FISCO BCOS-多服务器部署区块链（1）-搭建两服务两节点单群组区块链

笔记本:	FISCO		
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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

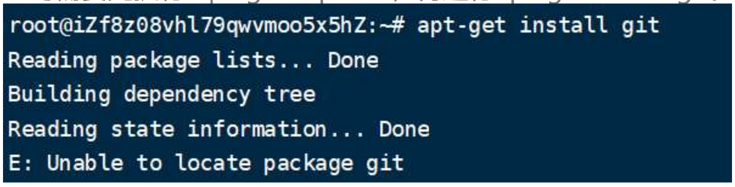
一、下载安装

1.下载

`cd ~/ && git clone https://github.com/FISCO-BCOS/generator.git`

出现问题：服务器没有git，且直接安装无效，如下图。

此时需要先执行 apt-get update，再进行apt-get install git。

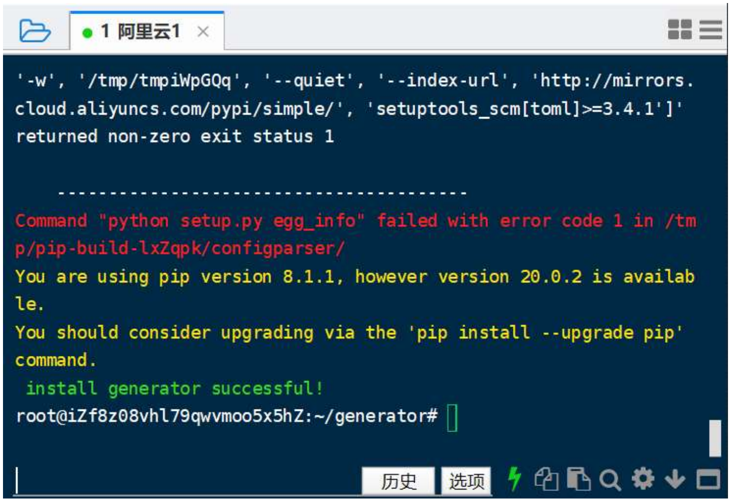


```
root@iZf8z08vhl79qwvmoo5x5hZ:~# apt-get install git
Reading package lists... Done
Building dependency tree
Reading state information... Done
E: Unable to locate package git
```

安装成功git之后，执行上面命令。

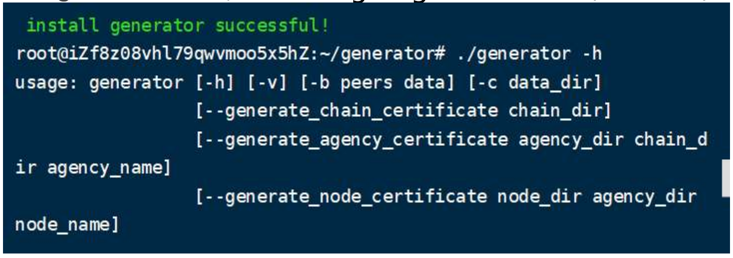
2.安装（此步骤要求有sudo权限）

2.1 `cd ~/generator && bash ./scripts/install.sh`



```
'-w', '/tmp/tmpiWpGQq', '--quiet', '--index-url', 'http://mirrors.
cloud.aliyuncs.com/pypi/simple/', 'setuptools_scm[toml]>=3.4.1']'
returned non-zero exit status 1

    ----------------------------------------
Command "python setup.py egg_info" failed with error code 1 in /tm
p/pip-build-lxZqpk/configparser/
You are using pip version 8.1.1, however version 20.0.2 is availab
le.
You should consider upgrading via the 'pip install --upgrade pip'
command.
 install generator successful!
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator#
```

2.2 验证是否安装成功`./generator -h`，看到usage：generator ***，如下图，表示成功安装。



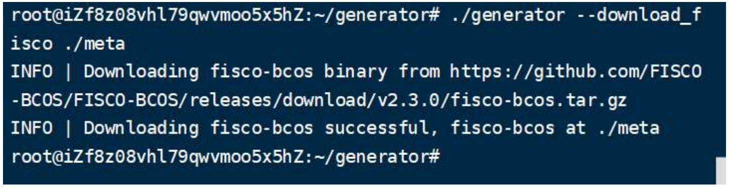
```
 install generator successful!
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# ./generator -h
usage: generator [-h] [-v] [-b peers data] [-c data_dir]
                 [--generate_chain_certificate chain_dir]
                 [--generate_agency_certificate agency_dir chain_d
ir agency_name]
                 [--generate_node_certificate node_dir agency_dir
node_name]
```

