

HOL-2608-05-VCF-L



VMware Cloud Foundation Operations HCX - Workload Migration

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Table of Contents

VMware Cloud Foundation Operations HCX - Workload Migration (HOL-2608-05-VCF-L)	3
<u>Module 1 - Migrations to VCF with HCX Assisted vMotion (HAV) (15 Minutes)</u>	4
Understanding HCX Assisted vMotion (Direct)	4
Understanding HCX Assisted vMotion - Requirements	4
Understanding HCX Assisted vMotion - Restrictions	4
Configure Migration	5
Starting the Migration	8
Verification	15
Conclusion	15
<u>Module 2 - HCX Bulk Migrations (15 minutes)</u>	17
Bulk Migration Actions	17
Single vCenter Option	17
Configure Bulk Migration	17
Starting the Migration	19
Verification	26
Conclusion	26
<u>Module 3 - HCX Replication Assisted vMotion(RAV) Migration (Non-Disruptive) (20 Minutes)</u>	27
RAV Overview	27
Configure a RAV Migration	27
Configure RAV Migration	29
Migration in Progress	41
Verification	45
Conclusion	47
<u>Module 4 - HCX OSAM (20 Minutes)</u>	48
Understanding OSAM	48
Understanding OSAM - Continued	48
Configure a OSAM Migration	51
Migration in Progress	60
Verification	65
Conclusion	65
Lab Conclusion	65

VMware Cloud Foundation Operations HCX - Workload Migration (HOL-2608-05-VCF-L)

The VMware Operations HCX platform provides a seamless experience extending workload mobility across vSphere environments in data centers. Migration can be achieved at scale with technologies like HCX Bulk Migration and Replication Assisted vMotion. Virtual machines stay connected with HCX Network Extension and utilize the best network paths with Mobility Optimized Networking. This lab will guide you through configuring and performing the different migration methods available with HCX.

Lab Guidance

Welcome! This lab is available for you to repeat as many times as you want. Use the Table of Contents in the upper right-hand corner of the Lab Manual to jump ahead to any module.

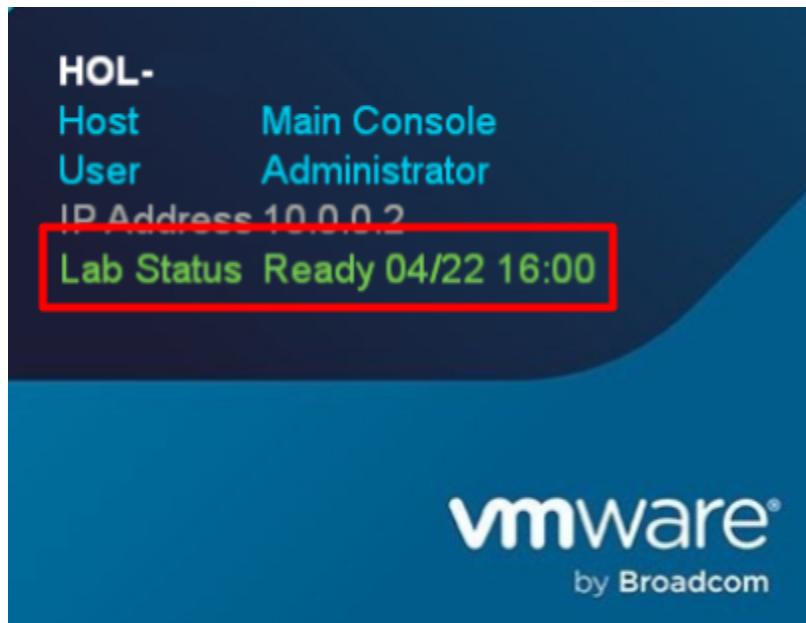
Module	Title	Length	Level
1	HCX Mobility Groups from Migration Waves	15 min	Advanced
2	HCX Bulk Migration	15 min	Intermediate
3	HCX Replication Assisted vMotion (RAV) Migration	20 min	Intermediate
4	HCX OSAM	20 min	Advanced

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First time using Hands-on Labs?

If this is your first time taking a lab you can review the [VMware Learning Platform interface](#) before proceeding.



The lab console will indicate when your lab has finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait for the status to update. If after 5 minutes your lab has not changed to "Ready", please ask for assistance.

Module 1 - Migrations to VCF with HCX Assisted vMotion (HAV) (15 Minutes)

Understanding HCX Assisted vMotion (Direct)

HCX Assisted vMotion (Direct) provides support for VMware vSphere native cross-vCenter vMotion migration.

With native cross-vCenter vMotion, a direct data path is established using the underlying management network between the VMware ESXi hosts associated with the source and destination vCenters. In this case, HCX orchestrates the migration flows between the HCX Managers deployed in each vCenter. For more information about native vSphere vMotion, see "Migration Between vCenter Server Systems" in the guide VMware vSphere vCenter Server and Host Management.

Like other HCX migration types, you enable HCX Assisted vMotion (Direct) during the service mesh creation process.

If you configure a site pair with only the HCX Assisted vMotion (Direct) migration type, HCX establishes management plane connectivity between sites, creates a Service Mesh, and deploys the HCX-IX appliance. In this case, the HCX-IX appliance is only used for HCX control plane communication and not for migration traffic.

Understanding HCX Assisted vMotion- Steps

The workload migration has the following high-level workflow in HCX:

1. During the Service Mesh configuration, enable HCX Assisted vMotion (Direct).
2. In the Migration interface, create a Mobility Group for the selected workloads.
3. Select HCX Assisted vMotion (Direct) as the migration type and configure the available Transfer, placement, and extended options.
4. HCX validates the configuration.
5. Start the migration.
6. HCX initiates the migration using native cross-vCenter vMotion.
7. HCX displays the status of the migration operation.

Understanding HCX Assisted vMotion - Requirements

- A dedicated vSphere vMotion data path must be set up between the source and the target ESXi hosts.
- Standard switches at the source and target clusters must have matching security policies and the teaming and failover policies.
- The Distributed Virtual Switch version at the source and the destination sites must be the same. See KB [56991](#).
- The source and target sites are running vSphere 6.7 or later.
- Migrating encrypted virtual machines:
 - The Key Management Server (KMS) used to encrypt the source VM is present on the target site for encrypted direct vMotion to be successful, regardless of the default KMS at either site.
 - The name and IP address of the KMS must match between the source and target sites.
 - The source and target sites must be running vSphere 7.0 or later.
- Virtual machines must be running Hardware Version 4 or later.
- VMware Tools are installed on the VM and their versions.
- Review the port requirements: VMware KB [2106952](#).
- All the native cross-vCenter vMotion dependencies detailed in KB article [2106952](#) must be satisfied.

Understanding HCX Assisted vMotion - Restrictions

- HCX diagnostics are not available for HCX Assisted vMotion (Direct).

- Virtual machines with mounted ISO images cannot be migrated. The HCX Bulk migration operation can be used to force unmount ISO images.
- Virtual machines cannot be migrated while they are using a shared SCSI bus, flagged for multi-writer, enabled for fault tolerance, or configured for shared VMDK disk sharing.
- Migration is not supported when the source VM is on an NSX-T-backed segment.
- Virtual Machines with DvFilter configurations are not supported.
- Virtual Machines with I/O Filter policies applied are not supported.
- HCX Assisted vMotion is not available for VMware Cloud on AWS.
- It is a best practice to avoid scheduling VM hardware upgrades in the source site vCenter while performing migration through HCX.
- HCX applies a maximum of 50 concurrent relocation operations per HCX Manager to avoid overloading the vCenter Server.
- All the native cross-vCenter vMotion limitations and restrictions related to scale and concurrency apply to HCX Assisted vMotion migration.
- Migration is not supported when the source VM is attached to an opaque network.

Configure Migration

Login to Region B

In the following few pages, we will walk through the process for logging in to VCF Operations HCX.

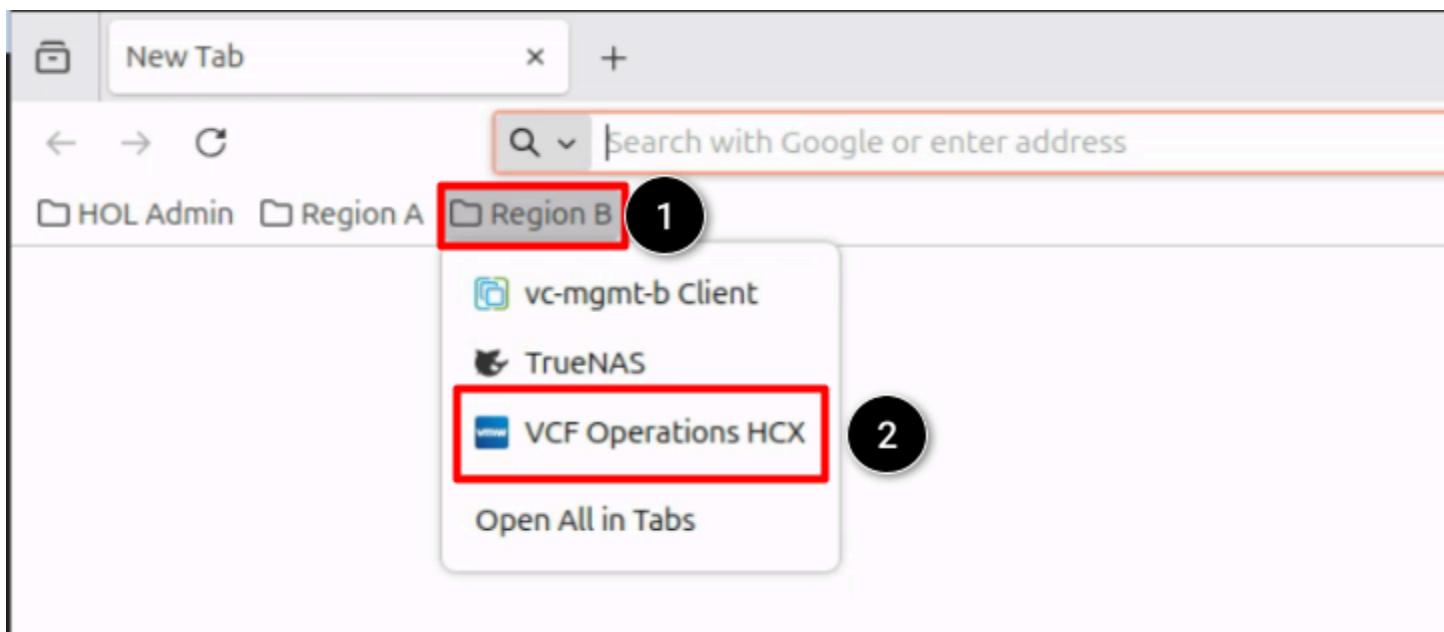
Start Firefox



Open the Firefox Browser from the Linux Task Bar.

1. Click on the Firefox icon to open the browser.

Open Region B VCF Operations HCX Console



Once Firefox has loaded:

1. Click on the **Region B** bookmark folder.
2. Click **VCF Operations HCX**.

Login to VCF Operations HCX Console

VMware Cloud Foundation®
Operations HCX

Login Method *
vSphere Users 1

Username *
administrator@vsphere.local 2

Password *
***** 3

LOG IN 4

The credentials for **administrator@vsphere.local** should already be cached in the browser window.

At the VCF Operations HCX login prompt, select the login method and type in the following user and password information:

1. At the Login Method dropdown, select **vSphere Users**.
2. At the username field, type **administrator@vsphere.local**.
3. At the password field, type **VMware123!VMware123!**
4. Click **LOG IN**.

Starting the Migration

The screenshot shows the VMware Cloud Foundation Operations HCX web interface. The left sidebar has several tabs: Dashboard, Infrastructure (Site Pairs, Interconnect, Transport Analytics), Services (Migration Planning, Network Extension, Migration), Administration (System Updates, Troubleshooting, Audit Logs, Activity Logs, Alerts, Support). The 'Migration' tab is highlighted with a red box and a black circle labeled '1'. At the top right, there is a 'NEW MOBILITY GROUP' button with a red box around it, and a black circle labeled '2' points to it. The main area is titled 'Migration' with tabs for 'Mobility Groups' and 'Site Pairs'. It includes a search bar for 'Group Name' and a table header with columns: Group Name, Tags, Workloads, In Draft, Syncing, In Delivered, Cancelled, Migrated, Status. Below the table, it says 'No Mobility Groups available'.

1. Click on the **Migration** Tab
2. Click on **NEW MOBILITY Group**

Choose VMs to Migrate

The screenshot shows the 'New Mobility Group' configuration page. At the top, it shows a connection path: Source: hcx-mgmt-01b.site-b.vcf.lab / VC: vc-mgmt-b.site-b.vcf.lab → Destination: hcx-mgmt-01a.site-a.vcf.lab / VC: vc-wld01-a.site-a.vcf.lab. There is a 'Reverse Migration' checkbox. The 'Group Name' field is filled with 'VCFHAV' (highlighted by a red box) and has a black circle labeled '1' next to it. Below it, there is a 'Supervisor Onboarding' checkbox. The main area is titled 'Select Workloads' with 'Show Selections' and 'Filters' buttons. On the left, there is a 'Search and Filter' section with a dropdown set to 'vc-mgmt-b.site-b.vcf.lab'. On the right, there is a table titled 'vc-mgmt-b.site-b.vcf.lab' showing workloads. The table has columns: Name, ID, vCPU, Memory, Storage. The first row, 'core-c', has a checked checkbox (highlighted by a red box) and a black circle labeled '2' next to it. Other rows include 'core-d', 'core-e', 'core-f', 'core-g', and 'core-h'. At the bottom right, there are buttons: CLOSE, SELECT (highlighted by a red box and a black circle labeled '3'), VALIDATE, SAVE, and CLOSE.

1. Type it a name, such as **VCFHAV**.
2. Check the checkbox next to **core-c** VM to select it for migration.
3. Click **SELECT**

Configure Migration Settings

New Mobility Group

At the top, in the light green box, are universal migration options. The selections you make will apply to all selected VMs within the Mobility Group.

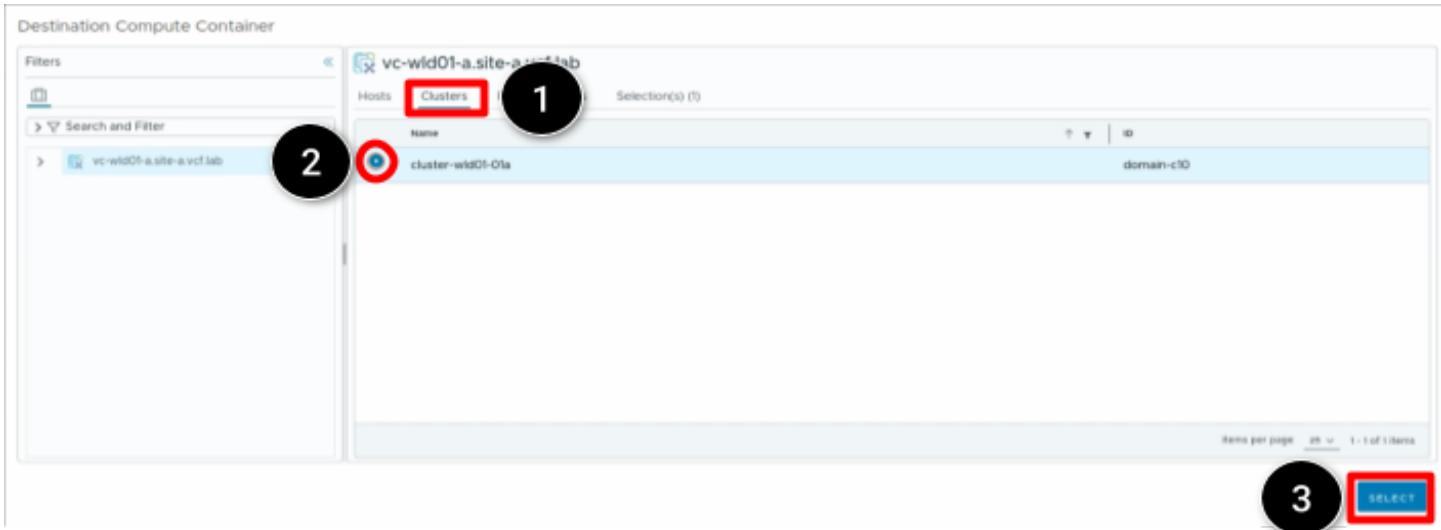
The following mandatory selections in the universal migration section are needed to complete the Mobility Group Configuration: Compute Container, Storage, Virtual Disk Format, and Migration Profile.

