

# Hitachi Hyper Scale-Out Platform Setup Installation Validation

## Lab Validation Report

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## Feedback

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# Hitachi Hyper Scale-Out Platform Setup Installation Validation

## Lab Validation Report

This lab validation report confirms the steps to deploy Hitachi Hyper Scale-Out Platform (HSP). This report also shows the quick launch of the kernel-based virtual machine (KVM) instance in Hyper Scale-Out Platform for use of different big data applications.

Videos of all test steps were made, showing the installation of Hyper Scale Out Platform. These are included in as a reference.

Hitachi Hyper Scale-Out Platform consists of the following:

- Commodity servers
- Integrated storage
- A virtual IP facility for client data access with transparent failover
- A 40 GbE network backplane for high-speed data transport within a Hyper Scale-Out Platform cluster

Hyper Scale-Out Platform exposes the following on top of a resilient, fully distributed, shared-nothing file system:

- OpenStack-compliant compute APIs
- Network File System (NFS)
- HDFS-compliant storage APIs

The HDFS-compliant file system on Hyper Scale-Out Platform is the Hadoop Compatible File System (HCFS).

Hitachi Hyper Scale-Out Platform removes data silos. You can have one big data lake for all types of data, structured or unstructured. Ingest data using NFS or other means, such as RESTful APIs, or Pentaho PDI connectors.

The Hyper Scale-Out Platform data lake architecture provides HDFS-compatible and POSIX access to stored data. The interface for Hyper Scale-Out Platform provides a seamless mechanism to bring this solution to production in less than half an hour.

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**Note** — Testing of this configuration was in a lab environment. Many things affect production environments beyond prediction or duplication in a lab environment. Follow the recommended practice of conducting proof-of-concept testing for acceptable results in a non-production, isolated test environment that otherwise matches your production environment before your production implementation of this solution.

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## Product Features

Hitachi Hyper Scale-Out Platform is an OpenStack-compatible, distributed scale-out application solution. It provides a hyper-converged storage and compute environment that allows virtualized applications to run at the source of the data on a single platform.

Hitachi Hyper Scale-Out Platform features include the following:

- 72 TB raw storage/node (12 × 6 TB)
- Intel Xeon processor, 12 cores and 192 GB RAM/node
- 20 nodes per rack
- 240 cores, 3.84 TB RAM, 1.44 PB
- 100 nodes per cluster (as tested)
- 2 × 40 GbE internal networks
- 2 × Brocade ICX7750 switches/rack
- 10 GbE external interface
- A 100% Symmetric clustered file system
- Aggregate bandwidth and IOPs scale linearly  
Performance scales with cluster size
- Self-healing and automatic rebalancing  
Data is redistributed across the cluster automatically as configuration changes using Paxos and CRUSH (for cluster membership and consistent hashing).
- Distributed file system metadata cache across cluster
- Any node can act as NFS (or Swift server) and independently update data and metadata  
There is no forwarding of requests.
- Underlying object based storage compartmentalizes against software and hardware failures  
Separating file system from object system provides more resilience to failures.
- Built on commodity hardware with redundancy smarts  
It is able to tolerate loss of disks and nodes with redundancy at higher levels.

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**Note** — The Hitachi Hyper Scale-Out Platform kit used in testing had 20 nodes. Only 10 nodes were used in testing.

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## Test Environment Configuration

Figure 1 is a high-level diagram for test environment. Table 1, “Key Hardware Products,” on page 3 lists the key hardware products used for the test environment. Table 2, “Key Software Products,” on page 4 lists the key software products used for the test environment.

