



INSTALLATION RUNBOOK FOR Huawei SDN controller

Huawei AC Controller

V200R001

7.0 Kilo

OpenStack Version: Product Type:

Product Name:

Driver Version:

MOS Version:

SDN controller

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Document History

Version	Revision Date	Description
1.0	09-08-2016	Initial Version
1.1	27-08-2016	Amend and change template

1. Introduction

This document serves as a detailed Deployment Guide for Mirantis Openstack with the Huawei software-defined network (SDN) controller. The Huawei SDN controller offers a SDN solution that can be used by Mirantis Openstack for implementing an Openstack networking service.

This document describes reference architecture along with detailed installation steps for integrating Huawei SDN controller with Mirantis Openstack. In addition, the document describes in detail the tests that need to be run to verify the integrated setup.

1.1 Target Audience

This guide is intended for Openstack Administrators who are deploying Mirantis Openstack using Openstack Networking (neutron) with Huawei SDN controller. The Openstack Administrator should be familiar with the Openstack compute and networking services. The administrator should also be familiar with Huawei SDN controller capabilities and configuration as documented in the Huawei SDN controller User's guide.

2. Product Overview

The AC-DCN system is Huawei's new-generation SDN controller oriented to enterprises and carriers' data centers. The AC-DCN functions as a control plane of networks, automatically delivering network configurations and services.

Based on Huawei main solutions such as CloudVPN and Service Chain, Huawei cooperates with top third parties to develop the innovative integration solution, meeting new requirements of customers.



0 Modular interconnection of the OpenStack cloud platform, AC-DCN, and VNF in a basic solution



- (1) Neutron component of the OpenStack platform: The plug-ins of the Neutron component, such as firewall as a service (FWaaS), load balancer as a service (LBaaS), Dynamic Host Configuration Protocol (DHCP) Agent, and L2/L3 Agent, deliver services to the SDN controller through the southbound RESTful APIs.
- (2) Huawei SDN controller: The SDN controller communicates with the OpenStack platform through the northbound RESTful APIs and communicates with virtualized network functions (VNF), such as firewalls (FWs), load balancers (LBs), routers, and switches over the RESTful APIs, NETCONF, and OpenFlow.
- (3) VNF component DHCP, DNS, and IPAM
- (4) VNF component LB

• (5) VNF component FW

4. Physical and Logical Network Topology

0 shows the topology of the physical environment and configuration of server ports.



- NOTE
 The S5300 switch bridges the management network and preboot execution environment (PXE) network. Communication between OpenStack and Agile Controller nodes is managed by the switch.
 - Three CE12804 switches are used. CE12804-1 functions as a gateway (GW) switch; CE12804-3 and CE12804-4 function as Top of Rack (TOR) switches. Each TOR switch is connected to a compute node, and the controller and network nodes are connected to CE12804-4. Fuel nodes are not connected to the service network.
 - The management network uses IP addresses that are on the network segment 192.168.79.0/24, the same as the floating IP address. The GW (IP address 192.168.79.1) is located on the S5300 switch. The three CE12804 switches communicate using routing protocols and they communicate with the AC-DCN at Layer 3.

5. Installation and Configuration

5.1 Environment Preparation

0 lists the physical devices required for the certification test.

Physical devices required for the certification test

Device Name	Quantity	Remark
Huawei RH1288 rack server	4	Functions as the controller node, network node, and compute nodes.
Huawei S5300 switch	1	Connects to the SDN controller, controller node, network node, and compute nodes.
Huawei CE12800 switch	3	Functions as the GW node and TOR nodes.
Huawei E9000 blade server	1	Runs the SDN controller and Mirantis cloud platform.

0 lists the software versions required for the certification test.

Software Name	Version	Quantity	Remark
Ubuntu linux	Ubuntu14.04	1	Basic OS
Mirantis OpenStack	Mirantis OpenStack Kilo	1	Mirantis cloudplatform
AC-DCN Controller	V200R001	1	SDN controller software
AC-DCN plug-ins	B717	1	Controller plug-ins
Tempest test toolkit	OpenStack Kilo	1	Openstack test platform

Software versions required for the certification test

5.2 MOS Installation

The cloud platform is deployed using PackStack. Since the lab environment cannot be connected to the Internet, the deployment is implemented using the installation packages provided by Mirantis engineers. The deployment procedure is completed in offline environment. All nodes in the test are located on the network 192.168.79.0/24, which is used as an external network and management network. The enp1s0f0 network adapter is bridged to the network. The enp1s0f1 network adapter is located in a VLAN (ID: 200 to 300) and used as a tenant network.

• Create a new OpenStack environment and select the default Ubuntu14.04 OS.



• Select KVM since the compute nodes are physical servers.



• Select Neutron with VLAN segmentation.





• Select No, use default providers since there is not a Ceph storage.

• Deselect additional services.



• Click Create.



• Plan network adapters.

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• Go back the Dashboard page, and click **Deploy Changes** to install the OpenStack environment. After the environment is installed, the following page is displayed. Click **Proceed to Horizon** to log in to the OpenStack.