If there is a need to have individual VMs with different settings, such as a different storage target, the VM can be edited in the bottom section where they are listed individually. To edit them, expand the arrow to the corresponding VM and make modifications. (Not shown here)

Configure Migration Settings - Compute Container

1. Click on **Mandatory: Compute Container** section

Configure Migration Settings - Select Compute Container Cluster



This entry selects the destination compute cluster

1. Select **Clusters** in the second pane.
2. Select **cluster-wld01-01a**.
3. Click **Select**.

Configure Migration Settings - Storage



This entry selects the destination compute cluster

1. Click on **Mandatory: Storage** section

Configure Migration Settings - Select Destination Storage

Select Destination Storage

Datastore Name	Datastore ID	Datastore Type	Free Space / Capacity / Free%
cluster-wld01-01a-vsan01	datastore-21	vsan	2.3 TB / 2.6 TB / 86%
ma-ds-52a7c3fa-e7704ea6-b6af-9ct03769867	datastore-5007	VMFS	500 TB / 500 TB / 100%

This entry selects the destination storage cluster

1. Select **cluster-wld01-01a-vsan01**
2. Click **SELECT**

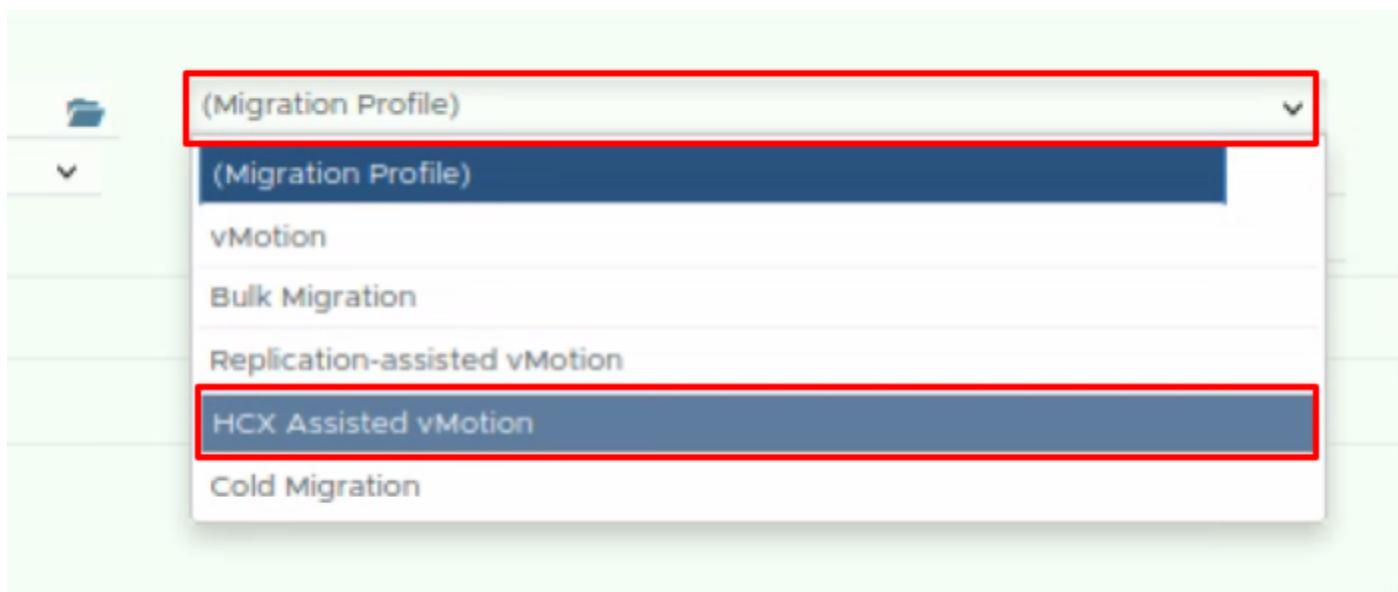
Configure Migration Settings - Select Destination Storage Format

- cluster-wld01-01a-vsan01
- Same format as source**
- (Mandatory: Virtual Disk Format)
- Same format as source**
- Thick Provision Eager Zeroed
- Thick Provision Lazy Zeroed
- Thin Provision**

After returning to the main configuration screen, we will select the destination storage format.

1. Click on **Mandatory: Virtual Disk Format** section.
2. Select **Thin Provision**.

Configure Migration Settings - Migration Profile



1. Click **(Migration Profile)**.
2. Click **HCX Assisted vMotion**.

Configure Migration Settings - VM Networking

Destination network selection is not a universal attribute that can be set in the light green area. Follow these steps to select the destination network for each VM in the Mobility Group.



1. Click the arrow to expand **core-c** settings.
2. Click **Mandatory: Destination Network**.

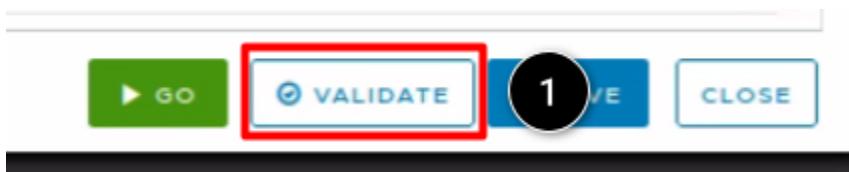
Configure Migration Settings - VM Networking DVPG

Select Destination Network

Name	ID
L2E_app-net01-b-52-26ebb6fb	dvportgroup-5011
mgmt-vds01-wld01-01a	dvportgroup-16
mgmt-vds01-wld01-01a-DVPG	dvportgroup-38
VCF-edge_edgecl-wld-a_PG-vds01-wld01-01a-External-1	dvportgroup-40
VCF-edge_edgecl-wld-a_PG-vds01-wld01-01a-External-2	dvportgroup-41
vds01-wld01-01a-DVUplinks-12	dvportgroup-13
vds02-wld01-01a-DVUplinks-14	dvportgroup-15

1. Select L2E_app-net01-b-52-26ebb6fb.
2. Click SELECT.

Validate the Mobility Group



1. Click VALIDATE

The migration process is now being validated for the parameters that were passed. Note: If you happen to have some warning, you may safely ignore them and proceed.

Start the Migration - GO

New Mobility Group

Validation is Successful. You can proceed with Migration.

Migration could fail as one or more Virtual Machines have warning(s). Please review them before proceeding.

Group Name: Bulk **Supervisor Onboarding**

Transfer and Placement:

- cluster-wd01-ola
- (Specify Destination Folder)
- cluster-wd01-ola-vsand01
- Thin Provision

Bulk Migration

(Optional: Transfer Schedule)

(Optional: Switchover Schedule)

Switchover:

Interconnect Options:

Extended Options:

VM for Migration

	Disk / Memory / vCPU	Migration Info
core-d	100 MB / 256 MB / 1 vCPU	
core-d	100 MB / 256 MB / 1 vCPU	Bulk Migration

Note: VMware or out-of-date tools detected on core-d. HCX will attempt a graceful shutdown.
VM may lose network connectivity after the migration because of the change in destination network(s) (0.2E_arp-net01-b-52-24eabb0f0).

1 **GO** **VALIDATE** **SAVE** **CLOSE**

- Click **GO** to start the migration of VMs

Migration in Progress

The Migration screen now shows the bulk migration in progress.

Migration

1 **Auto Refresh** **NEW MOBILITY GROUP**

Mobility Groups **Site Pairs**

2 **VCFHAV** **3**

Search by Group Name **REFRESH**

	Group Name	Tags	Workloads	In Draft	Syncing	In Switchover	Canceled	Errored	Migrated	Status
2	VCFHAV	3	1							Queued

Source HCX Manager: hcx-mgmt-0fb.site-b.vcf.lab

Destination HCX Manager: hcx-mgmt-0la.site-a.vcf.lab

Mobility Group ID: ca6ca91a-a9b9-40c8-a6c7-ca4t793c83d

Workloads: 1 **CPU:** 1 vCPUs **Memory:** 256 MB **Storage:** 100 MB

Initial Sync: 100 MB synced of 100 MB 100% **Switchover:** 0 of 1 migrated 0% **Created:** Aug 12, 2025, 7:42:19 AM UTC-0700

Manage Columns **Groups per page:** 20 **1 - 1 of 1 Mobility Groups**

1. Click the **Auto Refresh** slider to see updates to the process.
2. Click the arrow next to **VCFHAV** to see the status per VM. Note the source and destination locations.
3. Clicking the name of the migration task (VCFHAV) will show the status of the individual VMs in the Mobility Group.

NOTE: The migration could take up to ten minutes to complete. You may proceed to the next module and check this replication status at a later time if you so choose.

Migration is Complete

The screenshot shows the 'Migrations' section of the HCX interface. A single migration task, 'core-c', is listed under the 'Workload Name' column. It is marked as 'Completed' with a green checkmark and has a timestamp of 'Aug 12, 2025, 7:42:34 AM'. The 'Mobility Technology' column shows 'HAV' and the 'Progress' column shows a green checkmark and the word 'Migrated'. The 'Initial Sync Schedule' and 'Switchover Schedule' columns also show 'Completed' and their respective timestamps.

The Migration screen now shows that the bulk migration has completed.

Verification

From the Inventory view in the Region A vCenter Server, we will verify that the VMs were successfully migrated from the Remote site.

The screenshot shows the vSphere Client interface with the 'cluster-wld01-01a' selected in the left navigation pane. The right pane displays the 'VMs' tab, which lists several virtual machines. The 'core-c' VM is highlighted with a red box and circled with number 3. The 'VMs' tab itself is also highlighted with a red box and circled with number 2. The 'Virtual Machines' tab is currently selected. The table lists the VM names, states, statuses, and resource usage.

	Name	Status	Provisioned Space	Used Space	Host CPU	Host Mem
1	core-a	Powered Off	✓ Norm 2.63 GB	2.09 GB	0 Hz	0 B
2	core-b	Powered Off	✓ Norm 2.75 GB	2.21 GB	0 Hz	0 B
3	core-c	Powered On	✓ Norm 804 MB	500 MB	0 Hz	161 MB
	edge-wld01-01a	Powered On	✓ Norm 429.14 GB	88.56 GB	3.82 GHz	16.84 GB
	edge-wld01-02a	Powered On	✓ Norm 427.11 GB	85.3 GB	3.55 GHz	16.85 GB
	HOL-1-OK-RT	Powered On	✓ Norm 20.46 GB	14.5 GB	125 MHz	1.4 GB
	HOL-1-NE-RT	Powered On	✓ Norm 17.63 GB	14.67 GB	84 MHz	1.06 GB
	HOL-1-OSAM-SRG-RT	Powered On	✓ Norm 44.23 GB	36.26 GB	42 MHz	943 MB

1. On the left menu, expand the arrows for vc-wld01-a.site-a.vcf.lab, wld-01a-DC, and then cluster-wld01-01a.
2. Select **VMs** in the right pane
3. Notice the VM core-c is on this cluster just as we expected.

Conclusion

In this module you have completed the following tasks:

1. Create a new Mobility Group
2. Configure Mobility Group migration Parameters using HXC Assisted vMotion

3. Validate Mobility Group and begin a migration
4. Validate the running VM at the destination site

From here you can:

- Take this quick survey to provide feedback about your experience with VCF 9.0
- Continue with the next lab module.
- Click [vlp:table-of-contents]Show Table of Contents] to jump to any module or lesson in this lab.
- End your lab and return in the future.

Module 2 - HCX Bulk Migrations (15 minutes)

Bulk migration uses host-based replication to relocate a virtual machine between HCX data centers.

To reduce the downtime, the source VM remains online during the replication and is bootstrapped on the destination ESX host after replication completes.

Bulk Migration Actions

A Bulk Migration request triggers the following actions:

1. Replication begins an initial full synchronization transfer to the remote site. The time it takes to replicate is a function of the size of the VM, the data change rate on the virtual machine disk files (VMDKs), and available bandwidth.
2. Replication bandwidth consumption varies depending on the number of disks for each VM and the number of VMs being migrated concurrently.
3. The switchover can start immediately after the initial synchronization is completed, or it can be delayed until a specific time using the scheduled migration option. By using the scheduled migration option, the switchover can occur during a maintenance window.
4. A delta synchronization with two-hour recovery point objective (RPO) occurs while waiting for the scheduled switchover, after the initial synchronization is completed.
5. Depending upon data churn on the source disk, additional snapshots are created during the RPO cycle. After each RPO cycle, disk consolidation takes place and creates a "hbrdisk.RDID vmdk" called as replica instance vmdk file on target datastore. Refer VMware KB [87028](#).
6. During switchover, the source VM is powered off to perform a final off-line synchronization, data consolidation, and VM instantiation at the target data center.
7. Following the switchover, the migrated VM replica is powered on and HCX Manager renames the original VM using a POSIX timestamp suffix to avoid a naming conflict with the migrated VM. If the Retain MAC option was not selected, the migrated VM obtains a new MAC address.
8. The migration completes and the original VM is copied to the Migrated VMs folder.

Single vCenter Option

You can use Bulk migration within a single vSphere vCenter (VC) Server. In this case, both HCX Connector and HCX Cloud Manager are deployed to cater to different clusters within the same VC. Other than deployment within the same VC, the process for configuring HCX is the same, which means configuring the Compute Profile and the Service Mesh to enable Bulk migration.

Configure Bulk Migration

We will now do a bulk migration of VMs from Remote site to the Source Site. This migration method uses the VMware vSphere Replication protocols to move the virtual machines to a remote site.

- The Bulk migration option is designed for moving virtual machines in parallel.
- This migration type can be set to complete on a pre-defined schedule.
- The virtual machine runs at the initial site (our original Remote Site) until the cutover begins. The service interruption with bulk migration is equivalent to a reboot.

Login to Region B

In the following few pages, we will walk through the process for logging in to VCF Operations HCX.

