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# ThoughtSpot Deployment Guide for VMware

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# Installing VMware

**Summary:** Learn how to install a ThoughtSpot cluster on VMware.

## Installation Prerequisites

Ensure the successful creation of the virtual machines (VMs) before you install the ThoughtSpot cluster on VMware.

1. **Download the OVF** Download the [Open Virtualization Format \[See page 0\]](#) (OVF) file.
2. **Review configuration overview** Refer to [VMware configuration overview \[See page 10\]](#) for detailed instance specs.
3. **Create the instance** Refer to [Set up VMware for ThoughtSpot \[See page 13\]](#) to create and launch your instance.
4. **Review required ports** Refer to [Network Policies \[See page 0\]](#) to view the required ports for successful operation of ThoughtSpot.

## Configure Nodes

After creating the instance, you must configure the nodes.

### Step 1: Log into your cluster

Use Terminal on a Mac or a terminal emulator on Windows to log into your cluster.

1. Run `ssh admin@clusterIP` or `ssh admin@hostname`, replacing 'clusterIP' or 'hostname' with your specific network information.
2. When prompted, enter the admin password. Ask your network administrator if you do not know the admin credentials.

```
$ ssh admin@clusterIP
```

## Step 2: Get a list of nodes to configure

Run the `tscli cluster get-config` command to get a list of the nodes that must be configured for the new cluster, and redirect it to the file `nodes.config`. You can find more information on this procedure in the [nodes.config file reference \[See page 0\]](#).

```
$ tscli cluster get-config |& tee nodes.config
```

## Step 3: Configure the network of nodes

1. Refer to the [autodiscovery of one node example \[See page 0\]](#) before adding your specific network information.
2. Fill in the areas specified in [Parameters of the nodes.config file \[See page 0\]](#) with your specific network information.
  - If you have additional nodes, complete each node within the `nodes.config` file in the same way.

Make sure that you do not edit any part of the `nodes.config` file except the sections explained in [Parameters of nodes.config \[See page 0\]](#). Deleting quotation marks, commas, or other parts of the code could cause setup to fail.

## Step 4: Configure the nodes

Configure the nodes in the `nodes.config` file using the `set-config` [command \[See page 3\]](#).

1. Disable `Firewalld` by running `sudo systemctl stop firewalld` in your terminal.  
`Firewalld` is a Linux firewall that must be off for ThoughtSpot installation. When the cluster installer reboots the nodes, `Firewalld` automatically turns back on.
2. Run `cat nodes.config | tscli cluster set-config`.
  - If the command returns an error, refer to [set-config error recovery \[See page 4\]](#).

### Set-config

```
$ sudo systemctl stop firewalld
$ cat nodes.config | tscli cluster set-config
```

```
Connecting to local node-scout
Setting up hostnames for all nodes
Setting up networking interfaces on all nodes
Setting up hosts file on all nodes
Setting up IPMI configuration
Setting up NTP Servers
Setting up Timezone
Done setting up ThoughtSpot
```

**Set-config error recovery** If the set-config fails with the following warning, restart the node-scout service by running `sudo systemctl restart node-scout`.

**Restart node-scout service** If you have this error, restart the node-scout:

```
Connecting to local node-scout WARNING: Detected 0 nodes, but found configuration for only 1 nodes.
Continuing anyway. Error in cluster config validation: [] is not a valid link-local IPv6 address for node: 0e:86:e2:23:8f:76 Configuration failed.
Please retry or contact support.
```

Restart the node-scout with the following command, then retry the [set-config command](#) [See page 3].

```
$ sudo systemctl restart node-scout
```

The command output should no longer have a warning:

```
$ cat nodes.config | tscli cluster set-config
```

```
Connecting to local node-scout  
Setting up hostnames for all nodes  
Setting up networking interfaces on all nodes  
Setting up hosts file on all nodes  
Setting up IPMI configuration  
Setting up NTP Servers  
Setting up Timezone  
Done setting up ThoughtSpot
```

Step 5: Confirm node configuration with the `get-config` command

Run `tscli cluster get-config` in your terminal to confirm node configuration.