5.2.1 Health Check Results

After OpenStack is deployed, perform health monitoring on the system. The monitoring result shows that all system required components function properly. Since the system is an isolated intranet lab environment without any cinder component installed, check items related to Internet test and storage test are in failure status or not performed.

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5.3 Huawei AC controller driver and plug-ins Installation Procedure

The AC-DCN system is Huawei's new-generation SDN controller oriented to enterprises and carriers' data centers. The AC-DCN functions as a control plane of networks, automatically delivering network configurations and services.

Obtaining Software Packages

0 lists the software packages that are required for the Agile Controller installation. You can get these packages from Huawei support engineers.

Plug-in software packages

Software Name	Description	Download Path
hw_plugin_ac.zip	 Plug-in packages include: Plug-in platform package: provides a plug-in management platform. Plug-in for OpenStack and AC- DCN interconnection: provides REST APIs. 	The plug-in packages are obtained from the Software folder of the AC-DCN's test version on the VMP.
	 Local API: This API can be used by third-party applications to invoke the AC API. 	

hw_plugin_openstack.zip	 tools folder: OpenStack plug-in package 	
	 neutron_fwaas folder: firewall plug-in 	
	 neutron_vpnaas folder: VPN plug-in 	
	• etc folder	
	• neutron folder	

Uploading Software Packages

Start the iDeploy installation tool of the AC-DCN, and add the server where the AC-DCN will be installed to the host management list of iDeploy. You can get iDeploy from this url: <u>http://support.huawei.com/carrier/navi#col=tool/3rdtool&path=C0NT00L-29-8/C0NT00L-00009664/C0NT00L-00028294/C0NT00L-00029249/C0NT00L-0002458132</u>



Before using iDeploy to install the plug-ins of the AC-DCN, load the software packages to iDeploy.

• Prerequisites

- iDeploy has been installed.
- The plug-in packages of the AC-DCN have been obtained.
 - The software package is named hw_plugin_ac.zip.
 - For details about how to obtain the software packages, see section 0.
 - The software package is stored in Software\hw_plugin_ac.zip.
- Procedure

Open the IE browser, enter the iDeploy URL <u>http://IP:Port/ideploy</u> in the address box, enter the user name and password, and press **Enter** to log in to the iDeploy system.

- Precautions
 - IP: Set this parameter to the host IP address that the iDeploy server uses to provide services externally. For a local PC, enter http://localhost:*Port*/ideploy.
 - Port: Set this parameter to the port number that the iDeploy server uses to provide web access services. By default, this port is set to **18080**.
 - The default user name of the iDeploy system is **admin** and the default password is **Admin123**. Log in to a client to change the password.
 - Choose Control Panel > Software Resource Management > Manage Software Package.



- Click Add.
- On the displayed page, select Upload software package using HTTP Mode.



• Click Next to upload the software packages.



- The Select file dialog box is displayed.
- Select the packages and click Open.
- Click Add File to add a file.
- Click Upload. The upload result is displayed.
- Click finish.

Creating Installation Tasks of the AC-DCN

Choose **Task Management** > **Create Installation Task**, and enter basic information of tasks, as shown in the following figure.

• Create a task to install controller_install_pkg.zip.



• Select a server to deploy the AC-DCN.



- Click Next on the subsequent pages and click Finish on the last page.
- Create a task to install controller_config_pkg.zip.

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• Click **Next** on the subsequent pages and click **Finish** on the last page. The two tasks are shown in the following figure.

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Executing Installation Tasks of the AC-DCN

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Changing the Web Password

After the AC-DCN is installed, access https://ip:18002/index.html and enter the default user name **admin** and default password **Changeme123** to log in to the AC-DCN and change the password. The IP address indicates the IP address of the server where the AC-DCN is deployed.

Adding Host Information

Before installing plug-ins of the AC-DCN, create host information on the iDeploy system.

- Prerequisites
 - iDeploy has been installed.
 - A user has logged in to iDeploy.
- Procedure
 - Add site information.
 - Choose Control Panel > Host Management > Management Site.
 - On the **Management Site** page, click **Add**. The **Add Site** dialog box is displayed, as shown in the following figure.

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- In the Add Site dialog box, enter the site information.
- Click OK.
- Add host group information.
 - Choose Control Panel > Host Management > Management Host Group.
 - On the **Management Host Group** page, click **Add**. The **Add Host Group** dialog box is displayed, as shown in the following figure.



- In the Add Host Group dialog box, enter the host group information.
- Click OK.
- Add host information.
 - Choose Control Panel > Host Management > Host Management.

Current Location: Manage Host			
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Add Delete Check	Import	Export Set External IP	

- Select a site, for example, OpenStack, from the drop-down list box of **Site name**.
- Click Add.
- In the Add Host dialog box, enter the host information of the server. For the information to be entered, see the following table.
- Click **check**. If the entered information is correct.
- Click OK.
- Add information of other hosts. In Host Management, added hosts are shown.
- If a standalone host is installed, ignore this step.
- Add host information.

