1.概念

Marathon可以通过Constraints来控制其app在何处运行

我们可以通过Marathon的<u>REST API</u>或者<u>Marathon gem(marathon client)</u>来设置app的 constraints配置。

Constraints由三个部分组成:

字段名(field name),操作(operator), 可选参数(optional parameter)

其中字段名(field name)可以为mesos的一个slave的hostname或者Mesos slave的attribute。

2.实战

接下来我们结合实战,来介绍下Marathon Constrains的用法

Slave IP	Attribute
192.168.100.27	无
192.168.100.30	rack_id:rack-1
192.168.100.31	rack_id:rack-1
192.168.100.32	rack_id:rack-2

字段名

Hostname字段

hostname 匹配slave的hostnames。 hostname支持所有的operator

Attribute字段

attribute 匹配Mesos slave的attributes字段。我们可以通过在mesos节点上运行mesos-slave --help来学习如何设置mesos slave的attributes。

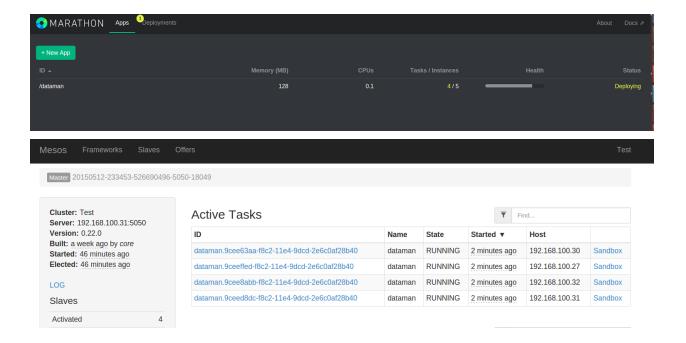
操作

UNIQUE operator

UNIQUE tells Marathon to enforce uniqueness of the attribute across all of an app's tasks.

```
$ curl -v -X POST http://192.168.100.30:8080/v2/apps \
    -H Content-Type:application/json -d '{
      "id":"dataman",
      "container": {
      "type": "DOCKER",
        "docker": {
          "image": "192.168.100.13:5000/fchen/mynginx",
          "network": "BRIDGE",
          "portMappings": [
            { "containerPort": 80, "hostPort": 0, "protocol": "tcp"}
        }
      },
      "constraints": [["hostname", "UNIQUE"]],
      "cmd": "/usr/sbin/nginx -c /etc/nginx/nginx.conf",
      "cpus": 0.1,
      "mem": 128.0,
      "instances": 5
```

field name = hostname, operator = UNIQUE, 在每个slave上只起一个instance。由于我们申请了5个nginx instance,而我们Mesos集群节点只有4个slave,所以我们在Marathon的管理界面上看到app dataman为Deploying状态。



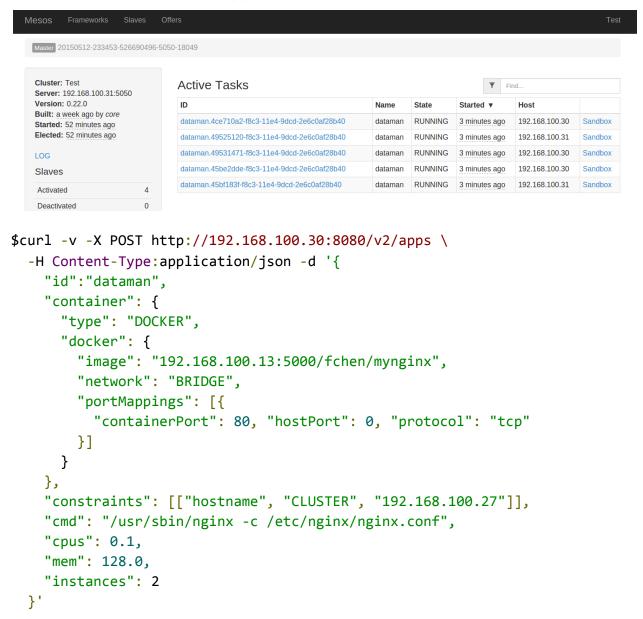
CLUSTER operator

CLUSTER allows you to run all of your app's tasks on slaves that share a certain attribute. This is useful for example if you have apps with special hardware needs, or if you want to run them on the same rack for low latency.

```
$ curl -v -X POST http://192.168.100.30:8080/v2/apps \
    -H Content-Type:application/json -d '{
      "id": "dataman",
      "container": {
        "type": "DOCKER",
        "docker": {
          "image": "192.168.100.13:5000/fchen/mynginx",
          "network": "BRIDGE",
          "portMappings": [
            { "containerPort": 80, "hostPort": 0, "protocol": "tcp"}
        }
      },
      "constraints": [["rack_id", "CLUSTER", "rack-1"]],
      "cmd": "/usr/sbin/nginx -c /etc/nginx/nginx.conf",
      "cpus": 0.1,
      "mem": 128.0,
      "instances": 5
```

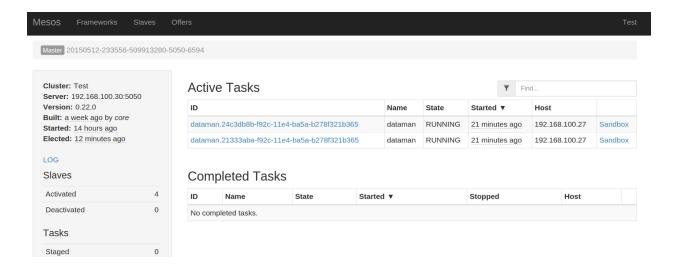
CLUSTER允许我们将app发布到Mesos特定的slave节点上。如果你的app对物理机的硬件有要求,那么这个特性就很有用了。