3.获取节点二进制

3.1 拉取最新fisco-bcos二进制文件到meta中

```
./generator --download_fisco ./meta
```

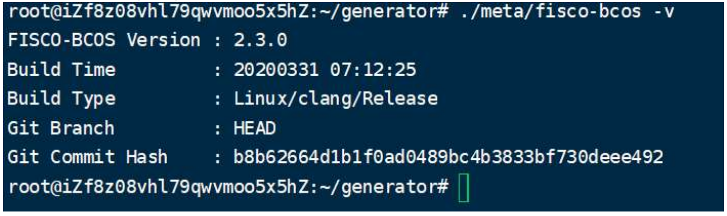
如下图所示，成功拉取



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# ./generator --download_f
isco ./meta
INFO | Downloading fisco-bcos binary from https://github.com/FISCO
-BCOS/FISCO-BCOS/releases/download/v2.3.0/fisco-bcos.tar.gz
INFO | Downloading fisco-bcos successful, fisco-bcos at ./meta
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator#
```

3.2 检查是否成功，`./meta/fisco-bcos -v`

如下图所示，即成功。



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# ./meta/fisco-bcos -v
FISCO-BCOS Version : 2.3.0
Build Time         : 20200331 07:12:25
Build Type         : Linux/clang/Release
Git Branch         : HEAD
Git Commit Hash    : b8b62664d1b1f0ad0489bc4b3833bf730deee492
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator#
```

二、机构初始化

进行完第一步“下载安装”之后，下载的generator就作为**证书颁发机构**，用来初始化机构A/B/C...等

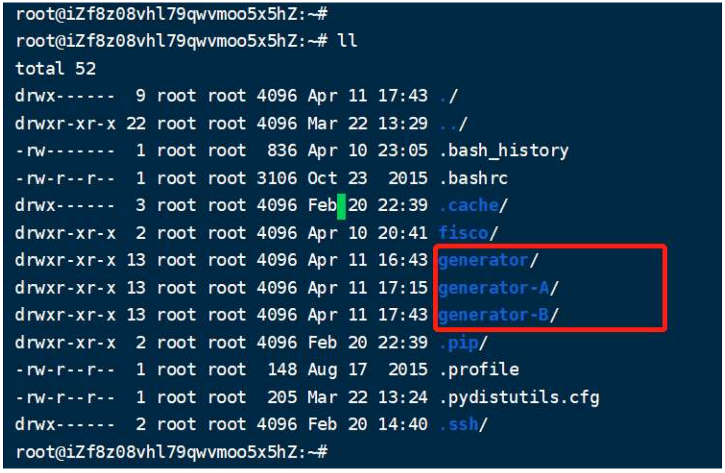
1.机构初始化

1.1 初始化机构A

```
cp -r ~/generator ~/generator-A
```

1.2 初始化机构B

```
cp -r ~/generator ~/generator-B
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~#
root@iZf8z08vhl79qwvmoo5x5hZ:~# ll
total 52
drwx------  9 root root 4096 Apr 11 17:43 ./
drwxr-xr-x 22 root root 4096 Mar 22 13:29 ../
-rw-------  1 root root  836 Apr 10 23:05 .bash_history
-rw-r--r--  1 root root 3106 Oct 23  2015 .bashrc
drwx------  3 root root 4096 Feb 20 22:39 .cache/
drwxr-xr-x  2 root root 4096 Apr 10 20:41 fisco/
drwxr-xr-x 13 root root 4096 Apr 11 16:43 generator/
drwxr-xr-x 13 root root 4096 Apr 11 17:15 generator-A/
drwxr-xr-x 13 root root 4096 Apr 11 17:43 generator-B/
drwxr-xr-x  2 root root 4096 Feb 20 22:39 .pip/
-rw-r--r--  1 root root  148 Aug 17  2015 .profile
-rw-r--r--  1 root root  205 Mar 22 13:24 .pydistutils.cfg
drwx------  2 root root 4096 Feb 20 14:40 .ssh/
root@iZf8z08vhl79qwvmoo5x5hZ:~#
```

2.初始化链证书

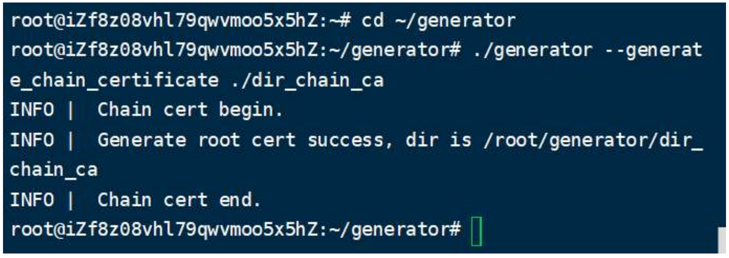
在证书颁发机构上进行操作，注意一条链拥有唯一的链证书ca.crt

2.1 在证书生成机构目录下操作，即先进入目录。

```
cd ~/generator
```

2.2 用命令生成链证书

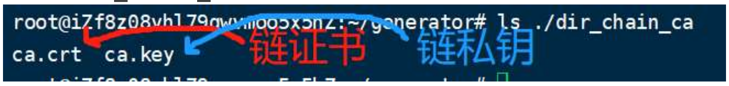
```
./generator --generate_chain_certificate ./dir_chain_ca
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~# cd ~/generator
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# ./generator --generat
e_chain_certificate ./dir_chain_ca
INFO |  Chain cert begin.
INFO |  Generate root cert success, dir is /root/generator/dir_
chain_ca
INFO |  Chain cert end.
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator#
```

