



## Migrating VNF in CSP Cluster

You can deploy, update, or migrate VNFs/VMs on a CSP cluster. The VNFs within the CSP cluster can be migrated from one cluster to another within the CSP Cluster.

- [Migrating VNF in CSP Cluster, on page 1](#)

## Migrating VNF in CSP Cluster

### Scenario 1

Migrate the VM from CSP-1 to CSP-2, when CSP-1 is reachable.

To migrate the VM from CSP-1 to CSP-2, NB sends an update to ESC by changing the locator (`vim_id`, `vim_project`) when CSP-1 is reachable.

The following sample shows the VM group from the deployment payload/XML:

```
<vm_group>
  <name>Group1</name>
  <locator>
    <vim_id>CSP-1</vim_id>
    <vim_project>CSP-1</vim_project>
  </locator>
```

The following sample shows migration success notification of VM on CSP-2:

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2020-09-03T05:41:16.299+00:00</eventTime>
  <escEvent xmlns="http://www.cisco.com/esc/esc">
    <status>SUCCESS</status>
    <status_code>200</status_code>
    <status_message>VIM Locator Updated Successfully</status_message>
    <vm_update_type>LOCATOR_UPDATED</vm_update_type>
    <depname>dep</depname>
    <tenant>demo</tenant>
    <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
    <vm_group>group</vm_group>
    <vm_source>
      <vmid>6b0e7179-fd5e-487e-9570-e7ba98cce0ec</vmid>
      <vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</vmname>
      <generated_vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</generated_vmname>

      <vim_id>CSP-2</vim_id>
      <vim_project>CSP-2</vim_project>
    <interfaces>
      <interface>
```

```

        <nicid>0</nicid>
        <type>access</type>
        <port_id>539c6df4-4680-4bba-8a0d-d621947f2228</port_id>
        <admin_state_up>true</admin_state_up>
        <network>Eth0-2</network>
        <subnet/>
        <ip_address>192.168.23.62</ip_address>
        <netmask>255.255.255.0</netmask>
    </interface>
    <interface>
        <nicid>1</nicid>
        <type>trunk</type>
        <port_id>0adc3096-509c-49b7-9bd7-a25bbf2a9345</port_id>
        <admin_state_up>true</admin_state_up>
        <network>Eth0-2</network>
        <subnet/>
    </interface>
</interfaces>
</vm_source>
<event>
    <type>VM_UPDATED</type>
</event>
</escEvent>
</notification>

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
    <eventTime>2020-09-03T05:41:16.322+00:00</eventTime>
    <escEvent xmlns="http://www.cisco.com/esc/esc">
        <status>SUCCESS</status>
        <status_code>200</status_code>
        <status_message>Service group update completed successfully</status_message>
        <depname>dep</depname>
        <tenant>demo</tenant>
        <tenant_id>demo</tenant_id>
        <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
        <event>
            <type>SERVICE_UPDATED</type>
        </event>
    </escEvent>
</notification>

```

## Scenario 2

Migrate the VM from CSP-1 to CSP-2, when CSP-1 is not reachable.

Assuming the recovery mode is auto and recovery policy as REBOOT\_ONLY during initial deployment. Consider CSP-1 host fails and ESC detects the VM failed due to CSP-1 failure. ESC tries to recover the VM but fails because CSP-1 is down. Now the NB sends an update to move the VM from CSP-1 to CSP-2.

The following sample shows recovery failure notification of VM on CSP-1:

```

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
    <eventTime>2020-09-03T04:30:18.642+00:00</eventTime>
    <escEvent xmlns="http://www.cisco.com/esc/esc">
        <status>SUCCESS</status>
        <status_code>200</status_code>
        <status_message>Recovery event for VM Generated ID
[dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555] triggered.</status_message>
        <depname>dep</depname>
        <tenant>demo</tenant>
        <tenant_id>demo</tenant_id>
        <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
        <vm_group>group</vm_group>
        <vm_source>
            <vmid>6b0e7179-fd5e-487e-9570-e7ba98cce0ec</vmid>
            <vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</vmname>
        </vm_source>
    </escEvent>
</notification>

```

```

    <generated_vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</generated_vmname>

    <vim_id>CSP-1</vim_id>
    <vim_project>CSP-1</vim_project>
  </vm_source>
  <event>
    <type>VM_RECOVERY_INIT</type>
  </event>
</escEvent>
</notification>

