



---

# ThoughtSpot Deployment Guide for Dell

*Release 6.0*

*December, 2019*

© COPYRIGHT 2015, 2019 THOUGHTSPOT, INC. ALL RIGHTS RESERVED.

910 Hermosa Court, Sunnyvale, California 94085

This document may not, in whole or in part, be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form without prior consent in writing from ThoughtSpot, Inc.

All rights reserved. The ThoughtSpot products and related documentation are protected by U.S. and international copyright and intellectual property laws. ThoughtSpot and the ThoughtSpot logo are trademarks of ThoughtSpot, Inc. in the United States and certain other jurisdictions. ThoughtSpot, Inc. also uses numerous other registered and unregistered trademarks to identify its goods and services worldwide. All other marks used herein are the trademarks of their respective owners, and ThoughtSpot, Inc. claims no ownership in such marks.

Every effort was made to ensure the accuracy of this document. However, ThoughtSpot, Inc., makes no warranties with respect to this document and disclaims any implied warranties of merchantability and fitness for a particular purpose. ThoughtSpot, Inc. shall not be liable for any error or for incidental or consequential damages in connection with the furnishing, performance, or use of this document or examples herein. The information in this document is subject to change without notice.

# Table of Contents

Dell appliance overview .....	2
Installing the ThoughtSpot Dell appliance .....	5
Supported hardware .....	17
Cable networking .....	20

# Hardware appliance overview

## Summary: What is in the box.

The ThoughtSpot appliance hardware will be installed in a rack in your data center. This section describes the typical physical configuration.

## Hardware provided by ThoughtSpot

When your ThoughtSpot appliance arrives, the following items will be included:

Item Name	UOM	Qty
Round Hole to Sq Hole Adapter Kit (For Slide Rail Management)	Each	1
Power Cord, C13 to C14, 6 feet	Each	2
Power Cord, C13 to NEMA 5-15, 6 feet <sup>1</sup> <b>This power cord is not included with the Haswell platform.</b>	Each	2
Document, Rack Rail Installation, TS-2000	Each	1
TS-2000 Quick Start Guide	Each	1
Bezel Assembly, TS-2000	Each	1
Slide Rail Kit	Each	1
Appliance (containing 1-4 nodes, depending on ordered configuration)	Each	1
SFP+ Connector per ordered node (data connection)	Each	1
5m Fiber cable per ordered node (data connection)	Each	1
5m Network cable per ordered node (management connection)	Each	1

1: The supply voltage, 120 VAC, available when using a NEMA-15 power cord is an insufficient input to achieve the full power output required by the Haswell power supply. Only the C13 to C14 power cord should be used with the Haswell platform.



## Additional hardware requirements

You must supply the following items, as they will not be included with your ThoughtSpot appliance:

- Data center with proper cooling
- 2U of rack space per appliance (post depth 26.5" - 36.4")
- AC power **Attention:** Refer to [Hardware details \[See page 17\]](#) for power input requirements.
- 10GbE infrastructure (switch) - 1x port required / node
- 100MbE infrastructure (switch) - 1x port required /node
- Network cable Cat 5e/6 (node management)<sup>1</sup>
- 10G connection: SFP+ for switch side<sup>2</sup>

