

FISCO BCOS-多服务器部署区块链（2）-群组扩充新服务器新节点

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本文参考官方链接: https://fisco-bcos-documentation.readthedocs.io/zh_CN/latest/docs/enterprise_tools/tutorial_detail_operation.html

一、证书授权机构初始化机构C

1. 进入证书生成机构目录

本次搭链的证书生成机构是阿里云1 (ip地址为: 47.113.185.200)

```
cd ~/generator
```

2. 初始化机构C

此时generator目录下有链证书及私钥, 实际环境中机构C无法获取链证书及私钥 (那应该怎么办呢? 抛出问题)。

```
cp -r ~/generator ~/generator-C
```

3. 生成机构C证书

```
./generator --generate_agency_certificate ./dir_agency_ca ./dir_chain_ca agencyC
```

```
root@iZf8z08vhl79qwmoo5x5hZ:~/generator# ./generator --generate_agency_certificate ./dir_agency_ca ./dir_chain_ca agencyC
INFO | Generate cert to ./dir_agency_ca by node_deployment.ini
```

4. 查看机构证书及私钥

```
ls dir_agency_ca/agencyC/
```

```
root@iZf8z08vhl79qwmoo5x5hZ:~/generator# ls dir_agency_ca/agencyC/
agency.crt agency.key ca.crt
```

上图中, 从左至右分别为机构证书、机构私钥、链证书

5. 发送机构证书、机构私钥、链证书给机构C。

```
cp ./dir_agency_ca/agencyC/* ~/generator-C/meta/
```

二、机构C生成节点

1. 进入生成机构C目录

```
cd ~/generator-C
```

2. 机构C修改配置文件

```
cat > ./conf/node_deployment.ini << EOF
```

```
[group]
```

```
group_id=1
```

```
[node0]
```

```
; host ip for the communication among peers.
```

```
; Please use your ssh login ip.
```

```
p2p_ip=127.0.0.1
```

```
; listen ip for the communication between sdk clients.
```

```
; This ip is the same as p2p_ip for physical host.
```

```
; But for virtual host e.g. vps servers, it is usually different from p2p_ip.
```

```
; You can check accessible addresses of your network card.
```

```
; Please see https://tecadmin.net/check-ip-address-ubuntu-18-04-desktop/
```

```
; for more instructions.
```

```
rpc_ip=127.0.0.1
```

```
channel_ip=0.0.0.0
```

```
p2p_listen_port=30302
```

```
channel_listen_port=20202
```

```
jsonrpc_listen_port=8547
```

```
EOF
```

2.1 查看配置文件内容

```
vim ./conf/node_deployment.ini
```

3. 机构A发送节点连接地址文件及群组1创世区块给机构C

3.1 A机构需要将节点P2P连接地址文件发送至机构C

(因为机构生成节点时需要指定其他节点的节点P2P连接地址)

```
cd ~/generator-A
```

```
cp ./agencyA_node_info/peers.txt ~/generator-C/meta/peersA.txt
```

3.2 分发群组1创世区块至机构C

```
cp ./group/group.1.genesis ~/generator-C/meta
```

4. 机构C生成并发送节点信息

4.1 进入生成机构C目录

```
cd ~/generator-C
```

4.2 机构C生成节点证书及P2P连接信息文件

```
./generator --generate_all_certificates ./agencyC_node_info
```

```
root@iZf8z08vhl79qwmoo5x5hZ:~/generator-A# cd ~/generator-C
root@iZf8z08vhl79qwmoo5x5hZ:~/generator-C# ./generator --generate_all_certificates ./agencyC_node_info
INFO | Generate cert to ./agencyC_node_info by node_deployment.ini
.
INFO | Generate /root/generator-C/meta/node_127.0.0.1_30302
INFO | Generate cert by node_installation.ini successful!
INFO | Generate cert by node_deployment.ini end.
root@iZf8z08vhl79qwmoo5x5hZ:~/generator-C#
```

4.3 机构C发送节点证书给机构A

```
cp ./agencyC_node_info/cert*.crt ~/generator-A/meta/
```

4.4 机构C发送P2P连接地址文件给机构A

```
cp ./agencyC_node_info/peers.txt ~/generator-A/meta/peersC.txt
```

5.机构C生成所属节点

5.1 进入生成机构C目录

```
cd ~/generator-C
```

5.2 生成节点C

```
./generator --build_install_package ./meta/peersA.txt ./nodeC
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C# ./generator --build_install_package ./meta/peersA.txt ./nodeC
INFO | Build operation begin.
INFO | Checking fisco-bcos binary...
INFO | Binary check passed.
INFO | Generate ./nodeC/node_127.0.0.1_30302
INFO | Build operation end.
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C#
```

5.3 机构C启动节点

```
bash ./nodeC/start_all.sh
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C# bash ./nodeC/start_all.sh
try to start node_127.0.0.1_30302
node_127.0.0.1_30302 start successfully
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C#
```

5.4 查看节点进程

```
ps -ef | grep fisco
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C# ps -ef | grep fisco
root 560 1 0 Apr11 00:17:50 /root/generator-B/node/node_127.0.0.1_30302/fisco-bcos -c config.ini
root 3467 1 0 17:48 pts/0 00:00:00 /root/generator-C/node/node_127.0.0.1_30302/fisco-bcos -c config.ini
root 3888 1618 0 17:49 pts/0 00:00:00 grep --color=auto fisco
root 46550 1 0 Apr11 00:16:59 /root/generator-A/node/node_127.0.0.1_30300/fisco-bcos -c config.ini
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C#
```