2.3 查看链证书及私钥

```
ls ./dir_chain_ca
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# ls ./dir_chain_ca
ca.crt  ca.key
```

3.机构A、B构建群组1

3.1 初始化机构A

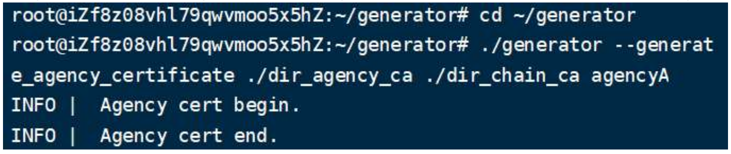
实际应用时应该由机构本地生成私钥agency.key，再生成证书请求文件，向证书签发机构获取机构证书agency.crt。

3.1.1 进入在证书机构目录

```
cd ~/generator
```

3.1.2 生成机构A证书

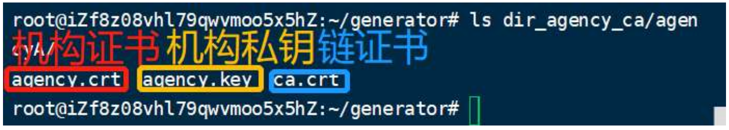
```
./generator --generate_agency_certificate ./dir_agency_ca ./dir_chain_ca agencyA
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# cd ~/generator
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# ./generator --generat
e_agency_certificate ./dir_agency_ca ./dir_chain_ca agencyA
INFO |  Agency cert begin.
INFO |  Agency cert end.
```

3.1.3 查看机构证书及私钥

```
ls dir_agency_ca/agencyA/
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator# ls dir_agency_ca/agen
cyA/
agency.crt  agency.key  ca.crt
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator#
```

3.1.4 发送机构证书、机构私钥、链证书给机构A，采用文件拷贝的方式，从证书授权机构将机构证书发送给对应的机构，放在机构的工作目录的meta子目录下。

```
cp ./dir_agency_ca/agencyA/* ~/generator-A/meta/
```