#### **Confirm node configuration**

```
$ tscli cluster get-config

{
  "ClusterId": "",
  "ClusterName": "",
  "DataNetmask": "255.255.252.0",
  "DataGateway": "192.168.4.1",
  "IPMINetmask": "255.255.252.0",
  "IPMIGateway": "192.168.4.1",
  "Timezone": "America/Los_Angeles",
  "NTPServers": "0.centos.pool.ntp.org,1.centos.pool.ntp.org,2.centos.pool.ntp.org,3.centos.pool.ntp.org",
  "DNS": "192.168.2.200,8.8.8.8",
  "SearchDomains": "example.company.com",
  "Nodes": {
    "ac:1f:6b:8a:77:f6": {
      "NodeId": "ac:1f:6b:8a:77:f6",
      "Hostname": "Thoughtspot-server1",
      "DataIface": {
        "Name": "eth2",
        "IPv4": "192.168.7.70"
      },
      "IPMI": {
        "IPv4": "192.168.5.70"
      }
    }
  }
}
```

## Install Cluster

Next, install the cluster using the release tarball (est. time 1 hour).

If you do not have a link to download the release tarball, open a support ticket at [ThoughtSpot Support](#) [See page 0] to access the release tarball.

### Step 1: Run the Installer

1. Copy the downloaded release tarball to `/home/admin` with the command `scp 0.0.tar.gz admin@hostname:/home/admin/file-name`. Replace '0.0' with your release number. Replace 'hostname' and 'file-name' with your specific hostname and the name of the tarball file.



```
$ scp 0.0.tar.gz admin@hostname:/home/admin/file-name
```

2. Run `tscli cluster create <release> .`

```
$ tscli cluster create 6.0.tar.gz
```

3. Edit the output with your specific cluster information. For more information on this process, refer to [Using the cluster create command \[See page 0\]](#) and [Parameters of the cluster create command \[See page 0\]](#).

The cluster installer automatically reboots all the nodes after the install. `Firewalld` automatically turns back on. Wait at least 15 minutes for the installation process to complete. The system is rebooting, which takes a few minutes. Log into any node to check the current cluster status, using the command `tscli cluster status .`

## Step 2. Check Cluster Health

Once the cluster is installed, check its status with the `tscli cluster status` command.

### Cluster Status

```

$ tscli cluster status
Cluster: RUNNING
Cluster name      : thoughtspot
Cluster id       : 1234X11111
Number of nodes  : 3
Release          : 6.0
Last update      = Wed Oct 16 02:24:18 2019
Heterogeneous Cluster : False
Storage Type     : HDFS

Database: READY
Number of tables in READY state: 2185
Number of tables in OFFLINE state: 0
Number of tables in INPROGRESS state: 0
Number of tables in STALE state: 0
Number of tables in ERROR state: 0

Search Engine: READY
Has pending tables. Pending time = 1601679ms
Number of tables in KNOWN_TABLES state: 1934
Number of tables in READY state: 1928
Number of tables in WILL_REMOVE state: 0
Number of tables in BUILDING_AND_NOT_SERVING state: 0
Number of tables in BUILDING_AND_SERVING state: 128
Number of tables in WILL_NOT_INDEX state: 0

```

### Step 3. Finalize Installation

After the cluster status changes to “Ready,” log into the ThoughtSpot application on your browser.

