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MultiChain
Private Blockchain Platform

How to Connect to a Blockchain

Step 1: Launch Node-2 by login into existing AWS account

Login into your AWS account or Create an AWS Account, If you do not have already. You get 1-year free tier access. To create a new account on AWS please click here.

Step 2: Launching EC2 Server we will tag it as Node-2

Launch an Ubuntu 14.04 LTS EC2 Server. You can choose 16.04 as well but it will not affect our execution. We are using 14.04 just because we find it more stable & bug free.

If you have an EC2 AMI (Machine Image) of Ubuntu 14.04 which has some updated configurations, key software (Like PHP, Python, Apache etc.) already installed, you can launch the EC2 server using that as well.

DO NOT TAKE AMI OF NODE-1 AND LAUNCH IT. I REPEAT, **DO NOT** TAKE AMI OF NODE-1 AND LAUNCH IT AS NODE-2. IT MUST BE A FRESH SERVER WITH FRESH MULTICHAIN INSTALLATION.

Step 3: Connecting to Node-2 using SSH

Connect to the server using SSH through its .pem file. You can SSH directly using the terminal you have in your windows/Mac/Linux machine or try putty. I would like recommend using some good terminal for quick & easy access in window based OS. To know more about connecting to your server please click here. Do ssh like this below.

```
ssh –i [full path of .pem file] Ubuntu@[Public IP of your node-2 server]
```

After the SSH you will see something like this in your terminal:

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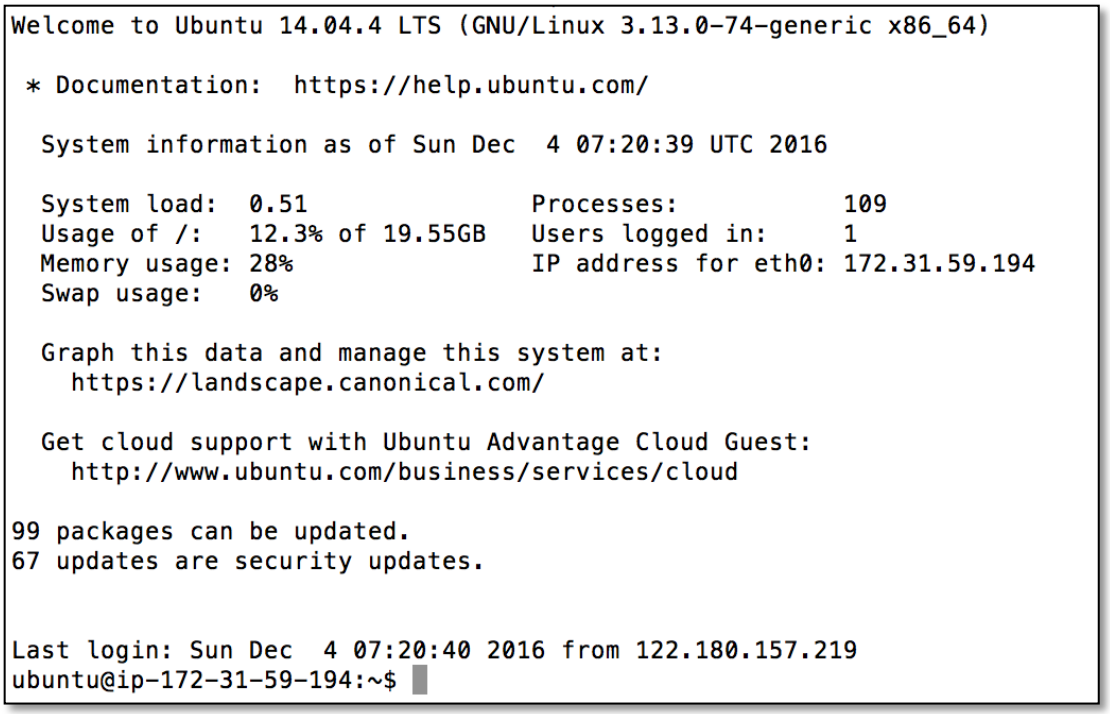

Step 4: Installing MultiChain

Now we will tag or call this first server as “Node-2” remember whenever I will mention Node-2 it means I am referring to our second server which we have just launched.

Here in this step we will also install the MultiChain.