3.2 初始化机构B

3.2.1 进入证书生成机构目录

```
cd ~/generator
```

3.2.2 生成机构B证书

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

3.2.3 发送证书至机构B的meta子目录

```
cp ./dir_agency_ca/agencyB/* ~/generator-B/meta/
```

注意事项：一条联盟链中只能用到一个根证书ca.crt，多服务器部署时不要生成多个根证书和私钥。一个群组只能有一个群组创世区块group.x.genesis

3.3 机构A修改配置文件

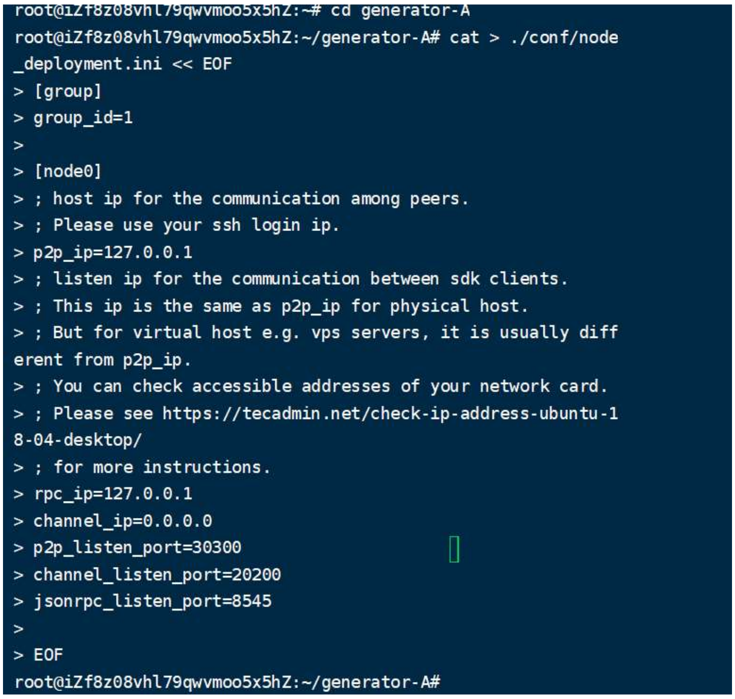
3.3.1 进入生成机构A的目录

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

3.3.2 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
```

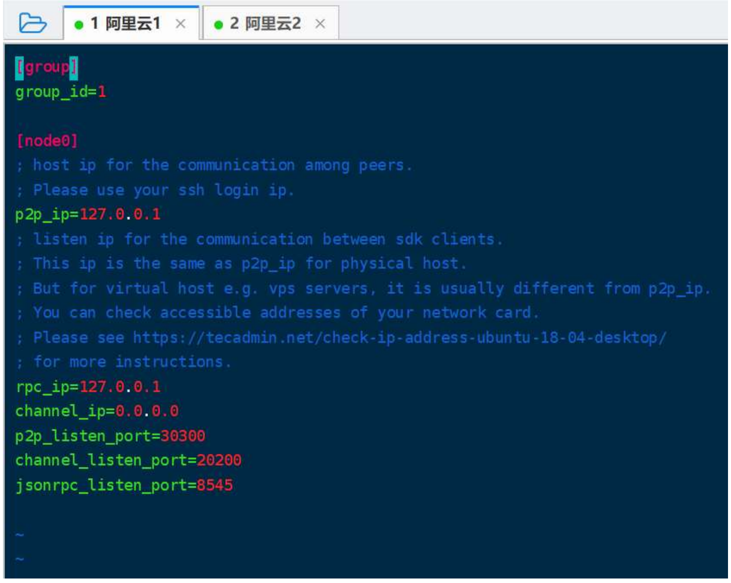
```
channel_ip=0.0.0.0
p2p_listen_port=30300
channel_listen_port=20200
jsonrpc_listen_port=8545
EOF
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~# cd generator-A
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# 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 diff
erent from p2p_ip.
> ; You can check accessible addresses of your network card.
> ; Please see https://tecadmin.net/check-ip-address-ubuntu-1
8-04-desktop/
> ; for more instructions.
> rpc_ip=127.0.0.1
> channel_ip=0.0.0.0
> p2p_listen_port=30300
> channel_listen_port=20200
> jsonrpc_listen_port=8545
>
> EOF
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A#
```

3.3.3 查看配置文件内容

```
cd ~/generator-A
vim ./conf/node_deployment.ini
```



```
[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=30300
channel_listen_port=20200
jsonrpc_listen_port=8545

~
~
```

同时按下shift Esc :，输入q退出。

3.4 机构B修改配置文件

3.4.1 进入生成机构B的目录

```
cd ~/generator-B
```

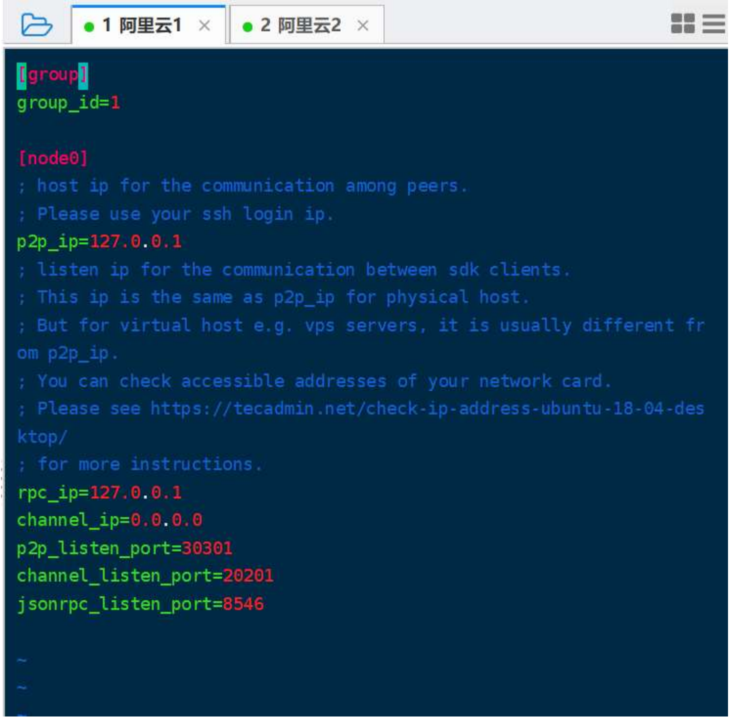
3.4.2 修改配置文件

```
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=30301
channel_listen_port=20201
jsonrpc_listen_port=8546
EOF
```

3.4.3 查看配置文件内容

```
cd ~/generator-B
vim ./conf/node_deployment.ini
```



```
[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 fr
om p2p_ip.
; You can check accessible addresses of your network card.
; Please see https://tecadmin.net/check-ip-address-ubuntu-18-04-des
ktop/
; for more instructions.
rpc_ip=127.0.0.1
channel_ip=0.0.0.0
p2p_listen_port=30301
channel_listen_port=20201
jsonrpc_listen_port=8546