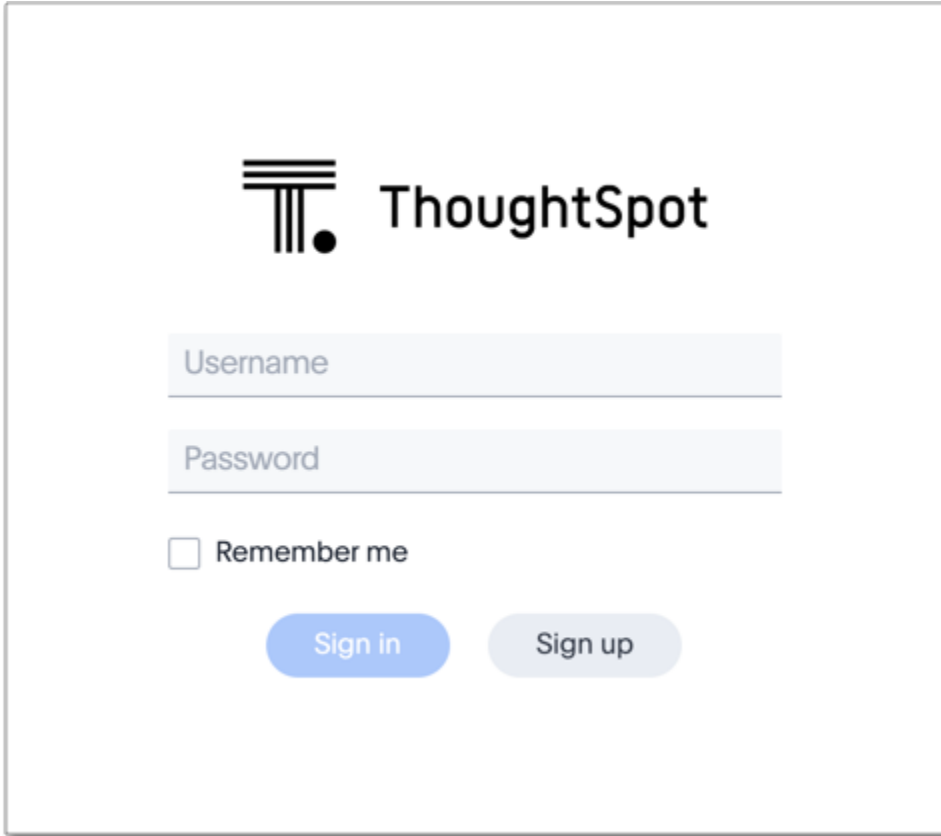
Follow these steps:

1. Start a browser from your computer.
2. Enter your secure IP information on the address line.

`https:<IP-address>`

3. If you don’t have a security certificate for ThoughtSpot, you must bypass the security warning to proceed:
  - Click **Advanced**
  - Click **Proceed**

4. The ThoughtSpot login page appears.
5. In the [ThoughtSpot login window \[See page 9\]](#), enter admin credentials, and click **Sign in**. Ask your network administrator if you do not know the admin credentials. ThoughtSpot recommends changing the default admin password.

The image shows the ThoughtSpot login page. At the top center is the ThoughtSpot logo, which consists of a stylized icon of three vertical bars of increasing height with a dot at the end, followed by the text "ThoughtSpot". Below the logo are two input fields: "Username" and "Password". Below these fields is a checkbox labeled "Remember me". At the bottom are two buttons: "Sign in" (in blue) and "Sign up" (in light blue).

## References

Use these references for successful installation and administration of ThoughtSpot.