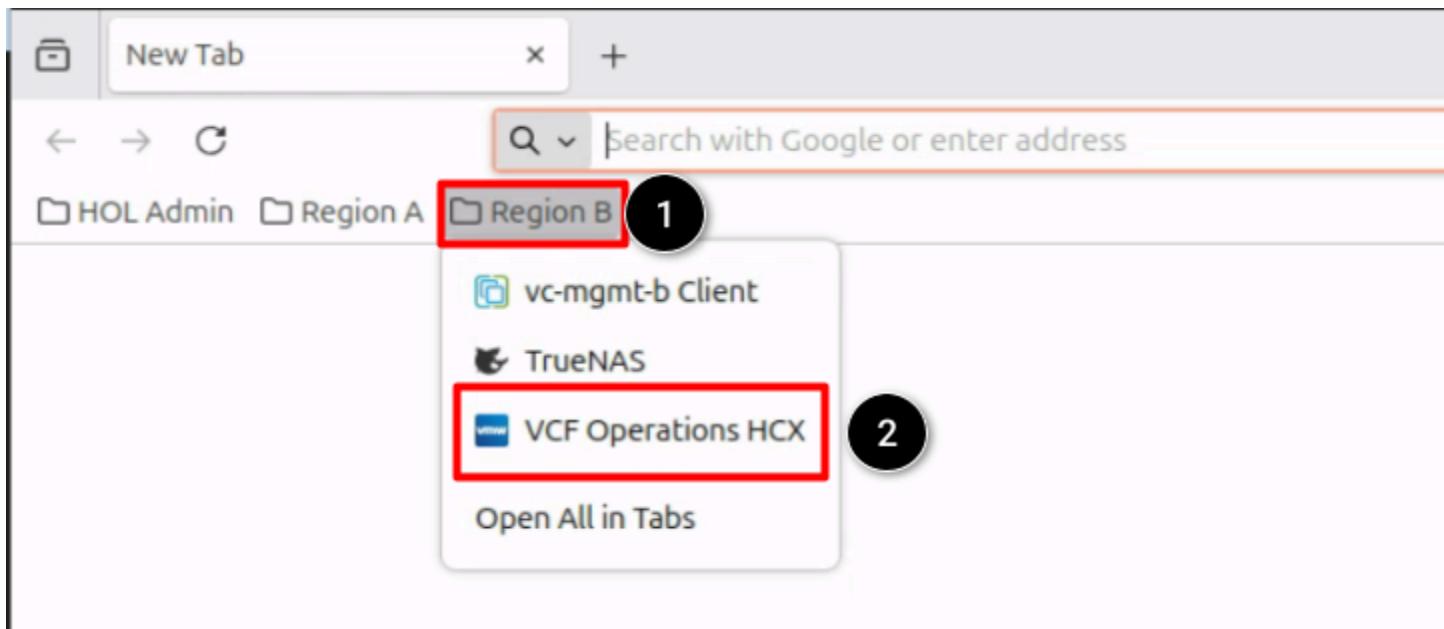
Start Firefox



Open the Firefox Browser from the Linux Task Bar.

1. Click on the Firefox icon to open the browser.

Open Region B VCF Operations HCX Console



Once Firefox has loaded:

1. Click on the **Region B** bookmark folder.
2. Click **VCF Operations HCX**.

Login to VCF Operations HCX Console

The screenshot shows the VMware Cloud Foundation Operations HCX login interface. The steps are numbered as follows:

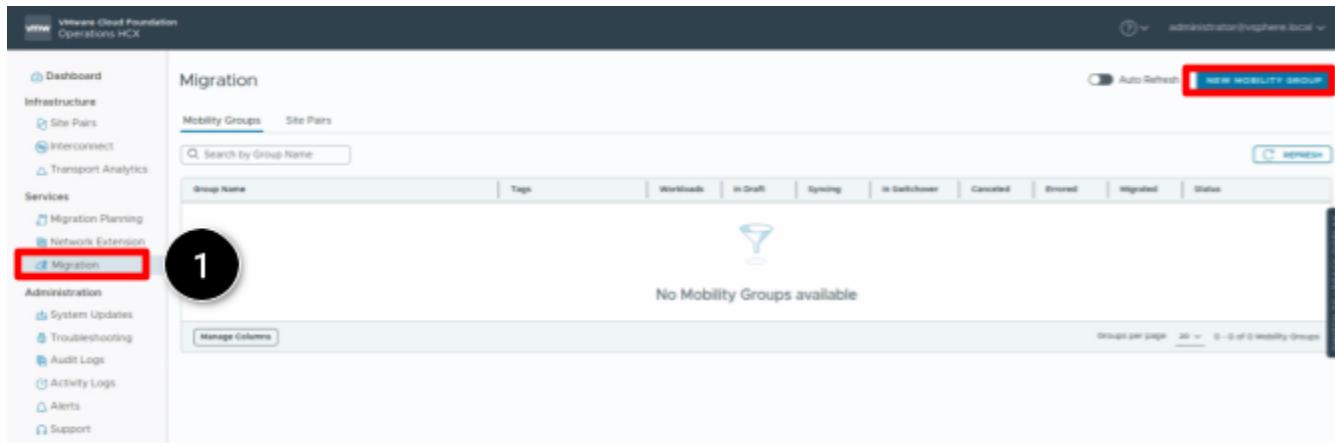
1. Login Method: vSphere Users
2. Username: administrator@vsphere.local
3. Password: (Masked)
4. LOG IN

A note at the bottom of the form states: "The credentials for administrator@vsphere.local should already be cached in the browser window."

At the VCF Operations HCX login prompt, select the login method and type in the following user and password information:

1. At the Login Method dropdown, select **vSphere Users**.
2. At the username field, type **administrator@vsphere.local**.
3. At the password field, type **VMware123!VMware123!**
4. Click **LOG IN**.

Starting the Migration



1. Click on the **Migration** Tab
2. Click on **NEW MOBILITY Group**

Choose VMs to Migrate

New Mobility Group

Remote Site Connection: Reverse Migration
 Source: hcx-mgmt-0fa.site-b.vcf.lab / VC: vc-mgmt-b.site-b.vcf.lab → Destination: hcx-mgmt-0fa.site-a.vcf.lab / VC: vc-wld01-a.site-a.vcf.lab

Group Name: Supervisor Onboarding

No VM is selected for migration Select VMs for Migration

Select Workloads Show Selections

	Name	ID	vCPU	Memory	Storage
<input type="checkbox"/>	core-c	vm-1008	1vCPU	256 MB	100 MB
<input checked="" type="checkbox"/>	core-d	vm-5002	1vCPU	256 MB	100 MB
<input type="checkbox"/>	core-e	vm-1010	1vCPU	256 MB	100 MB
<input type="checkbox"/>	core-f	vm-1011	1vCPU	256 MB	100 MB
<input type="checkbox"/>	core-g	vm-1012	1vCPU	256 MB	100 MB
<input type="checkbox"/>	core-h	vm-1013	1vCPU	256 MB	100 MB

1. Check the checkbox next to **core-d** VM to select it for migration.
2. Type it a name, such as **Bulk**.
3. Click **SELECT**

Configure Migration Settings

New Mobility Group

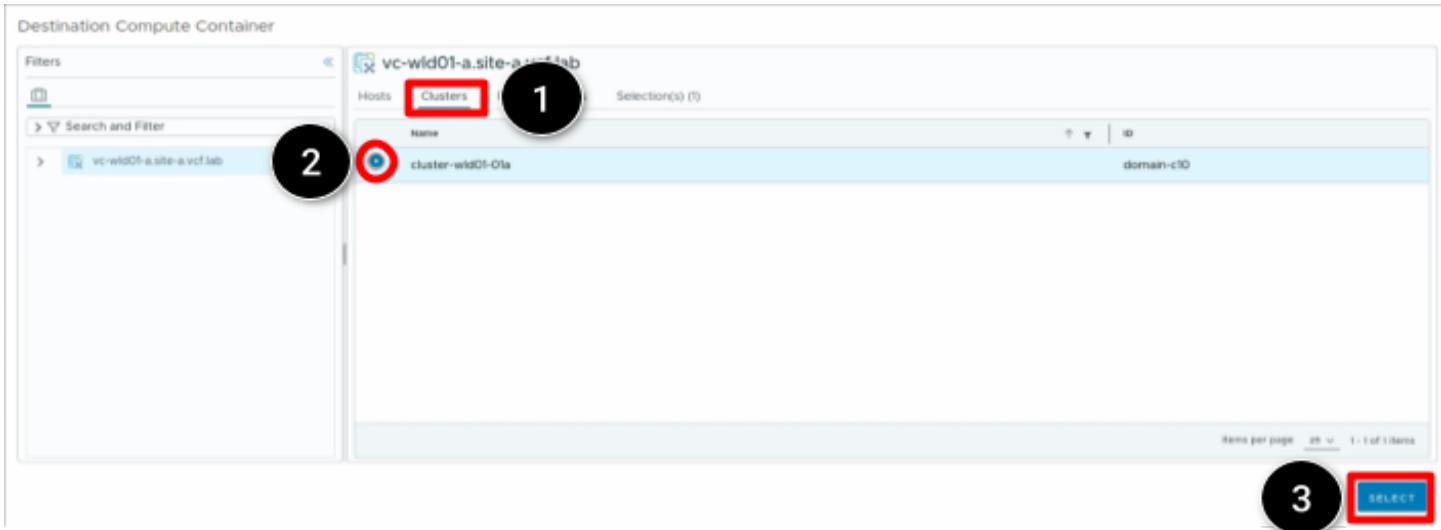
At the top, in the light green box, are universal migration options. The selections you make will apply to all selected VMs within the Mobility Group.

The following mandatory selections in the universal migration section are needed to complete the Mobility Group Configuration: Compute Container, Storage, Virtual Disk Format, and Migration Profile.

If there is a need to have individual VMs with different settings, such as a different storage target, the VM can be edited in the bottom section where they are listed individually. To edit them, expand the arrow to the corresponding VM and make modifications. (Not shown here)

Configure Migration Settings - Compute Container

1. Click on **Mandatory: Compute Container** section.



This entry selects the destination compute cluster

1. Select **Clusters** in the second pane.
2. Select **cluster-wld01-01a**.
3. Click **Select**.

Configure Migration Settings - Storage



This entry selects the destination compute cluster

2. Click on **Mandatory: Storage** section

Configure Migration Settings - Select Destination Storage

Select Destination Storage

Datastore Name	Datastore ID	Datastore Type	Free Space / Capacity / Free%
cluster-wld01-01a-vsan01	datastore-21	vsan	2.3 TB / 2.6 TB / 86%
ma-ds-52a7c3fa-e7704ea6-b6af-9ct03769867	datastore-5007	VMFS	500 TB / 500 TB / 100%

This entry selects the destination storage cluster

1. Select **cluster-wld01-01a-vsan01**
2. Click **SELECT**

- cluster-wld01-01a-vsan01**
- Same format as source** (Mandatory: Virtual Disk Format)
- Same format as source
- Thick Provision Eager Zeroed
- Thick Provision Lazy Zeroed
- Thin Provision**

After returning to the main configuration screen, we will select the destination storage format.

1. Click on **Mandatory: Virtual Disk Format** section.
2. Select **Thin Provision**.

Configure Migration Settings - Migration Profile

New Mobility Group

Remote Site Connection: Reverse Migration
 Source: hcx-mgmt-01b.site-b.vcf.lab / VC: vc-mgmt-b.site-b.vcf.lab → Destination: hcx-mgmt-01a.site-a.vcf.lab / VC: vc-wld01-a.site-a.vcf.lab Recycle Connections

Group Name: Bulk supervisor Onboarding

Transfer and Placement:
 (Mandatory: compute container)
 (Specify Destination Folder)

clustering-wld01-01a-vsan01
 same format as source

Switchover:
 Interconnect Options:
 Extended Options: [Edit Extended Options](#)

Migration Profile:
Bulk Migration (selected)
vMotion
vMotion-assisted vMotion
HCX Assisted vMotion
Cold Migration

1. Click **(Migration Profile)**.
2. Click **Bulk Migration**.

Configure Migration Settings - VM Networking

Destination network selection is not a universal attribute that can be set in the light green area. Follow these steps to select the destination network for each VM in the Mobility Group.



1. Click the arrow to expand **core-d** settings.
2. Click **Mandatory: Destination Network**.

Select Destination Network

Name	dvportgroup
L2E_app-net01-b-52-26ebb6fb	dvportgroup-50ff
mgmt-vld01-wld01-Ola	dvportgroup-16
mgmt-vld01-wld01-Ola-DVPG	dvportgroup-38
VCF-edge_edgecl-wld-a_PG-vds01-wld01-Ola-External-1	dvportgroup-40
VCF-edge_edgecl-wld-a_PG-vds01-wld01-Ola-External-2	dvportgroup-41
vds01-wld01-Ola-DVUplinks-12	dvportgroup-13
vds02-wld01-Ola-DVUplinks-14	dvportgroup-15

3. Select **L2E_app-net01-b-52-26ebb6fb**.
4. Click **SELECT**.

Validate and GO



1. Click **VALIDATE**

The migration process is now being validated for the parameters that were passed. Note: If you happen to have some warning, you may safely ignore them and proceed.

New Mobility Group

The screenshot shows the 'Transfer and Placement' section of the HCX Migration interface. It includes fields for 'Group Name' (set to 'Bulk'), 'Supervisor Onboarding' (unchecked), 'Batch size' (set to '1 vCPU'), and 'Select VMs for Migration'. Under 'Transfer and Placement', there are sections for 'Switchover', 'Interconnect Options', and 'Extended Options'. The 'Edit Extended Options' tab is selected. At the bottom, there are buttons for 'Retain MAC', 'Migrate Custom Attributes', and 'Migrate vCenter Tags'. A warning message at the bottom states: 'Non VMware or out of date tools detected on core-d. HCX will attempt a graceful shutdown.' and 'VM may lose network connectivity after the migration because of the change in destination network(s) (0.2E_app-mesh01-b-52-26eb6bf8)'.

1. Click **GO** to start the migration of VMs

Migration in Progress

The Migration screen now shows the bulk migration in progress.

The screenshot shows the 'Migration' screen with the 'Mobility Groups' tab selected. A red box highlights the 'Bulk' status under the 'Status' column. Another red box highlights the 'Workloads' table, which shows 1 workloads, 1 vCPU, 256 MB memory, and 100 MB storage. A third red box highlights the 'Auto Refresh' slider at the top right. The status bar at the bottom right indicates 'In Progress'.

1. Click the **Auto Refresh** slider to see updates to the process.
2. Click the arrow next to **Bulk** to see the status per VM. Note the source and destination locations.

3. Clicking the name of the migration task (Bulk) will show the status of the individual VMs in the Mobility Group.

NOTE: The migration could take up to ten minutes to complete. You may proceed to the next module and check this replication status at a later time if you so choose.

Migration is Complete

The screenshot shows the HCX Migration interface. At the top, there are buttons for FORCE CLEANUP, CANCEL MIGRATION, ARCHIVE, FORCE POWER-OFF, START INITIAL SYNC, EDIT MIGRATION SCHEDULE, and SWITCHOVER NOW. To the right are toggles for 'Auto Refresh' and 'Include Archived', and search fields for 'Search by Workload Name' and a 'REFRESH' button. Below this is a table with columns: Workload Name, Mobility Technology, Progress, Initial Sync Schedule, and Switchover Schedule. One row is visible for 'core-d', showing 'Bulk Migration' under Mobility Technology, 'Migrated' under Progress, 'Completed' under Initial Sync Schedule, and 'Completed' under Switchover Schedule, both dated Jul 21, 2025.

The Migration screen now shows that the bulk migration has completed.

Verification

From the Inventory view in the Region A vCenter Server, we will verify that the VMs were successfully migrated from the Remote site.