~
~
```

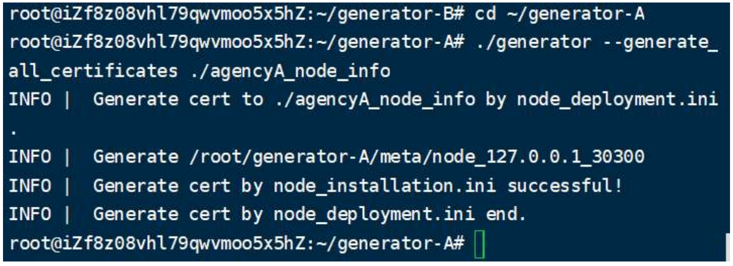
3.5 机构A生成并发送节点信息

3.5.1 进入生成机构A目录

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

3.5.2 机构A生成节点证书及P2P链接信息文件

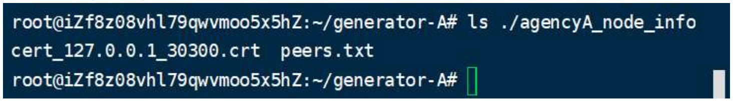
```
./generator --generate_all_certificates ./agencyA_node_info
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# cd ~/generator-A
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# ./generator --generate_
all_certificates ./agencyA_node_info
INFO |  Generate cert to ./agencyA_node_info by node_deployment.ini
.
INFO |  Generate /root/generator-A/meta/node_127.0.0.1_30300
INFO |  Generate cert by node_installation.ini successful!
INFO |  Generate cert by node_deployment.ini end.
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# 
```

3.5.3 查看生成文件

```
ls ./agencyA_node_info
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# ls ./agencyA_node_info
cert_127.0.0.1_30300.crt  peers.txt
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# 
```

上图中，从左至右分别为需要交互给机构A的节点证书，节点P2P连接地址文件(根据node_deployment.ini生成的本机构节点信息)

3.5.4 A机构需将节点P2P连接地址文件发送至机构B

（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）

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

3.6 机构B生成并发送节点信息

3.6.1 进入生成机构B目录

```
cd ~/generator-B
```

3.6.2 机构B生成节点证书及P2P连接信息文件

```
./generator --generate_all_certificates ./agencyB_node_info
```

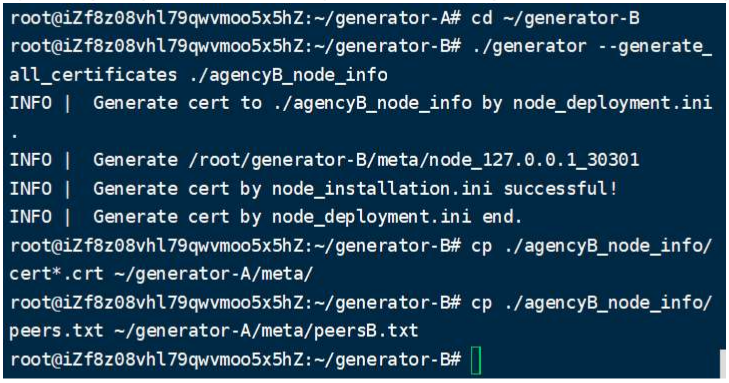
3.6.3 机构B发送节点证书至机构A

因为生成创世区块的机构需要节点证书，咱们这个是由A机构生成创世区块，因此B机构除了发送节点P2P连接地址文件外，还需发送节点证书至机构A

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

3.6.4 机构B发送节点P2P连接地址文件

```
cp ./agencyB_node_info/peers.txt ~/generator-A/meta/peersB.txt
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# cd ~/generator-B
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# ./generator --generate_
all_certificates ./agencyB_node_info
INFO |  Generate cert to ./agencyB_node_info by node_deployment.ini
.
INFO |  Generate /root/generator-B/meta/node_127.0.0.1_30301
INFO |  Generate cert by node_installation.ini successful!
INFO |  Generate cert by node_deployment.ini end.
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# cp ./agencyB_node_info/
cert*.crt ~/generator-A/meta/
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# cp ./agencyB_node_info/
peers.txt ~/generator-A/meta/peersB.txt
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# 
```

3.7 机构A生成群组1创世区块

此处是选择机构A生成群组创世区块，实际生产中可以通过联盟链委员会协商选择

3.7.1 进入生成机构A目录

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

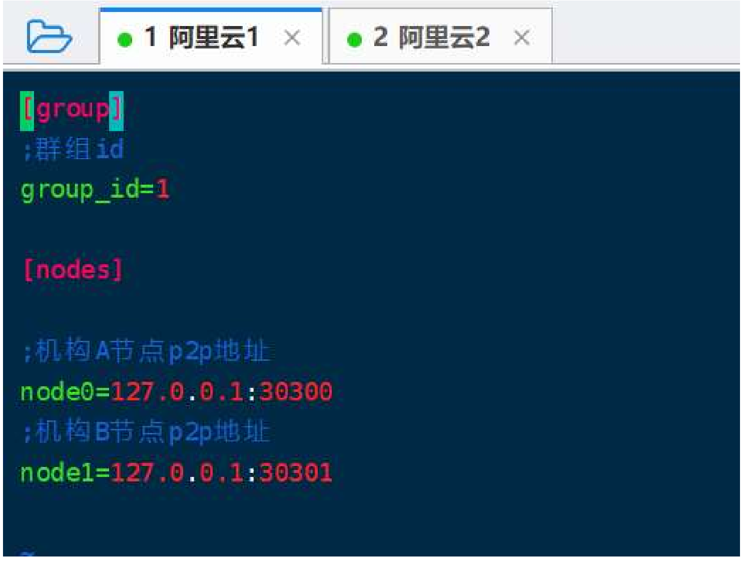
3.7.2 机构A修改配置文件conf文件下的group_genesis.ini