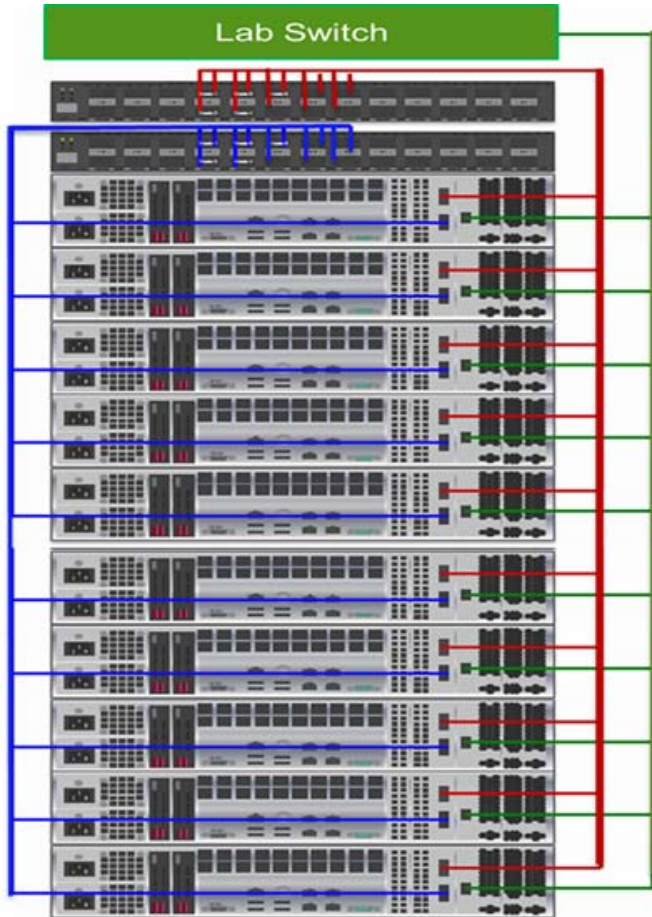


Figure 1

Table 1. Key Hardware Products

Hardware	Description	Version	Quantity
Hitachi Hyper-Scale Out Platform	<ul style="list-style-type: none"> <li>■ 20 single node D51B-2U</li> <li>■ 2 × Brocade ICX7750 switches</li> <li>■ 1 × 4 POST 24-32 RACK kit</li> </ul>	1.1.1.00017	1
Hitachi Apresia 10 GbE switch (from Hitachi Cable America)	<ul style="list-style-type: none"> <li>■ 10 GbE switch</li> </ul>	8.19.03	1

**Table 2. Key Software Products**

Software	Version	Function
Hitachi Hyper Scale-Out Platform	1.1.1.00017	Software for Hyper Scale-out Platform
Community Enterprise Operating System (CentOS)	6.6	Virtual machines

## Test Methodology

Solutions Engineering conducted tests on a Hitachi Hyper Scale-Out Platform in the Hitachi Data Systems laboratory. The test cases were the steps used to deploy a system in *Hyper Scale-Out Platform Implementation Guide*. All setup procedures were recorded with a timer.

1. **Initialize the cluster and assign a virtual IP address to the cluster.**
2. **Configure Hitachi Hyper Scale-Out Platform according to the Pre-Engagement Checklist.**

Provide values for the following:

- Cluster default gateway
- NTP
- Domain name
- DNS server IP

3. **Create the file system and NFS shares.**
4. **Copy the KVM virtual machine image to the cluster share.**
5. **Create the virtual machine template on the Hyper Scale-Out Platform cluster.**
6. **Deploy virtual machine instances and verify that the virtual machines are up and running.**
7. **Test the newly deployed environment.**

Test results, including videos of the installation process, are in “Test Results” on page 7.



## Analysis

During this lab validation, completion of all the test steps took about 21 minutes total. Following these steps, 10 brand new individual physical nodes were configured into a fully functional Hitachi Hyper Scale-Out Platform. This proved ease of use of and a streamlined installation process for Hyper Scale-out Platform.

