

Technical Guide - Adding Compute and Storage Nodes to the Dell Red Hat OpenStack Cloud Solution - Version 5.0



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Notes, Cautions, and Warnings

-  A **Note** indicates important information that helps you make better use of your system.
-  A **Caution** indicates potential damage to hardware or loss of data if instructions are not followed.
-  A **Warning** indicates a potential for property damage, personal injury, or death.

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Executive Summary

One of the common needs of a cloud platform is to scale resources as compute and storage needs expand. Over time there is often a need to add additional Compute resources, as the required VM (Virtual Machine) growth has exceeded planned capacity. Likewise, Storage resources must expand to keep up with demand.

This technical guide explains the process of adding a Dell™ PowerEdge™ R430/R630/R730 Compute node or R730XD Storage node to an existing Dell Red Hat® OpenStack Cloud Solution cluster.

Compute nodes are used for hosting VMs in the Dell Red Hat OpenStack Cloud Solution version 5.0.

Storage nodes are used for hosting Red Hat Ceph Storage version 1.3.2 which manages block, image, and ephemeral storage in the Dell Red Hat OpenStack Cloud Solution version 5.0.

Intended Audience

This guide is written for OpenStack administrators or deployment engineers who are responsible for installation and ongoing operation of OpenStack clusters. It assumes that the reader is familiar with:

- OpenStack
- Red Hat Enterprise Linux (RHEL)
- Red Hat OpenStack Platform (RHOSP) documentation
- Networking and system administration

Adding Nodes

This section describes prerequisites and procedures to add a Compute or Storage node to a Dell Red Hat OpenStack Cloud Solution cluster. Topics discussed include:

- [Prerequisites](#) on page 6
- [Adding the Node](#) on page 6

Prerequisites

The following prerequisites must be met:

- Compute and Storage nodes' RAID and BIOS settings have been configured using the Dell Toolkit (DTK) utility
- Dell Red Hat OpenStack Cloud Solution version 5.0 installed
- [Dell Red Hat OpenStack Cloud Solution Deployment Guide](#) available for reference



Note: All nodes in the same roles must be of the same server models, with identical HDD, RAM, and NIC configurations. So, all Controller nodes must be identical to each other; all Compute nodes must be identical to each other; and so on. See the [Dell Red Hat OpenStack Cloud Solution Reference Architecture](#) for configuration options for each node role.

Adding the Node

To add a Compute or Storage node to a Dell Red Hat OpenStack Cloud Solution cluster:



Note: If you add a new Compute node, **and** your existing installation uses Instance HA technology, you will need to do a manual install of Instance HA for the new Compute node after it is added to the cluster. See the instructions in [Technical Guide - Using Instance High Availability in the Dell Red Hat OpenStack Cloud Solution - Version 5.0](#).

1. Log onto the Director Node as the *admin_user* user (or user as configured in *Director Node Configuration Parameters*, in the [Dell Red Hat OpenStack Cloud Solution Deployment Guide](#)).
2. Navigate to the directory in which the Dell Red Hat OpenStack Cloud Solution was deployed (e.g., the */home/admin_user/pilot* directory.)
3. Run the following command specifying the iDRAC credentials (replace example below with actual values) and the IP address of the node being added:

```
./discover_nodes/discover_nodes.py -u root -p 'calvin' 192.168.110.122 >
~/newnodes.json
```

4. If more than one node is being added, then you can specify an IP range using two IP addresses separated by a dash:

```
./discover_nodes/discover_nodes.py -u root -p '<root_password>'
192.168.110.122-192.168.110.126
> ~/newnodes.json
```

5. When discovery is complete, examine *~/newnodes.json* to verify that it contains an entry for every cluster node to be provisioned, and no other nodes:

```
{
  "nodes": [
    {
```

```

    "arch": "",
    "cpu": "",
    "disk": "",
    "mac": [],
    "memory": "",
    "pm_addr": "192.168.110.122",
    "pm_password": "calvin",
    "pm_type": "pxe_ipmitool",
    "pm_user": "root"
  }
]
}

```

The `pm_user`, `pm_password`, and `pm_addr` attribute values are examples - the actual values should conform to your node specifications. The other attributes will be adjusted during the node introspection phase.

- Execute the following command to register the new nodes:

```
$ openstack baremetal import --json ~/newnodes.json
```

- Identify the new nodes by UUID, and start the introspection process. For example:



Note: Your node UUIDs will differ.

```
$ ironic node-list
```

UUID	Power State	Provisioning State	Name	Instance UUID	Maintenance
df221970-94d8-4ed0-9f68-835bd8e166d2	None				
855240f6-4943-4348-830f-2436b585d7e4	power on	active			
af5ab2bf-6b82-4587-92ba-cfb6f5e7a759	power on	active		bceb5b21-a068-44b4-9444-a89f1f4blace	False
d07bb1b2-13be-4762-8a99-4cef9ec26faf	power on	active		df64c706-b4d5-4cb7-8eab-65ec4ca3b810	False
40a6b131-c17b-44ed-ac32-76e6f51d3aea	power on	active		d6f05ce1-92ca-4ee8-adcd-fe7e2e423d69	False
f27bfbda-b69a-4d23-be07-93284d1c33f5	power on	active		309a49d2-c50a-46e5-89b1-9bd3906e8cc7	False
f5787449-2e37-4737-93d0-84b18117f649	power on	active		aed26822-b803-43fc-b293-f66e98b851ab	False
f119bc65-9e51-4d0d-ad45-58916f7e8097	power on	active		ce43d39d-24f7-4e19-ac2e-11fa5417b46a	False
70c68e66-6465-4fd0-a91c-c4210045641e	power on	active		ca0ca01c-8312-4752-8590-ffdfa14c7192	False
f06aed59-b987-4634-83d4-5bed8d35b0c9	None	available		None	