The screenshot shows the vSphere Client interface. On the left is a tree view of the vCenter environment, with arrows pointing to 'vc-wld01-a.site-a.vcf.lab', 'wld01a-DC', and 'cluster-wld01-01a'. In the center, tabs for 'Summary', 'Monitor', 'Configure', 'Run', 'Hosts', 'VMs' (which is highlighted with a red box), 'Namespaces', 'Datastores', 'Networks', and 'Updates' are visible. The 'VMs' tab is selected, showing a list of virtual machines. A red box highlights the 'core-d' VM in the list. A large red circle with the number '3' is drawn around this highlighted VM. A smaller red circle with the number '2' is drawn around the 'VMs' tab in the header. A large black circle with the number '1' is drawn around the tree view on the left.

1. On the left menu, expand the arrows for vc-wld01-a.site-a.vcf.lab, wld01a-DC, and then cluster-wld01-01a.
2. Select **VMs** in the right pane
3. Notice the VM core-d is on this cluster just as we expected.

Conclusion

In this module you have completed the following tasks:

1. Create a new Mobility Group.
2. Configure Mobility Group migration Parameters using Bulk Migration.
3. Validate Mobility Group and begin a migration .
4. Validate the running VM at the destination site.

From here you can:

- Take this quick survey to provide feedback about your experience with VCF 9.0
- Continue with the next lab module.
- Click [vlp:table-of-contents]Show Table of Contents] to jump to any module or lesson in this lab.
- End your lab and return in the future.

Module 3 - HCX Replication Assisted vMotion(RAV) Migration (Non-Disruptive) (20 Minutes)

RAV Overview

HCX Replication Assisted vMotion (RAV) uses the HCX along with replication and vMotion technologies to provide large-scale, parallel migrations with zero downtime.

HCX RAV provides the following benefits:

- Large-scale live mobility: Administrators can submit large sets of VMs for a live migration.
- Switchover window: With RAV, administrators can specify a switchover window.
- Continuous replication: Once a set of VMs is selected for migration, RAV does the initial syncing, and continues to replicate the delta changes until the switchover window is reached.
- Concurrency: With RAV, multiple VMs are replicated simultaneously. When the replication phase reaches the switchover window, a delta vMotion cycle is initiated to do a quick, live switchover. Live switchover happens serially.
- Resiliency: RAV migrations are resilient to latency and varied network and service conditions during the initial sync and continuous replication sync.
- Switchover larger sets of VMs with a smaller maintenance window: Large chunks of data synchronization by way of replication allow for smaller delta vMotion cycles, paving way for large numbers of VMs switching over in a maintenance window.

HCX RAV migration triggers the following events:

- Replication begins with a full synchronization (replication) of the virtual machine disks to the destination site.
- Migrated VMs enter a continuous synchronization cycle until a switchover is triggered.
- Depending upon data churn on the source disk, additional snapshots are created during the RPO cycle. After each RPO cycle, disk consolidation takes place and creates a “hbrdisk.RDID vmdk” called as replica instance vmdk file on target datastore. Refer VMware KB [87028](#).
- You can have the switchover process start immediately following the initial sync or delay the switchover until a specific time using the scheduled migration option. If the switchover is scheduled, the synchronization cycle continues until the switchover begins.
- The final delta synchronization begins when the switchover phase starts. During this phase, vMotion is engaged for migrating the disk delta data and virtual machine state.
- As the final step in the switchover, the source VM is removed, and the migrated VM is connected to the network powered on. Replication Assisted vMotion creates two folders at the destination site. One folder contains the virtual machine infrastructure definition, and the other contains the virtual machine disk information. This is normal behavior for RAV migrations and has no impact on the functionality of the virtual machine at the destination site.

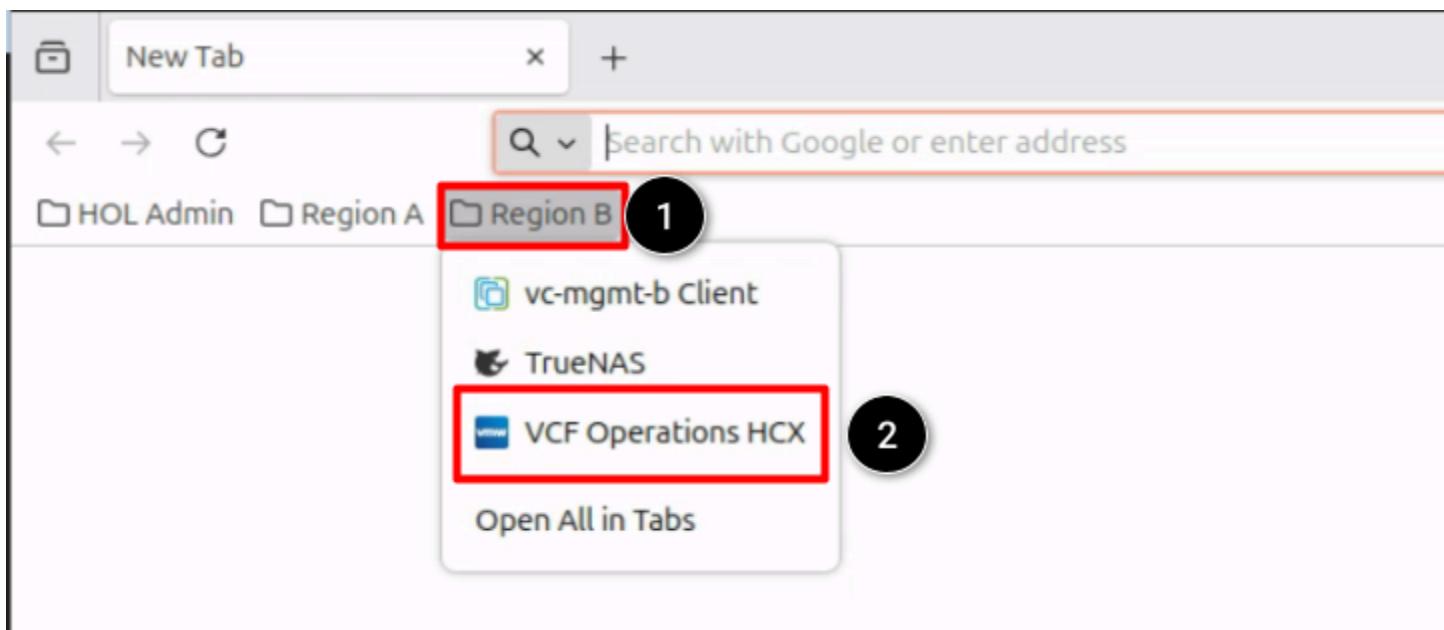
Configure a RAV Migration



Open the Firefox Browser from the Linux Task Bar.

1. Click on the Firefox icon to open the browser.

Open Region B VCF Operations HCX Console



Once Firefox has loaded:

1. Click on the **Region B** bookmark folder.
2. Click **VCF Operations HCX**.

Login to VCF Operations HCX Console

The screenshot shows the VMware Cloud Foundation Operations HCX login screen. At the top, it says "VMware Cloud Foundation® Operations HCX". Below that, there's a section for "Login Method" with a dropdown menu showing "vSphere Users" (marked with a red box and number 1). Underneath is a "Username" field containing "administrator@vsphere.local" (marked with a red box and number 2). Below that is a "Password" field with masked text (marked with a red box and number 3). At the bottom is a blue "LOG IN" button (marked with a red box and number 4).

The credentials for **administrator@vsphere.local** should already be cached in the browser window.

At the VCF Operations HCX login prompt, select the login method and type in the following user and password information:

1. At the Login Method dropdown, select **vSphere Users**.
2. At the username field, type **administrator@vsphere.local**.
3. At the password field, type **VMware123!VMware123!**.
4. Click **LOG IN**.

Configure RAV Migration

1. Click on the **Migration** Tab
2. Click on **NEW MOBILITY Group**

Note: If you have completed Modules 1 and 3, please continue on this page. If you have not, please navigate to [Choose VMs - Method 2](#)

Choose VMs - Method 1

1. Select **Reverse Migration**. This VM was migrated previously, we will use Reverse Migration to move it back to the source vCenter
2. Name the Mobility Group **RAV**.
3. Select the **core-c** vm.
4. Click **SELECT**.

Note: For this Lab we are only migrating one VM. RAV is built to handle large mobility groups and utilizes parallel replication for greater efficiency.

Configure Migration Settings

New Mobility Group

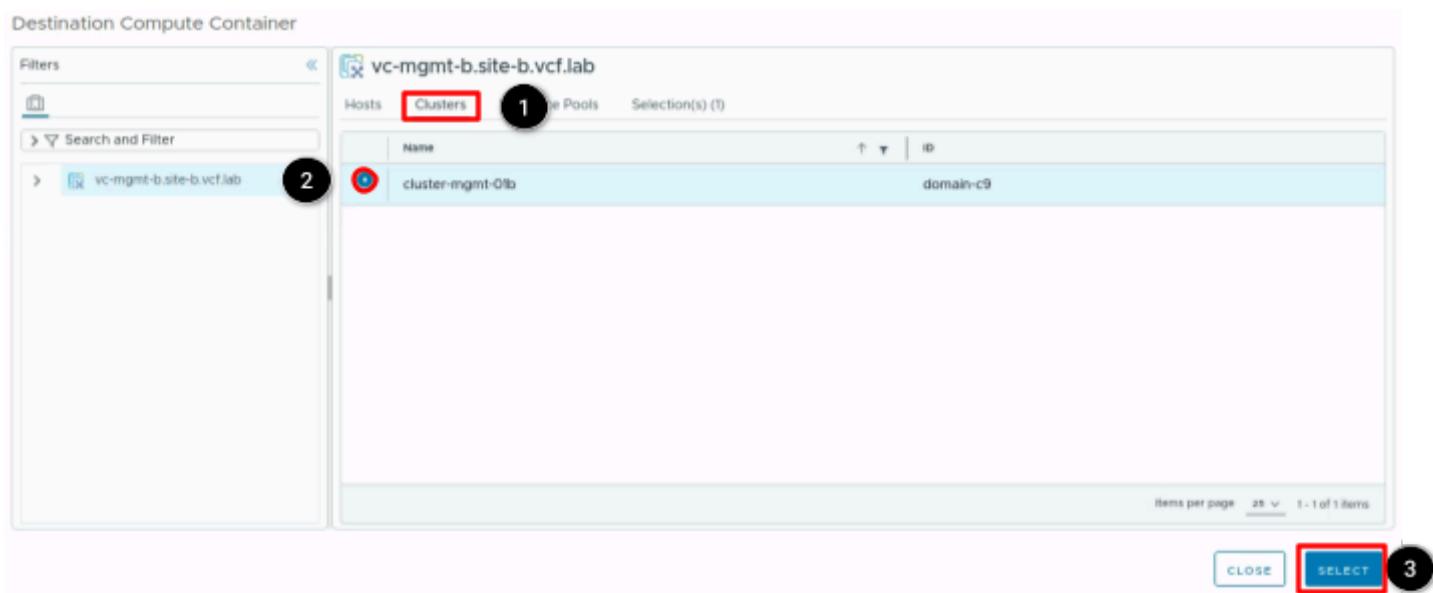
At the top, in the light green box, are universal migration options. The selections you make will apply to all selected VMs within the Mobility Group.

The following mandatory selections in the universal migration section are needed to complete the Mobility Group Configuration: Compute Container, Storage, Virtual Disk Format, and Migration Profile.

If there is a need to have individual VMs with different settings, such as a different storage target, the VM can be edited in the bottom section where they are listed individually. To edit them, expand the arrow to the corresponding VM and make modifications. (Not shown here)

Configure Migration Settings - Compute Container

1. Click on **Mandatory: Compute Container** section.



This entry selects the destination compute cluster

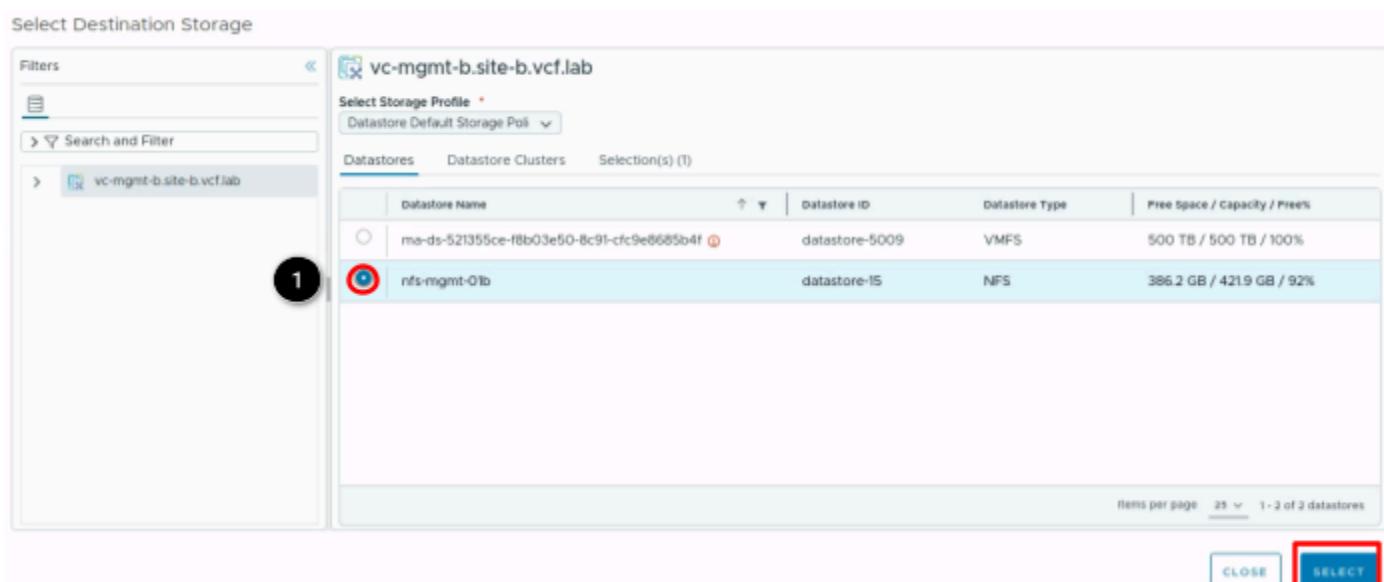
1. Select **Clusters** in the second pane.
2. Select **cluster-mgmt-01b**.
3. Click **Select**.