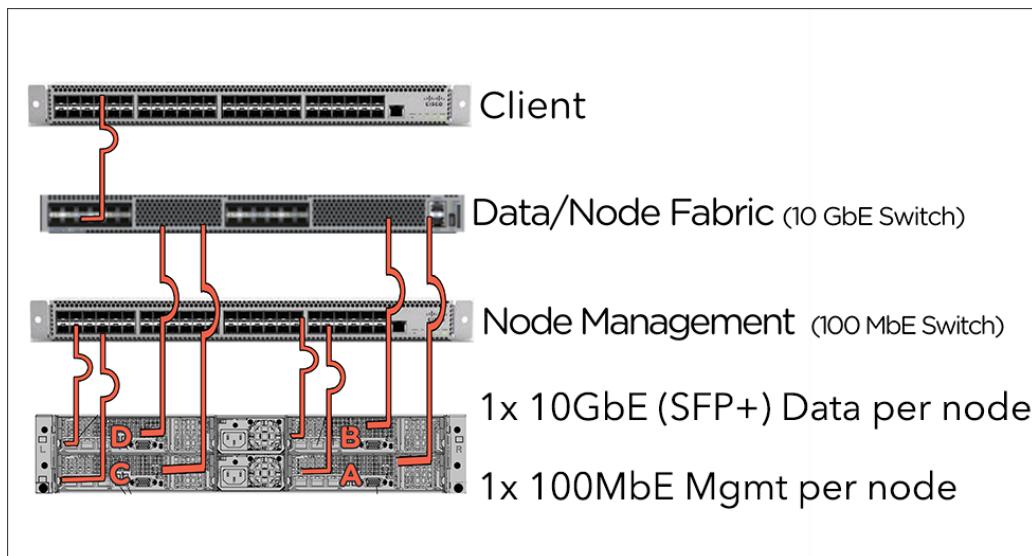
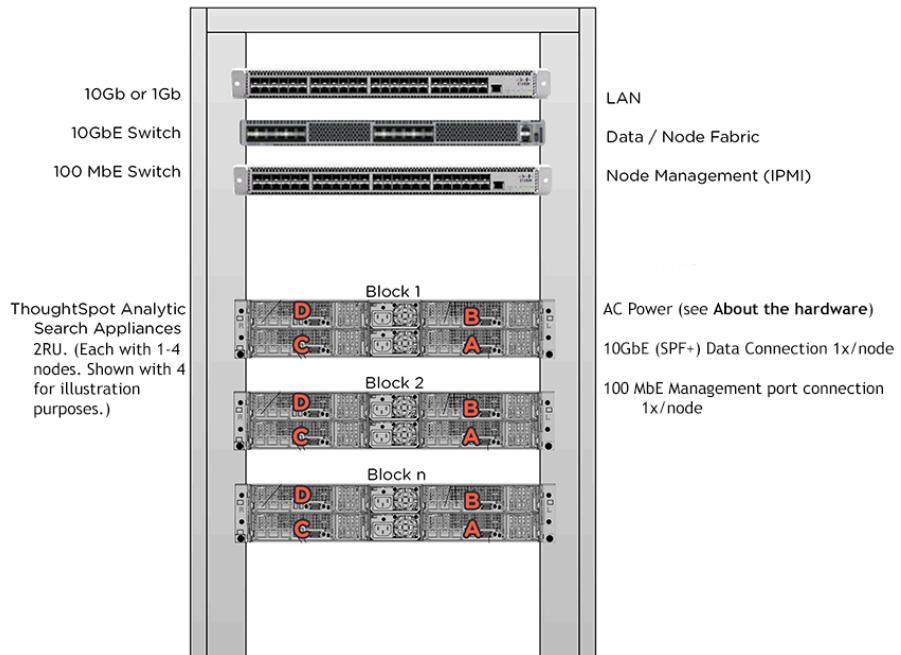
1. One 5m CAT 5e/6 network cable, per node, is provided with the appliance for management port connection. Customer supplied cable can be used if preferred.

2. One SFP+ connector is provided, per node, for the node side data connection. One 5m fiber cable is also provided. The customer must provide switch side SFP+ that is compatible with their switch. Customer supplied DAC cables or fiber cables can be used if preferred.

## Typical physical deployment

These diagrams show a physical configuration with three blocks of four nodes each. Your appliance can have 1-4 nodes, depending on the ordered configuration.

### Server Rack (42U) Back (Customer Supplied)



# Installing the ThoughtSpot Dell appliance

**Summary:** Learn how to install the ThoughtSpot Dell appliance.

## Installation Prerequisites

Ensure that you have the following items, information, and understanding of policies before you begin installing your Dell 6420 appliance:

- 10gbE switch with IPv6 broadcast and multicast enabled. You need one switch per node.
- Data center with proper cooling
- AC power
- 10G connection: SFP+ for switch side
- 10GbE network cables, either direct attach copper (DAC) or fiber. See [Cable Reference \[See page 0\]](#).
- 10bps switch for connection to the iDRAC (Out of Band Management) port
- Cat5 network cables
- Rack space (2U or 3.5 inches per appliance) and a power strip
- Monitor and keyboard
- Networking information, for data, management IPs, DNS, timezone, and default gateway IP. Contact your network administrator for this information, and fill out the ThoughtSpot site survey so that you have a quick reference.

## About the Hardware

These pictures show the front and back view of the Dell C6420 appliance.

### Appliance Front View



Appliance Back View



## Connect the Appliance

After you rack and stack the appliance, you can begin to configure it.

### Step 1: Connect switches to 10GbE ports

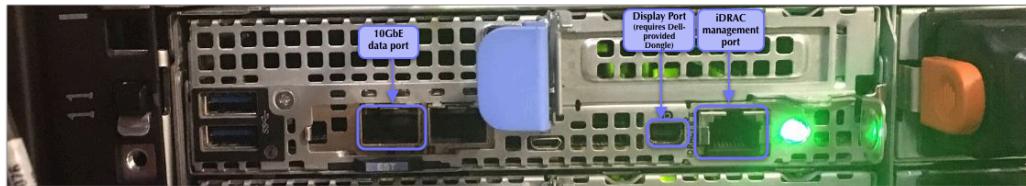
Connect the 10GbE port of each node, as illustrated in [Appliance Port Location \[See page 6\]](#), to the 10GbE switches on your own rack using either fiber or DAC cables.