```
cat > ./conf/group_genesis.ini << EOF
[group]group_id=1

[nodes]
node0=127.0.0.1:30300
node1=127.0.0.1:30301

EOF
```

3.7.3 修改./conf/group_genesis.ini文件，即添加注释

vim ./conf/group_genesis.ini

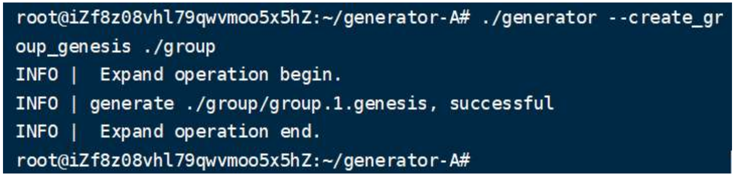
```
;命令解释
[group]
;群组id
group_id=1

[nodes]
;机构A节点p2p地址
node0=127.0.0.1:30300
;机构B节点p2p地址
node1=127.0.0.1:30301
```



```
[group]
;群组id
group_id=1

[nodes]

;机构A节点p2p地址
node0=127.0.0.1:30300
;机构B节点p2p地址
node1=127.0.0.1:30301
```

3.7.4 生成group_genesis.ini配置的群组创世区块（一个群组只能生成一个创世区块）

```
./generator --create_group_genesis ./group
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# ./generator --create_gr
oup_genesis ./group
INFO |  Expand operation begin.
INFO | generate ./group/group.1.genesis, successful
INFO |  Expand operation end.
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A#
```

3.7.5 分发群组1创世区块至机构B

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

3.8 机构A生成所属节点

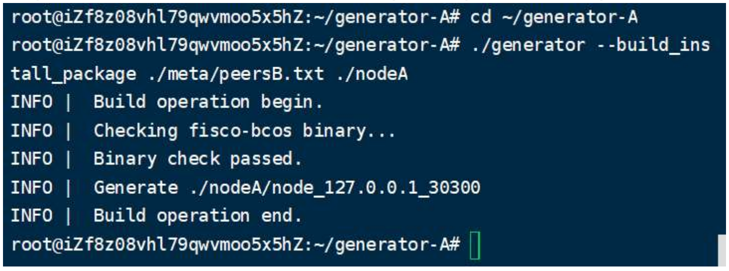
生成机构A所属节点，此命令会根据用户配置的node_deployment.ini文件生成相应的节点配置文件夹

3.8.1 进入生成机构A目录

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

3.8.2 生成机构A所属节点

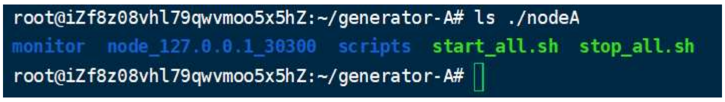
```
./generator --build_install_package ./meta/peersB.txt ./nodeA
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# cd ~/generator-A
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# ./generator --build_ins
tall_package ./meta/peersB.txt ./nodeA
INFO |  Build operation begin.
INFO |  Checking fisco-bcos binary...
INFO |  Binary check passed.
INFO |  Generate ./nodeA/node_127.0.0.1_30300
INFO |  Build operation end.
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A#
```

3.8.3 查看生成节点配置文件夹

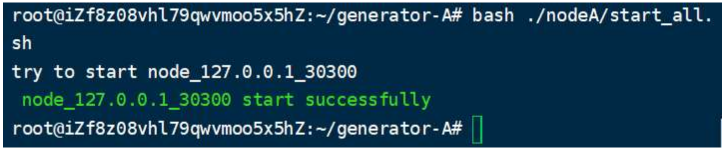
```
ls ./nodeA
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# ls ./nodeA
monitor  node_127.0.0.1_30300  scripts  start_all.sh  stop_all.sh
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A#
```

3.8.4 机构A启动节点

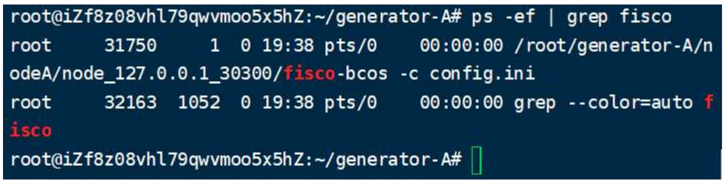
```
bash ./nodeA/start_all.sh
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# bash ./nodeA/start_all.
sh
try to start node_127.0.0.1_30300
 node_127.0.0.1_30300 start successfully
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A#
```

3.8.5 查看节点进程

