Huawei Storage Certification Training

HCIA-Storage V5.0 Lab Environment Setup Guide

(Server Virtualization Edition)



HUAWEI TECHNOLOGIES CO., LTD

|  |
| --- |
| Copyright © Huawei Technologies Co., Ltd. 2022. All rights reserved.  No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.  Trademarks and Permissions  C:\Users\jwx341670\AppData\Local\Microsoft\Windows\INetCache\Content.Word\HW_POS_RBG_Vertical-150ppi.png and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.  All other trademarks and trade names mentioned in this document are the property of their respective holders.  Notice  The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.  The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied. |

|  |  |
| --- | --- |
| **Huawei Technologies Co., Ltd.** | |
| Address: | Huawei Industrial Base Bantian, Longgang Shenzhen 518129  People's Republic of China |
| Website: | http://[e](http://e.huawei.com/).huawei.com |

**Huawei Certification System**

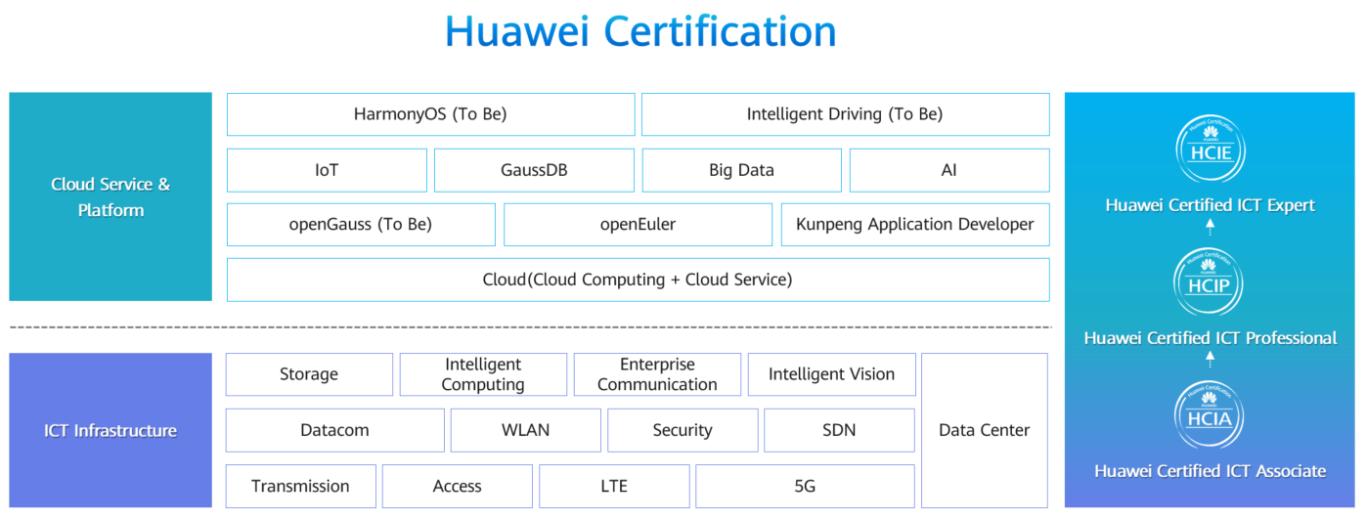
Huawei Certification is an integral part of the company's "Platform + Ecosystem" strategy, and it supports the ICT infrastructure featuring "Cloud-Pipe-Device". It evolves to reflect the latest trends of ICT development. Huawei Certification consists of two categories: ICT Infrastructure Certification, and Cloud Service & Platform Certification, making it the most extensive technical certification program in the industry.

Huawei offers three levels of certification: Huawei Certified ICT Associate (HCIA), Huawei Certified ICT Professional (HCIP), and Huawei Certified ICT Expert (HCIE).

Huawei Certification covers all ICT fields and adapts to the industry trend of ICT convergence. With its leading talent development system and certification standards, it is committed to fostering new ICT talent in the digital era, and building a sound ICT talent ecosystem.

Huawei Certified ICT Associate-Storage (HCIA-Storage) is designed for Huawei engineers, students, and ICT industry personnel. HCIA-Storage covers knowledge about storage technology trends, storage basic technologies, storage common advanced technologies, storage business continuity solutions and storage system O&M management.

The HCIA-Storage certificate system introduces you to the industry and market, helps you in innovation, and enables you to stand atop the ICT frontiers.



About This Document

Overview

This document provides guidance for trainees to install and deploy the HCIA-Storage lab environment, set up the lab environment, and complete HCIA-Storage experiments based on the *HCIA-Storage V5.0 Lab Guide*.

