

Casper Node Deployment Guide

<https://github.com/casper-network/casper-node-quickstart>

Introduction

The Casper Node Quickstart provides CloudFormation templates to deploy and bootstrap a Casper Node on AWS.

The CloudFormation templates create the following components as part of the infrastructure:

- A VPC with public and private subnets, and all the routing configuration.
- A Single EC2 Instance that bootstraps a Casper node.
- A Security Group exposing necessary casper-node ports (7777,8888,35000)
- A CloudWatch dashboard with metrics to monitor the node.
- Configuration to access the node through Session Manager.

Deployment Options

A Casper Node validator must only run a single instance with the same Validator Keypair at any given time.

As High Availability of the node is not required (periods of downtime are acceptable for a single node joining the distributed Casper Network) only a Single Availability Zone (AZ) deployment model is supported by the Quickstart.

Time to Complete

Running the Quickstart will take approximately 15 minutes.

Prerequisites

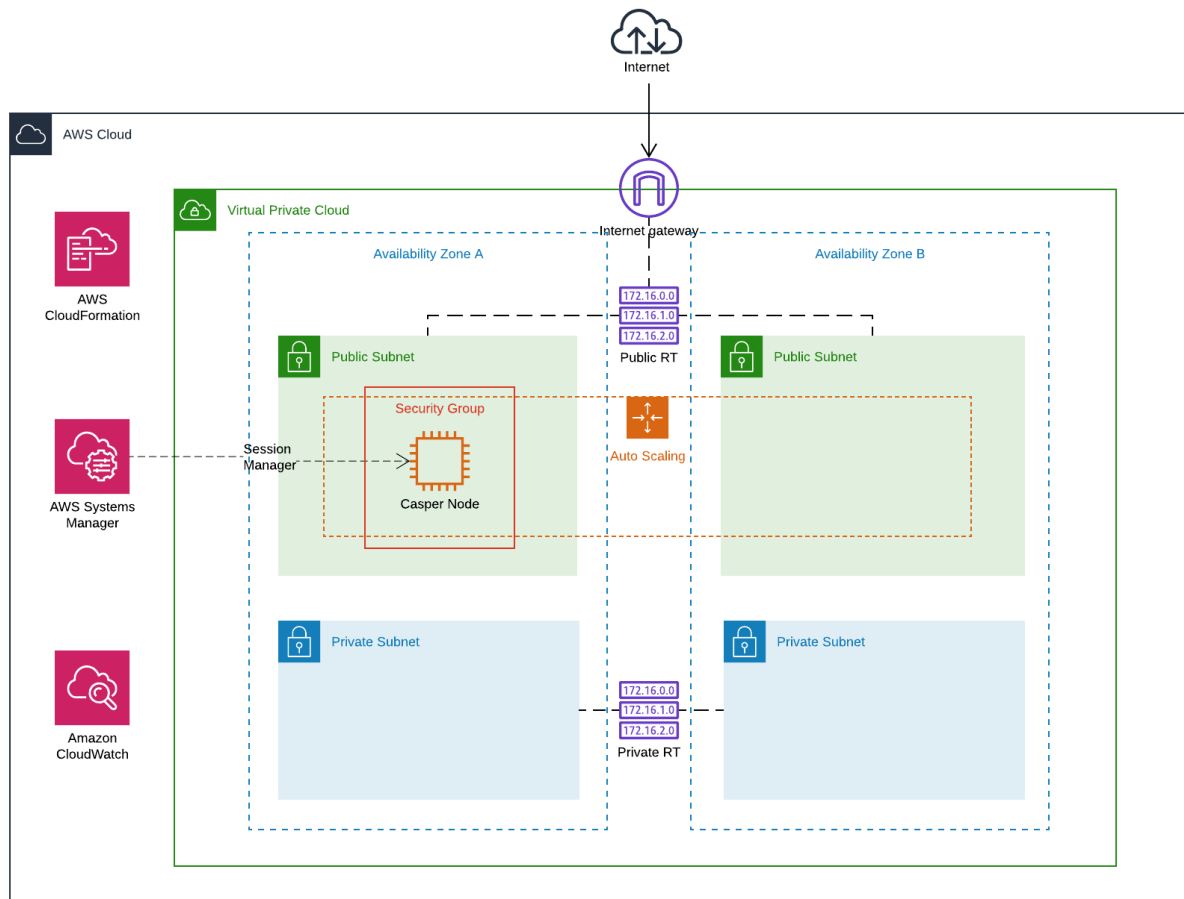
Skills

Basic familiarity with AWS and Ubuntu Linux is assumed.

Requirements

The Quickstart creates all resources necessary to run the node, only an AWS account is required to get started.

Architecture Diagram



Customer data is stored in the following locations:

- Instance's EBS Volume
- Cloudwatch (Logs)

Security

IAM

An IAM user with appropriate resource creation permissions should be used when running the Quickstart. Use of the AWS account's root user is discouraged.