```
ps -ef | grep fisco
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# ps -ef | grep fisco
root     31750     1  0 19:38 pts/0    00:00:00 /root/generator-A/n
odeA/node_127.0.0.1_30300/fisco-bcos -c config.ini
root     32163  1052  0 19:38 pts/0    00:00:00 grep --color=auto f
isco
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# 
```

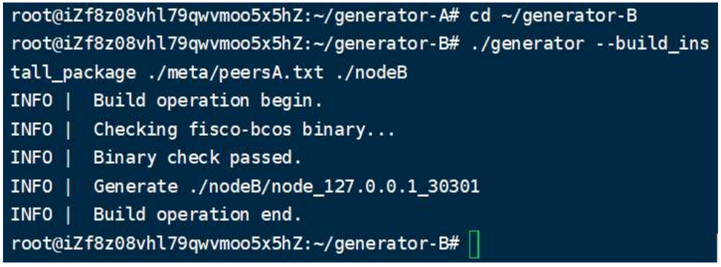
3.9 机构B生成所属节点

3.9.1 进入生成机构B目录

```
cd ~/generator-B
```

3.9.2 生成机构B所属节点

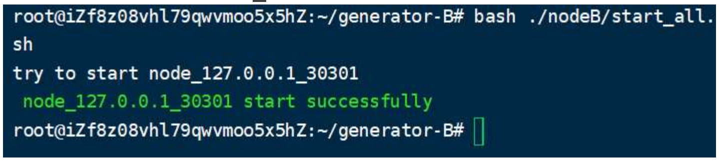
```
./generator --build_install_package ./meta/peersA.txt ./nodeB
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# cd ~/generator-B
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# ./generator --build_ins
tall_package ./meta/peersA.txt ./nodeB
INFO |  Build operation begin.
INFO |  Checking fisco-bcos binary...
INFO |  Binary check passed.
INFO |  Generate ./nodeB/node_127.0.0.1_30301
INFO |  Build operation end.
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# 
```

3.9.3 机构B启动节点

```
bash ./nodeB/start_all.sh
```



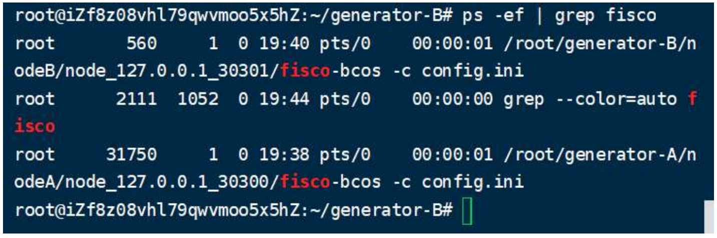
```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# bash ./nodeB/start_all.
sh
try to start node_127.0.0.1_30301
 node_127.0.0.1_30301 start successfully
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# 
```

注意事项：节点启动只需要推送对应ip的node文件夹即可，如127.0.0.1的服务器，只需node_127.0.0.1_port对应的节点配置文件夹。多机部署时，只需要将生成的节点文件夹推送至对应服务器即可

3.10 查看群组1节点运行状态

3.10.1 查看进程

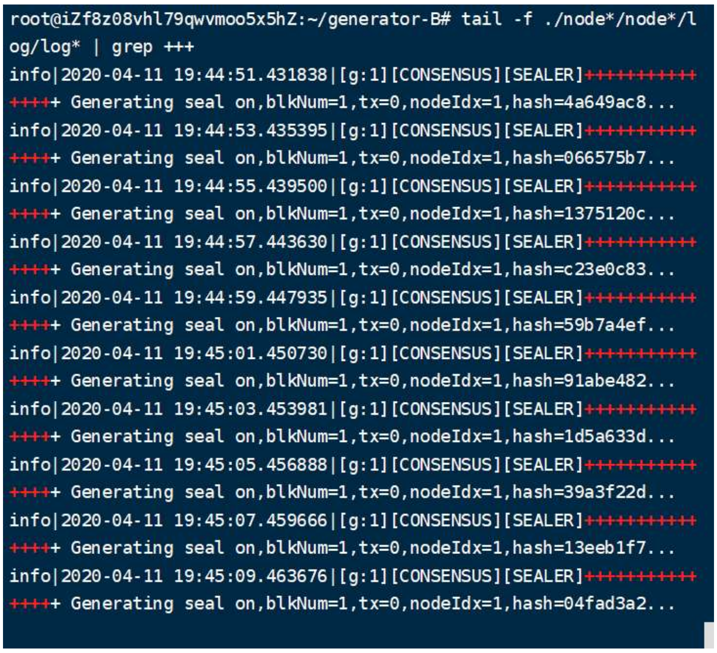
```
ps -ef | grep fisco
```