This lab environment uses Huawei FusionCompute virtualization platform as an example. The OceanStor Emulator Storage (eStor) is deployed on the VMs in FusionCompute to simulate operations on Huawei OceanStor Dorado V6.

The lab environment can have one or more physical servers. You must install FusionCompute on the servers and then deploy the OceanStor eStor, Linux, and Windows VMs to set up the lab environment.

The environment setup personnel must have basic knowledge of Huawei Cloud, for example, have participated in the HCIA-Cloud Compute training.

Note:



Huawei OceanStor eStor emulates OceanStor Dorado V6 storage systems' basic functions and features, such as SAN/NAS configuration, reads/writes, snapshot, remote replication, and HyperMetro services. eStor is used for trainings and function demonstrations. It helps sales, service, O&M, and management personnel of storage systems to better understand how to use Huawei OceanStor Dorado V6. Currently, eStor can emulate one or multiple single-controller storage systems on FusionCompute.

Contents

[About This Document 3](#_Toc117844475)

[Overview 3](#_Toc117844476)

[1 Device List 5](#_Toc117844477)

[1.1 Device Information 5](#_Toc117844478)

[2 Hardware and Software Configuration 6](#_Toc117844479)

[2.1 Hardware Information 6](#_Toc117844480)

[2.2 Software Information 6](#_Toc117844481)

[2.3 Data Planning 7](#_Toc117844482)

[3 Operation Process 8](#_Toc117844483)

[3.1 Networking Topology 8](#_Toc117844484)

[3.2 Lab Planning 9](#_Toc117844485)

[3.3 Operation Process 10](#_Toc117844486)

[4 KeyProcedure 11](#_Toc117844487)

[4.1 Installing and Connecting Devices 11](#_Toc117844488)

[4.2 Deploying the Virtualization Platform 12](#_Toc117844489)

[4.3 Deploying Linux and Windows VMs 14](#_Toc117844490)

[4.4 Deploying the eStor 15](#_Toc117844491)

[4.5 Verifying the Lab Environment 16](#_Toc117844492)

[5 Other Operations 17](#_Toc117844493)

[5.1 Clearing the Environment 17](#_Toc117844494)

# Device List

## Device Information

For details about the devices, see the *HCIA-Storage V5.0 Device List (FusionCompute)*.

# Hardware and Software Configuration

## Hardware Information

The following table is for reference.

Hardware information

|  |  |  |  |
| --- | --- | --- | --- |
| Device Name | Device Model | Quantity | Remarks |
| Application server | Huawei 2288H V5 | 1 | Install the FusionCompute virtualization platform on the server, and deploy Windows and Linux VMs and Huawei OceanStor eStor on FusionCompute. |
| Maintenance terminal | -- | 1 | Used for virtualization platform deployment and management. Laptops or desktop PCs can be used. |

For details about hardware configurations, see the *HCIA-Storage V5.0 Device List (FusionCompute)*.

https://download.huawei.com/mdl/imgDownload?uuid=9bce549b513c40deb19f2079c2e9c719Note:

In addition to hardware requirements, the PC and server configurations must meet the environment requirements. For details, see the *FusionSphere Virtualization Suite Product Documentation*.

PC: See **Installation and Configuration** > **Installation Guide** > **Installation Preparations** > **System Requirements** > **PC Requirements** in the product documentation.

Server: See **Installation and Configuration** > **Installation Guide** > **Installation Preparations** > **System Requirements** > **Host Requirements** in the product documentation.

## Software Information

The following table lists the software that may be used in the lab environment for reference.

Software version

| Name | Version | Remarks |
| --- | --- | --- |
| PuTTY | PuTTY 0.74 | Recommended version |
| FusionCompute | FusionCompute 6.5.1 | Recommended version |
| Huawei OceanStor eStor (FusionCompute) | V1R1C00T40 | This version or later is recommended. |
| Windows application server | Windows 2008 R2 | This version or later is recommended. |
| Linux application server | SUSE, CentOS, Red Hat, EulerOS | -- |

Software download addresses (for reference):



PuTTY: You are advised to use open-source software PuTTY to log in to a terminal. You can use the common domain name (**putty.org**) of PuTTY to browse or download the desired document or tool.

FusionCompute: You can log in to Huawei technical support website (http://support.huawei.com/enterprise/) and enter **FusionCompute** in the search box to search for, browse, and download the desired document or tool.

