IP> to IP-address noted before.

```

GNU nano 2.2.6      File: /etc/default/docker      Modified
# Docker Upstart and SysVinit configuration file
#
# THIS FILE DOES NOT APPLY TO SYSTEMD
#
# Please see the documentation for "systemd drop-ins":
# https://docs.docker.com/engine/articles/systemd/
#
# Customize location of Docker binary (especially for development testing).
#DOCKER="/usr/local/bin/docker"
#
# Use DOCKER_OPTS to modify the daemon startup options.
#DOCKER_OPTS="--dns 8.8.8.8 --dns 8.8.4.4"
DOCKER_OPTS="-H tcp://0.0.0.0:2375 --cluster-store consul://192.168.0.111:8500 $
#
# If you need Docker to use an HTTP proxy, it can also be specified here.
#export http_proxy="http://127.0.0.1:3128/"

```

Save your changes.

Task 4: Restart Docker.

Step 1: Enter the following command: **systemctl restart docker**, and then press Enter.

Task 5: To check:

Step 1: Enter the following command: **docker info**, and then press Enter.

```

HyprIoTOS: root@c11-node in ~
$ docker info
Containers: 0
  Running: 0
  Paused: 0
  Stopped: 0
Images: 1
Server Version: 1.10.2
Storage Driver: overlay
  Backing Filesystem: extfs
Execution Driver: native-0.2
Logging Driver: json-file
Plugins:
  Volume: local
  Network: bridge null host
Kernel Version: 4.1.17-hyprIoTOS-v7+
Operating System: Raspbian GNU/Linux 8 (jessie)
OSType: linux
Architecture: armv7l
CPUs: 4
Total Memory: 925.5 MiB
Name: c11-node
ID: I5PU:LBWR:ETOJ:C4AU:MIXI:BUSO:2BTK:YGAB:DDE4:BHYF:NHGM:F3WO
Debug mode (server): true
File Descriptors: 17
Goroutines: 46
System Time: 2016-03-17T23:55:15.12118316+01:00
EventsListeners: 0
Init SHA1: dfeb8c17f8c9a118753fea8353b715a7a75f5491
Init Path: /usr/lib/docker/dockerinit
Docker Root Dir: /var/lib/docker
Cluster store: consul://192.168.0.111:8500
Cluster advertise: 192.168.0.112:2375
HyprIoTOS: root@c11-node in ~
$

```

```

HypriotOS: root@cl1-node in ~
$ ps aux | grep docker
root      1676  1.8  2.6 865292 25104 ?        Ssl  23:54   0:05 /usr/bin/docker
daemon -H fd:// -H tcp://0.0.0.0:2375 --cluster-store consul://192.168.0.111:85
00 --cluster-advertise=eth0:2375 --storage-driver=overlay -D
root      1757  0.0  0.2  4192  2004 pts/0    S+   23:58   0:00 grep docker
HypriotOS: root@cl1-node in ~
$ █

```

Step 2: Enter the following command: **ps aux | grep docker**, and then press Enter.

Task 6: Start Swarm-agent on node.

```

HypriotOS: root@cl2-node in ~
$ export MY_IP=$(ip addr|awk '/eth0/ && /inet/ {gsub(/\[/[0-9][0-9]/, ""); print $
2}')
HypriotOS: root@cl2-node in ~
$ █

```

Step 1: Enter the following command: **export MY\_IP=\$(ip addr|awk '\`/eth0/ && /inet/ {gsub(/\[/[0-9][0-9]/, ""); print \$2}')** ,and then press Enter.

```

HypriotOS: root@cl2-node in ~
$ docker run -d --restart=always --name=swarm-agent hypriot/rpi-swarm join -adv
ertise ${MY_IP}:2375 consul://192.168.0.111:8500
c9e57483d0164045730e039c101f6351697aeae7694d9448970e9c5a3a92ad38
HypriotOS: root@cl2-node in ~
$ █

```

Step 2: Enter the following command, to start Swarm-agent: **docker run -d --restart=always --name=swarm-agent hypriot/rpi-swarm join -advertise \${MY\_IP}:2375 consul://<Master IP>:8500**, and then press Enter.