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2020-09-03T04:31:20.449+00:00</eventTime>
  <escEvent xmlns="http://www.cisco.com/esc/esc">
    <status>FAILURE</status>
    <status_code>500</status_code>
    <status_message> VM [dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555] failed to be
rebooted.</status_message>
    <depname>dep</depname>
    <tenant>demo</tenant>
    <tenant_id>demo</tenant_id>
    <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
    <vm_group>group</vm_group>
    <vm_source>
      <vmid>6b0e7179-fd5e-487e-9570-e7ba98cce0ec</vmid>
      <vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</vmname>
      <generated_vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</generated_vmname>

      <vim_id>CSP-2</vim_id>
      <vim_project>CSP-2</vim_project>
    </vm_source>
    <event>
      <type>VM_RECOVERY_REBOOT</type>
    </event>
  </escEvent>
</notification>

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2020-09-03T04:41:20.844+00:00</eventTime>
  <escEvent xmlns="http://www.cisco.com/esc/esc">
    <status>FAILURE</status>
    <status_code>500</status_code>
    <status_message>Recovery: Recovery completed with errors for VM:
[dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555]</status_message>
    <depname>dep</depname>
    <tenant>demo</tenant>
    <tenant_id>demo</tenant_id>
    <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
    <vm_group>group</vm_group>
    <vm_source>
      <vmid>6b0e7179-fd5e-487e-9570-e7ba98cce0ec</vmid>
      <vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</vmname>
      <generated_vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</generated_vmname>

      <vim_id>CSP-1</vim_id>
      <vim_project>CSP-1</vim_project>
    </vm_source>
    <vm_target>
      <vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</vmname>
      <generated_vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</generated_vmname>

    </vm_target>
  </event>

```

```

        <type>VM_RECOVERY_COMPLETE</type>
    </event>
</escEvent>
</notification>

```

Consider, you have a cluster of three CSPs (CSP-1,CSP-2, and CSP-3). VM is deployed on CSP-1

### Before you begin

- A VIM Connector must be created. For more information, See Adding VIM Connector to CSP Cluster Chapter.
- VM is deployed with the same underlying storage. For more information, See Deploying VNFs Using ESC on CSP Cluster Chapter.

The following scenarios show the migration of the VMs:

### Procedure

#### Step 1 Update locator details in the following deployment payload

```

(Update vim_id, vim_project to CSP-1 → CSP-2)
<locator>
<vim_id>CSP-2</vim_id>
<vim_project>CSP-2</vim_project>
</locator>

```

#### Step 2 Execute the following command for migrating the VM:

```
esc_nc_cli --user <username> --password <password> edit-config deploy_csp_2.xml
```

#### Example payload:

```

deploy_csp_1.xml
<esc_datamodel xmlns="http://www.cisco.com/esc/esc">
  <flavors>
    <flavor>
      <name>FLAVOR_2_4096_10000</name>
      <vcpus>2</vcpus>
      <memory_mb>4096</memory_mb>
      <root_disk_mb>10240</root_disk_mb>
    </flavor>
  </flavors>
  <tenants>
    <tenant>
      <name>name1</name>
      <vim_mapping>>false</vim_mapping>
      <deployments>
        <deployment>
          <name>dep</name>
          <vm_group>
            <name>Group1</name>
            <locator>
              <vim_id>CSP-1</vim_id>
              <vim_project>CSP-1</vim_project>
            </locator>
            <image>csr1000v-universalk9.16.06.01.qcow2</image>
            <flavor>FLAVOR_2_4096_10000</flavor>
            <bootup_time>600</bootup_time>
            <recovery_wait_time>60</recovery_wait_time>
            <recovery_policy>

```