Huawei OceanStor eStor (FusionCompute): You can log in to Huawei technical support website (http://support.huawei.com/enterprise/) and enter **OceanStor eStor** in the search box to search for, browse, and download the desired document or tool.

## Data Planning

The following table lists the accounts of main devices in the lab environment for reference.

Account information

|  |  |  |
| --- | --- | --- |
| System Name | User Name/Password | Remarks |
| FusionCompute | admin/Huawei@123 | Recommended configuration |
| Huawei OceanStor eStor | admin/Huawei12#$ | Recommended configuration |
| Linux | root/Huawei12#$ | Recommended configuration |
| Windows | Administrator/Huawei12#$ | Recommended configuration |

Note:

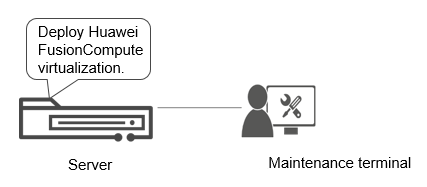


The default user name and password for the first login to Huawei OceanStor eStor are **admin** and **Admin@storage**, respectively.

# Operation Process

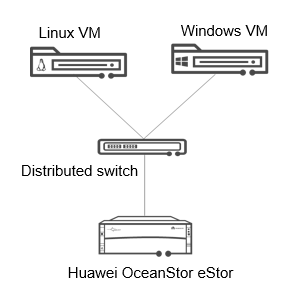
## Networking Topology

The following figure shows the physical networking diagram.



Physical networking

The following figure shows the FusionCompute virtualization topology.



VM networking

The preceding figure shows the topology of the HCIA-Storage server virtualization environment (FusionCompute). The lab environment can have one or more physical servers. The FusionCompute virtualization platform is installed on the servers to virtualize resources. Then Huawei OceanStor eStor, Linux, and Windows are deployed on VMs.

## Lab Planning

The network of the lab environment consists of a management plane and a service plane, which are used for device management and service access, respectively. The management plane can be further divided into the FusionCompute and storage management planes. The network plane information is as follows (for reference).

Network plane information

|  |  |  |  |
| --- | --- | --- | --- |
| Network Plane | Information | Network (Example) | Remarks |
| Virtualization management plane | FusionCompute management | 192.168.10.XX | Virtualization platform management |
| Storage management plane | Huawei OceanStor eStor management | 192.168.10.XX | Storage configuration management |
| Service plane | Huawei OceanStor eStor service ports, Linux server, and Windows server | 192.168.11.XX | Storage service access |

Note:



For details, see the *FusionSphere Virtualization Suite Product Documentation*. See **Installation and Configuration** > **Installation Guide** > **Installation Preparations** > **System Requirements** > **Network Requirements** in the product documentation.

The following table lists the IP address plan for the lab environment (for reference).

IP address plan

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Item | IP Address (for Reference) | Remarks |
| 1 | CNA node | 192.168.10.XX/24 | Computing node agent |
| 2 | FusionCompute | 192.168.10.XX/24 | Virtualization management platform |
| 3 | Huawei OceanStor eStor management | 192.168.10.XX/24 | Storage management address, which is the address for accessing DeviceManager |
| 4 | Linux | 192.168.11.XX/24 | VM |
| 5 | Windows | 192.168.11.XX/24 | VM |
| 6 | Huawei OceanStor eStor services | 192.168.11.XX/24 | Storage service IP address |

Note:

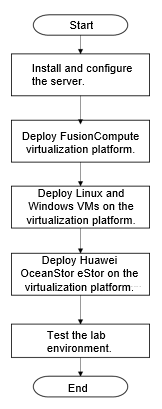


The CNA must be installed on each server to virtualize hardware resources (CPU, memory, storage, and network). It can be installed using the deployment tool or by manually mounting an image. It can provide the virtual computing function, manage VMs on compute nodes, and manage compute, storage, and network resources on compute nodes.

## Operation Process

The lab environment is deployed in virtualization mode. Huawei FusionCompute virtualization platform is installed on the server, and the operating system is deployed on the virtualization platform.

The following flowchart is for reference.



# Key Procedure

To set up the lab environment, you must install devices, deploy the virtualization platform on the server, deploy VMs on the virtualization platform, and deploy the OceanStor eStor. Set up the environment by referring to the device list and scenario-based practice lab guide.

[Reference Document]

Reference documents include *FusionSphere Virtualization Suite Product Documentation*, *FusionServer Pro Rack Server Product Documentation*, and *OceanStor eStor Installation Guide FusionCompute (for Enterprise)*.

This chapter describes the key steps to set up the lab environment.

## Installing and Connecting Devices

Install devices.