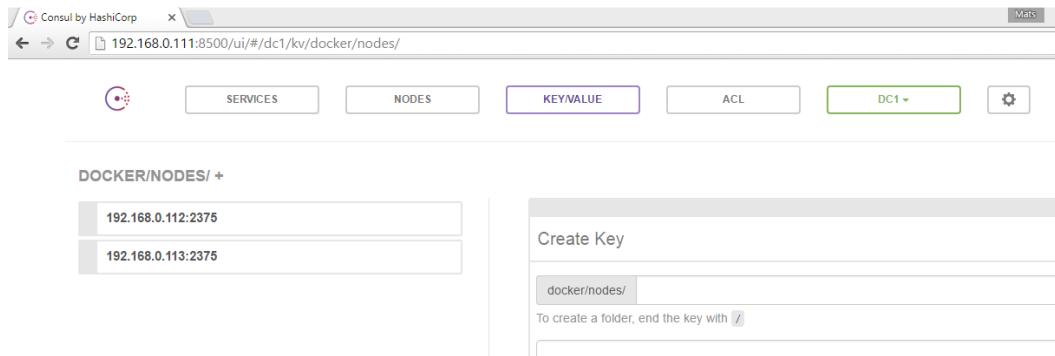
Switch <Master IP> to IP-address noted before.

```

HypriotOS: root@cl2-node in ~
$ docker logs -f swarm-agent
time="2016-03-18T14:14:09Z" level=info msg="Initializing discovery without TLS"
time="2016-03-18T14:14:09Z" level=info msg="Registering on the discovery service
every 1m0s..." addr="192.168.0.113:2375" discovery="consul://192.168.0.111:8500
"
time="2016-03-18T14:15:09Z" level=info msg="Registering on the discovery service
every 1m0s..." addr="192.168.0.113:2375" discovery="consul://192.168.0.111:8500
"
$ █

```

Step 3: Check so that Swarm-agent is running, enter the following command: **docker logs -f swarm-agent**, and then press Enter.



Task 7: Check in consul for the nodes, after you finished the configuration for both nodes.

Step 1: In web browser, enter following url: **http://<Master IP>:8500**, press Enter.

Switch <Master IP> to IP-address noted before.

Step 2: Click on KEY/VALUE-DOCKER-NODES, on the screen there should be two nodes.

### ***Start Swarm-master.***

This task is on Swarm-master, after the task will we have a HTTP Docker API that will serve as Proxy for your docker commands. Retrieve and regularly update a list of Docker remote nodes and Orchestrate the docker commands it will receive.

Task 1: Start Swarm-master.

```
HyprIoTOS: root@cl-master in ~
$ docker run -d -p 10000:6000 hypriot/rpi-swarm manage -H 0.0.0.0:6000 consul://192.168.0.111:8500
```

Step 1: To start Swarm-master, enter the following command: **docker run -d**



`-p 10000:6000 hypriot/rpi-swarm manage -H 0.0.0.0:6000 consul://<Master IP>:8500`, and then press Enter.

Switch <Master IP> to IP-address noted before.

Task 2: Test the Swarm cluster.

Step 1: Enter the following command: `export`

`DOCKER_HOST=tcp://<Master IP>:10000`, and then press Enter.

Step 2: Enter the following command: `docker info`, and then press Enter.

```
$ docker info
Containers: 2
  Running: 2
  Paused: 0
  Stopped: 0
Images: 7
Server Version: swarm/1.1.3
Role: primary
Strategy: spread
Filters: health, port, dependency, affinity, constraint
Nodes: 2
  cl1-node: 192.168.0.112:2375
    â Status: Healthy
    â Containers: 1
    â Reserved CPUs: 0 / 4
    â Reserved Memory: 0 B / 971.8 MiB
    â Labels: executiondriver=native-0.2, kernelversion=4.1.17-hypriotos-v7+, operatingsystem=Raspbian GNU/Linux 8 (jessie), storagedriver=overlay
    â Error: (none)
    â UpdatedAt: 2016-03-18T14:27:00Z
  cl2-node: 192.168.0.113:2375
    â Status: Healthy
    â Containers: 1
    â Reserved CPUs: 0 / 4
    â Reserved Memory: 0 B / 971.8 MiB
    â Labels: executiondriver=native-0.2, kernelversion=4.1.17-hypriotos-v7+, operatingsystem=Raspbian GNU/Linux 8 (jessie), storagedriver=overlay
    â Error: (none)
    â UpdatedAt: 2016-03-18T14:27:10Z
Plugins:
Volume:
Network:
Kernel Version: 4.1.17-hypriotos-v7+
Operating System: linux
Architecture: arm
CPUs: 8
Total Memory: 1.898 GiB
Name: d622306b8080
HypriotOS: root@cl-master in ~
$
```