```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# ps -ef | grep fisco
root       560     1  0 19:40 pts/0    00:00:01 /root/generator-B/n
odeB/node_127.0.0.1_30301/fisco-bcos -c config.ini
root      2111  1052  0 19:44 pts/0    00:00:00 grep --color=auto f
isco
root     31750     1  0 19:38 pts/0    00:00:01 /root/generator-A/n
odeA/node_127.0.0.1_30300/fisco-bcos -c config.ini
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# 
```

3.10.2 查看节点log

```
tail -f ./node*/node*/log/log* | grep +++
```



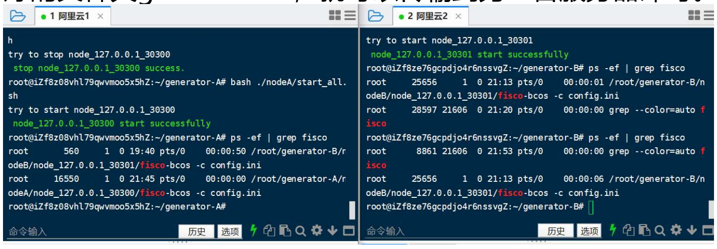
```
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-B# tail -f ./node*/node*/l
og/log* | grep +++
info|2020-04-11 19:44:51.431838|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=4a649ac8...
info|2020-04-11 19:44:53.435395|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=066575b7...
info|2020-04-11 19:44:55.439500|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=1375120c...
info|2020-04-11 19:44:57.443630|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=c23e0c83...
info|2020-04-11 19:44:59.447935|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=59b7a4ef...
info|2020-04-11 19:45:01.450730|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=91abe482...
info|2020-04-11 19:45:03.453981|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=1d5a633d...
info|2020-04-11 19:45:05.456888|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=39a3f22d...
info|2020-04-11 19:45:07.459666|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=13eeb1f7...
info|2020-04-11 19:45:09.463676|[g:1][CONSENSUS][SEALER]+++++++++++
++++ Generating seal on,blkNum=1,tx=0,nodeIdx=1,hash=04fad3a2...
```

ctrl c 结束查看

4.推送机构B的生成文件夹到目标服务器

scp -r /root/generator-B/ root@172.24.234.85:~/

为了操作简单，以上生成B的系列操作在同一个服务器上，那么多机构链就需要那么生成好的文件夹generator-B，就可以传输到另一台服务器即可。



```
h
try to stop node_127.0.0.1_30300
 stop node_127.0.0.1_30300 success.
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# bash ./nodeA/start_all.
sh
try to start node_127.0.0.1_30300
 node_127.0.0.1_30300 start successfully
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A# ps -ef | grep fisco
root       560     1  0 19:40 pts/0    00:00:50 /root/generator-B/n
odeB/node_127.0.0.1_30301/fisco-bcos -c config.ini
root     16550     1  0 21:45 pts/0    00:00:00 /root/generator-A/n
odeA/node_127.0.0.1_30300/fisco-bcos -c config.ini
root@iZf8z08vhl79qwvmoo5x5hZ:~/generator-A#
```

```
try to start node_127.0.0.1_30301
 node_127.0.0.1_30301 start successfully
root@iZf8ze76gcpdjo4r6nssvgZ:~/generator-B# ps -ef | grep fisco
root     25656     1  0 21:13 pts/0    00:00:01 /root/generator-B/n
odeB/node_127.0.0.1_30301/fisco-bcos -c config.ini
root     28597 21606  0 21:20 pts/0    00:00:00 grep --color=auto f
isco
root@iZf8ze76gcpdjo4r6nssvgZ:~/generator-B# ps -ef | grep fisco
root      8861 21606  0 21:53 pts/0    00:00:00 grep --color=auto f
isco
root     25656     1  0 21:13 pts/0    00:00:06 /root/generator-B/n
odeB/node_127.0.0.1_30301/fisco-bcos -c config.ini
root@iZf8ze76gcpdjo4r6nssvgZ:~/generator-B#
```

多机构搭建群组1的操作完成！