我们可以看到marathon将我们的app都发布到了rack-1节点上去了。



我们还可以指定field name为hostname,并将optional parameter指定为我们希望app运行的slave的hostname。

这样我们将2个dataman的instance发布到了192.168.100.27这台slave上。

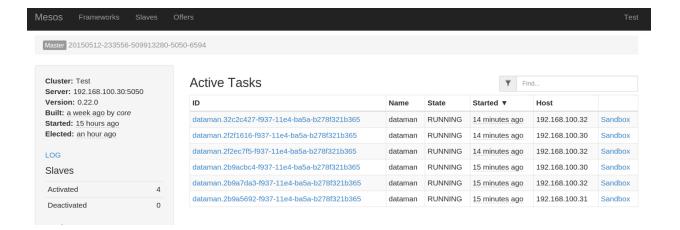


GROUP_BY operator

GROUP_BY can be used to distribute tasks evenly across racks or datacenters for high availability.

```
$curl -v -X POST http://192.168.100.30:8080/v2/apps \
  -H Content-Type:application/json -d '{
    "id": "dataman",
    "container": {
      "type": "DOCKER",
      "docker": {
        "image": "192.168.100.13:5000/fchen/mynginx",
        "network": "BRIDGE",
        "portMappings": [{
          "containerPort": 80, "hostPort": 0, "protocol": "tcp"
        }]
      }
    },
    "constraints": [["rack id", "GROUP BY"]],
    "cmd": "/usr/sbin/nginx -c /etc/nginx/nginx.conf",
    "cpus": 0.1,
    "mem": 128.0,
    "instances": 6
  }'
```

GROUP_BY帮我们将instance均匀的分布到不同的机架上,保证了高可用性。可以看到rack-1和rack-2上的instance个数均为3个。



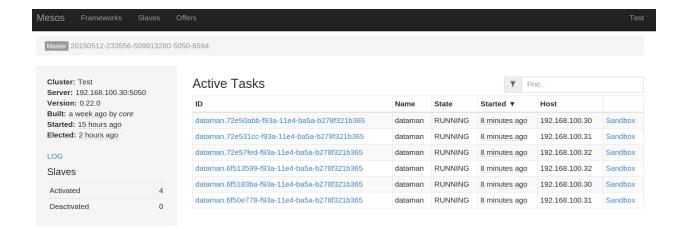
LIKE operator

LIKE accepts a regular expression as parameter, and allows you to run your tasks only on the slaves whose field values match the regular expression.

```
curl -v -X POST http://192.168.100.30:8080/v2/apps \
  -H Content-Type:application/json -d '{
    "id": "dataman",
    "container": {
      "type": "DOCKER",
      "docker": {
        "image": "192.168.100.13:5000/fchen/mynginx",
        "network": "BRIDGE",
        "portMappings": [{
          "containerPort": 80, "hostPort": 0, "protocol": "tcp"
        }]
      }
    },
    "constraints": [["rack_id", "LIKE", "rack-[1-2]"]],
    "cmd": "/usr/sbin/nginx -c /etc/nginx/nginx.conf",
    "cpus": 0.1,
    "mem": 128.0,
    "instances": 6
  }'
```

LIKE操作可以将我们的instance发布到我们希望的slave上,匹配正则表达式。

注意:LIKE操作必须带上parameter。



UNLIKE operator

Just like LIKE operator, but only run tasks on slaves whose field values don't match the regular expression.

```
curl -v -X POST http://192.168.100.30:8080/v2/apps \
  -H Content-Type:application/json -d '{
    "id": "dataman",
    "container": {
      "type": "DOCKER",
      "docker": {
        "image": "192.168.100.13:5000/fchen/mynginx",
        "network": "BRIDGE",
        "portMappings": [{
          "containerPort": 80, "hostPort": 0, "protocol": "tcp"
        }]
      }
    },
    "constraints": [["rack id", "UNLIKE", "rack-[2,3]"]],
    "cmd": "/usr/sbin/nginx -c /etc/nginx/nginx.conf",
    "cpus": 0.1,
    "mem": 128.0,
    "instances": 6
  }'
```

同LIKE操作,UNLIKE不将instance发布到匹配的slave上,参数匹配正则表达式。

Mesos Frameworks Slaves Offers Test

Master 20150512-233556-509913280-5050-6594

Cluster: Test
Server: 192.168.100.30:5050
Version: 0.22.0
Built: a week ago by core
Started: 15 hours ago
Elected: 2 hours ago

LOG
Slaves

Activated 4
Deactivated 0

Active Tasks			▼ Find		
ID	Name	State	Started ▼	Host	
dataman.56130ad3-f93c-11e4-ba5a-b278f321b365	dataman	RUNNING	just now	192.168.100.27	Sandbox
dataman.557a4d42-f93c-11e4-ba5a-b278f321b365	dataman	RUNNING	just now	192.168.100.30	Sandbox
dataman.557a2631-f93c-11e4-ba5a-b278f321b365	dataman	RUNNING	just now	192.168.100.31	Sandbox
dataman.527ec080-f93c-11e4-ba5a-b278f321b365	dataman	RUNNING	a minute ago	192.168.100.27	Sandbox
dataman.51e629fe-f93c-11e4-ba5a-b278f321b365	dataman	RUNNING	a minute ago	192.168.100.30	Sandbox
dataman.51e6c63f-f93c-11e4-ba5a-b278f321b365	dataman	RUNNING	a minute ago	192.168.100.31	Sandbox