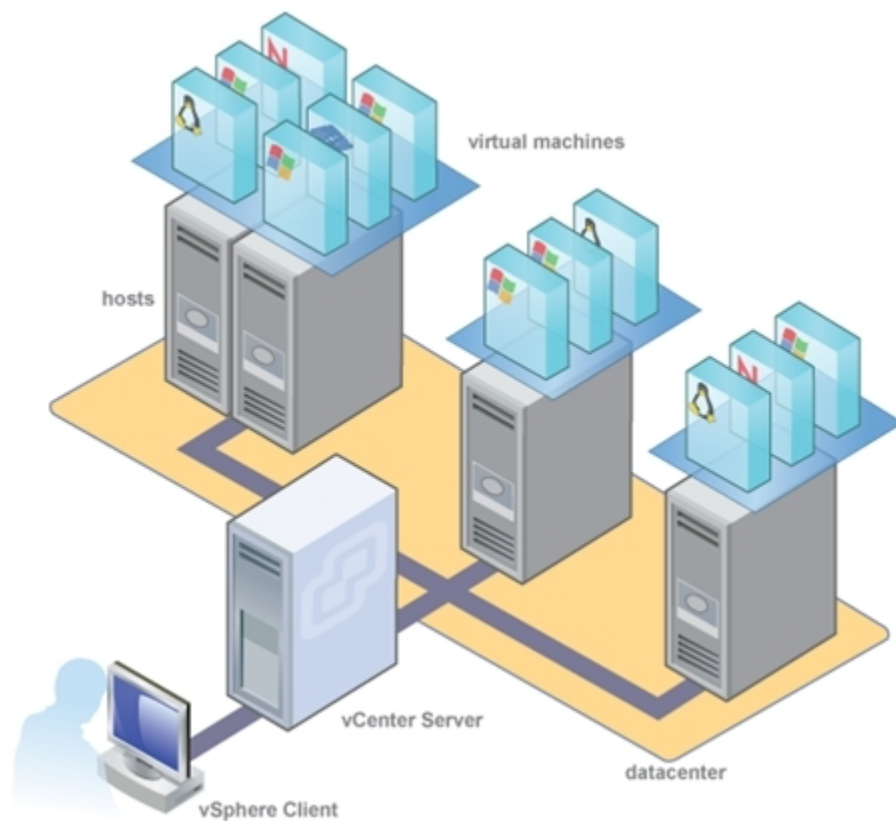
- [The `nodes.config` file \[See page 0\]](#)
- [Parameters of the `nodes.config` file \[See page 0\]](#)
- [Using the `cluster create` command \[See page 0\]](#)
- [Parameters of the `cluster create` command \[See page 0\]](#)
- [ThoughtSpot Documentation \[See page 0\]](#)
- [Contact Support \[See page 0\]](#)

# VMware configuration overview

Congratulations on purchasing the ThoughtSpot instance. This section is an overview of the ThoughtSpot AI-Driven analytics platform hosted on the VMware vSphere Hypervisor (ESXi) 6.5 environment.

## About ThoughtSpot on VMware

The VMware virtualization platform provides highly scalable and efficient memory and CPU resources management that can be used by ThoughtSpot instances. Additionally, the VMware virtualization environment is an easy transition between development and production environments. The following diagram shows the components of a VMware and ThoughtSpot architecture:



**Note:** This is a generic representation; Only CentOS-based virtual machines are supported with ThoughtSpot.

Your database capacity will determine the number of ThoughtSpot instances and the instance network/storage requirements. In addition, you can scale your ThoughtSpot VMs as your dataset size grows.

## Supported configurations

ThoughtSpot Engineering has performed extensive testing of the ThoughtSpot platform on VMware for the best performance, load balancing, scalability, and reliability. Based on this testing, ThoughtSpot recommends the following *minimum specifications* for an individual VMware ESXi host machine:

Per VM user data capacity	CPU/RAM	Data disk
20 GB	16/128 GB	800 GB
100 GB	32/256 GB	800 GB
256 GB	72/512 GB	6 TB
<b>Note:</b> All cores must be hyperthreaded. 200GB SSD boot disk required for all configurations.		

Locally attached storage provides the best performance.

SAN can be used, but must comply with the following requirements:

- 136 MBps minimum random read bandwidth
- 240 random IOPS (~4ms seek latency)

NAS/NFS is not supported since its latency is so high that it tends to be unreliable.

All virtualization hosts should have VMware vSphere Hypervisor (ESXi) 6.5 installed.

ThoughtSpot provides a VMware template (OVF) together with a VMDK (Virtual Machine Disk) file for configuring a VM. VMDK is a file format that describes containers for virtual hard disk drives to be used in virtual machines like VMware Workstation or VirtualBox. OVF is a platform-independent, efficient, extensible, and open packaging distribution format for virtual machines.