Configure Migration Settings - Storage



This entry selects the destination compute cluster

1. Click on **Mandatory: Storage** section



This entry selects the destination storage cluster

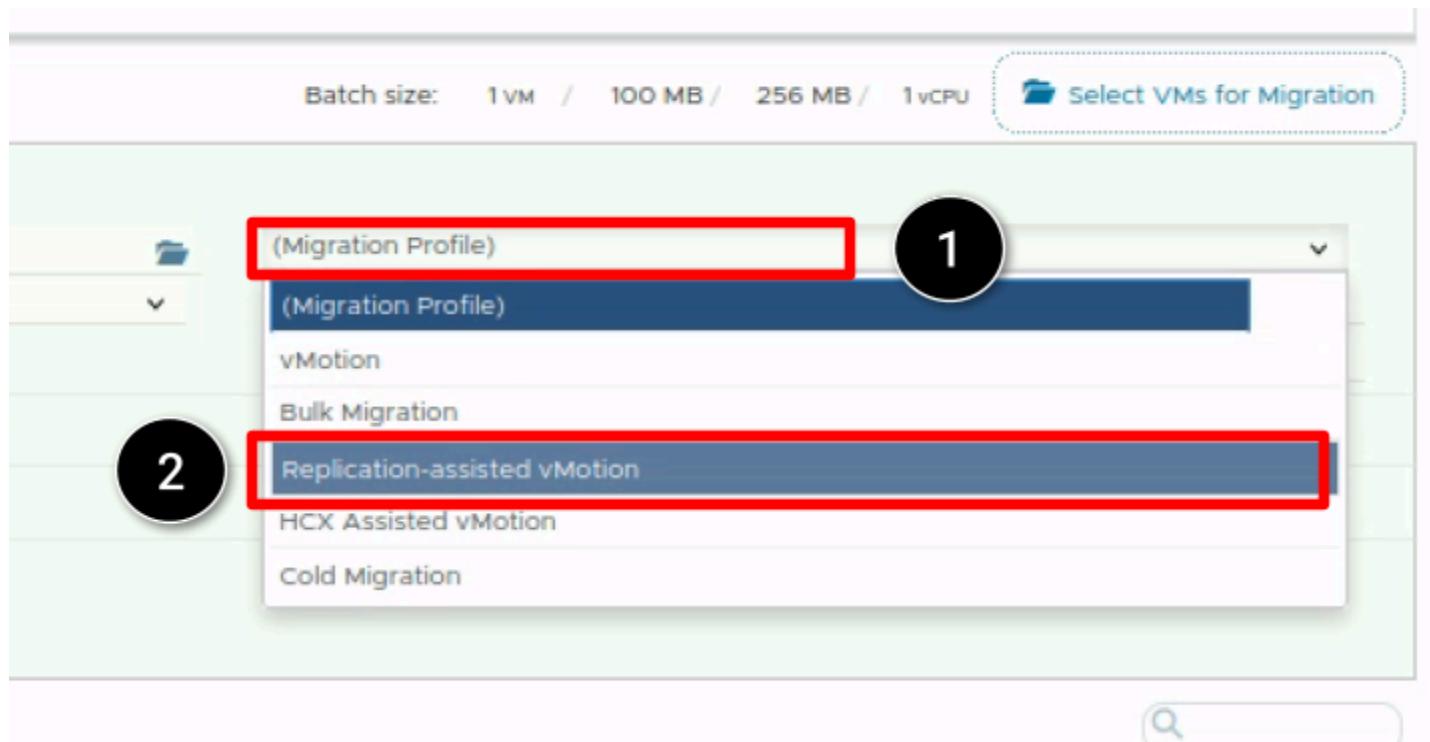
1. Select **nfs-mgmt-01b**
2. Click **SELECT**



After returning to the main configuration screen, we will select the destination storage format.

1. Click on **Mandatory: Virtual Disk Format** section.
2. Select **Thin Provision**.

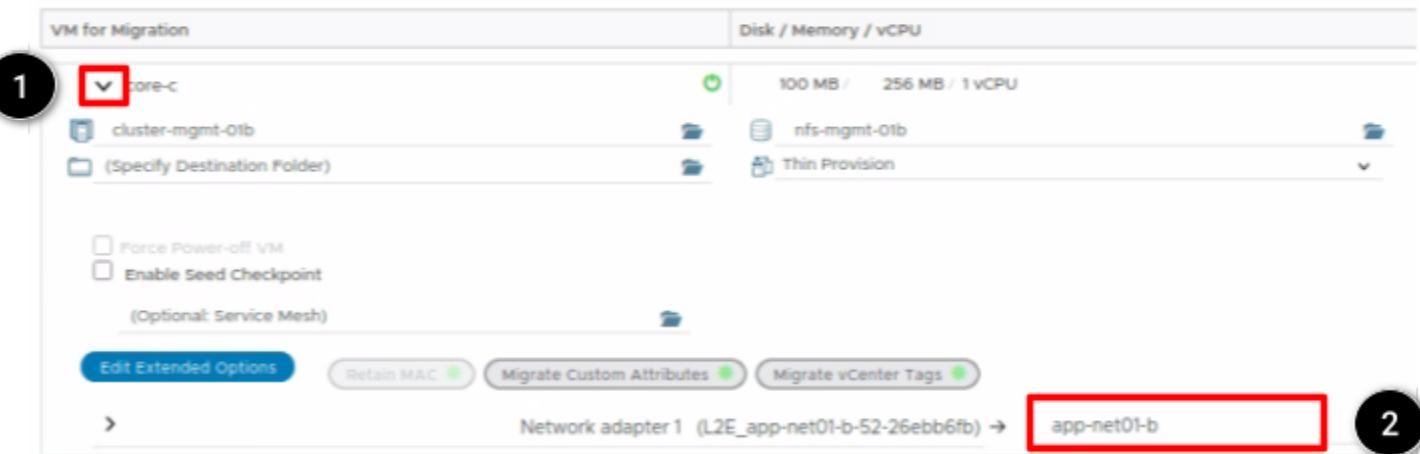
Configure Migration Settings - Migration Profile



1. Click on **(Migration Profile)**.
2. Click **Replication-assisted vMotion**.

Configure Migration Settings - VM Networking

Destination network selection is not a universal attribute that can be set in the light green area. Follow these steps to select the destination network for each VM in the Mobility Group.



1. Click the arrow to expand **core-c** settings.
2. Click **Mandatory: Destination Network**.

Select Destination Network

Name	dvportgroup
L2E_app-net01-b-52-26ebbf6fb	dvportgroup-5011
mgmt-vds01-wld01-01a	dvportgroup-16
mgmt-vds01-wld01-01a-DVPG	dvportgroup-38
VCF-edge_edgecl-wld-a_PG-vds01-wld01-01a-External-1	dvportgroup-40
VCF-edge_edgecl-wld-a_PG-vds01-wld01-01a-External-2	dvportgroup-41
vds01-wld01-01a-DvUplinks-12	dvportgroup-13
vds02-wld01-01a-DvUplinks-14	dvportgroup-15

1. Select **app-net01-b** if it is not already selected.
2. Click **SELECT**.

Choose VMs - Method 2

Note: If you completed Method 1 with Reverse Migration, click [Here](#) to proceed to the next step.

New Mobility Group

Name	ID	vCPU	Memory	Storage
core-c	vm-7005	1vCPU	256 MB	100 MB
core-d-1755020385040	vm-1009	1vCPU	256 MB	100 MB
core-e	vm-1010	1vCPU	256 MB	100 MB
core-f	vm-1011	1vCPU	256 MB	100 MB
core-g	vm-1012	1vCPU	256 MB	100 MB
core-h	vm-1013	1vCPU	256 MB	100 MB

1. Name the Mobility Group **RAV**.
2. Select the **core-c** vm.
3. Click **SELECT**.

Note: For this Lab we are only migrating one VM. RAV is built to handle large mobility groups and utilizes parallel replication for greater efficiency.

Configure Migration Settings

New Mobility Group

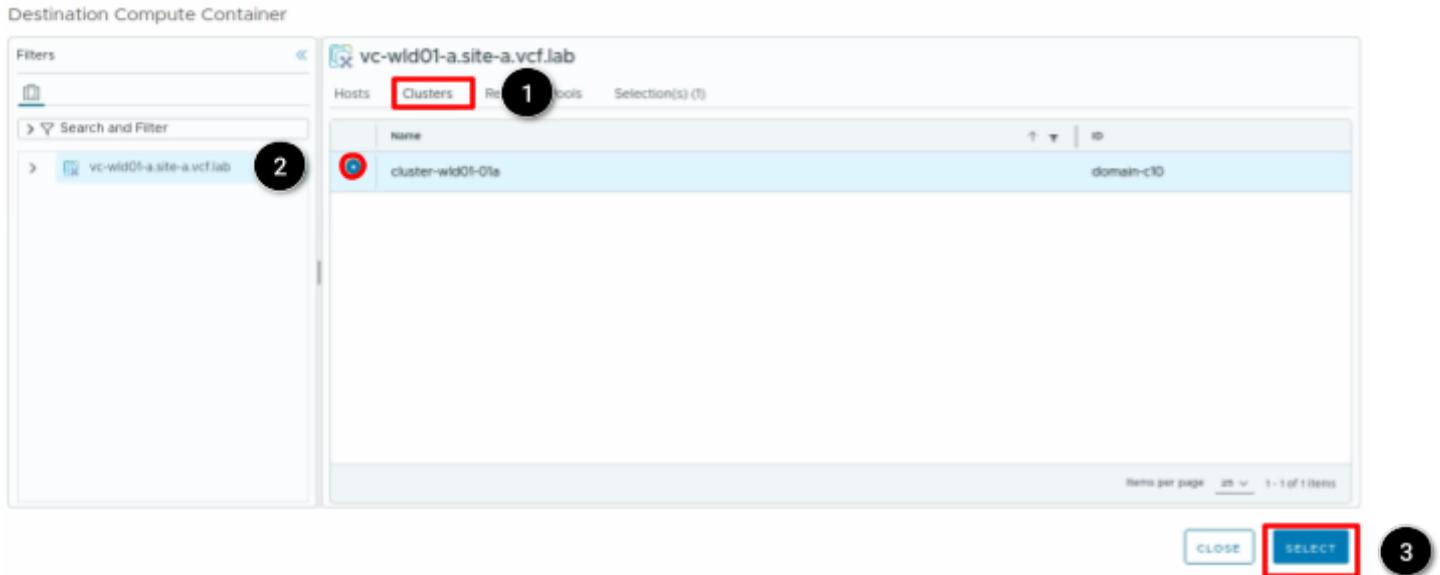
At the top, in the light green box, are universal migration options. The selections you make will apply to all selected VMs within the Mobility Group.

The following mandatory selections in the universal migration section are needed to complete the Mobility Group Configuration: Compute Container, Storage, Virtual Disk Format, and Migration Profile.

If there is a need to have individual VMs with different settings, such as a different storage target, the VM can be edited in the bottom section where they are listed individually. To edit them, expand the arrow to the corresponding VM and make modifications. (Not shown here)

Configure Migration Settings - Compute Container

1. Click on **Mandatory: Compute Container** section



This entry selects the destination compute cluster

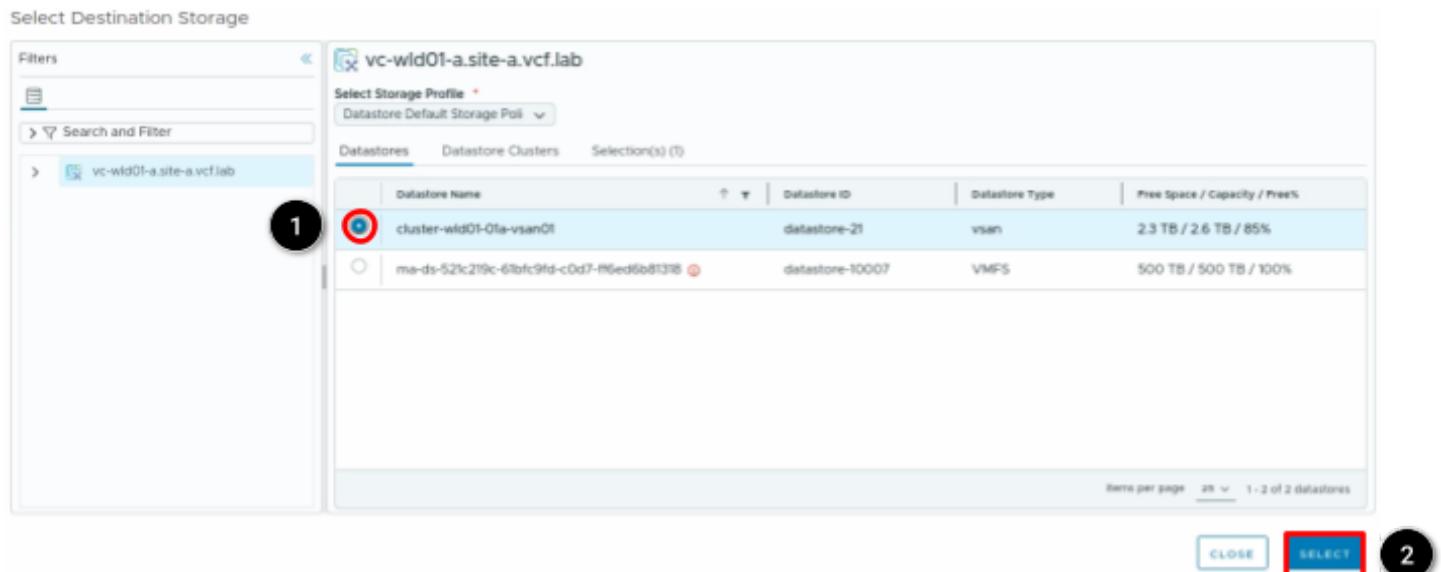
1. Select **Clusters** in the second pane.
2. Select **cluster-wld01-01a**.
3. Click **Select**.

Configure Migration Settings - Storage



This entry selects the destination compute cluster

1. Click on **Mandatory: Storage** section



This entry selects the destination storage cluster

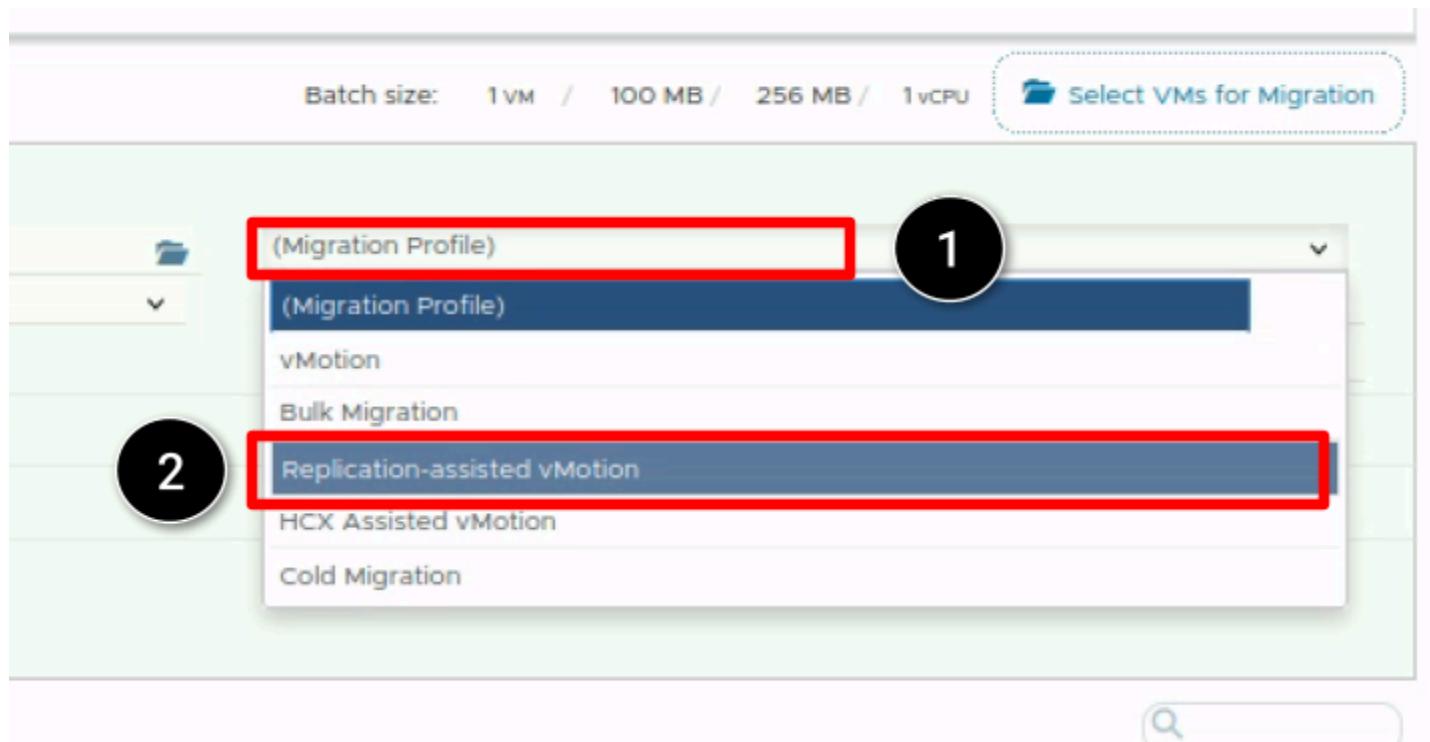
1. Select **cluster-wld01-01a-vsan01**.
2. Click **SELECT**.



