Dell EMC Ready Bundle for Red Hat OpenStack

Automated Update and Upgrade Guide

Version 6.0.1

DELLEMC

Dell EMC Converged Platforms and Solutions

Contents

Trademarks

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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Chapter

1

Overview

Topics:

- *Intended Audience*
- *Dependencies*

The ability to keep the Red Hat OpenStack Platform up to date with the latest patches or even upgrading to the next release will arise from time to time. In this guide, both of these scenarios will be described for manual updates.To facilitate fewer touch points, Dell EMC has created a set of tools to support the process and automate many of the steps.

A minor Undercloud and Overcloud update raises the solution:

- **From** — the Dell EMC Ready Bundle for Red Hat OpenStack v5.x on RHOSP 8
- **To** — the Dell EMC Ready Bundle for Red Hat OpenStack v5.x on RHOSP 8, Minor Update

A major Overcloud upgrade raises the solution:

- **From** — the Dell EMC Ready Bundle for Red Hat OpenStack v5.x on RHOSP 8
- **To** — the Dell EMC Ready Bundle for Red Hat OpenStack v6.x on RHOSP 9

Intended Audience

This guide assumes the reader is familiar with:

- OpenStack
- Dell EMC PowerEdge R630 and Dell EMC PowerEdge R730xd RAID and BIOS configuration
- Red Hat Enterprise Linux (RHEL)
- Red Hat OpenStack Platform (RHOSP) documentation
- Network Configuration
- The concepts and procedures in *Red Hat's Red Hat OpenStack Platform update/upgrade documentation*

Dependencies

For customers performing a self-installation, these files are available on request from Dell EMC. Please contact your account representative, or email openstack@dell.com for instructions.

Dell EMC Ready Bundle for Red Hat OpenStack Automated Update and Upgrade Guide dependencies and prerequisites include:

- The following archive containing the update/upgrade scripts is required by this guide: `JS5-update-upgrade.tgz`.

Chapter
2

Minor Undercloud/Overcloud Update

Topics:

- *Minor Update Procedure*
- *Caveats and Impacts for Minor Update*
- *Deploy the Update/Upgrade Tools*
- *Run the Update Script*
- *Reboot the Director Node*
- *Logging and Lock Files*
- *Finalize the Update*

This chapter describes how to perform a minor RHOSP Undercloud/Overcloud update:

- **From** — the Dell EMC Ready Bundle for Red Hat OpenStack v5.x on RHOSP 8
- **To** — the Dell EMC Ready Bundle for Red Hat OpenStack v5.x on RHOSP 8, Minor Update

Minor Update Procedure

At some point after deploying the Dell EMC Ready Bundle for Red Hat OpenStack version 5.x using locked bits, a software update will be required. The following procedure enables you to perform a **minor update**.

- A minor update is when the OpenStack version **stays the same** (i.e., updating within Liberty)
- A *major upgrade* is when the OpenStack version **moves from one version to the next** (i.e., upgrading from Liberty to Mitaka)

Caveats and Impacts for Minor Update

This topic discusses caveats and impacts for the minor update procedure.

Minor Update Caveats

Caveats include:

- You must have installed the Dell EMC Ready Bundle for Red Hat OpenStack Version 5.0, based on Red Hat OpenStack Platform Version 8 with Lock deployment files. See *Updating the Environment*.

⚠ **Caution:** If you have established another cluster (Horizon) password since your original Dell EMC Ready Bundle for Red Hat OpenStack Version 5.x installation, the upgrade process may reset the password in the database to the **original**, auto-generated password. You must log into Horizon with this original password to reset it to your new password.

Minor Update Impacts

Impacts include:

- **Service downtime** — The update will involve some service interruptions. Contact Red Hat Support for more information.
- **Total system downtime** — Reboots may be required for kernel updates. Contact Red Hat Support for more information.
- **Data loss** — None.
- **Backup, rollback, and/or recovery procedures** — See *Important Pre-Upgrade Notes*.

Deploy the Update/Upgrade Tools

To deploy the update/upgrade tools:

1. Upload the `JS5-update-upgrade.tgz` file to the OpenStack Administrator's home directory on the Director Node.
2. Log into the Director Node as the *stack* user, and then extract the tar file contents into the *pilot* directory:

```
$ cd /home/stack/pilot
$ tar zxvf ~/JS5-update-upgrade.tgz
```

Run the Update Script

To run the update script:

1. Ensure that the cluster is running cleanly.
2. Log into the Director Node as the *stack* user, and then execute the `update-js5.0.sh` script in the *pilot* directory:

```
$ ~/pilot/update-js5.0.sh <openstack_pool_id> <ceph_pool_id>
  <rh_subscription_id> <rh_subscription_pw> [ <stack_name> ]
```

Required arguments include:

- `openstack_pool_id` — The OpenStack pool ID. Requires a Red Hat OpenStack Platform subscription.
- `ceph_pool_id` — The Ceph pool ID. Requires a Red Hat Ceph Storage subscription.
- `rh_subscription_id` — The CDN username.
- `rh_subscription_pw` — The CDN user password.