The ThoughtSpot VM configuration uses thin provisioning and sets the recommended reserved memory, among other important specifications. You can obtain these files from your ThoughtSpot Customer Success Engineer.

## Questions or comments?

We hope your experience with ThoughtSpot is excellent. Please let us know how it goes, and what we can do to make it better. You can [contact ThoughtSpot \[See page 0\]](#) by filing a support ticket, email or phone.

# Set up ThoughtSpot in VMware

**Summary:** Learn how to install a ThoughtSpot cluster in a VMware environment.

This page explains how to install a ThoughtSpot cluster in a VMware VSphere Hypervisor (ESXi) 6.5 environment. For each hardware node, you must:

- Complete the prerequisites
- Use the ThoughtSpot Open Virtualization Format (OVF) file to create a virtual machine (VM)
- Add hard disks to the VM

## Prerequisites

This installation process assumes you have already acquired your host machines. You can install on a cluster with any number of nodes. A one node cluster is suitable for a sandbox environment but is insufficient for a production environment. You need at least three nodes for high availability (HA), but there is no limit on the number of nodes.

1. Make sure you have installed the Hypervisor on each of your nodes.

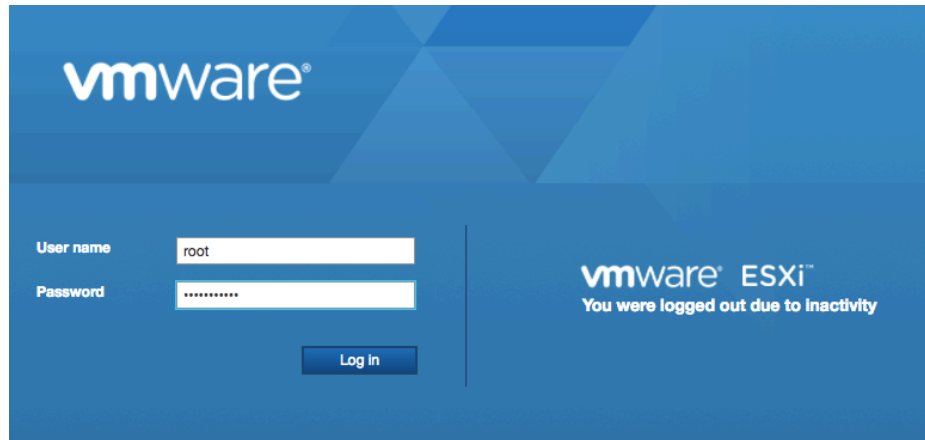
The VM template, by default, captures a 72-core configuration. If your physical host has more than 72 cores, you may want to edit VM to have (  $n-2$  ) cores (for a physical host with  $n$  cores) to fully take advantage of computing power of the physical host. Extra cores help performance.

You should aim to allocate 490 GB or more RAM.