Install the server.

[Suggested Procedure]

For details, see **Huawei FusionServer V5 Rack Server User Guide** > **2288H V5 Server User Guide** > **Installation and Configuration** > **Hardware Installation** in the *FusionServer Pro Rack Server Product Documentation*.

Note:



You can log in to Huawei's technical support website (https://support.huawei.com/enterprise/) and input the document or tool name such as **FusionServer** in the search box to search for, browse, and download the desired document or tool.

Configure the server.

After installation, you must configure RAID for the server (for example, configure RAID 1 with two disks) and enable the virtualization function in the BIOS.

[Suggested Procedure]

For details on how to configure RAID, see **Installation and Configuration** > **Typical Hardware Configuration Examples** > **Configuring the 2288H V5 Servers or TaiShan 200 Servers (Model: 2280)** > **Configuring RAID 1** in the *FusionSphere Virtualization Suite Product Documentation*.

For details on how to configure the BIOS, see **Installation and Configuration** > **Typical Hardware Configuration Examples** > **Configuring the 2288H V5 Servers or TaiShan 200 Servers (Model: 2280)** > **Setting the BIOS** in the *FusionSphere Virtualization Suite Product Documentation*.

Note:



For details, see the *FusionSphere Virtualization Suite Product Documentation*. You can log in to Huawei's technical support website (https://support.huawei.com/enterprise/en/index.html) and type the name of a documentation or tool (such as **FusionCompute**) in the search box to search for, browse, and download the desired document or tool.

## Deploying the Virtualization Platform

Download the FusionCompute virtualization software from the Huawei support website and install it on the server.

To obtain the software, log in to Huawei's technical support website (https://support.huawei.com/enterprise/) and input the software name such as **FusionCompute** in the search box to search for and download the software.

Install FusionCompute.

Install and deploy the Huawei FusionCompute virtualization environment on the server.

[Suggested Procedure]

For details, see the *FusionSphere Virtualization Suite Product Documentation*.

Software information: **Installation and Configuration** > **Installation Guide** > **Installation Preparations** > **Software Packages**

Installation procedure: **Installation and Configuration** > **Installation Guide** > **Installation Overview** > **Installation Process**

Installation method: **Installation and Configuration** > **Installation Guide** > **Tool-based Installation (Recommended)** > **Installing Management Software (Using the FusionCompute Installation Tool)**

Alternatively, you can install the virtualization environment by following instructions in "Installing FusionCompute" in the *OceanStor eStor Installation Guide FusionCompute (for Enterprise)*.

Note:



You are advised to disable the system firewall during the installation to prevent errors. To ensure system security, it is recommended that you change the default passwords in the system immediately after the installation is complete and periodically change the passwords during the subsequent maintenance process. The default username and password of the FusionCompute login account (common mode) is **admin** and **IaaS@PORTAL-CLOUD8!** respectively.

Add datastores.

After the installation is complete, log in to FusionCompute and add datastores. The datastores are used as disks for creating VMs.

[Suggested Procedure]

For details, see the following:

For details on how to log in to FusionCompute, see **Operation and Maintenance** > **Service Management** > **Service Management in Single-Hypervisor Scenarios** > **Before You Start** > **Logging In to the System** > **Logging In to FusionCompute** in the *FusionSphere Virtualization Suite Product Documentation*.

(Optional) For details on how to initialize FusionCompute, see **Installation and Configuration** > **Initial Configurations** > **Basic Configuration** in the *FusionSphere Virtualization Suite Product Documentation*.

For details on how to add a datastore, see **Operation and Maintenance** > **Service Management** > **Service Management in Single-Hypervisor Scenarios** > **Storage Management** > **Data Store Management** > **Adding a Data Store** in the *FusionSphere Virtualization Suite Product Documentation*.

Note:



The default username and password of the FusionCompute login account (common mode) is **admin** and **IaaS@PORTAL-CLOUD8!** respectively.

## Deploying Linux and Windows VMs

After the FusionCompute virtualization platform is deployed, create Linux and Windows VMs on the platform for subsequent operations such as mounting LUNs for storage services.

Create a VM.

Create a VM on the FusionCompute virtualization platform.

[Suggested Procedure]

For details, see **Operation and Maintenance** > **Service Management** > **Service Management in Single-Hypervisor Scenarios** > **Provisioning a VM** > **Creating a Bare VM** > **Creating a VM** in the *FusionSphere Virtualization Suite Product Documentation*.

Install Linux.

Install Linux on a VM. After the installation is complete, log in as the **root** user.