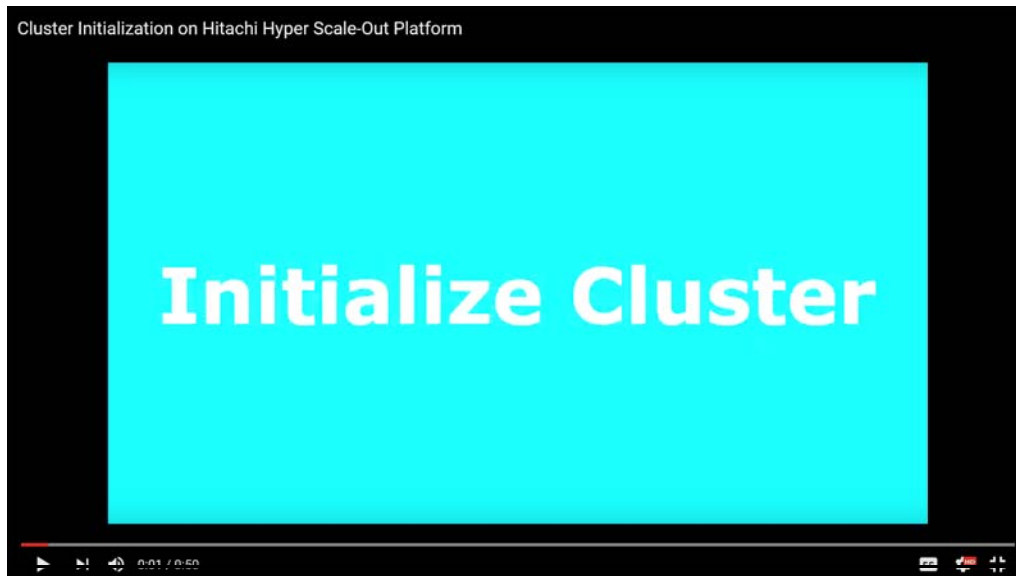
## Test Results

These are the test results.

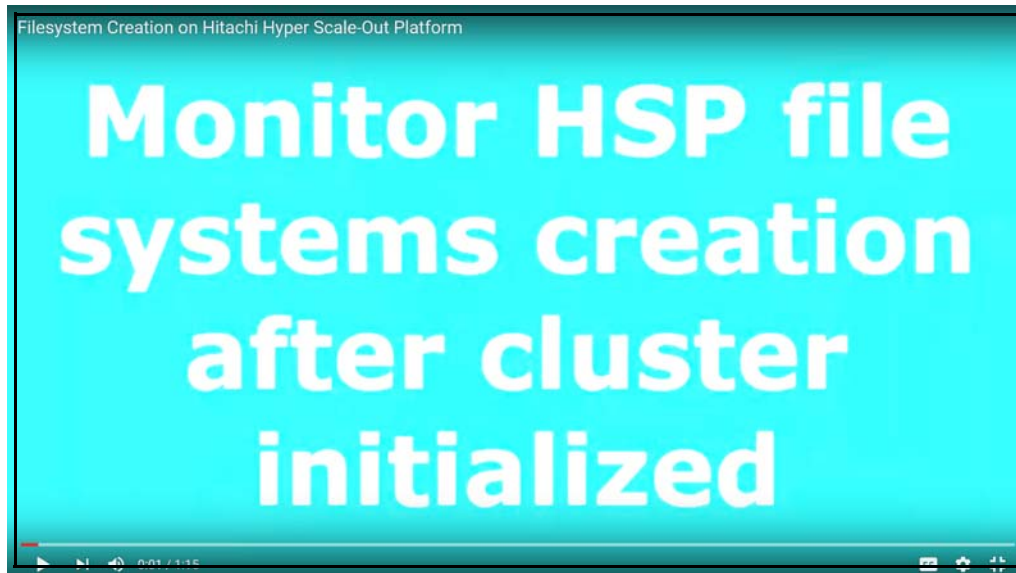
### 1. Initialize the cluster and assign a virtual IP address to the cluster.

The cluster initialization and assignment of the virtual IP address completed successfully in about 10 minutes.

- The cluster initialization for 10 nodes completed in about 2 minutes.



- The validation test of the cluster file systems completed in about 8 minutes.



**For your installation, note the following:**

This test used a Raritan keyboard, mouse, and monitor remote connection to make the virtual IP assignment. You can use a serial port connection and direct keyboard, mouse, and monitor in place of the Raritan remote connection. Use the virtual IP as the web management interface.

If the production network and management network are in different, separated physical networks, create a link between the management and production networks through the 10 GbE switch.

**2. Configure Hitachi Hyper Scale-Out Platform according to the Pre-Engagement Checklist.**

All key information for the cluster was entered in about 2 minutes.