Refer to the [Cable reference \[See page 0\]](#) for information on the cable types:

- [Fiber Cables \[See page 0\]](#)
- [DAC Cables \[See page 0\]](#)

**❶ Note:** Ask your hardware vendor for more details about what they supply and what you need to buy.

### Appliance Port Location



- Connect to switches **only** the nodes you want in your cluster. Power off or disconnect any other nodes or appliances, to prevent accidental configuration of incorrect nodes.

**Note:** You need at least three nodes for high availability (HA). Each appliance can have up to four nodes.

- You must connect all nodes, even if using only one node, to a 10GbE switch.

## Step 2: Connect iDRAC ports

Connect the iDRAC management ports of each node to the management switch. If you need help finding the ports, see [Appliance Port Location \[See page 6\]](#).

## Step 3: Connect a keyboard and monitor

Connect a keyboard and monitor to the appliance. You need these to initially configure the appliance, and you can disconnect them later. Use the adapter Dell provides. Plug it into the Display Port shown in [Appliance Port Location \[See page 6\]](#), and plug the monitor in on the other side of the adapter.

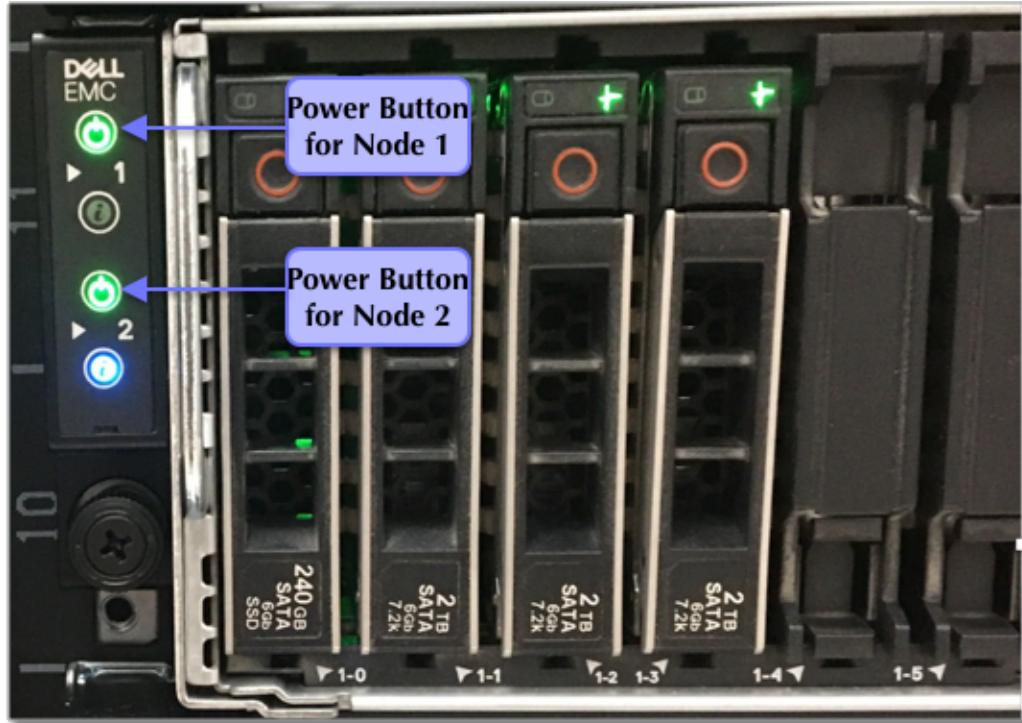
### Dell-provided display to VGA adapter



## Step 4: Turn on nodes

Turn on power for the nodes by pressing the power button for each one; see [Appliance Power Button \[See page 7\]](#).