[Suggested Procedure]

For details, see **Operation and Maintenance** > **Service Management** > **Service Management in Single-Hypervisor Scenarios** > **Provisioning a VM** > **Creating a Bare VM** > **Installing a Linux VM** in the *FusionSphere Virtualization Suite Product Documentation*.

Install Windows.

Repeat step 1 and step 2 to create a Windows VM. After the installation is complete, log in to the VM as an administrator.

[Suggested Procedure]

For details, see **Operation and Maintenance** > **Service Management** > **Service Management in Single-Hypervisor Scenarios** > **Provisioning a VM** > **Creating a Bare VM** > **Installing an x86 VM (Running a Windows OS)** in the *FusionSphere Virtualization Suite Product Documentation*.

## Deploying the eStor

Deploy Huawei OceanStor eStor on the FusionCompute virtualization platform. Then access DeviceManager on a browser.

Import a disk node VM.

On the FusionCompute virtualization platform, import the Huawei OceanStor eStor disk node VM.

[Suggested Procedure]

For details, see "Deploying eStor" in the *OceanStor eStor Installation Guide FusionCompute (for Enterprise)*.

Note:



For details, see *FusionCompute OceanStor eStor V100R001C00 Installation Guide v6.0*. You can log in to Huawei's technical support website (https://support.huawei.com/enterprise/en/index.html) and type the name of a documentation or tool (such as **eStor**) in the search box to search for, browse, and download the desired document or tool.

Configure the disk node.

On the FusionCompute virtualization platform, start the VM (eStor disk node), log in using VNC, and complete initial configuration.

[Suggested Procedure]

For details, see "Deploying eStor" in the *OceanStor eStor Installation Guide FusionCompute (for Enterprise)*.

Note: Once configured, wait 1 minute for the initialization to finish.

Import controller node VMs.

On the FusionCompute virtualization platform, import two Huawei OceanStor eStor controller node VMs. Note that the latest version of eStor is installed on the two controllers.

[Suggested Procedure]

For details, see "Deploying eStor" in the *OceanStor eStor Installation Guide FusionCompute (for Enterprise)*.

Note:



For details, see *FusionCompute OceanStor eStor V100R001C00 Installation Guide v6.0*. You can log in to Huawei's technical support website (https://support.huawei.com/enterprise/en/index.html) and type the name of a documentation or tool (such as **eStor**) in the search box to search for, browse, and download the desired document or tool.

Configure controller nodes.

On the FusionCompute virtualization platform, start the VMs (eStor controller nodes), log in to the VMs using VNC, and complete initial configuration for the two controller nodes.

[Suggested Procedure]

For details, see "Deploying eStor" in the *OceanStor eStor Installation Guide FusionCompute (for Enterprise)*.

After the configuration is complete, wait 5 to 8 minutes for the initialization.

(Optional) Add a NIC.

On the FusionCompute virtualization platform, add a NIC to the eStor for service access.

[Suggested Procedure]

For details, see **Operation and Maintenance** > **Service Management** > **Service Management in Single-Hypervisor Scenarios** > **Virtual Machine Management** > **VM Adjustment** > **Modifying VM Flavors** > **Adding a NIC** in the *FusionSphere Virtualization Suite Product Documentation*.

## Verifying the Lab Environment

1. Verify that you can log in to and configure Huawei OceanStor eStor. You can use a browser (Firefox is recommended) to access the DeviceManager on the eStor.
2. Verify that the Linux and Windows VMs can communicate with the eStor properly. For example, you can use the **ping** command to check the network connectivity.

# Other Operations

## Clearing the Environment

After completing the practice, perform the following steps to clear the environment (if necessary):

On a PC whose IP address is in the same network segment as that of eStor, use PuTTY to log in to the CLI of eStor as user **admin**.

Run the following commands to enter the minisystem mode:

admin:/>change user\_mode current\_mode user\_mode=developer

Command is executable now.

developer:/>minisystem

Storage: minisystem>

Run the **ld\_diskcommand.sh sys\_clear** command to clear the environment.

Storage: minisystem> ld\_diskcommand.sh sys\_clear

rm: cannot remove `/tmp': Is a directory

=====clear sys=====

mke2fs 1.41.9 (22-Aug-2009)

mke2fs 1.41.9 (22-Aug-2009)

/dev/md200 is mounted; will not make a filesystem here!

eStor---------clear sys end

Storage: minisystem>

https://download.huawei.com/mdl/imgDownload?uuid=9bce549b513c40deb19f2079c2e9c719Note:

Restarting Huawei OceanStor eStor can also clear some configurations.

----End