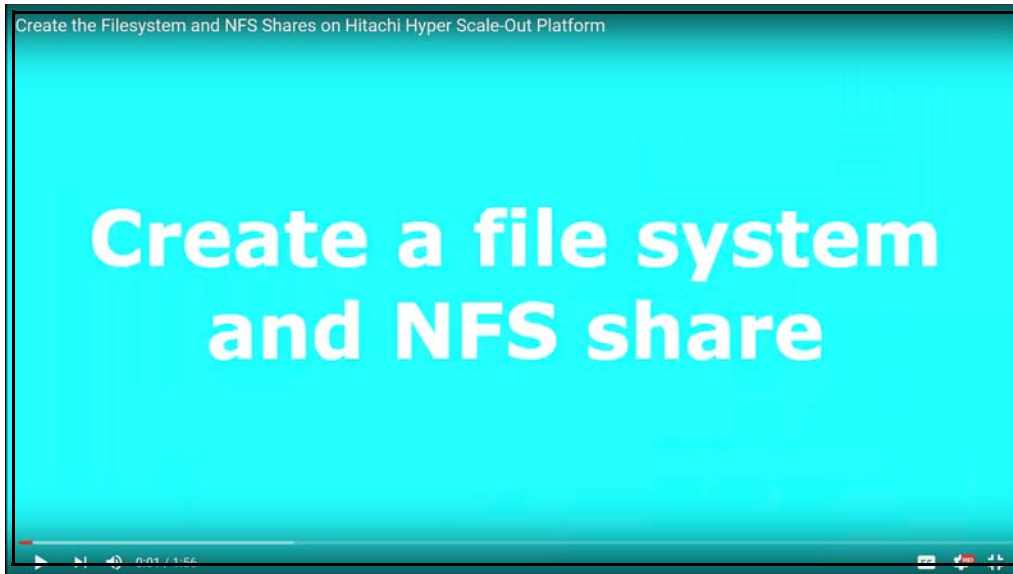
After assigning the virtual IP address in step 1, use the same web interface to configure the rest of the Hyper Scale-Out Platform cluster through the virtual IP.

**For your installation, note the following:**

The IP addresses for the physical nodes and virtual machines have to be in the same network.

### 3. Create the file system and NFS shares.

Creating the file system and NFS share took about 2 minutes.



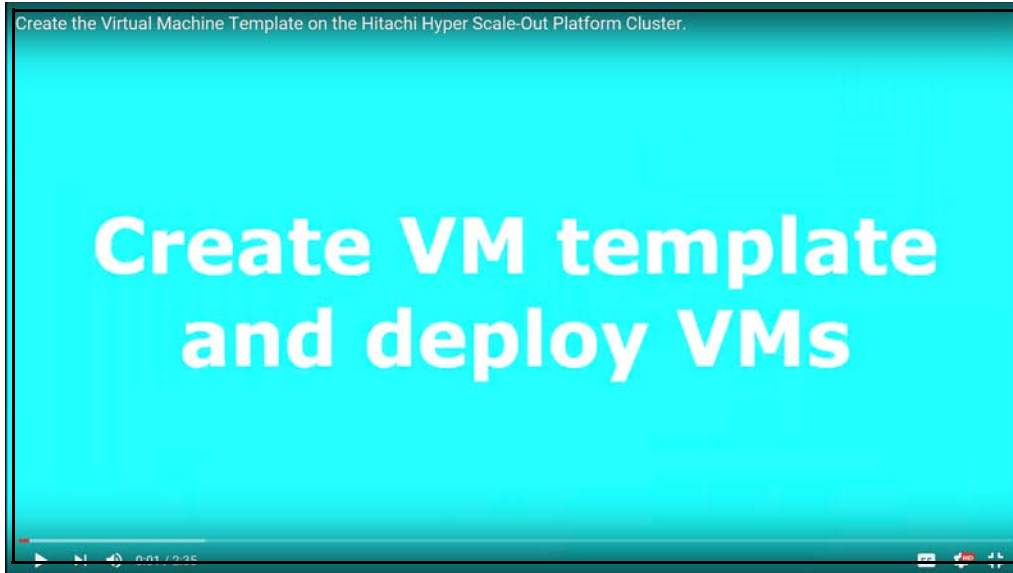
### 4. Copy the KVM virtual machine image to the cluster share.

Copying a Centos6.6 virtual machine template with size 3.5 GB in qcow2 format to the cluster share took about 2 minutes.



## 5. Create the virtual machine template on the Hyper Scale-Out Platform cluster.

The virtual machine template created using the VM image from the previous step. Five virtual machines were created from the template and powered on. Logged in to one of the VMs to verify the VMs were functional. The task completed in about 5 minutes.



### For your installation, note the following:

When using Hyper Scale-Out Platform to handle the network, do the following:

- Disable the network manager.
- Turn off DHCP on the virtual machine template.

Using a static IP or DHCP for the template requires using a VNC address to obtain the assigned IP address by connecting to the VNC IP address first.

## For More Information

Hitachi Data Systems Global Services offers experienced storage consultants, proven methodologies and a comprehensive services portfolio to assist you in implementing Hitachi products and solutions in your environment. For more information, see the Hitachi Data Systems [Global Services](#) website.

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