Casper Validator Node

Best Practices | Modifications

Last Updated: June 30, 2021

Rosadotech Consulting

787-479-3293
raul@rosadotech.us
www.rosadotech.us
113 Paseo Herradura
Trujillo Alto, PR 00979

Introduction

The purpose of this document is to provide instruction and in some cases guidance regarding the security of a Casper Node. This document will outline any changes that are made from the standard basic configurations that are given Official CasperLabs Operators Documentation which can be found here (link to Official Documentation).

Node Basic Requirements

This section will outline the important basics that are needed to run a validator node. Nothing changes from the Official documentation but this document makes references to these requirements.

Hardware Recommendation

Both Mainnet and Testnet have the same Hardware Recommendations. These Recommendations are shown below.

- CPU - 4 Cores
- RAM - 32 GB
- Disk - 1 TB (SSD preferred)
- OS - Ubuntu 20.04
- Rust Build Environment

Note: 1TB could be needed at spikes, but the administrator could definitely move it down quite a bit based on past performance. Scalable Block Store features are recommended while using Cloud solutions such as AWS, Digital Ocean, ect.

Open Ports

There are a number of ports that must remain exposed to the public. These ports are used and referenced in this document to inspect the node and do various tasks.

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- 7777 - RPC Port
- 8888 - Status Port
- 9999 - Event Port
- 35000 - Gossip Port
- 3987 - ssh port used in this document

General Node Setup

The Official Setup should be followed in conjunction with the security measures that are outlined in this document. It is recommended that the SysAdmin or DevOps team first complete a Security Checklist before setting up the validator node.

Syncing & Monitoring Tips

This section will outline useful tips and helpful commands when first setting up the Casper Validator node. The Official Documentation was used but there are some things that were left out that could help new operators

Is the node running?

You can use the command below to check the status of your

```
casper-node-launcher. systemctl status

casper-node-launcher
```

if the result shows active then it's running and either syncing or already synced. If the result says failed, the first thing to check is the log. You can check the error log with the command below.

```
cat /var/log/casper/casper-node.stderr.log
```

The most common problem is the config.toml. If that is reported as the problem go look in that file and make sure that the trusted hash is updated to whatever it should be set to and

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that the secret key path is correct. You can also try to just get a new trusted hash if all else fails.

Are the staged upgrades installed properly?

To successfully fully sync a node you must follow the documentation and install the lowest version needed. The upgrades must be installed as staged rollouts. The upgrades must be installed from lowest to highest (oldest to most recent). You can check what the next upgrade is by running

```
curl -s http://127.0.0.1:8888/status | jq -r
```

There will be an object in the returned json that's called next_upgrade. Make sure that your node is upgrading in order before it syncs to the required era for each upgrade.

In addition, make sure the config.toml is updated with a trusted hash and has the correct directory to the secret keys for each upgrade in the /etc/casper directory.

Is the node syncing?

First check to make sure your node is running. If it is you check to see what the last added block info is by using

```
curl -s localhost:8888/status | jq .last_added_block_info
```

This can return **null** if this is a brand new node that hasn't synced. You'll just have to wait a bit but there are other things you can check as well to be sure. First check often that your node stays up and running and check the error logs for failures.

Next, you can also check if sync is happening by using the following command:

```
watch -n 5 'curl -s localhost:8888/metrics | \
grep block_by_hash_count; curl -s localhost:8888/status |
\ jq ".peers | length"; systemctl status
casper-node-launcher'
```

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If the linear_chain_sync_get_block_by_hash_count is incrementing it's a good sign. It's not a guarantee though. If your last added block is null and this is new, then wait 6-8 hours. It can even take longer so try waiting a while.

After a long time, check the latest block. It should update the era and latest block. If you get stuck on a particular era it's a sign that maybe your staged upgrades are not installed properly.

Is the node synced?

Simply check the last added block info and compare it to what Casper is reporting as the latest block Height and Era online. If you are all caught up, you are synced.

Summary

This document provides an overview of the base practices and security features that should be considered when deploying a Casper Validator Node. A basic checklist should be fully utilized, in order for the Casper Validators to follow best practices with a very high degree of confidence.