Installing on Linux: Our case

Here the command is in red followed by the comment in bracket (please do not copy & paste the comments in your shell terminal)

sudo su (To switch to root permanently)
cd /home/ubuntu/ (To make sure we are in Ubuntu user’s home)
mkdir tmp (Create a tmp directory in home)
cd tmp (Move to tmp directory in home)
wget http://www.multichain.com/download/multichain-1.0-alpha-26.tar.gz (Download multichain using wget, you can use any method to download the MultiChain including curl or browser download & then upload the file to the server)
tar -xvzf multichain-1.0-alpha-26.tar.gz (Unzip the downloaded file)
cd multichain-1.0-alpha-26 (move to the unzipped directory)
mv multichaind multichain-cli multichain-util /usr/local/bin (move the key files to bin to make easily accessible on the command line without specifying the full path)

exit (to return to your regular user ie. Ubuntu in EC2 case)

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You can also use this link to the latest version, instead of the URL above. The link is updated a few days after each release.

Run multichain-cli or multichaind on the terminal and if you see some output other than command not found then it means you successfully installed the MultiChain.

Step 5: Connect to your Blockchain chain1 which is created on Node-1

We created a Blockchain using MultiChain with name as chain1 in our previous lecture. So lets try to connect to that chain1 using that node's address.

Before we do that you need to update the security-group of node-1 & also node-2 to make sure our nodes allow the connection on the MultiChain's port. To do that

- Step 1) Go to "Network & Security" section of EC2 dashboard and click "Security Gorups" . Refer to screen below.
- Step 2) Select the group name which is attached to our nodes. Refer to screen below.
- Step 3) In the bottom window select "Inbound" Tab. Refer to screen below.
- Step 4) Click "Edit". Refer to screen below.
- Step 5) Add the port number from the Node-1's address. Which is our case in 7193.

Node-1 Address is: chain1@172.31.50.255:**7193** This can be different in your case. So please follow your own port number or address.

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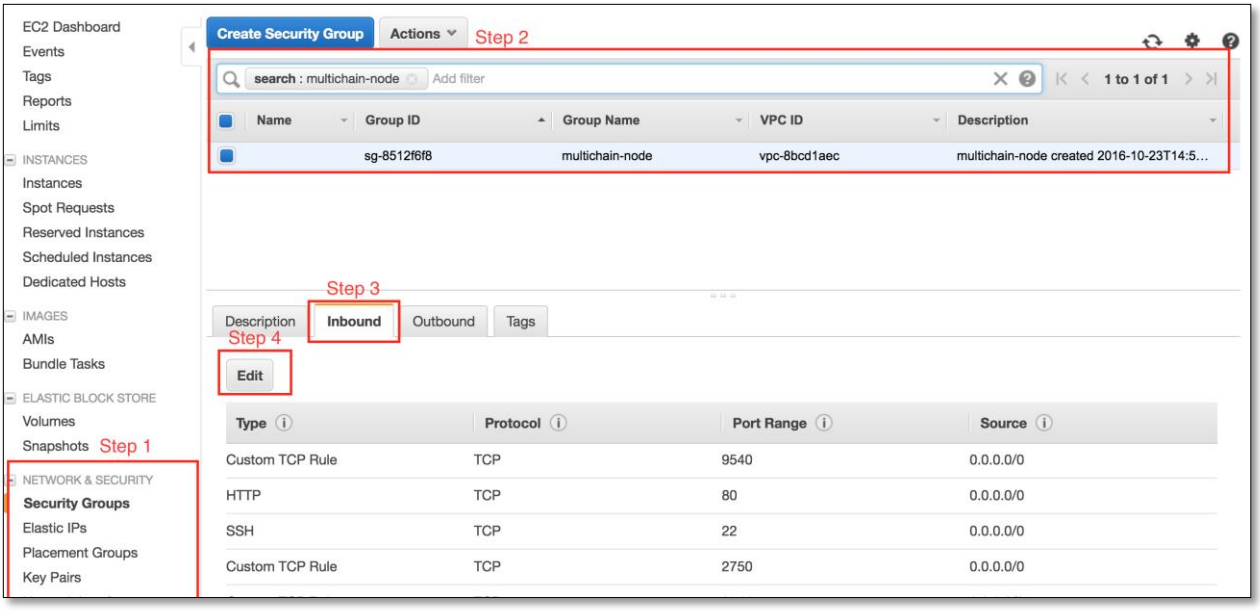