After returning to the main configuration screen, we will select the destination storage format.

1. Click on **Mandatory: Virtual Disk Format** section.
2. Select **Thin Provision**.

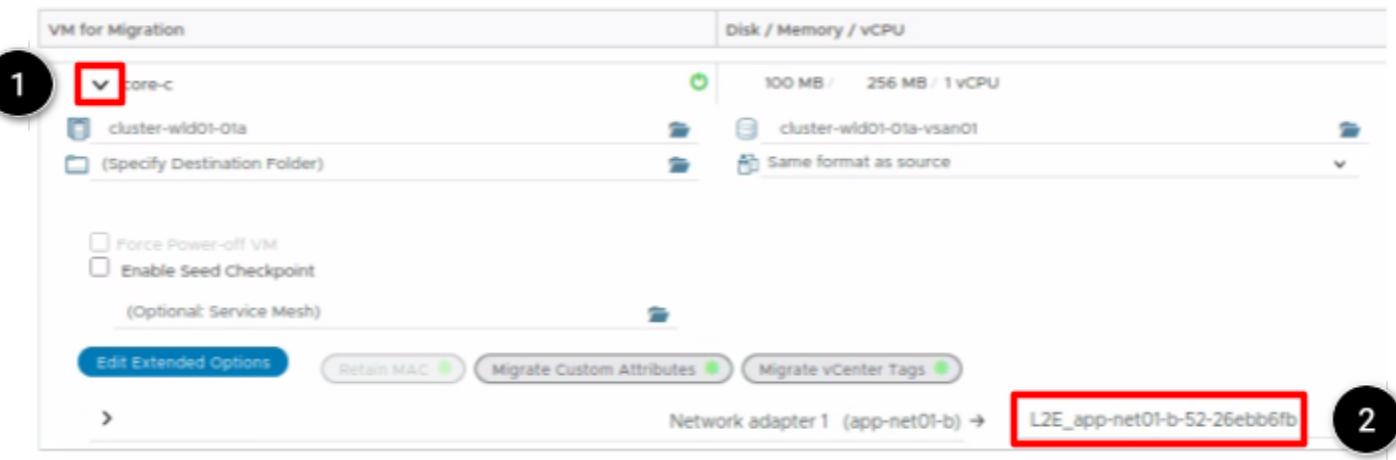
Configure Migration Settings - Migration Profile



1. Click on **(Migration Profile)**.
2. Click **Replication-assisted vMotion**.

Configure Migration Settings - VM Networking

Destination network selection is not a universal attribute that can be set in the light green area. Follow these steps to select the destination network for each VM in the Mobility Group.



1. Click the arrow to expand **core-c** settings.
2. Click **Mandatory: Destination Network**.

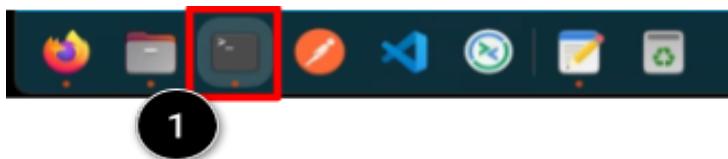
The screenshot shows a list of network port groups. The first item, 'L2E_app-net01-b-52-266bb6fb', has a blue selection circle next to it. At the bottom right of the list, there is a red-bordered 'SELECT' button.

Name	ID
L2E_app-net01-b-52-266bb6fb	dvportgroup-5011
mgmt-vds01-wld01-C1a	dvportgroup-16
mgmt-vds01-wld01-C1a-DVPG	dvportgroup-38
VCF-edge_edgecl-wld-a_PG-vds01-wld01-C1a-External-1	dvportgroup-40
VCF-edge_edgecl-wld-a_PG-vds01-wld01-C1a-External-2	dvportgroup-41
vds01-wld01-C1a-DvUplinks-12	dvportgroup-13
vds02-wld01-C1a-DvUplinks-14	dvportgroup-15

1. Select L2E_app-net01-b-52-266bb6fb if it is not already selected.
2. Click **SELECT**.

Ping core-c

Next we will open a ping to the core-c VM to show it is uninterrupted through the RAV migration.



1. Click the **Terminal** icon on the taskbar.

```
holuser@console:~$ nslookup core-c
Server:      10.1.10.129
Address:     10.1.10.129#53

** server can't find core-c: NXDOMAIN

holuser@console:~$ ping 10.1.10.129
PING 10.1.10.129 (10.1.10.129) 56(84) bytes of data.
64 bytes from 10.1.10.129: icmp_seq=1 ttl=64 time=0.498 ms
64 bytes from 10.1.10.129: icmp_seq=2 ttl=64 time=0.400 ms
64 bytes from 10.1.10.129: icmp_seq=3 ttl=64 time=0.373 ms
64 bytes from 10.1.10.129: icmp_seq=4 ttl=64 time=0.330 ms
64 bytes from 10.1.10.129: icmp_seq=5 ttl=64 time=0.390 ms
```

2. Type **nslookup core-c**. Note the resulting IP address of **10.1.10.129**.
3. Type **ping 10.1.10.129**.

This will initiate a persistent ping that we can monitor through the migration to show zero down time for the VM.

Validate and GO



1. Click back to the Firefox browser
2. Click **VALIDATE**

The migration process is now being validated for the parameters that were passed. Note: If you happen to have some warning, you may safely ignore them and proceed.

New Mobility Group

1. Click **GO** to start the migration of VMs

Migration in Progress

The Migration screen now shows the bulk migration in progress.

The screenshot shows the VMware HCX Migration interface. At the top right, there is an 'Auto Refresh' slider with a red box around it (1). Below it is a 'NEW MOBILITY GROUP' button. The main area displays a Mobility Group named 'RAV'. Step 2 highlights the arrow icon next to the group name 'RAV' (2). Step 3 highlights the number '1' next to the migration task table (3). The table shows details like Source HCX Manager, Destination HCX Manager, and various resource allocation metrics. Below the table, sections for Initial Sync and Switchover show progress bars at 0%. At the bottom, Created and Migration Start Time are listed.

1. Click the **Auto Refresh** slider to see updates to the process.
2. Click the arrow next to **RAV** to see the status per VM. Note the source and destination locations.
3. Clicking the name of the migration task (Bulk) will show the status of the individual VMs in the Mobility Group.

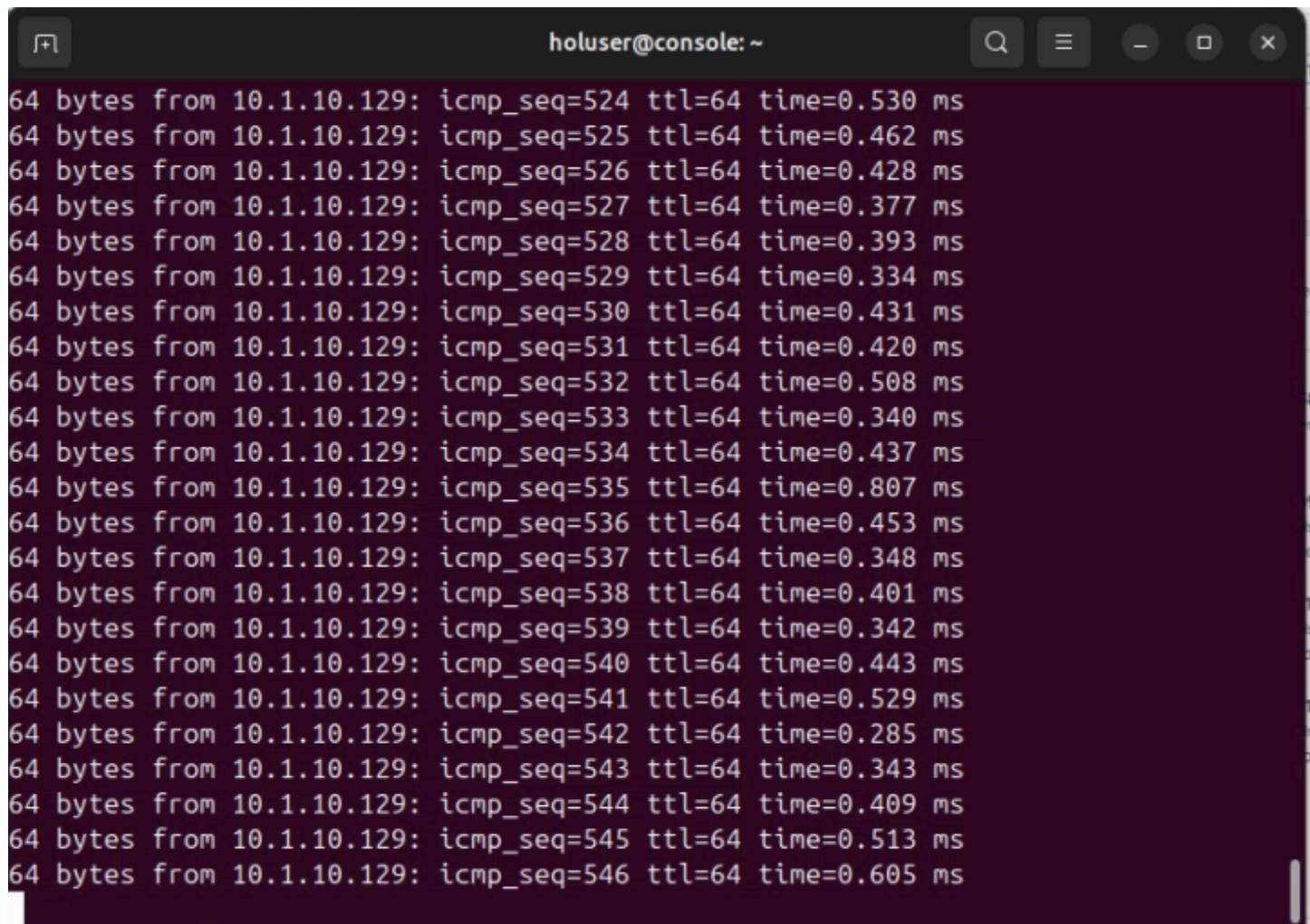
View Replication Status

The screenshot shows the VMware HCX Replications interface. At the top right, there is an 'Auto Refresh' slider with a red box around it (1). Below it is an 'ACTIONS' dropdown. The main area displays a migration named 'core-c'. Step 1 highlights the arrow icon next to the workload name 'core-c' (1). Step 2 highlights the 'Events' tab (2). The 'Events' tab shows a timeline of migration events with green checkmarks and descriptions. The events listed are: 1. Validating source details, 5. Requesting lock on IX appliance, 6. Received lock request on IX appliance, and 7. Granted lock on IX appliance.

1. Click the arrow next to **core-c**.
2. In the right pane click **Events**.

This pane will automatically update with each step as the migration progresses.

Check Ping Status to core-c



A screenshot of a terminal window titled "holuser@console:~". The window displays a continuous stream of ICMP echo replies from the IP address 10.1.10.129. Each reply shows a sequence number (icmp_seq), a TTL of 64, and a time value ranging from 0.334 ms to 0.605 ms. The terminal interface includes standard window controls (minimize, maximize, close) and a search bar.

```
64 bytes from 10.1.10.129: icmp_seq=524 ttl=64 time=0.530 ms
64 bytes from 10.1.10.129: icmp_seq=525 ttl=64 time=0.462 ms
64 bytes from 10.1.10.129: icmp_seq=526 ttl=64 time=0.428 ms
64 bytes from 10.1.10.129: icmp_seq=527 ttl=64 time=0.377 ms
64 bytes from 10.1.10.129: icmp_seq=528 ttl=64 time=0.393 ms
64 bytes from 10.1.10.129: icmp_seq=529 ttl=64 time=0.334 ms
64 bytes from 10.1.10.129: icmp_seq=530 ttl=64 time=0.431 ms
64 bytes from 10.1.10.129: icmp_seq=531 ttl=64 time=0.420 ms
64 bytes from 10.1.10.129: icmp_seq=532 ttl=64 time=0.508 ms
64 bytes from 10.1.10.129: icmp_seq=533 ttl=64 time=0.340 ms
64 bytes from 10.1.10.129: icmp_seq=534 ttl=64 time=0.437 ms
64 bytes from 10.1.10.129: icmp_seq=535 ttl=64 time=0.807 ms
64 bytes from 10.1.10.129: icmp_seq=536 ttl=64 time=0.453 ms
64 bytes from 10.1.10.129: icmp_seq=537 ttl=64 time=0.348 ms
64 bytes from 10.1.10.129: icmp_seq=538 ttl=64 time=0.401 ms
64 bytes from 10.1.10.129: icmp_seq=539 ttl=64 time=0.342 ms
64 bytes from 10.1.10.129: icmp_seq=540 ttl=64 time=0.443 ms
64 bytes from 10.1.10.129: icmp_seq=541 ttl=64 time=0.529 ms
64 bytes from 10.1.10.129: icmp_seq=542 ttl=64 time=0.285 ms
64 bytes from 10.1.10.129: icmp_seq=543 ttl=64 time=0.343 ms
64 bytes from 10.1.10.129: icmp_seq=544 ttl=64 time=0.409 ms
64 bytes from 10.1.10.129: icmp_seq=545 ttl=64 time=0.513 ms
64 bytes from 10.1.10.129: icmp_seq=546 ttl=64 time=0.605 ms
```

1. Click the **Terminal** icon again to bring up the persistent ping to core-c. There should be no interruptions.

Migration is Complete

The screenshot shows the VMware Cloud Foundation Operations HCX interface. On the left, there's a navigation bar with 'Dashboard', 'RAV' (Completed), 'Infrastructure', and 'Migrations'. The 'Migrations' section is active, showing a list of completed tasks. One task is highlighted: 'holuser@console:~' with a timestamp of '2023-09-12 10:40:00 AM'. The task details show a ping test from '10.1.10.129' to '10.1.10.129' with various ICMP sequence numbers and times. To the right of the migration list is a timeline of events:

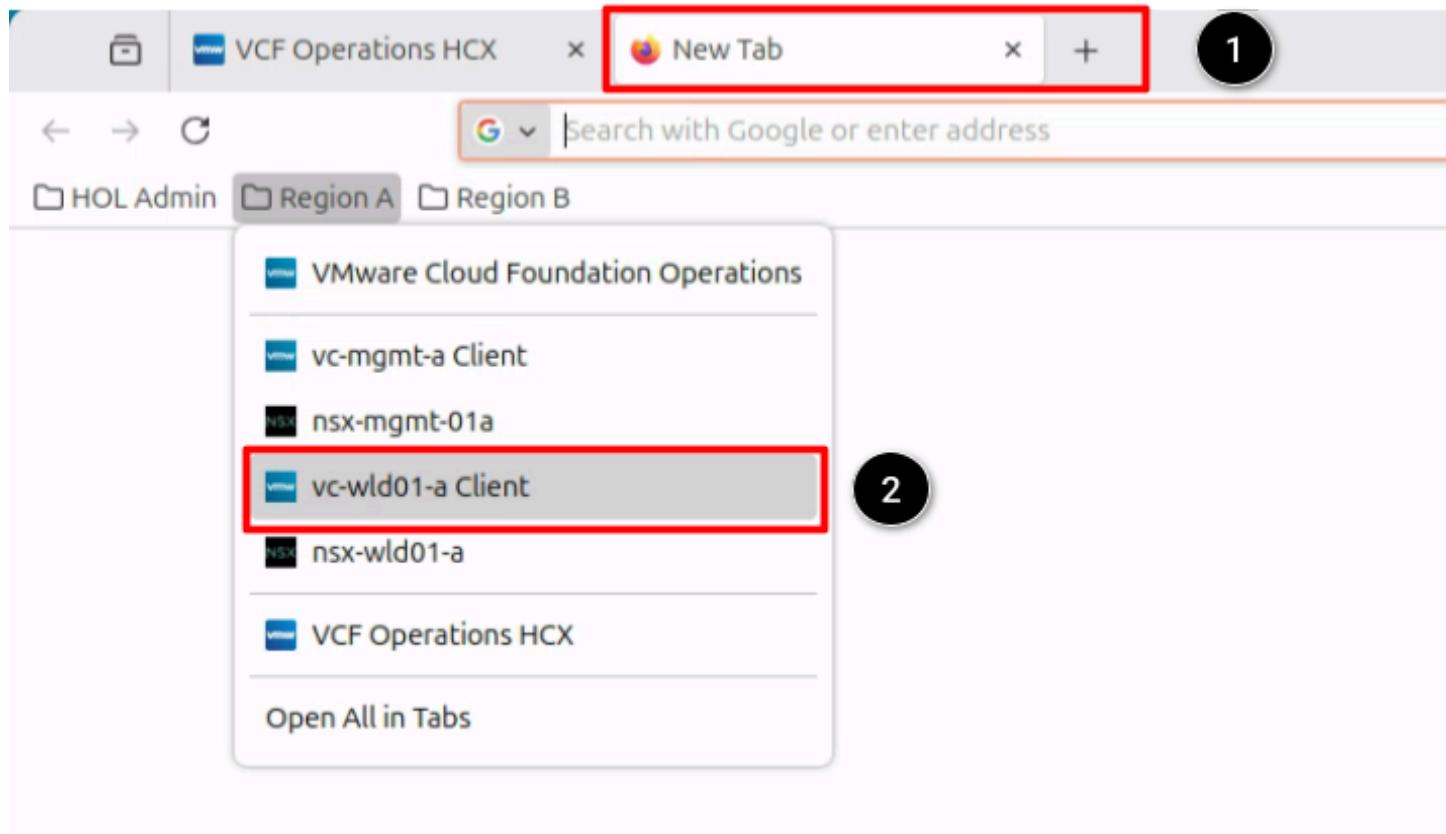
- 1. Validating source details (SHOW 55 MORE EVENTS)
- 57. Clearing up vMotion switchover source side completed
- 58. Released Mobility Agent Lock
- 59. Migration completed

A 'REFRESH EVENTS' button is located at the bottom right of the timeline.

With the ping test and the HCX event showing, as in the screenshot, you can see the migration task has completed and the ping is still going.

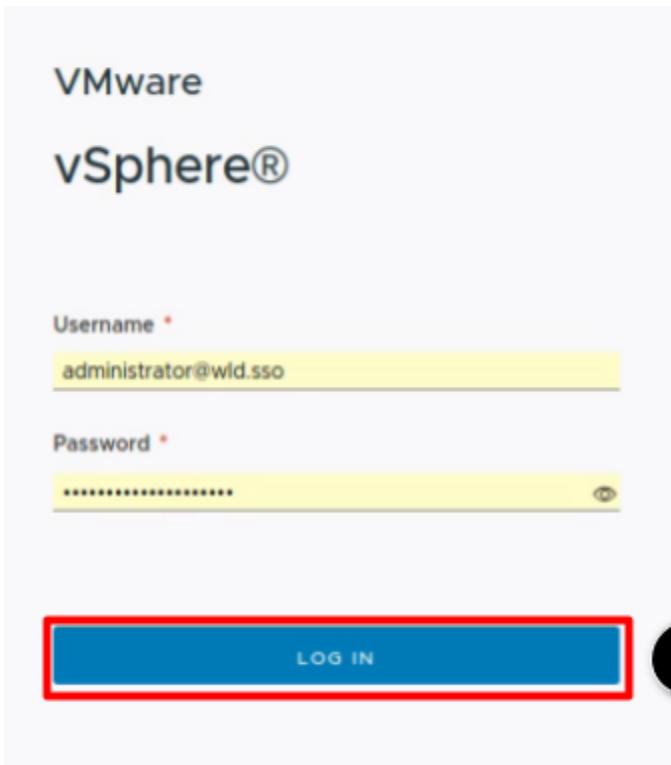
Verification

Open Site A



1. Open a new tab in the Firefox browser.
2. Click **vc-wld01-a-Client** to open the Site a vCenter.

Log into vCenter



The credentials should already be populated

1. Click **LOG IN**.

Check inventory for core-c

Name	State	Status	Provisioned Space	Used Space	Host CPU	Host Mem
core-a	Powered Off	Norm	2.63 GB	2.09 GB	0 Hz	0 B
core-b	Powered Off	Norm	2.75 GB	2.21 GB	0 Hz	0 B
core-c	Powered On	Norm	780 MB	484 MB	0 Hz	152 MB
edge-wld01-01a	Powered On	Norm	428.61 GB	80.56 GB	3.93 GHz	17.21 GB
edge-wld01-02a	Powered On	Norm	427.05 GB	83.13 GB	3.95 GHz	17.21 GB
HOL-10X-R1	Powered On	Norm	19.6 GB	13.64 GB	126 MHz	1.37 GB
HOL-1-NE-R1	Powered On	Norm	16.55 GB	13.59 GB	105 MHz	1.01 GB

From the Inventory view in the Region A vCenter Server, we will verify that the VMs were successfully migrated from the Remote site.

1. On the left menu, expand the arrows for vc-wld01-a.site-a.vcf.lab, wld-01a-DC, and then cluster-wld01-01a.
2. Select **VMs** in the right pane.
3. Notice the VM core-c is on this cluster just as we expected.

Conclusion

In this module you have completed the following tasks:

1. Create a new Mobility Group.
2. Configure Mobility Group migration Parameters using Replication Assisted Migration.
3. Validate Mobility Group and begin a migration .
4. Validate the running VM at the destination site.

From here you can:

- Take this quick survey to provide feedback about your experience with VCF 9.0
- Continue with the next lab module.
- Click [vlp:table-of-contents]Show Table of Contents] to jump to any module or lesson in this lab.
- End your lab and return in the future.

Module 4 - HCX OSAM (20 Minutes)

Understanding OSAM

The HCX OS Assisted Migration service uses the Sentinel software that is installed on Linux- or Windows-based guest virtual machines to assist with communication and replication from their environment to a VMware vSphere SDDC.

You must install HCX Sentinel on all guest virtual machines requiring migration using HCX OS Assisted Migration. Sentinel gathers the system configuration from the guest virtual machine and assists with the data replication. The source system information is used by various HCX OS Assisted Migration service processes. In part, the information is used to create an inventory of guest virtual machine systems for migration and to help replication processes prepare the disks on the replica virtual machine for replication and migration.

Sentinel also helps with the data replication by reading data that is written to the source disks and passing that data to the SDR appliance at the destination site.

Understanding OSAM - Continued

Guest virtual machines connect and register with an HCX Sentinel Gateway (SGW) appliance at the source site. The SGW then establishes a forwarding connection with an HCX Sentinel Data Receiver (SDR) appliance at the destination vSphere site. You specify the network connections between the guest virtual machines and SGW in the computer profile.

You must install the HCX Sentinel software on each guest virtual machine requiring migration to initiate the guest virtual machine discovery and data replication. After Sentinel is installed, a secure connection is established between the guest virtual machine and the HCX SGW. HCX builds an inventory of candidates for migration as the Sentinel software is installed on the guest virtual machines.

Using the established connection between the SGW and SDR, replication connections are made between the Sentinel software on the guest virtual machines and the SDR, with one connection each for control operations and data replication.

Supported Guest Operating Systems

The OS Assisted Migration service supports migration of virtual machines running non-vSphere guest operating systems in Linux or Windows environments.

Linux Environments

The OS Assisted Migration service supports migration of virtual machines running non-vSphere guest operating systems in Linux or Windows environments.

Supported Linux OS versions on KVM Hypervisor (BIOS and EFI)	Supported Linux OS versions on Hyper-V Hypervisor (BIOS and EFI)
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CentOS 6.1 - CentOS 6.10 (32-bit, 64-bit)

RHEL 7.1 - RHEL 7.9 64-bit (BIOS/GEN-1 & UEFI/GEN-2)

RHEL 6.1 - RHEL 6.10 (32-bit, 64-bit)

RHEL 6.4 - RHEL 6.10 32-bit and 64-bit (BIOS/GEN-1 Only)

CentOS 7.1 - CentOS 7.9 (64-bit)

CentOS 7.0 - CentOS 7.9 64-bit (BIOS/GEN-1 & UEFI/GEN-2)

RHEL 7.1 - RHEL 7.9 (64-bit)

CentOS 6.4 - RHEL 6.10 32-bit and 64-bit (BIOS/GEN-1 Only)

RHEL 8.0 - RHEL 8.6 (64-bit)

RHEL 8.0 - RHEL 8.6 64-bit (BIOS/GEN-1 & UEFI/GEN-2)

CentOS 8.0 - CentOS 8.4 (64-bit)

CentOS 8.0 - CentOS 8.4 64-bit (BIOS/GEN-1 & UEFI/GEN-2)

Ubuntu 14.04 LTS (32-bit, 64-bit)

Ubuntu 14.04 LTS 32-bit (BIOS/GEN-1) and 64-bit (BIOS/GEN-1 & UEFI/GEN-2)

Ubuntu 16.04 LTS (32-bit, 64-bit)

Ubuntu 16.04 LTS 32-bit and 64-bit (BIOS/GEN-1 & UEFI/GEN-2)

Ubuntu 18.04 LTS (64-bit)

Ubuntu 18.04 LTS 64-bit (BIOS/GEN-1 & UEFI/GEN-2)

Windows Environments

HCX supports various Windows guest operating systems on KVM or Hyper-V supervisors.

Supported OS versions on KVM Hypervisor

Windows Server 2019

Supported OS versions on Hyper-V Hypervisor

Windows Server 2019

Windows Server 2016

Windows Server 2016

Windows Server 2012

Windows Server 2012

Windows Server 2012 R2

Windows Server 2012 R2

Windows Server 2008 R2 (64-bit)

Windows Server 2008 R2 (64-bit)

Windows Server 2008 SP2 (32-bit and
64-bit)

Windows Server 2008 SP2 (32-bit and
64-bit)

Configure a OSAM Migration

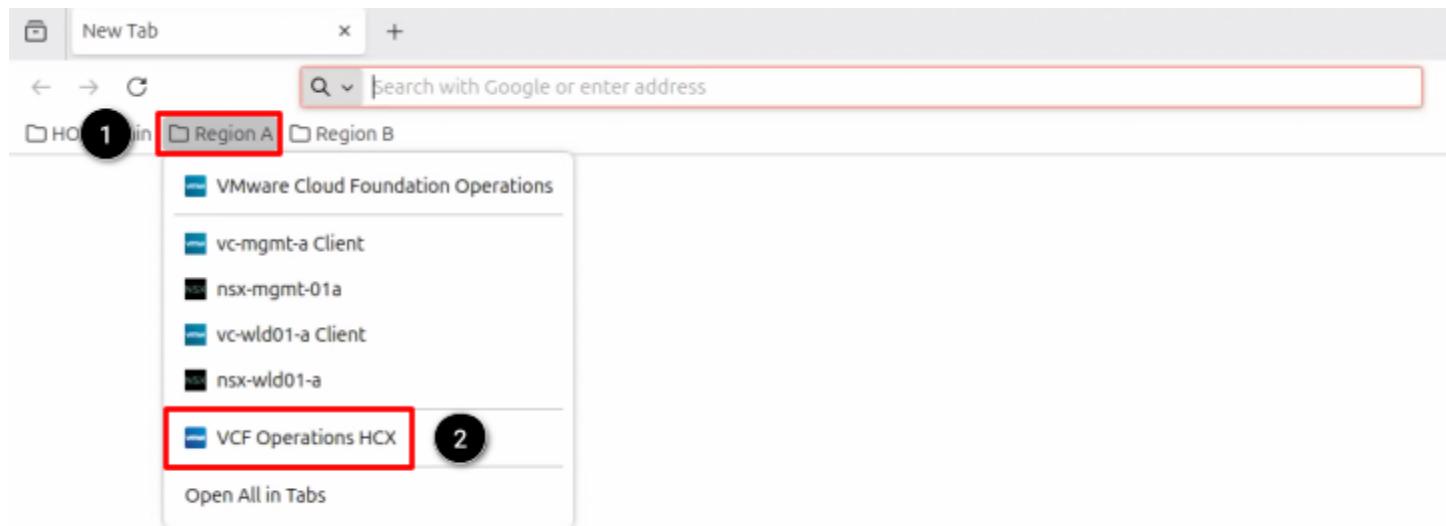
Start Firefox



Open the Firefox Browser from the Linux Task Bar.

1. Click on the **Firefox** icon to open the browser.

Open Region A VCF Operations HCX Console



Once Firefox has loaded:

1. Click on the **Region A** bookmark folder.
2. Click **VCF Operations HCX**.

Login to VCF Operations HCX Console

The screenshot shows the VMware Cloud Foundation Operations HCX login interface. The steps are numbered on the right side of the form fields:

1. Login Method: vSphere Users
2. Username: administrator@wld.sso
3. Password: *****
4. LOG IN button

The credentials for **administrator@wld.sso** should already be cached in the browser window.

At the VCF Operations HCX login prompt, select the login method and type in the following user and password information:

1. At the Login Method dropdown, select **vSphere Users**.
2. At the username field, type **administrator@wld.sso**
3. At the password field, type **VMware123!VMware123!**
4. Click **LOG IN**.

Configure OSAM Migration

The screenshot shows the VMware Cloud Foundation Operations HCX dashboard. On the left sidebar, under the Services section, the 'Migration' option is highlighted with a red box and a circled '1'. The main panel displays an 'Overview' section with a large '3' representing 'TOTAL VMS MIGRATED' and a '0' representing 'MIGRATION IN PROGRESS'. Below this is a world map showing migration paths between North America and Europe.

1. Click **Migration**.

Create a new Mobility Group

The screenshot shows the 'Migration' page within the VMware Cloud Foundation Operations HCX interface. The 'Mobility Groups' tab is selected. A red box highlights the 'NEW MOBILITY GROUP' button in the top right corner, with a circled '2' indicating the step. The main area shows a message 'No Mobility Groups available' with a funnel icon. The left sidebar has a 'Migration' section highlighted with a red box and a circled '1'.