Refer to the AWS documentation on [Security best practices in IAM](#)

Roles

An *Instance Role* to provide the EC2 Instance with access to Systems Manager & CloudWatch is created by the Quickstart

Sizing & Costs

Casper Node Hardware Requirements:

- CPU: 4 vCPU
- Memory: 32GB
- Disk: 2TB

The Quickstart defaults to a *r5.xlarge* instance with 2TB EBS storage to meet these requirements.

<https://aws.amazon.com/ec2/instance-types/r5/>

Cost Estimate (Apr 2023)

Amazon EC2 estimate (N.Virginia Region)

Amazon EC2 Reserved instances (monthly)

183 USD

Amazon Elastic Block Storage (EBS) pricing (monthly)

160 USD

Total monthly cost:

343 USD

Deployment

- While logged into your AWS account, navigate in a browser to the Casper Node Quickstart Github project and click the *Launch Stack* button.
(<https://github.com/casper-network/casper-node-quickstart>)
- A required Parameter that must be given during the Stack creation process is **TrustedHash**. TrustedHash can be obtained from the <http://cspr.live> website.

Node Configuration

CasperNetwork

Name of the Casper network to join (e.g casper, casper-test)

casper

TrustedHash

Trusted Hash from a valid node status endpoint or cspr.live site.

0c5fd67a8c0ac4579571416afc8e1983aebae7f185797e1a5109e67a653272c7

- Set any desired options, and finally **'Create Stack'**

Capabilities

The following resource(s) require capabilities: [AWS::CloudFormation::Stack]

This template contains Identity and Access Management (IAM) resources. Check that you want to create each of these resources and that they have the minimum required permissions. In addition, they have custom names. Check that the custom names are unique within your AWS account. [Learn more](#)

For this template, AWS CloudFormation might require an unrecognized capability: CAPABILITY_AUTO_EXPAND. Check the capabilities of these resources. [Learn more](#)

☒ I acknowledge that AWS CloudFormation might create IAM resources with custom names.

☒ I acknowledge that AWS CloudFormation might require the following capability:
CAPABILITY_AUTO_EXPAND

Cancel

Previous


Create change set

Create stack

- CloudFormation will begin to create all necessary resources to run Casper Node

Events (1)

 Search events

Timestamp	Logical ID	Status	Status reason
2021-06-01 15:03:32 UTC+1000	casper-main11	 CREATE_IN_PROGRESS	User Initiated

Accessing the Node

You can securely access the node in two ways:

1. Using AWS Session Manager by opening the [console](#) and clicking on *Start Session*, then just select your instance and you will get access to the node through a terminal embedded in the browser. *(Note: You can also access the node through your terminal by using the aws cli and the session manager plugin)*
2. Using SSH: To enable SSH access to your node you have to provide the *KeyName* and *IpWhiteList* parameters when you create the stack. To access the node, go to the [EC2 Console](#), select the node and click on the *Connect* button, you can find the SSH tab there with sample commands to connect to the instance.

For more information on how to create an AWS KeyPair check the [AWS docs](#) *It's important that you store the SSH key in a secure place since it provides access to your node.*

Troubleshooting

Process status

```
systemctl status casper-node-launcher
```

Casper Node Logs

```
tail -f /var/log/casper/casper-node.log
```

Cloudwatch Logs

An AWS CloudWatch dashboard is created as part of the infrastructure with metrics about the node. You can access the dashboard using the [CloudWatch console](#) or by opening the URL of the dashboard in the CloudFormation stack outputs.

Monitoring

NodeUtil watch tool

```
/etc/casper/node_util.py watch
```

Node Status Endpoint

<http://node-public-ip:8888/status> (browser)
curl localhost:8888/status (logged into node)

Prometheus Metrics Endpoint

<http://node-public-ip:8888/metrics> (browser)
curl localhost:8888/metrics (logged into node)

Community maintained Monitoring tools

- <https://github.com/matsuro-hadouken/casper-tools>

Backup

During node bootstrap, validator keys are created in `/etc/casper/validator_keys`

These keys should be backed up by the node operator and stored in a secure location.

[AWS Data Lifecycle Manager](#) can be optionally set up by the node operator to schedule periodic backups of the Casper Node EBS disk. As the snapshots will contain sensitive information (validator keys), appropriate IAM access controls should be applied.

Recovery

If an EBS snapshot is present, the node can be restored using the following process

- EC2 -> Snapshots -> Select Snapshot -> Create Image
- EC2 -> AMIs -> Select Image -> Launch

If no snapshot exists, A new node should be deployed using the Quickstart and the following process applied.

- `systemctl stop casper-node-launcher`
- replace `/etc/casper/validator_keys` with your previously backed up keys.
- `systemctl start casper-node-launcher`

Support

[CasperLabs Support Portal](#)

Discord is used as the primary communication medium to provide both support and announce information regarding network upgrades to node operators.

Casper Discord Server: <https://discord.gg/casperblockchain>

Additional Documentation

[Casper Node Docs](#)

[Casper Node Configuration Guide](#)