### Appliance Power Button



**Note:** There is one power button for each node.

## Configure the management settings

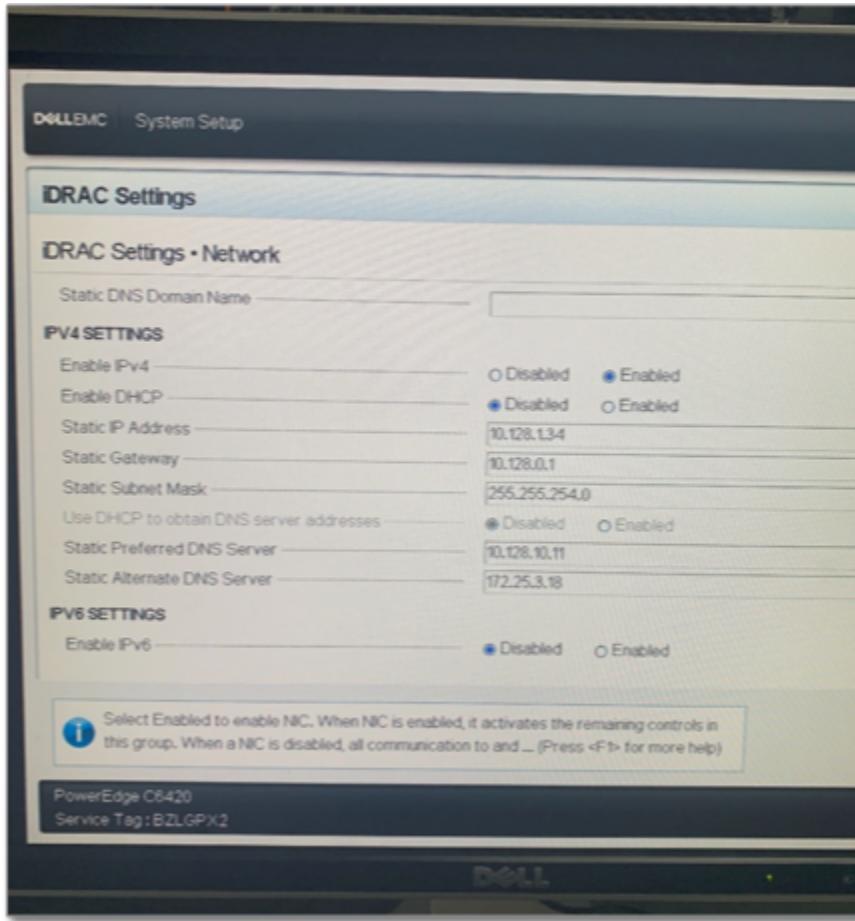
Next, input your specific network information to configure the management settings. Refer to [Dell Management Configuration \[See page 9\]](#). If you need additional guidance, view [Dell Support \[See page 0\]](#) for this product.

1. **Open the iDRAC settings modal** Before the node boots, a screen appears on your monitor with several options. Click F11 to enter the Boot Manager.
2. **Press F2** Click F2 when the option to do so appears on your screen.
3. **Select iDRAC** In the Bios setup screen, there are several options. Select **iDRAC** to configure your iDRAC settings.
4. **Select network configuration** From the iDRAC settings options, select **network**.
5. **Fill out the iDRAC settings form** Add your specific network information for the IP address, Gateway, and Netmask in the empty boxes. DNS information is optional. Refer to your ThoughtSpot site survey for a quick reference, and ask your network administrator for help if you have not filled out the site survey yet.

- For **Enable IPv4**, select **enabled**.
- For **Enable DHCP**, select **disabled**.
- For **Enable IPv6**, select **disabled**.

6. **Save changes and reboot** Follow the prompts on the monitor to save changes to the management settings form, exit, and reboot the system.
7. **Log into ThoughtSpot** When the system reboots, the login page appears. Log in as an administrator. Ask your network administrator if you do not know the admin credentials.

### Dell Management Configuration



## Configure Nodes on the Command Line

Once you have connected the appliance, a command line appears on your console. Configure the nodes on this command line.

## Step 1: Get a list of nodes to configure

Make sure you have logged into your cluster. If you have not, use admin credentials to log into your cluster. Then, run the `tscli cluster get-config` command to get a list of the nodes to configure for the new cluster. Redirect it to the file `nodes.config`. You can find more information on this process in the [nodes.config file reference \[See page 0\]](#).

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

## Step 3: Configure the network of nodes

1. Add your specific network information for the nodes in the `nodes.config` file, as demonstrated in the [autodiscovery of one node example \[See page 0\]](#).
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 [\[See page 10\]](#). Run `$ cat nodes.config | tscli cluster set-config`.

- If the command returns an error, refer to [set-config error recovery \[See page 11\]](#).

### Set-config

```
$ 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 f
ound configuration for only 1 nodes.
Continuing anyway. Error in cluster config validation: [] is no
t a valid link-local IPv6 address for node: 0e:86:e2:23:8f:76 C
onfiguration failed.
Please retry or contact support.
```

Restart node-scout with the following command, then retry the [set-config command](#) [See page 10].

```
$ 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` on the command line 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.or
g,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). Make sure you can connect to ThoughtSpot remotely. If you can, you can run the installer on your local computer.

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.

### 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’ with your specific hostname.
- Replace ‘file-name’ with 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 ouput 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. 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`.

## 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
```