Task 3: Create overlay network.

```

HyprIoTOS: root@cl-master in ~
$ docker network ls
NETWORK ID          NAME                DRIVER
c88361e31203       cl1-node/none      null
bff9c52b5cb6       cl1-node/host      host
60899ff7356c       cl1-node/docker_gwbridge bridge
7a7e6242646b       cl1-node/bridge    bridge
3c3be1df95e6       cl2-node/host      host
93fe1619c43a       voteapps_back-tier overlay
aadcab9ebc6d       voteapps_front-tier overlay
331b6ef3ce4d       cl2-node/none      null
3a8251f7f8ab       cl2-node/bridge    bridge
HyprIoTOS: root@cl-master in ~
$

```

Step 1: Check available networks, run the following command: **docker network ls**, and then press Enter.

```

HyprIoTOS: root@cl-master in ~
$ docker network create --driver=overlay easec-net-01
1a8622d439af1c898fa7f34c57753979ba27ccfffb8189656b0e7c1a3ce75d862
HyprIoTOS: root@cl-master in ~
$

```

Step 2: Create new overlay network, run the following command: **docker network create --driver=overlay easec-net-01**, and then press Enter.

```

HyprIoTOS: root@cl-master in ~/rpi-voting-app/vote-apps/worker on master
$ docker network ls
NETWORK ID          NAME                DRIVER
67738db2c87f       cl1-node/host      host
cc9667f5e03c       cl2-node/none      null
8c37519bcb25       cl2-node/host      host
54eb11a2a85b       easec-net-01       overlay
1e61dc5f36ad       cl2-node/bridge    bridge
0b22535f7435       cl1-node/bridge    bridge
6256e7fa867a       cl1-node/none      null
HyprIoTOS: root@cl-master in ~/rpi-voting-app/vote-apps/worker on master
$

```

Step 3: Check available networks, run the following command: **docker network ls**, and then press Enter.

***Start the Birthday app (On Master).***

Task 1: Move to directory vote-apps.

Step 1: Enter the following command: **cd . . .**, and then press Enter.

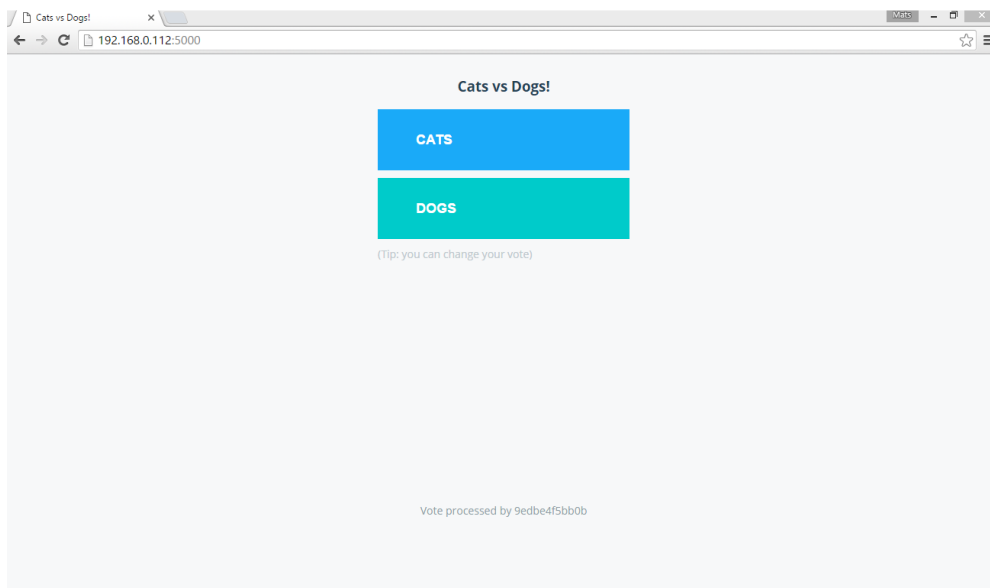
Task 2: Run docker-compose.

Step 1: Enter the following command: **export DOCKER\_HOST=tcp://<Master IP>:10000**, and then press Enter.

Step 2: Enter the following command: **docker-compose up**, and then press Enter.

### ***Connect to Birthday app (On your client).***

Task 1: Connect to Birthday app.



Step 1: On your client, enter following url:

**http://<ip\_address\_of\_node1>:5000**, and then press Enter.

On this page you could vote for your favorite pet!

Step 1: On your client, open up a new windows in your web browser, and then enter following url: **http://<ip\_address\_of\_node1>:5001**, and then press Enter.

The web page will show the result!