```

        <recovery_type>AUTO</recovery_type>
        <action_on_recovery>REBOOT_ONLY</action_on_recovery>
        <max_retries>1</max_retries>
</recovery_policy>
<interfaces>
  <interface>
    <nicid>0</nicid>
    <type>virtual</type>
    <model>virtio</model>
    <network>Eth0-2</network>
    <ip_address>192.168.23.61</ip_address>
  </interface>
  <interface>
    <nicid>1</nicid>
    <type>virtual</type>
    <model>virtio</model>
    <network>Eth0-2</network>
    <ip_address>192.168.23.61</ip_address>
    <admin_state_up>false</admin_state_up>
  </interface>
</interfaces>
<kpi_data>
  <kpi>
    <event_name>VM_ALIVE</event_name>
    <metric_value>50</metric_value>
    <metric_cond>GT</metric_cond>
    <metric_type>UINT32</metric_type>
    <metric_occurrences_true>3</metric_occurrences_true>
    <metric_occurrences_false>3</metric_occurrences_false>
    <metric_collector>
      <type>ICMPPing</type>
      <nicid>0</nicid>
      <poll_frequency>15</poll_frequency>
      <polling_unit>seconds</polling_unit>
      <continuous_alarm>false</continuous_alarm>
    </metric_collector>
  </kpi>
</kpi_data>
<rules>
  <admin_rules>
    <rule>
      <event_name>VM_ALIVE</event_name>
      <action>ALWAYS log</action>
      <action>FALSE recover autohealing</action>
      <action>TRUE servicebooted.sh</action>
    </rule>
  </admin_rules>
</rules>
<config_data>
  <configuration>
    <dst>iosxe_config.txt</dst>
    <file>file:///var/tmp/csr_config.sh</file>
  </configuration>
</config_data>
<scaling>
  <min_active>1</min_active>
  <max_active>1</max_active>
  <elastic>true</elastic>
  <static_ip_address_pool>
    <network>Eth0-2</network>
    <netmask>255.255.255.0</netmask>
    <gateway>192.168.23.1</gateway>
    <ip_address>192.168.23.61</ip_address>
  </static_ip_address_pool>

```

```

</scaling>
<extensions>
  <extension>
    <name>interfaces</name>
    <containers>
      <container>
        <name>0</name>
        <properties>
          <property>
            <name>passthroughMode</name>
            <value>none</value>
          </property>
          <property>
            <name>tagged</name>
            <value>>false</value>
          </property>
          <property>
            <name>type</name>
            <value>access</value>
          </property>
          <property>
            <name>vlan</name>
            <value>1</value>
          </property>
        </properties>
      </container>
      <container>
        <name>1</name>
        <properties>
          <property>
            <name>passthroughMode</name>
            <value>none</value>
          </property>
          <property>
            <name>tagged</name>
            <value>>false</value>
          </property>
          <property>
            <name>type</name>
            <value>access</value>
          </property>
          <property>
            <name>bandwidth</name>
            <value>160</value>
          </property>
          <property>
            <name>vlan</name>
            <value>2</value>
          </property>
        </properties>
      </container>
    </containers>
  </extension>
  <extension>
    <name>serial_ports</name>
    <containers>
      <container>
        <name>0</name>
        <properties>
          <property>
            <name>serial_type</name>
            <value>console</value>
          </property>
        </properties>
      </container>
    </containers>
  </extension>
</extensions>

```

```

        </container>
      </containers>
    </extension>
  <extension>
    <name>image</name>
    <properties>
      <property>
        <name>disk-resize</name>
        <value>>true</value>
      </property>
      <property>
        <name>disk_type</name>
        <value>virtio</value>
      </property>
      <property>
        <name>disk_storage_name</name>
        <value>gluster</value>
      </property>
    </properties>
  </extension>
</extensions>
</vm_group>
</deployment>
</deployments>
</tenant>
</tenants>
</esc_datamodel>

```

### Step 3 Check the notification for the success or failure of migration.

```

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2020-09-03T05:41:16.299+00:00</eventTime>
  <escEvent xmlns="http://www.cisco.com/esc/esc">
    <status>SUCCESS</status>
    <status_code>200</status_code>
    <status_message>VIM Locator Updated Successfully</status_message>
    <vm_update_type>LOCATOR_UPDATED</vm_update_type>
    <depname>dep</depname>
    <tenant>demo</tenant>
    <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
    <vm_group>group</vm_group>
    <vm_source>
      <vmid>6b0e7179-fd5e-487e-9570-e7ba98cce0ec</vmid>
      <vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</vmname>
      <generated_vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</generated_vmname>
    </vm_source>
    <vim_id>CSP-2</vim_id>
    <vim_project>CSP-2</vim_project>
    <interfaces>
      <interface>
        <nicid>0</nicid>
        <type>access</type>
        <port_id>539c6df4-4680-4bba-8a0d-d621947f2228</port_id>
        <admin_state_up>true</admin_state_up>
        <network>Eth0-2</network>
        <subnet/>
        <ip_address>192.168.23.62</ip_address>
        <netmask>255.255.255.0</netmask>
      </interface>
      <interface>
        <nicid>1</nicid>
        <type>trunk</type>
        <port_id>0adc3096-509c-49b7-9bd7-a25bbf2a9345</port_id>
        <admin_state_up>true</admin_state_up>
      </interface>
    </interfaces>
  </escEvent>
</notification>

```

