

EngageChain Cloud Server (Public IP) Node Mining Deployment Guide

Applicable scenario: Deploy block-producing nodes on one or more cloud servers (Tencent Cloud / Alibaba Cloud / AWS, etc.). The node has a public IP. A public-node can be discovered by other cloud-server nodes and can also be directly connected to by LAN / mobile nodes via the public address.

1. Differences from LAN Deployment

Item	LAN deployment	Cloud server deployment
Inter-node address	Private IP	Public IP
Key parameter	None	<code>--external-address /ip4/<public-ip>/tcp/30333</code>
Firewall	Usually none	Need to open ports in the cloud console security group
Registration / block production	Same (fully automatic)	Same (fully automatic)

Role of `--external-address`: when the node binds `0.0.0.0` to listen, the private address broadcast by default (e.g., `172.16.0.5:30333`) cannot be dialed by other nodes. After specifying the public address, the node broadcasts the public `IP:30333` during PeerList exchange, so other nodes can directly connect by the public address.

2. Prerequisites

2.1 Cloud Server Requirements

Item	Requirement
Public IP	1 (an Elastic Public IP is better, to avoid IP changes)
Security group open	Inbound rule opens TCP 30333 (P2P, must open); if mobile/remote RPC access is needed, also open TCP 8545
Operating system	Windows Server 2019/2022 (or Windows 10/11 cloud host)
Bandwidth	Recommend ≥ 5 Mbps; block-producing nodes continuously sync blocks

2.2 Security Group Opening Example (Tencent Cloud)

1 Console → Security Group → Inbound Rules → Add Rule:

- Protocol: TCP, Port: 30333, Source: 0.0.0.0/0 (or only allow other node IPs)
- Protocol: TCP, Port: 8545, Source: 0.0.0.0/0 (if RPC remote / mobile access is needed)

1 After saving, verify locally: `telnet <public-ip> 30333` should connect.

Note: The Windows server firewall (if enabled) also needs to open the same ports:

```
``bat
netsh advfirewall firewall add rule name="engage-p2p" dir=in action=allow protocol=TCP localport=30333
netsh advfirewall firewall add rule name="engage-rpc" dir=in action=allow protocol=TCP localport=8545
...
```

2.3 Generate Miner Address

Each block-producing node needs a **fixed** miner address (the address is also the source of the VRF election key):

```
engaged.exe key generate

:: Output example:
::Address: eg10100xxx
::Public key: 5f89baxxx
::Secret key (private, 64 hex chars): d9fcxxx
::WARNING: Keep your secret key safe! Anyone with it controls the address.
```

3. Public-Node Deployment and Startup

Only one public server is needed to act as both a block-producing node and a seed node (other nodes can bootstrap you); LAN nodes and mobile nodes can all connect through its public IP:

Startup command script:

```
@echo off
engaged.exe start ^
  --p2p-listen /ip4/0.0.0.0/tcp/30333 ^
  --rpc-listen 0.0.0.0:8545 ^
  --external-address /ip4/public-ip/tcp/30333 ^
  --bootnode /ip4/124.221.244.124/tcp/30333 ^
  --http-sync-peers http://124.221.244.124:8545 ^
  --data-dir data ^
  --node-secret-file node_secret.txt ^
  --network mainnet ^
  --mine ^
  --miner-address eg10100xxx ^
  --log-level info
```

Key points:

- **The port of `--external-address` must match the `--p2p-listen` port** (default 30333).
- `--external-address` can be passed multiple times (e.g., broadcast IPv4/IPv6 simultaneously); usually one is enough.

- `--rpc-listen 0.0.0.0:8545`: must be open when the mobile App connects to the node for mining via HTTP 8545.

4. Confirm the Public Address Takes Effect

In the seed log you should see `Incoming connection / Connected to` records from other public-node IPs, indicating that public broadcast and direct connection are working normally.

5. Common Troubleshooting

Symptom	Cause	Handling
Other nodes cannot connect to this machine	Security group/firewall did not open 30333	Open the port; verify with <code>telnet <public-ip> 30333</code>
Log keeps <code>Failed to dial <private-ip></code>	Did not configure <code>--external-address</code> , broadcast private address	Add <code>--external-address /ip4/<public-ip>/tcp/30333</code> and restart
Broadcast public address but others still cannot connect	Port mapping / security group issue	Confirm 30333 is publicly reachable; <code>--external-address</code> port matches the listen port
Height keeps inconsistent (fork)	New node competed for blocks before syncing	Unstable seed, find a new seed; clear <code>data</code> and restart
Cloud server lost contact after restart	Public IP changed (non-elastic IP)	Use an Elastic Public IP or update <code>--external-address</code>

6. Operations Notes

- **Fix `--miner-address`**: the restart command must match the one used at generation, otherwise block-production eligibility is lost.
- **Public RPC security**: when `0.0.0.0:8545` is open to the public, the node RPC can be accessed by any machine. To restrict, limit the 8545 source to the mobile / private IP range in the security group.
- The node restarts and continues the chain from the last height; when an unhealable fork occurs, clear `data` and re-sync.