### 3. Finalize Installation

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

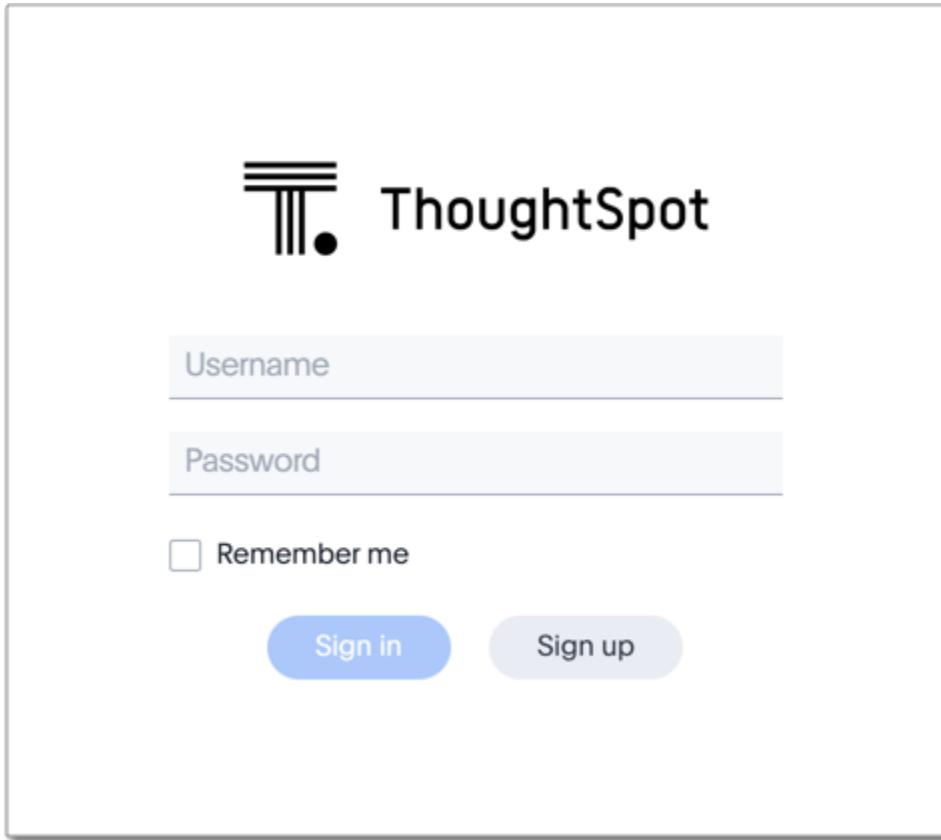
Follow these steps:

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 \[See page 16\]](#), enter admin credentials, and click **Sign in**.  
ThoughtSpot recommends changing the default admin password.



## 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 \[See page 0\]](#)
- [Cable Reference \[See page 0\]](#)
- [ThoughtSpot Documentation \[See page 0\]](#)
- [Contact Support \[See page 0\]](#)

# Supported hardware

## **Summary:** Required and provided installation hardware.

This section lists all required hardware that is needed to successfully install your ThoughtSpot appliance in your data center. Some hardware will be provided with your appliance, while the rest must be provided on-site.

The ThoughtSpot instance hardware is configured for fast data searching and reliability. This overview details the hardware specification and installation. The system is made up of compute nodes, which form a cluster. The 2U system includes up to 4 nodes and can hold up to 1TB of data. This can be scaled out.

## Network connection

Before you can access ThoughtSpot, you need a network connection.

Refer to [Network Ports \[See page 0\]](#) in the Administrator's Guide to see which ports must remain open to outside traffic for handling certain network requests and for inter-cluster communication. The [Administrator's Guide \[See page 0\]](#) also provides information on network security and how to test your network connectivity between nodes.

Here are some more details on ports and node communication:

- Port redundancy (bonding) is not supported. Only one 10G port is active per node.
- Nodes communicate with each other through the 10G connection (data ports).
- All nodes should be on the same VLAN – ideally connected to the same top of rack switch.
- IPMI ports are used for management functions of the nodes.

## Appliance hardware platforms

You can deploy the ThoughtSpot Analytical Search engine on Haswell appliance hardware platforms, with the following specifications:

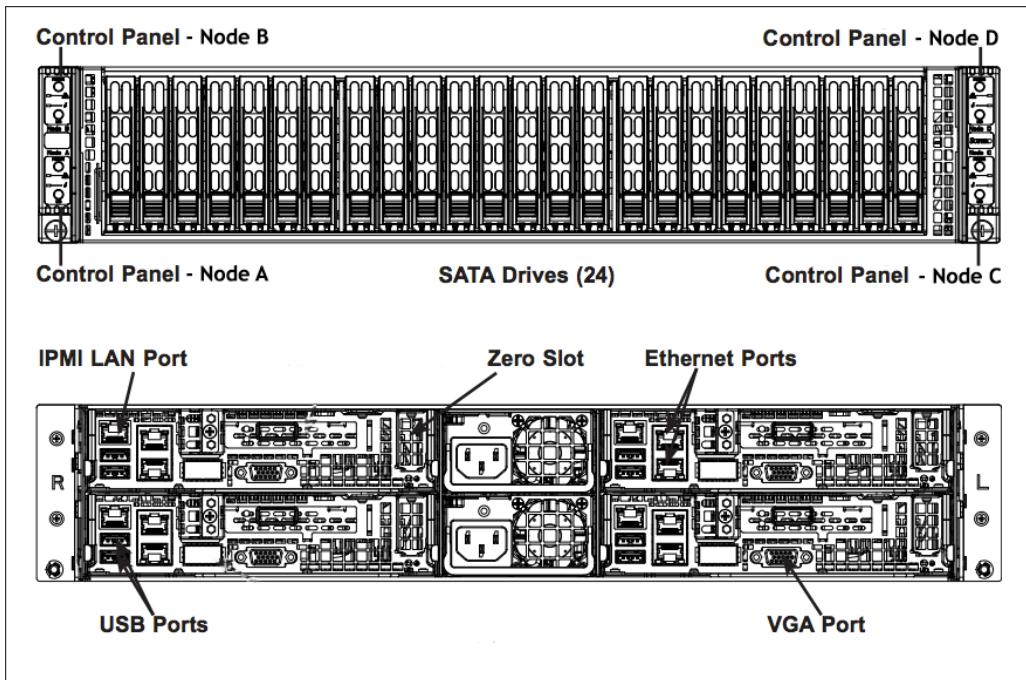
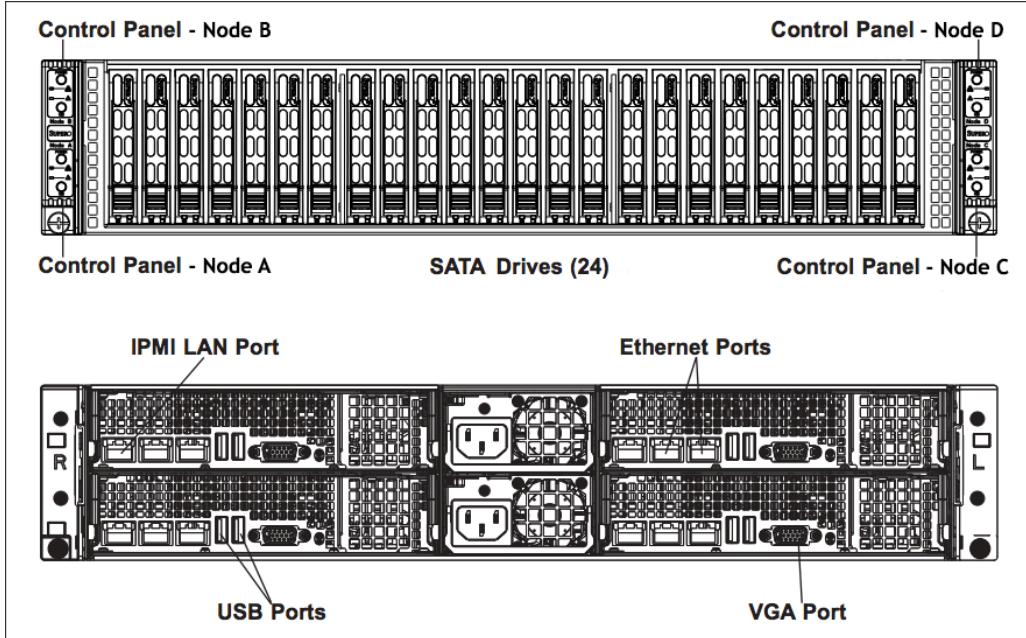
<b>Details</b>	<b>Haswell</b>
<b>Dimensions</b>	2 RU chassis (17.25 x 3.47 x 28.5 in.)
<b># of nodes</b>	Populated with 1 to 4 nodes
<b>Node specifica-tions</b>	Each node is independent and consists of a server board (removable from rear), 1x 200GB SSD, 3x 2TB HDD
<b>Max power con-sumption</b>	2000 W
<b>Required power input</b>	200-240 / 11.8 - 9.8A / 50-60Hz

**ⓘ Note:** ThoughtSpot deployments are no longer offered on Ivy Bridge platforms.

## Chassis views

These diagrams show the front and rear chassis views. The marked features are present on all four nodes on the rear of the chassis even though they are only pointed out on one node in the diagrams.

The chassis appear fully populated (4-nodes). Your appliance may be populated with 1-4 nodes, depending on the ordered configuration. If less than 4-nodes were ordered, the empty slot will be filled with a filler panel.



