Nethermind and Teku Setup Guide

This guide will help you set up and run Teku with Nethermind using Docker. Follow the steps below to get started.

Prerequisites

Ensure you have the following installed:

- Docker
- Docker Compose
- OpenSSL (for generating the JWT secret)

Step 1: Create Project Directory

Create a directory for your project and navigate into it.

```
mkdir nethermind-teku-setup && cd nethermind-teku-setup
```

Step 2: Generate JWT Secret

Generate a JWT secret that will be used by both Teku and Nethermind.

```
openssl rand -hex 32 | tr -d "\n" > jwtsecret
```

Step 3: Create 'nethermind.config.json' File

Create the nethermind.config.json file with the following content:

```
{
  "Init": {
    "Network": "holesky"
  },
  "Logging": {
    "File": {
      "Name": "/data/logs/nethermind.log",
      "Level": "info"
    }
  },
  "Sync": {
    "FastSync": true,
    "PivotBlockHash":
"0x0000000000000000000000000000000000000000000000000000000000000000",
    "PivotBlockNumber": 0
  },
  "JsonRpc": {
    "Enabled": true,
    "Host": "0.0.0.0",
    "Port": 8545,
    "Modules": ["eth", "net", "web3", "personal", "debug", "txpool"],
    "EngineHost": "0.0.0.0",
    "EnginePort": 8551,
```

```
    "EngineApis": ["engine"],
    "WebSocketsEnabled": true,
    "WebSocketsPort": 8546,
    "WebSocketsHost": "0.0.0.0"
  },
  "Database": {
    "Path": "/data",
    "LogsRetentionPeriod": 7,
    "PruningEnabled": true
  },
  "Ethereum": {
    "GenesisBlockHash":
"0x0000000000000000000000000000000000000000000000000000000000000000",
    "ChainId": 1337
  },
  "Discovery": {
    "Enabled": true,
    "Port": 30303,
    "ListenIP": "0.0.0.0"
  },
  "P2P": {
    "Enabled": true,
    "Port": 30303,
    "ExternalIP": "0.0.0.0"
  },
  "Metrics": {
    "Prometheus": {
      "Enabled": true,
      "Port": 9090
    }
  },
  "HealthChecks": {
    "Enabled": true,
    "Prometheus": {
      "Enabled": true,
      "Port": 9090
    }
  },
  "TxPool": {
    "MaxSize": 2048
  },
  "JsonRpc": {
    "Enabled": true,
    "Host": "0.0.0.0",
    "Port": 8545,
    "EnginePort": 8551,
    "JwtSecretFile": "/data/jwtsecret"
  }
}
```

Step 4: Create Dockerfile.teku

Create a 'Dockerfile.teku' file with the following contents:

```
FROM consensys/teku:latest

USER root

# Create necessary directories with correct permissions
RUN mkdir -p /opt/teku/data/logs && \
    chown -R teku:teku /opt/teku/data

USER teku

ENTRYPOINT ["teku"]
CMD ["--network=holesky", "--data-path=/opt/teku/data", "--eth1-endpoints=http://nethermind:8545", "--metrics-enabled=true", "--metrics-port=8008", "--rest-api-enabled=true", "--rest-api-docs-enabled=true", "--rest-api-interface=0.0.0.0", "--rest-api-port=5051", "--ee-endpoint=http://nethermind:8551", "--ee-jwt-secret-file=/data/jwtsecret"]
```

Step 5: Create docker-compose.yml

Create a docker-compose.yml file with the following contents:

```
version: '3.8'

services:
  nethermind:
    image: nethermind/nethermind
    container_name: nethermind
    volumes:
      - ./nethermind.config.json:/home/nethermind/.nethermind/config.json
      - ./jwtsecret:/data/jwtsecret
      - nethermind_data:/data
    ports:
      - "8545:8545"   # JSON-RPC port
      - "8546:8546"   # WebSocket port
      - "30303:30303" # P2P port
      - "9090:9090"   # Prometheus metrics
      - "8551:8551"   # Engine JSON-RPC port
    command: -c /home/nethermind/.nethermind/config.json

  teku:
    image: edwards-custom-teku
    container_name: teku
    volumes:
      - ./jwtsecret:/data/jwtsecret
      - teku_data:/opt/teku/data
    ports:
      - "8008:8008"   # Prometheus metrics
      - "5051:5051"   # REST API port

volumes:
```

```
  nethermind_data:
  teku_data:
```

Step 6: Create start_teku.sh Script

Create a start_teku.sh script with the following content.

```
#!/bin/bash

# Create directories and set permissions
mkdir -p /opt/teku/data/logs
chown -R teku:teku /opt/teku/data

# Start Teku beacon node
teku \
  --network=holesky \
  --data-path=/opt/teku/data \
  --eth1-endpoints=http://nethermind:8545 \
  --metrics-enabled=true \
  --metrics-port=8008 \
  --rest-api-enabled=true \
  --rest-api-docs-enabled=true \
  --rest-api-interface=0.0.0.0 \
  --rest-api-port=5051
```

```
chmod +x start_teku.sh
```

Step 6: Build Custom Teku Image

Build the custom Teku image using the Dockerfile created earlier.

```
docker build -t edwards-custom-teku -f Dockerfile.teku .
```

Step 7: Start Docker Containers

Build the custom Teku image using the Dockerfile created earlier.

```
docker-compose up -d
```

Step 8: Check Logs

Check the logs of both containers to ensure they are running correctly.

```
docker logs nethermind
docker logs teku
```

 Nethermind Screenshot  Teku Screenshot

Step 9: Verify Available Endpoints

Verify the available endpoints in Teku.

```
curl -X POST --data '{"jsonrpc":"2.0","method":"eth_blockNumber","params":[],"id":1}'
http://localhost:8545
```

 JSON RPC