2. Create datastores for all solid-state drive (SSD) and hard drive devices.

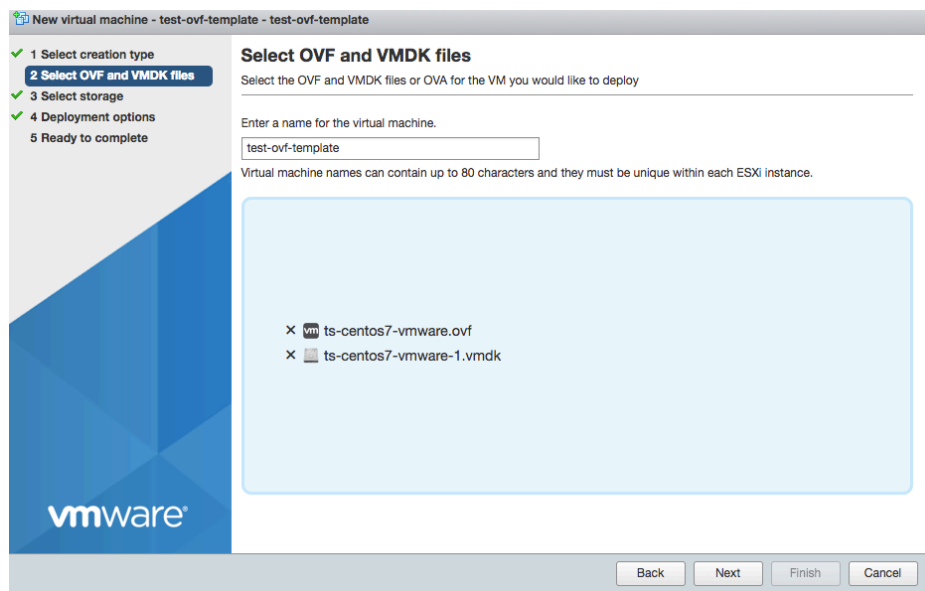
## Use the OVF to Create a VM

1. [Download \[See page 0\]](#) the `ThoughtSpot OVF` to a location on an accessible disk.
2. Log into the ESXi web portal.



3. Select **Virtual Machines > Create/Register VM**.

The system displays the dialog for selecting an OVF template.



4. Choose the OVF template and click **Next**.

The system prompts you to select a storage.

5. Choose the SSD as the destination and click **Next**.

The system displays the **Deployment Options** dialog.

6. Enter the options and click **Next**.



Setting	Value
Network mappings	Select the correct network for your installation.
Disk provisioning	Choose Thin.
Power on automatically	Check this box.

7. Review your selection and click **Finish**.

New virtual machine - test-ovf-template - test-ovf-template

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 Deployment options
- 5 Ready to complete

### Ready to complete

Review your settings selection before finishing the wizard

Product	ts-centos7-vmware
VM Name	test-ovf-template
Disks	ts-centos7-vmware-1.vmdk
Datastore	datastore1
Provisioning type	Thin
Network mappings	VM Network: VM Network
Guest OS Name	[object Object]

Do not refresh your browser while this VM is being deployed.

Back Next Finish Cancel

8. Wait for the template to be loaded.

Depending on your network speed, loading can take several minutes.

Task	Target	Progress	Result
Upload disk - ts-centos7-vmware-template-1.vmdk ...	test-ovf-template	...	
Destroy	test-ovf-template	...	Completed successfully
Power Off VM	test-ovf-template	...	Completed successfully
Import VApp	Resources	...	

9. Make sure that VM is powered off.

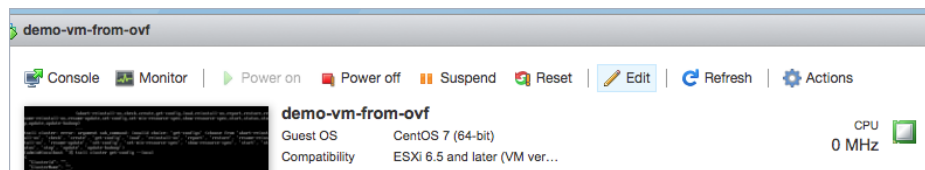
## Add hard disks to the VM

Use Case	HDFS Disk Requirements
POC	2 x 1 TB on HDD
Production	3 x 2 TB on HDD

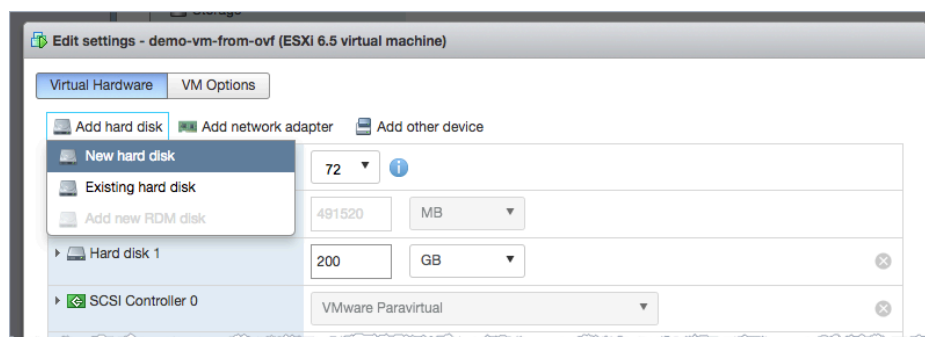
For a proof of concept (POC), follow these steps to create two 1TB HDFS disks on HDD storage, as shown here (2 x 1TB).