Parameter Name	Description
Host name	Indicates a host name. Enter a correct host name. Otherwise, the installation will fail. Log in to a card as the root user, and run the hostname command to query the host name of the card.
IP address	Indicates the IP address of the server.
Services IP address	This parameter can be left empty.
Protocol	Indicates the protocol used for iDeploy and server connection. Select the SSH protocol.
Login mode	Indicates a server login mode. Select the password login mode.
User name	Indicates the user name used to log in to the server. Enter root .
Password	Indicates the password used to log in to the server. Enter the password of the root user.
Root password	Indicates the login password of the root user.
Host group	Set this parameter according to planning. In this test, set this parameter to Host_Group .

Installing AC Plug-ins

Modifying Configurations

- After the AC-DCN is installed, modify its configuration file.
 - Modify the users.properties file under the AC server directory /opt/controller/naas/naas-karaf-1.0.1-SNAPSHOT/etc/.



 Remove the comment sign # before the following two lines and save the modification as shown in the preceding screen: controller = controller,_g_:admingroup _g_:admingroup = group,admin,manager,viewer,webconsole

Uploading the Software Packages of the AC Plug-ins



Creating an Installation Task of the AC Plug-ins

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 Enter the user name and password of the system. By default, the user name and password are controller.



• Click Next on the subsequent pages and click Finish on the last page.

Executing an Installation Task of the AC Plug-ins

• If progress is 100%, the AC plug-ins are successfully installed.

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Adding Northbound Interface Users

- Prerequisite
 - The AC-DCN and AC plug-ins have been installed.
- Procedure
 - Log in to the AC-DCN using the admin account.
 - Choose System > Administrator from the navigation tree to access the user management page. Create a northbound interface user.

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 Log out of the current account and log in using the new account. Follow system prompt to change the password.

Installing OpenStack Plug-ins

Installing OpenStack Plug-ins Using the Shell Command

- Prerequisite
 - The host OS and native OpenStack environment have been installed.
 - Procedure
 - The procedure of installing OpenStack plug-ins on the controller node is as follows:
 - Upload and decompress the hw_plugin_openstack.zip package to a directory (for example, /upload) of the controller node using the root account.
 - Install the OpenStack plug-ins.
 - ✓ Run the **Shell** command to access the **tools** folder.

- ✓ Execute **dos2unix install.sh** to convert the shell script to Unix.
- ✓ Run the **chmod u+x install.sh** command to add execution rights to the file.
- ✓ Run the *./* install.sh command to install the plug-ins.
- ✓ Install modules according to system prompt.
 - Install the L2/L3 Agent.
 - Install the firewall.
 - Install the VPN.
 - Install the previous components.
 - During installation, the system will instruct users to enter **Y** to confirm the installation content. Enter **Y** for confirmation, as shown in the following figure.



During installation, the system will instruct users to enter the IP address
of the AC-DCN to complete the installation.

Please enter AC IP address:

- Run the cd /etc/neutron/plugins/ml2 command to access the ml2 directory. Open the ml2_conf.ini file in the directory, and add huawei before openvswitch in mechanism_drivers = openvswitch.
- Run the **service neutron-server restart** command to restart neutron services.

Configuring the AC-DCN

Adding Northbound Users

Log in to the AC-DCN using the **admin** account, choose **System** > **Administrator** from the navigation tree to access the user management page, and create a northbound interface user. By default, the user name is esdk@huawei.com.

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Log out of the current account and log in using the new account. Follow system prompt to change the password.

Creating a Cloud Platform

Choose **System** > **Cloud Platform** from the navigation tree to access the cloud platform management page and create a cloud platform. Set the agent name to **physnet1** and set the account to <u>esdk@huawei.com</u>. Other options can be set at random, provided that the verification can be successful.

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Adding Devices

Choose **Network > Network Device** from the navigation tree to access the network device management page. Click **Automatic Discovery**, set the start IP address and end IP address in **IP Section**, set the user name, certification password and certification protocol in **SNMP V3 Protocol**, and click **Start**.

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Discovering Links

Choose **Network** > **Link** from the navigation tree to access the link management page. Click **Link Discover**, select required devices on the refreshed page, and click **Find** to discover links.

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Creating and Configuring a POD

• Choose **Network** > **POD** to access the POD management page, click +, and set the POD parameters as follows. Click **Confirm** to create a POD.

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Add devices to the POD. Choose Network > Network Device from the navigation tree to
access the network device management page. Select devices to be added to the POD,
and click Add to POD. In the dialog box that is displayed, select a POD name and click
Add.

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 Add servers to the POD. Choose Network > Servers from the navigation tree to access the server management page. Select servers to be added to the POD, and click Add to POD. In the dialog box that is displayed, select a POD name and click Add.

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• Configure the POD. Choose **Network** > **POD** from the navigation tree to access the POD management page. Click the **Device** tab page and set switch roles.

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Click $\ensuremath{\text{NVE}}$ and set the VTEP information.

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Click **Gateway** and set the NETCONF information.

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Click the Global Configuration tab page, set the parameters framed in red, and click Apply.

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The AC-DCN configuration is completed.

5.4 Limitations

Please check user guide of Huawei AC controller. You can get this document from Huawei support engineers.

5.5 Trouble shooting

Please check user guide of Huawei AC controller. You can get this document from Huawei support engineers.