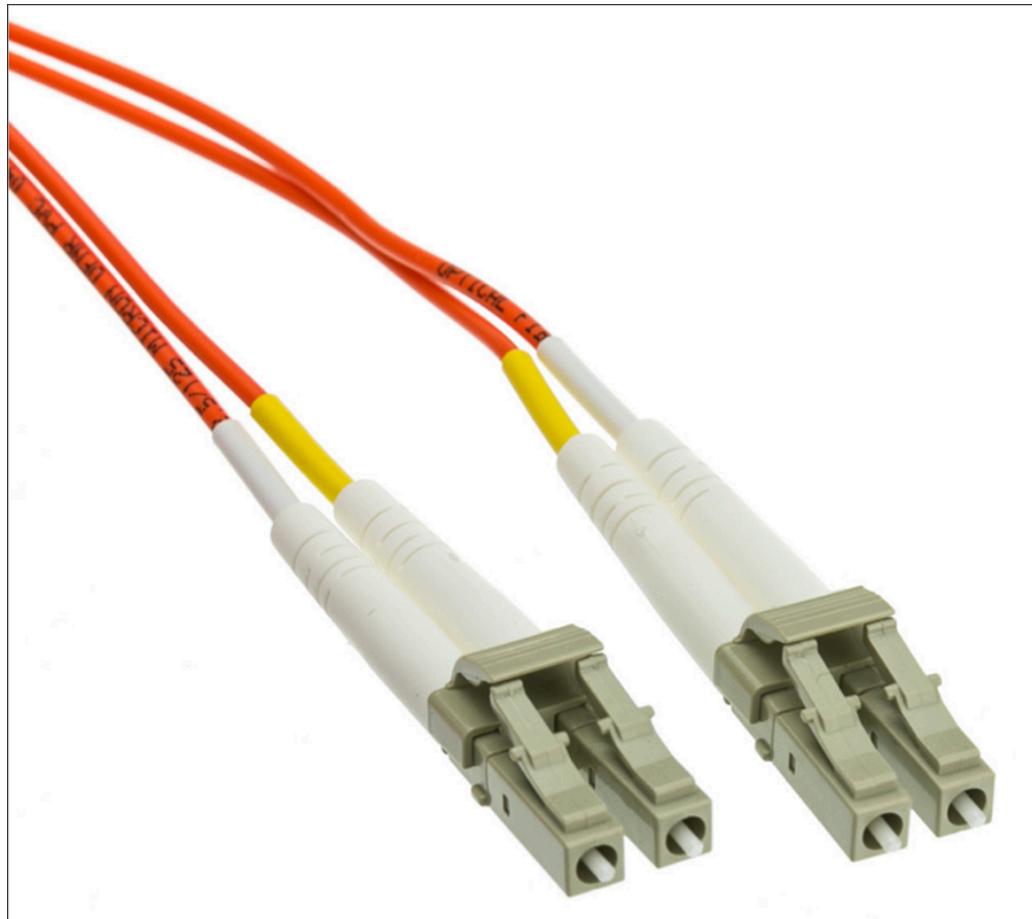
# Cable networking

This section reviews the types of cables needed for 10GbE networking and how to plug them in. There are three types of cables to consider for 10GbE networking:

- Fiber
- Direct Attach Copper (DAC)
- Category 6a (not supported by ThoughtSpot)

## Option 1 - Fiber cables

Fiber can be run long distances to the switch.

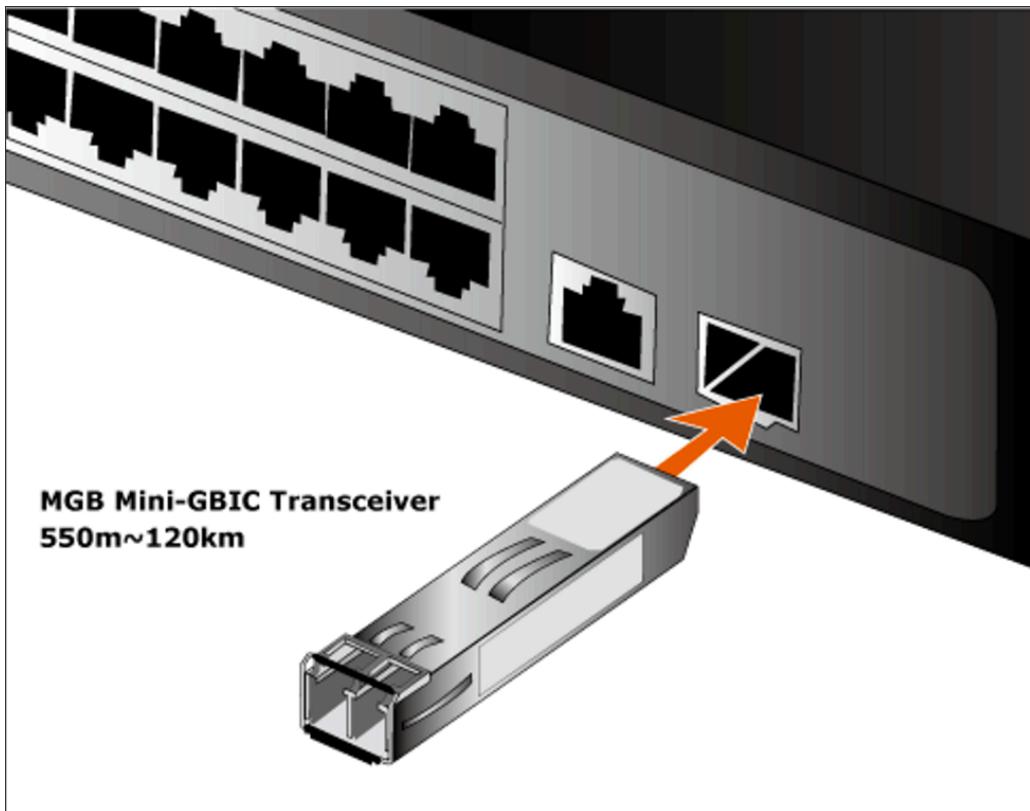


These cables require gigabit interface converters (GBICs), SFP+ form factor.