Optional argument includes:

- `stack_name` — The Overcloud stack name. Defaults to *overcloud*.

Reboot the Director Node

After the first phase of updating the Director packages, the script will prompt to reboot the Director Node (by selecting *[Enter]*), to incorporate a new OS kernel and software. When it is finished rebooting:

1. Log into the Director Node as the *stack* user.
2. Execute the `update-js5.0.sh` script in the *pilot* directory, with the exact arguments as in *Run the Update Script* on page 9:

```
$ ~/pilot/update-js5.0.sh <openstack_pool_id> <ceph_pool_id>
  <rh_subscription_id> <rh_subscription_pw> [ <stack_name> ]
```

The update process will proceed to the next update phase.

Logging and Lock Files

The logging for the update process will be in `~/pilot/update-js5.0.log`. As each phase of the update process completes, a lock file will be put in `~/pilot/update-lockfiles`:

- `director-updated.lock`
- `overcloud-images-updated.lock`
- `overcloud-registered.lock`
- `overcloud-prepared.lock`
- `overcloud-updated.lock`

If an update phase fails, the lock file will not be created. When the error condition has been fixed, the script can be restarted (with the same arguments) and the process will continue, starting at the failed phase and continuing on from there.

Finalize the Update

To verify that the cluster's status is clean:

1. The entire Overcloud (cluster) **must** be rebooted after update, as a new OS kernel is installed but not yet running on the Overcloud nodes, and the newly-updated software depends upon the new kernel version. Please use your standard procedure for rebooting. Virtual machines on the cluster **must be restarted after Compute nodes have been rebooted.**
2. Log into a Controller node as the *heat-admin* user:

```
$ ssh cntl0
```

3. Execute the following command:

```
$ sudo pcs status
```

The result should show that all resources have started.
4. Check `/var/log/messages` for errors.
5. Fix any error conditions that may be found.
6. If errors were found and fixed, execute the `update-js5.0.sh` script in the *pilot* directory, with the exact arguments as in *Run the Update Script* on page 9:

```
$ ~/pilot/update-js5.0.sh <openstack_pool_id> <ceph_pool_id>
  <rh_subscription_id> <rh_subscription_pw> [ <stack_name> ]
```

Chapter

3

Major Undercloud/Overcloud Upgrade

Topics:

This topic describes how to perform a major RHOSP Undercloud/Overcloud upgrade:

- **From** — the Dell EMC Ready Bundle for Red Hat OpenStack v5.x on RHOSP 8
- **To** — the Dell EMC Ready Bundle for Red Hat OpenStack v6.x on RHOSP 9

Major Upgrade Procedure

This procedure will perform a **major upgrade** of your Red Hat OpenStack Platform version 8 to version 9, with the latest packages.

- A major upgrade is when the OpenStack version **moves from one version to the next** (i.e., upgrading from Liberty to Mitaka)
- A *minor update* is when the OpenStack version **stays the same** (i.e., updating within Liberty)

Caveats and Impacts for Major Upgrade

This topic discusses caveats and impacts for the major upgrade procedure.

Major Upgrade Caveats

Caveats include:

1. The upgrade procedure assumes that you have updated your original Red Hat OpenStack Platform version 5.x installation according to the procedures in *Minor Undercloud/Overcloud Update* on page 7.
2. Ensure all nodes are registered to Red Hat Subscription Manager.
3. Read the following document to review how the upgrade script generally works:

   - *Director-Based Environments: Performing Upgrades to Major Versions*
4. Information you need before starting:

   a. Number of Controller nodes
   b. Number of Compute nodes
   c. Number of Storage nodes
   d. VLAN range used in the deployment (i.e., `'201:220'`)
   e. Red Hat Subscription Manager user name
   f. Red Hat Subscription Manager password
   g. Red Hat Ceph Storage entitlement pool ID
5. During the upgrade, any workload VMs will be unreachable by `ping` for about 10 minutes while the Controller nodes are being upgraded.

   Add-ons that were installed as part of the **initial** installation of the Dell EMC Ready Bundle for Red Hat OpenStack should function normally after a major solution upgrade from version 5.0.x to version 6.0.x.

   However, normal functionality of add-ons installed **after** the initial installation is not guaranteed.

   Affected add-ons include:

   - Red Hat CloudForms
   - OpenShift Container Platform
   - Instance High Availability

   ⚠ **Caution:** If you have established another cluster (Horizon) password since your original Dell EMC Ready Bundle for Red Hat OpenStack Version 5.x installation, the update process may reset the password in the database to the **original**, auto-generated password. You must log into Horizon with this original password to reset it to your new password.

Major Upgrade Impacts

Impacts include:

- **Service downtime** — The update will involve some service interruptions. Contact Red Hat Support for more information.
- **Total system downtime** — Reboots may be required for kernel updates. Contact Red Hat Support for more information.
- **Data loss** — None.
- **Backup, rollback, and/or recovery procedures** — See *Important Pre-Upgrade Notes*.