三、机构C节点加入群组1

1.发送群组1创世区块给机构C

1.1 进入生成机构A目录

```
cd ~/generator-A
```

1.2 发送群组1创世区块给机构C

```
./generator --add_group ./group/group.1.genesis ~/generator-C/nodeC
```

1.3 重启机构C节点

```
cd ~/generator-C
```

```
bash ./nodeC/stop_all.sh
```

```
bash ./nodeC/start_all.sh
```

```
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-A# cd ~/generator-C
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C# bash ./nodeC/stop_all.sh
try to stop node_127.0.0.1_30302
stop node_127.0.0.1_30302 success.
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C# bash ./nodeC/start_all.sh
try to start node_127.0.0.1_30302
node_127.0.0.1_30302 start successfully
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C#
```

四、配置及使用控制台

因为将节点加入已有群组需要用户使用控制台发送指令，将节点加入群组。

1.安装java

```
sudo apt install -y default-jdk
```

```
Processing triggers for systemd (229-4ubuntu21.27) ...
Processing triggers for ca-certificates (20170717-16.04.2) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
done.
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C#
```

2.下载控制台配置文件

2.1 进入生成机构A目录

```
cd ~/generator-A
```

2.2 拉取控制台

```
./generator --download_console ./ --cdn
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C# ./generator --download_console ./ --cdn
INFO | ===== USE_CDN ===== ON =====
INFO | Downloading console binary from https://www.fisco.com.cn/cdn
INFO | get console in ../console/conf!
INFO | get sdk cert in meta!
INFO | generate console cert!
INFO | get console file end
root@iZf8z08vhl79qvmoo5x5hZ:~/generator-C#
```

3.查看机构C节点信息

由于机构A使用控制台加入机构C节点4为观察节点，其中参数第二项需要替换为加入节点的nodeid，nodeid在节点文件夹的conf的node.nodeid文件

```
cat ~/generator-C/nodeC/node_127.0.0.1_30302/conf/node.nodeid
root@iZf8z08vhl79qvmoo5x5hZ:~# cat ~/generator-C/nodeC/node_127.0.0.1_30302/conf/node.nodeid
f8d449eae86cc17f9f5adeb895e9db68d1bf8aa41511619a690b3897d65dbd97147ccfe00458697e4b361dfb4f27f6f01d7e8d2dcf22c7107998b431c48866f
root@iZf8z08vhl79qvmoo5x5hZ:~#
```

4.启动控制台

cd ~/generator-A/console && bash ./start.sh 1

```
root@12f8286vhl79qvm003:~# cd ~/generator-A/console && bash ./start.sh 1
=====
Welcome to FISCO BCOS console(1.0.0)!
Type 'help' or 'h' for help. Type 'quit' or 'q' to quit console.

  _____
 | $$$$$$$\$$$$$| $$$$$| $$$$$| $$$$$\| $$$$$$$| $$$$$| $$$$$| $$$$$\|
 | $$      | $$ | $$__\| $$ \| $$ | $$ | $$__\| $$ \| $$ | $$__\| $$
 | $$ \   | $$ \$$ \| $$ | $$ | $$ | $$ \| $$ | $$ | $$$\$$ \
 | $$$$$ | $$ \$$$$$| $$ __| $$ | $$ | $$$$$$$| $$ __| $$ | $$\$$$$\
 | $$ _| $$| \_| $| $$ / | $$\| $$ | $$\| $$ / | $$\| $| \_| $$
 | $$ | $$ \\\$ \$/\$ \$/\$ \$/\$ \$/\$ \$/\$ \$/\$ \$/\$ \$/\$ \$/\$
 \$$ \$$$$$ \$$$$$ \$$$$$ \$$$$$ \$$$$$ \$$$$$ \$$$$$ \$$$$$

[group:1]>
```

5.使用控制台将机构C节点注册为观察节点

addObserver

f8d449eae86cc17f9f5adeb895e9db68d1bf8aa41511619a690b3897d65dbd97147ccfe000458697e4b361dfb4f27f6f01d7e8d2dcf22c7107998b431c48866f

其中，是3查看出来的机构C节点信息

```
[group:1]> addObserver f8d449eae86cc17f9f5adeb895e9db68d1bf8aa415116
{
  "code":0,
  "msg":"success"
}

[group:1]> █
```

6.使用控制台将机构C节点注册为共识节点

addSealer f8d449eae86cc17f9f5adeb895e9db68d1bf8aa41511619a690b3897d65dbd97147ccfe000458697e4b361dfb4f27f6f01d7e8d2dcf22c7107998b431c48866f

```
[group:1]> addSealer f8d449eae86cc17f9f5adeb895e9db68d1bf8aa415116
19a690b3897d65dbd97147ccfe000458697e4b361dfb4f27f6f01d7e8d2dcf22c7
107998b431c48866f
{
  "code":0,
  "msg":"success"
}

[group:1]> █
```

7.利用控制台查看共识节点信息

getSealerList

```
[group:1]> getSealerList
[
  639ea3484271db83f7124f7b6e20ad6df58125164c6fdbf639832140d74531f
2b55828fe1088f06b76bb7fcc18c82615e5f8bf930e5138fef31cca82720b93,
  76fcbf82f76f5e8199ef792781975c272cd26b27fced4786019d07a2b319e0d
b6aaf1bd1fb3f21fa52baa26e2459d3f6481016f63dcd9a4cc90681dca0ba28e6,
  f8d449eae86cc17f9f5adeb895e9db68d1bf8aa41511619a690b3897d65dbd9
7147ccfe000458697e4b361dfb4f27f6f01d7e8d2dcf22c7107998b431c48866f
]

[group:1]> █
```

8.推送机构C文件夹给阿里云服务器3即可

至此，就完成了新服务器生成新节点并加入已有群组的完整步骤！！