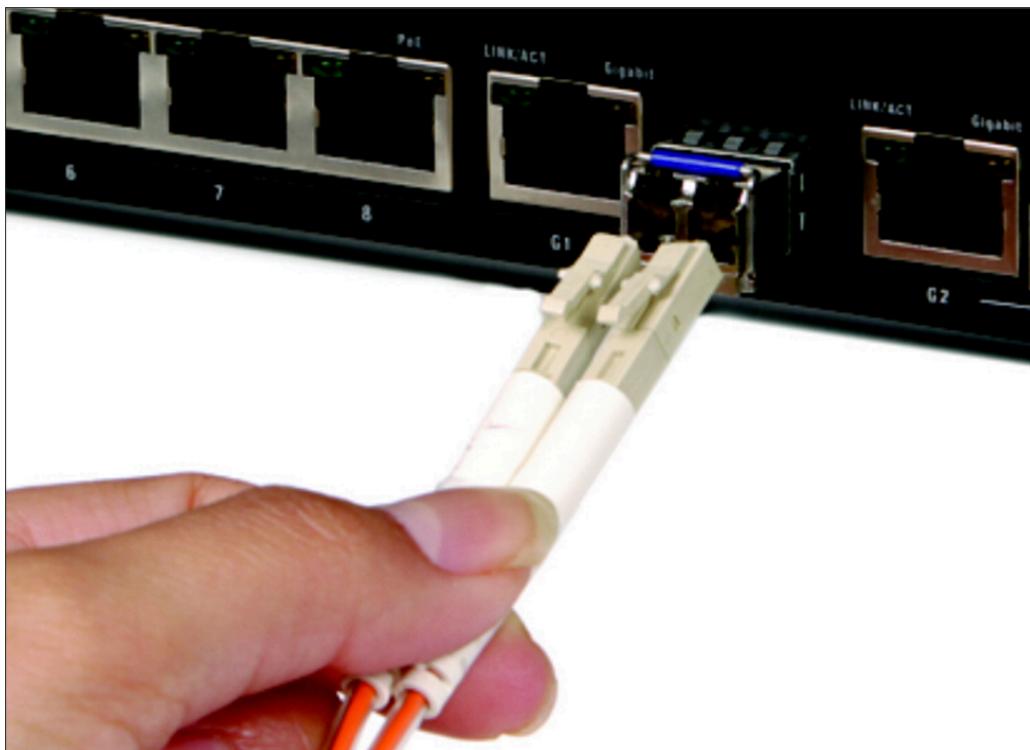
**Remember:** ThoughtSpot does not supply cables or GBICs



The GBIC must be plugged into a data port on the back of the appliance before plugging in the fiber cables.



The fiber cables must then be plugged into the GBIC.

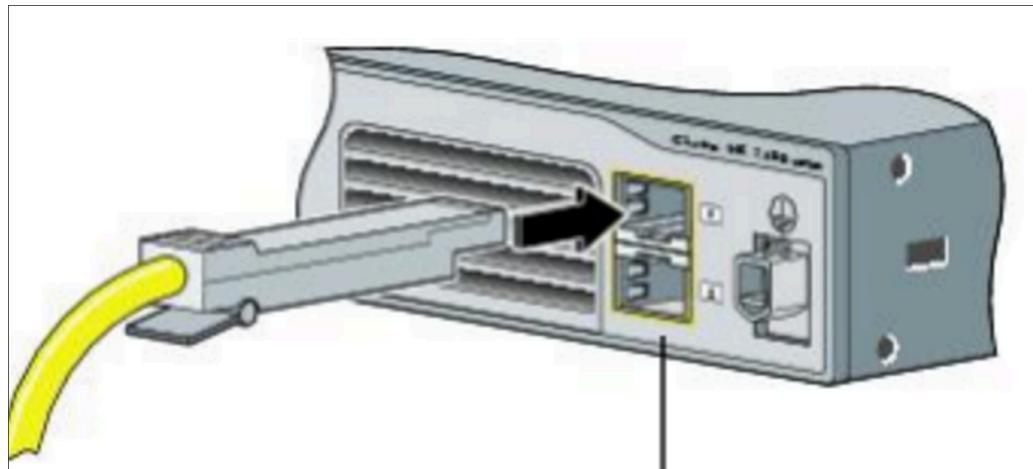


## Option 2 - DAC/Twinax cables

Copper can only be run short distances to the switch. An SFP+ is attached to the cable.



Here is how you would plug in a DAC cable.



## Non-option - Category 6a cables (not supported by ThoughtSpot)

There are no adapters for these cables. The 10GbE NIC (Network Interface Card) used on the ThoughtSpot appliance is not compatible with this type of cable/connection.