For production deployments, ThoughtSpot requires you to have three 2TB HDFS disks on HDD (3 x 2TB). For this use case, follow these same steps to create the additional, larger capacity disks.

1. Edit the VM you just created.



2. Select **Add hard disk > New hard disk**.

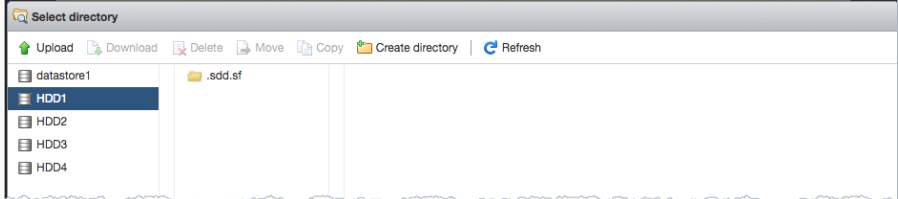


The new disk appears as a new row under the only existing SSD row.

3. Click the **New Hard disk** to expand the detailed configuration options.

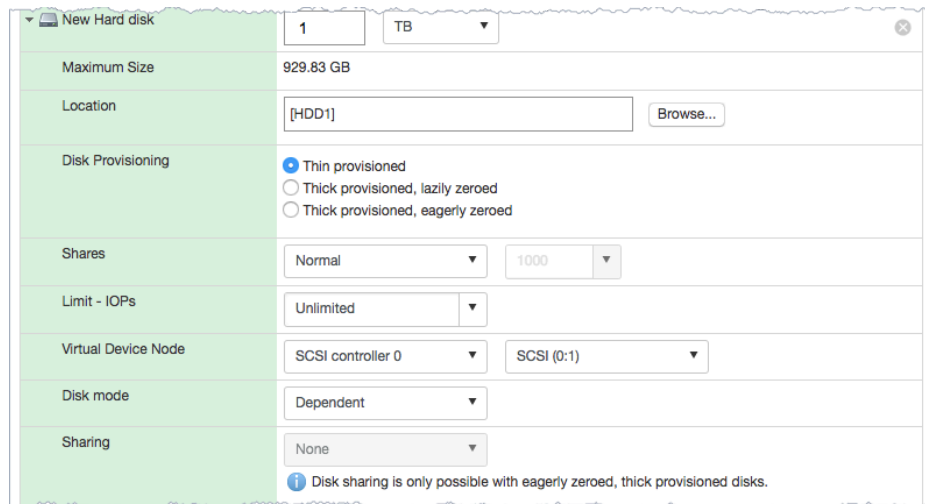
- For a proof of concept, set the options as follows. (For production deployments, set the size to 2TB.)

Setting	Value
size	1 TB
Location	Use the <b>Browse</b> button to select the hard disk store.



**Thin provisioned** Check this box.

You should see something similar to the following:



- Save your changes.
- Repeat steps 1-5 to create more hard disks.
- Power on the VM
- After the VM is online, run the following command to prepare the HDFS disks:

```
sudo /usr/local/scaligent/bin/prepare_disks.sh
```

## Next steps

There is no network at this point on your VMs. As a prerequisite:

1. Verify that Network Adapter type is set to VMware vmxnet3 (Recommended).
2. Verify that all ESXi hosts in your VMware farm for ThoughtSpot have been trunked to the VLAN assigned to your ThoughtSpot VMs.
3. Verify that the console of all ThoughtSpot VMs is accessible in VMware vCenter Server.

After you finish, go to the [ThoughtSpot Support website \[See page 0\]](#) and use the support ticket for installation tasks. If necessary, create a new ticket.