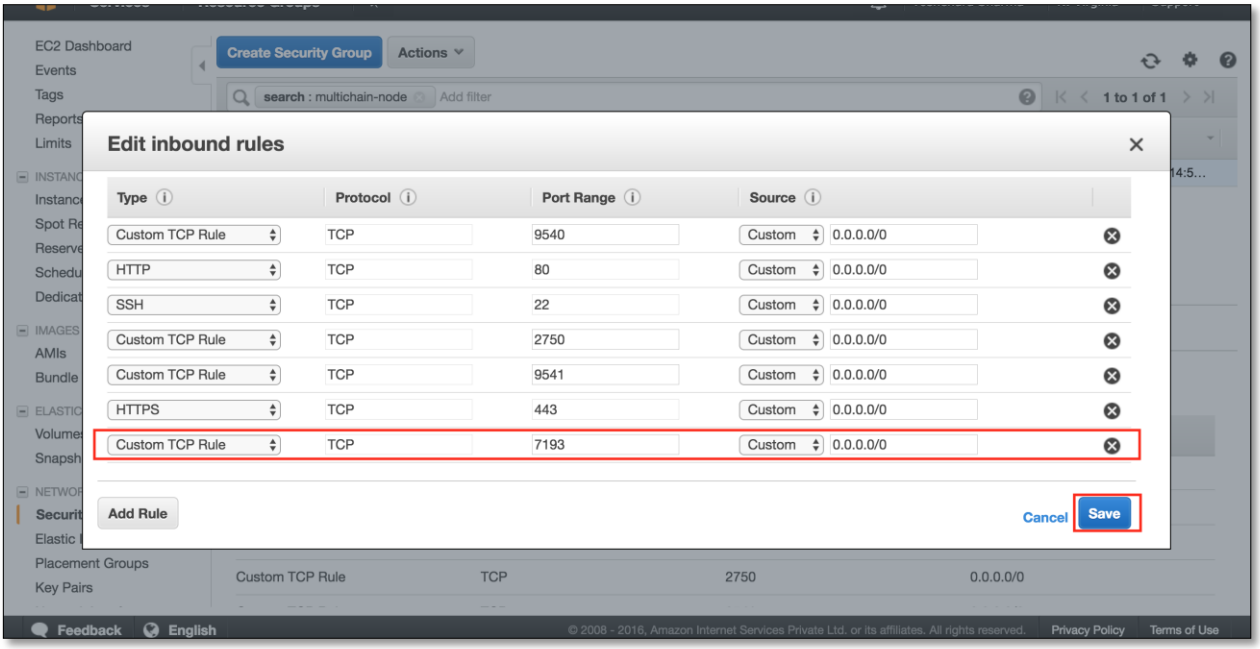

We will now try to connect to Node-1 from Node-2. To do that please execute this command. Please note that chain address will be surely different in your case so please use your own address. DO NOT JUST COPY PASTE THE ENTIRE COMMAND.

multichaind chain1@172.31.50.255:7193

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This above command will show a message as shown below:

```
ubuntu@ip-172-31-56-148:~$ multichaind chain1@172.31.50.255:7193

MultiChain Core Daemon build 1.0 alpha 26 protocol 10006

Retrieving blockchain parameters from the seed node 172.31.50.255:7193 ...
Blockchain successfully initialized.

Please ask blockchain admin or user having activate permission to let you connect and/or transact:
multichain-cli chain1 grant 1bDkf8QFnAY3Sf5Fr3iNDYTWvQXNqRAK8gqNts connect
multichain-cli chain1 grant 1bDkf8QFnAY3Sf5Fr3iNDYTWvQXNqRAK8gqNts connect,send,receive

ubuntu@ip-172-31-56-148:~$
```

This means we need to allow Node-2 to connect to our Blockchain. We can do that using Node-1 & execute the mentioned commands. So now go to Node-1 & execute the second mentioned command as shown in the message into Node-1 & then try to connect to Blockchain again on Node-2. Here, I am assuming that you have done that & tried connecting to your Blockchain from Node-2 again & successfully connected it. Successful connection will show the following message.