- Set the maintenance status, and start the introspection process, for each new node. This process detects hardware properties of the nodes, and updates both the Ironic database and the JSON file.

```
$ ironic node-set-maintenance <UUID> true
```

```
$ openstack baremetal introspection start <UUID>
```

9. Repeat the commands in Step 8 for each new node.



Caution: You must not proceed until introspection is complete on each node.

10. When the introspection process is complete for all the new nodes, the maintenance status for each must be reset to *false*:

```
$ ironic node-set-maintenance <UUID> false
```

11. Repeat the command in Step 8 for each new node.

12. Each node must then be assigned a role within the cluster: Use the `assign_role.py` script to assign roles to node.

```
$ ./assign_role.py <IP> <role> --file ~/newnodes.json
```

a. For <IP>, substitute the IP address of the node's iDRAC.

b. For <role>, substitute the role that the node will perform (*compute* or *storage*).

For example:

```
$ ./assign_role.py 192.168.110.122 compute --file ~/newnodes.json
```

13. Repeat the command in Step 12 for each new node, using its iDRAC IP address and node type.

14. The boot images used during deployment must be set for the new nodes. To get the UUIDs of the images:

```
$ glance image-list
```

The display returns a list similar to this:

```
+-----+-----+-----+-----+-----+
| ID                                     | Name                                     | Disk |
| Format | Container Format | Size          | Status |
+-----+-----+-----+-----+-----+
| 5f4bfcd7-24d3-436f-9c59-161ad862597e | bm-deploy-kernel                       | aki  | |
| aki   |                   | 5153184       | active |
| 1bf9ed8c-82c1-4ab0-ae54-f0067cc2abb9 | bm-deploy-ramdisk                      | ari  |
| ari   |                   | 341547616     | active |
| 7fca165f-cd6b-4173-86a7-47b147c00320 | overcloud-full                         | qcow2|
| bare  |                   | 1019496448    | active |
| 94a365a2-bc82-4fa9-a2ec-13670050d454 | overcloud-full-initrd                 | ari  |
| ari   |                   | 40323665      | active |
| c136dbe1-2960-492c-a1eb-3f7048b08b5c | overcloud-full-vmlinuz                | aki  |
| aki   |                   | 5153184       | active |
+-----+-----+-----+-----+-----+
```

15. Set these UUIDs for each new nodes' `deploy_kernel` and `deploy_ramdisk` settings:

```
$ ironic node-update <UUID> add driver_info/
deploy_kernel='<kernel_image_ID>'
$ ironic node-update <UUID> add driver_info/
deploy_ramdisk='<ramdisk_image_ID>'
```

For example:

```
$ ironic node-update f06aed59-b987-4634-83d4-5bed8d35b0c9 add driver_info/
deploy_kernel='5f4bfcd7-24d3-436f-9c59-161ad862597e'
```



```
$ ironic node-update f06aed59-b987-4634-83d4-5bed8d35b0c9 add driver_info/
deploy_ramdisk='1bf9ed8c-82c1-4ab0-ae54-f0067cc2abb9'
```

16. Repeat the commands in Step 15 for each new node.

17. The new nodes are ready to be deployed. Specify the new total number of Compute or Storage nodes to the `deploy_overcloud.py` script, to have the cluster updated and the new nodes added and configured:

```
$ ./deploy_overcloud.py --computes 4 --storage 3 --vlans 201:250
```



Note: This step will take some time, as the OS will be installed and the OpenStack software deployed and configured on the additional node(s).

18. If a Storage node was added, attach the new Storage node to Calamari:

a. Execute the Calamari initialization scripts that enables you to use Calamari services:

```
# ./config_calamari_nodes.sh <calamari_node_ip> <root_password>
```

b. Log into the Calamari web interface.

c. Add the new Storage node to the Calamari group.

The new Storage node is now ready for use. The newly-added OSDs will automatically be used by existing Ceph pools that were created in the initial solution deployment.

The new nodes, and reconfigured cluster, are now ready for use.

Getting Help

This appendix details contact and reference information for the Dell Red Hat® OpenStack Cloud Solution with Red Hat OpenStack Platform.

Contacting Dell

For customers in the United States, call 800-WWW-DELL (800-999-3355).



Note: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1. Visit dell.com/support.
2. Click your country/region at the bottom of the page. For a full listing of country/region, click **All**.
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4. Select the appropriate service or support link based on your need.
5. Choose the method of contacting Dell that is convenient for you.

References

Additional information can be obtained at <http://www.dell.com/en-us/work/learn/openstack-cloud> or by e-mailing openstack@dell.com.

If you need additional services or implementation help, please contact your Dell sales representative.

To Learn More

For more information on the Dell Red Hat® OpenStack Cloud Solution visit <http://www.dell.com/learn/us/en/04/solutions/red-hat-openstack>.

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