```

        <network>Eth0-2</network>
        <subnet/>
      </interface>
    </interfaces>
  </vm_source>
  <event>
    <type>VM_UPDATED</type>
  </event>
</escEvent>
</notification>

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2020-09-03T05:41:16.322+00:00</eventTime>
  <escEvent xmlns="http://www.cisco.com/esc/esc">
    <status>SUCCESS</status>
    <status_code>200</status_code>
    <status_message>Service group update completed successfully</status_message>
    <depname>dep</depname>
    <tenant>demo</tenant>
    <tenant_id>demo</tenant_id>
    <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
    <event>
      <type>SERVICE_UPDATED</type>
    </event>
  </escEvent>
</notification>

```

### Scenario 3

Migrate the VM from Local to Gluster storage on the same CSP.

To migrate the VM from local to gluster, the NB sends an update with the following properties:

- a) Add a new VIM connector with cluster name.

```

<property>
  <name>cluster_name</name>
  <value>Cluster_Test</value>
</property>

```

For more information on adding a new VIM connector, see [Adding VIM Connector to CSP Cluster](#).

- b) After adding the new connector, update locator and disk\_storage\_name to **gluster** in deployment payload to enable configuration change.

Following example shows how to add disk\_storage\_name as gluster under image extension properties and updating with the cluster VIM Connector:

```

<vm_group>
  <name>Group1</name>
  <locator>
    <vim_id>CSP-1</vim_id>
    <vim_project>CSP-1</vim_project>
  </locator>
  <extension>
    <name>image</name>
    <properties>
      <property>
        <name>disk-resize</name>
        <value>>true</value>
      </property>
      <property>
        <name>disk_type</name>
        <value>virtio</value>
      </property>
    </properties>
  </extension>

```



```

        <property>
          <name>disk_storage_name</name>
          <value>gluster</value>
        </property>
      </properties>
    </extension>

```

c) Execute the following command to deploy the VIM:

```
esc_nc_cli --user <username> --password <password> edit-config deploy.xml
```

Check the following notification for success/failure migration.

```

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2020-09-03T05:41:16.299+00:00</eventTime>
  <escEvent xmlns="http://www.cisco.com/esc/esc">
    <status>SUCCESS</status>
    <status_code>200</status_code>
    <status_message>VIM Locator Updated Successfully</status_message>
    <vm_update_type>LOCATOR_UPDATED</vm_update_type>
    <depname>dep</depname>
    <tenant>demo</tenant>
    <depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
    <vm_group>group</vm_group>
    <vm_source>
      <vmid>6b0e7179-fd5e-487e-9570-e7ba98cce0ec</vmid>
      <vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</vmname>
    </vm_source>
    <generated_vmname>dep_group_0_46e607a8-b797-4056-96f3-42a90a63b555</generated_vmname>
    <vim_id>CSP-2</vim_id>
    <vim_project>CSP-2</vim_project>
    <interfaces>
      <interface>
        <nicid>0</nicid>
        <type>access</type>
        <port_id>539c6df4-4680-4bba-8a0d-d621947f2228</port_id>
        <admin_state_up>true</admin_state_up>
        <network>Eth0-2</network>
        <subnet/>
        <ip_address>192.168.23.62</ip_address>
        <netmask>255.255.255.0</netmask>
      </interface>
      <interface>
        <nicid>1</nicid>
        <type>trunk</type>
        <port_id>0adc3096-509c-49b7-9bd7-a25bbf2a9345</port_id>
        <admin_state_up>true</admin_state_up>
        <network>Eth0-2</network>
        <subnet/>
      </interface>
    </interfaces>
  </vm_source>
  <event>
    <type>VM_UPDATED</type>
  </event>
</escEvent>
</notification>

<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2020-09-03T05:41:16.322+00:00</eventTime>
  <escEvent xmlns="http://www.cisco.com/esc/esc">
    <status>SUCCESS</status>
    <status_code>200</status_code>
    <status_message>Service group update completed successfully</status_message>
    <depname>dep</depname>

```

```
<tenant>demo</tenant>
<tenant_id>demo</tenant_id>
<depid>06c94f58-b753-425b-b97c-f7adb9140ead</depid>
<event>
  <type>SERVICE_UPDATED</type>
</event>
</escEvent>
</notification>
```

---