Executing the command on Node-1 will be shown like this:

```
ubuntu@ip-172-31-50-255:~$ multichain-cli chain1 grant 1bDkf8QFnAY3Sf5Fr3iNDYTWvQXNqRAK8gqNts connect,send,receive
{"method":"grant","params":["1bDkf8QFnAY3Sf5Fr3iNDYTWvQXNqRAK8gqNts","connect,send,receive"],"id":1,"chain_name":"chain1"}

b2965dd74450f76ee39f057095a28e0219134540d6ca29cbe0a20eee109415b7
ubuntu@ip-172-31-50-255:~$
```

And Executing this on Nnode-2 will be shown like this:

multichaind chain1@172.31.50.255:7193

```
ubuntu@ip-172-31-56-148:~$ multichaind chain1@172.31.50.255:7193

MultiChain Core Daemon build 1.0 alpha 26 protocol 10006

Retrieving blockchain parameters from the seed node 172.31.50.255:7193 ...
Blockchain successfully initialized.

Please ask blockchain admin or user having activate permission to let you connect and/or transact:
multichain-cli chain1 grant 1bDkf8QFnAY3Sf5Fr3iNDYTWvQXNqRAK8gqNts connect
multichain-cli chain1 grant 1bDkf8QFnAY3Sf5Fr3iNDYTWvQXNqRAK8gqNts connect,send,receive

ubuntu@ip-172-31-56-148:~$ multichaind chain1@172.31.50.255:7193

MultiChain Core Daemon build 1.0 alpha 26 protocol 10006

Retrieving blockchain parameters from the seed node 172.31.50.255:7193 ...
Other nodes can connect to this node using:
multichaind chain1@172.31.56.148:7193

Node started
```

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And after a few second this message will be shown like this:

```
ubuntu@ip-172-31-56-148:~$ multichaind chain1@172.31.50.255:7193

MultiChain Core Daemon build 1.0 alpha 26 protocol 10006

Retrieving blockchain parameters from the seed node 172.31.50.255:7193 ...
Other nodes can connect to this node using:
multichaind chain1@172.31.56.148:7193

Node started


Retrieving blockchain parameters from the seed node 172.31.50.255:7193 ...
Blockchain successfully initialized.
```

This means your Node-2 is now connected to Node-1 successfully.

All your Blockchain's settings are in params.dat file inside the ~/.multichain/chain1/. To confirm the settings please use this below command and it will spit everything in your terminal.

```
cat ~/.multichain/chain1/params.dat
```

Now since your Blockchain has been created its time to initialize the Blockchain including mining the genesis Block (The first Block in the Blockchain).

```
multichaind chain1 -daemon
```

You will see a message that server has been started & in a few second that the genesis Block has been mined. You will also see the Blockchain node's address which other nodes can use to connect to the Blockchain.

```
ubuntu@ip-172-31-50-255:~$ multichaind chain1 -daemon

MultiChain Core Daemon build 1.0 alpha 26 protocol 10006

MultiChain server starting
Looking for genesis block...
Genesis block found

Other nodes can connect to this node using:
multichaind chain1@172.31.50.255:7193

Node started
ubuntu@ip-172-31-50-255:~$
```

You can now check if all is well by typing this command in Node-2.

```
multichain-cli chain1 getinfo
```

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```
ubuntu@ip-172-31-56-148:~$ multichain-cli chain1 getinfo
{"method":"getinfo","params":[],"id":1,"chain_name":"chain1"}

{
    "version" : "1.0 alpha 26",
    "protocolversion" : 10006,
    "chainname" : "chain1",
    "description" : "MultiChain chain1",
    "protocol" : "multichain",
    "port" : 7193,
    "setupblocks" : 60,
    "nodeaddress" : "chain1@172.31.56.148:7193",
    "burnaddress" : "1XXXXXXXYXXXXXXXY7XXXXXXVKXXXXXXYD6nfx",
    "incomingpaused" : false,
    "miningpaused" : false,
    "walletversion" : 60000,
    "balance" : 0.00000000,
    "walletdbversion" : 2,
    "reindex" : false,
    "blocks" : 255,
    "timeoffset" : 0,
    "connections" : 2,
    "proxy" : "",
    "difficulty" : 0.00001526,
    "testnet" : false,
    "keypoololdest" : 1481264319,
    "keypoolsize" : 2,
    "paytxfee" : 0.00000000,
    "relayfee" : 0.00000000,
    "errors" : ""
}
```

That's it for this lecture.

If you are interested in conducting Blockchain training in your city, office or country please reach out to us using this link or drop us an email at training@recordskeeper.co.