Deploy the Update/Upgrade Tools

See *Deploy the Update/Upgrade Tools* on page 8 for instructions for deploying the upgrade tool if it is not already in your tool set on your RHEL OSP Director Node.

Run the Upgrade Script

To run the upgrade script:

1. Ensure that the cluster is running cleanly.
2. Log into the Director Node as the *stack* user, and then execute the `upgrade-js5.0.sh` script in the *pilot* directory:

```
$ ~/pilot/upgrade-js5.0.sh <control_scale> <compute_scale> <ceph_scale>
  <vlan_range> <subscription_mgr_user> <subscription_mgr_password>
  <ceph_pool_id>
```

Required arguments include:

- `control_scale` — The number of Controller nodes in the existing cluster.
- `compute_scale` — The number of Compute nodes in the existing cluster.
- `ceph_scale` — The number of Storage nodes in the existing cluster.
- `vlan_range` — The VLAN range for the cluster (i.e., `'201:220'`).
- `rh_subscription_id` — The CDN username.
- `rh_subscription_pw` — The CDN user password.
- `ceph_pool_id` — The Ceph pool ID. Requires a Red Hat Ceph Storage subscription.

Reboot the Director Node

After the first phase of upgrading the Director packages, the Director Node will reboot to incorporate new software. When it is finished rebooting:

1. Log into the Director Node as the *stack* user.
2. Execute the `upgrade-js5.0.sh` script in the *pilot* directory, with the exact arguments as in *Run the Upgrade Script* on page 13:

```
$ ~/pilot/upgrade-js5.0.sh <control_scale> <compute_scale> <ceph_scale>
  <vlan_range> <subscription_mgr_user> <subscription_mgr_password>
  <ceph_pool_id>
```

The upgrade will proceed to the next upgrade phase. After the Undercloud is upgraded, the Director Node will again reboot.
3. Log back into the Director Node as the *stack* user.

4. Rerun the `upgrade-js5.0.sh` script.

   The upgrade process will continue.

Logging and Lock Files

The logging for the update process will be in `~/pilot/upgrade-js5.0.log`. As each phase of the upgrade process completes, a lock file will be put in `~/pilot/upgrade-lockfiles`:

- `upgrade-prepared.lock`
- `undercloud-upgraded.lock`
- `overcloud-images-upgraded.lock`
- `aodh-installed.lock`
- `keystone_upgraded.lock`
- `nova_keys_created.lock`
- `scripts_upgraded.lock`
- `controllers_upgraded.lock`
- `computes_upgraded.lock`
- `storage_upgraded.lock`
- `upgrade_finalized.lock`

If an upgrade phase fails, the lock file will not be created. When the error condition has been fixed, the script can be restarted (with the same arguments) and the process will continue, starting at the failed phase and continuing on from there.

Troubleshooting Major Upgrade

A failed upgrade phase should show the status of:

- The stack (cluster)
- The resources
- The software deployments

To troubleshoot an upgrade:

1. The follwing commands can be used to see statuses in more detail:

```
$ heat stack-list
$ heat resoursce-list <stack-name> | grep -v COMPLETE
$ heat deployment-list | grep -v COMPLETE
$ nova list
```

2. Log into a Controller node as the *heat-admin* user:

```
$ ssh cntl0
```

3. Execute the following command:

```
$ sudo pcs status
```

4. If there are `Failed actions` in the `pcs status` output, you can clean up the resources by executing the following command:

```
$ sudo pcs resource cleanup --force
```

> **Note:** It may take several minutes to bring the resources to a stable `started` state.

5. If the `pcs status` output shows `unmanaged` status for resources, you must unset `maintenence mode` by:

   a. Logging into a Controller node as the *heat-admin* user:

   ```
   $ ssh cntl0
   ```

   b. Executing the following commands:

   ```
   $ sudo pcs property set maintenance-mode=false
   $ sudo pcs cluster stop
   $ sudo pcs cluster start
   ```

6. Wait for cluster to stabilize (there may be a few stopped items).
7. Rerun the upgrade script.

Finalize the Upgrade

To verify that the cluster's status is clean:

1. Log into a Controller node as the *heat-admin* user:

   ```
   $ ssh cntl0
   ```

2. Execute the following command:

   ```
   $ sudo pcs status
   ```

   The result should show that all resources have started.

3. Check `/var/log/messages` for errors.
4. Fix any error conditions that may be found.
5. If errors were found and fixed, execute the `upgrade-js5.0.sh` script in the *pilot* directory, with the exact arguments as in *Run the Upgrade Script* on page 13:

   ```
   $ ~/pilot/upgrade-js5.0.sh <control_scale> <compute_scale> <ceph_scale>
    <vlan_range> <subscription_mgr_user> <subscription_mgr_password>
    <ceph_pool_id>
   ```

Appendix
A

References

Topics:

• *To Learn More*

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 EMC sales representative.

To Learn More

For more information on the Dell EMC Ready Bundle for Red Hat OpenStack visit *http://www.dell.com/ learn/us/en/04/solutions/red-hat-openstack*.