1. Click on the **Migration** Tab
2. Click on **NEW MOBILITY Group**

Select Non VM Inventory for Migration

New Mobility Group

Remote Site Connection:

> Source: hcx-mgmt-01a.site-a.vcf.lab-osam / sentinel: Non vSphere Inventory → Destination: hcx-mgmt-01a.site-a.vcf.lab / VC: vc-wld01-a.site-a.vcf.lab

Group Name: OSAM 2 Supervisor Onboarding

No VM is selected for migration Select VMs for Migration 1 4

Select Workloads 3 Show Selections

Filters Hide unselectable workloads (0)

	name	ID	vCPU	Memory	Storage
<input checked="" type="checkbox"/>	ubuntu-osam	b7da4a27-bebc-4ee5-80ee-257d0361f6ea	2 vCPU	4 GB	50 GB

1. Validate the **Remote Site Connection** is to **Non vSphere Inventory**.
2. Enter **OSAM** in the Name field.
3. Click the check box next to the **ubuntu-osam** VM.
4. Click **SELECT**.

Configure Migration Settings

New Mobility Group

Remote Site Connection: Reverse Migration

> Source: hcx-mgmt-01b.site-b.vcf.lab / VC: vc-mgmt-01b.site-b.vcf.lab → Destination: hcx-mgmt-01a.site-a.vcf.lab / VC: vc-wld01-a.site-a.vcf.lab 1 Reload Connections

Group Name: 2 Supervisor Onboarding Batch size: 1 VM / 100 MB / 256 MB / 1 vCPU 3 Select VMs for Migration

Transfer and Placement: 4

(Mandatory: Compute Container) (Mandatory: Storage) (Migration Profile)

(Specify Destination Folder) Same format as source (Optional: Transfer Schedule)

(Optional: Switchover Schedule)

> Switchover:
Interconnect Options:
Extended Options: Edit Extended Options

VM for Migration	Disk / Memory / vCPU	Migration Info
core-d	100 MB / 256 MB / 1 vCPU	(Migration profile is not specified)

GO VALIDATE SAVE CLOSE

At the top, in the light green box, are universal migration options. The selections you make will apply to all selected VMs within the Mobility Group.

The following mandatory selections in the universal migration section are needed to complete the Mobility Group Configuration: Compute Container, Storage, Virtual Disk Format, and Migration Profile.

If there is a need to have individual VMs with different settings, such as a different storage target, the VM can be edited in the bottom section where they are listed individually. To edit them, expand the arrow to the corresponding VM and make modifications. (Not shown here)

Configure Migration Settings - Compute Container

1. Click on **Mandatory: Compute Container** section.

Destination Compute Container

1. Select **Clusters** tab.

2. Select **cluster-wld01-01a**.

3. Click **SELECT**.

This entry selects the destination compute cluster

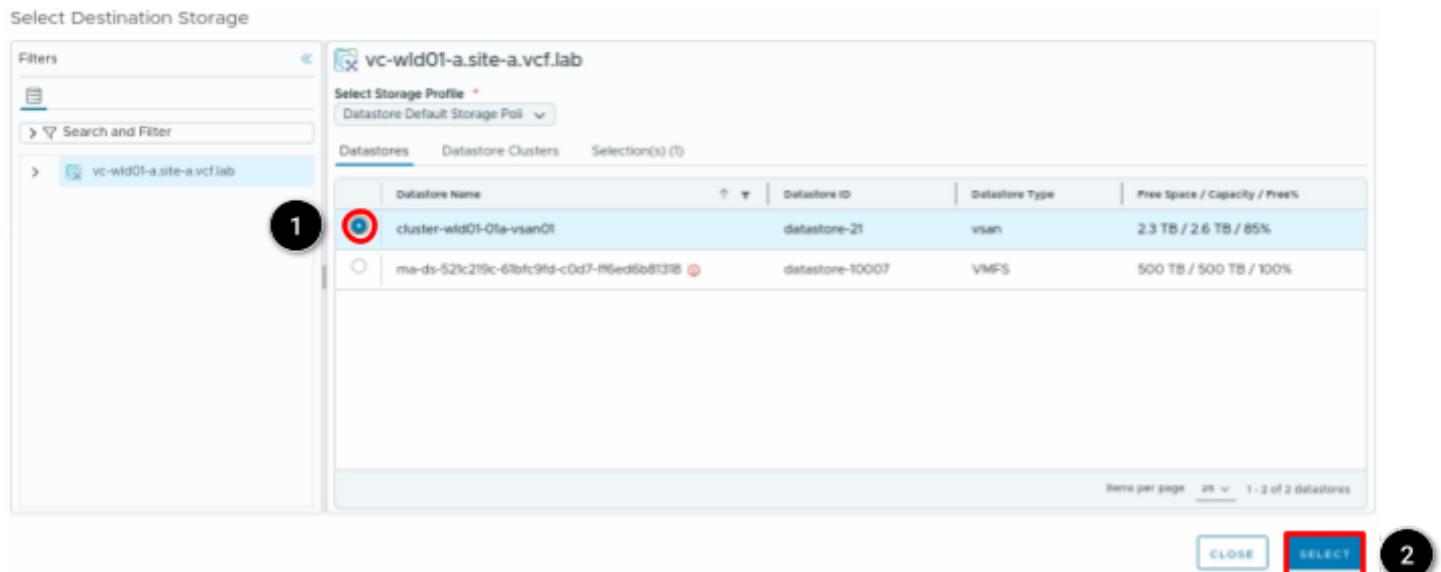
1. Select **Clusters** in the second pane.
2. Select **cluster-wld01-01a**.
3. Click **Select**.

Configure Migration Settings - Storage

1. Click on **Mandatory: Storage** section.

This entry selects the destination compute cluster

1. Click on **Mandatory: Storage** section



This entry selects the destination storage cluster

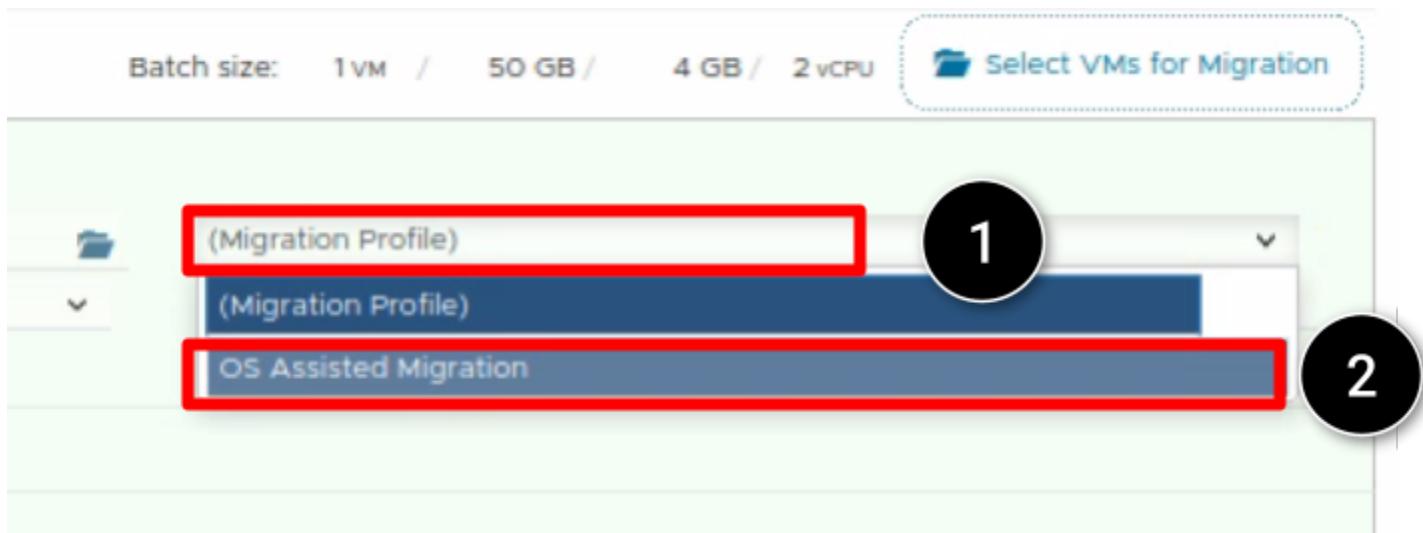
1. Select **cluster-wld01-01a-vsan01**.
2. Click **SELECT**.



After returning to the main configuration screen, we will select the destination storage format.

1. Click on **Mandatory: Virtual Disk Format** section.
2. Select **Thin Provision**.

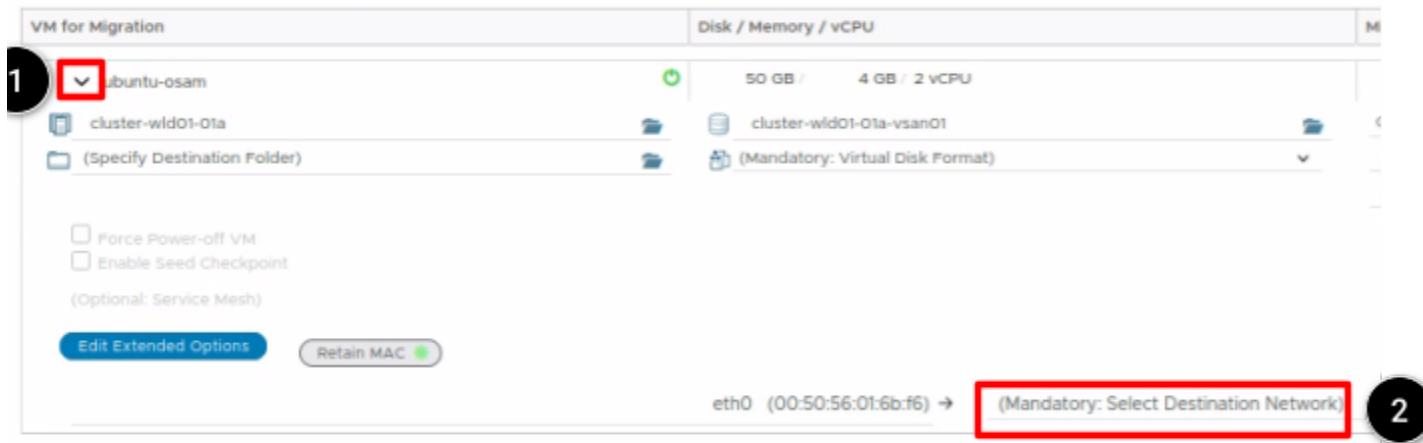
Configure Migration Settings - Migration Profile



1. Click on **(Migration Profile)**.
2. Click **OS Assisted Migration..**

Configure Migration Settings - VM Networking

Destination network selection is not a universal attribute that can be set in the light green area. Follow these steps to select the destination network for each VM in the Mobility Group.



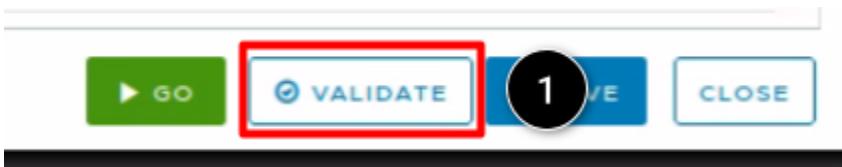
1. Click the arrow to expand **ubuntu-osam** settings.
2. Click **Mandatory: Destination Network**.

Select Destination Network

Name	ID
hcx-osam-migration-01a	dvportgroup-11001
L2E_app-net01-b-52-26ebb6fb	dvportgroup-5011
mgmt-vds01-wld01-01a	dvportgroup-16
mgmt-vds01-wld01-01a-DVPG	dvportgroup-38
VCF-edge_edged1-wld-a_PG-vds01-wld01-01a-External-1	dvportgroup-40
VCF-edge_edged1-wld-a_PG-vds01-wld01-01a-External-2	dvportgroup-41
vds01-wld01-01a-DVU/plinks-12	dvportgroup-13

1. Select **hcx-osam-migration-01a** if it is not already selected.
2. Click **SELECT**.

Validate and GO



1. Click back to the Firefox browser
2. Click **VALIDATE**

The migration process is now being validated for the parameters that were passed. Note: If you happen to have some warning, you may safely ignore them and proceed.

New Mobility Group

Validation is successful. You can proceed with Migration.

Migration could fail as one or more Virtual Machines have warning(s). Please review them before proceeding.

Group Name: OSAM Supervisor Onboarding

Batch size: 1 VM / 50 GB / 4 GB / 2 vCPU select vms for Migration

Switchover:
Interconnect Options:
Extended Options:

VM for Migration

ubuntu-osam	50 GB	4 GB	2 vCPU
cluster-wld01-0la		cluster-wld01-0la-vsan01	
(specify Destination Folder)		Thin Provision	

Force Power-off VM
 Enable Seed Checkpoint
(Optional: Service Mesh)

Disk / Memory / vCPU

Migration info

OS Assisted Migration
(Optional: Transfer Schedule)
(Optional: Switchover Schedule)
 Replicate Dataset File

eth0 (00:50:56:01:6b:16) → hcx-osam-migration-0la

1

- Click **GO** to start the migration of VMs

Migration in Progress

The Migration screen now shows the bulk migration in progress.

Migration

Auto Refresh **1** NEW MOBILITY GROUP

Mobility Groups Site Pairs

Q Search by Group Name

	Group Name	Tags	Workloads	In Draft	Syncing	In Switchover	Canceled	Errored	Migrated	Status
2 <input type="checkbox"/>	3 OSAM <input type="checkbox"/>		1		1					<input type="radio"/> In Progress
Source HCX Manager	hcx-mgmt-0la.site-a.vcf.lab-osam									
Destination HCX Manager	hcx-mgmt-0la.site-a.vcf.lab									
Mobility Group ID	9349177d-35d7-43b8-be6d-63b5e7934988									
Workloads	1	CPU	2 vCPUs	Memory	4 GB	Storage	50 GB			
Initial Sync	0 GB synced of 50 GB <input type="radio"/> 1 0%									
Switchover	0 of 1 migrated 0%									

- Click the **Auto Refresh** slider to see updates to the process.
- Click the arrow next to **OSAM** to see the status per VM. Note the source and destination locations.

3. Clicking the name of the migration task (OSAM) will show the status of the individual VMs in the Mobility Group.

View Replication Status

The screenshot shows the 'Migrations' tab in the VMware Cloud Foundation Operations HCX Advanced interface. A migration task for 'ubuntu-osam' is selected. The right-hand pane shows the 'Initial Sync In Progress' status with three events listed:

- Aug 12, 2025, 1:55:24 PM (3 minutes ago) start: 1. Selected Datastore: cluster-wld01-01a-vsanc01 (datastore-21) (SHOW 2 MORE EVENTS)
- Aug 12, 2025, 1:55:32 PM (3 minutes ago) +8s: 4. Allocating replica disks
- Aug 12, 2025, 1:56:53 PM (2 minutes ago): 5. Preparing Sentinel Data Receiver

A red box labeled '1' highlights the 'ubuntu-osam' entry in the list. A red box labeled '2' highlights the 'Events' tab in the right-hand pane.

1. Click the arrow next to **ubuntu-osam**.
2. In the right pane click **Events**.

This pane will automatically update with each step as the migration progresses.

Switchover in Progress

The screenshot shows the OSAM (Operational State Automation Manager) interface. At the top left, there's a navigation bar with icons for Home, OSAM, and a status indicator 'In Progress'. On the right, there are buttons for 'Auto Refresh' and 'ACTIONS'. Below the navigation is a toolbar with buttons for 'FORCE CLEANUP', 'CANCEL MIGRATION', 'ARCHIVE', 'FORCE POWER-OFF', 'START INITIAL SYNC', 'EDIT MIGRATION SCHEDULE', and 'SWITCHOVER NOW'. There's also a checkbox for 'Include Archived' and a search bar 'Q, Search by Workload Name' with a 'REFRESH' button.

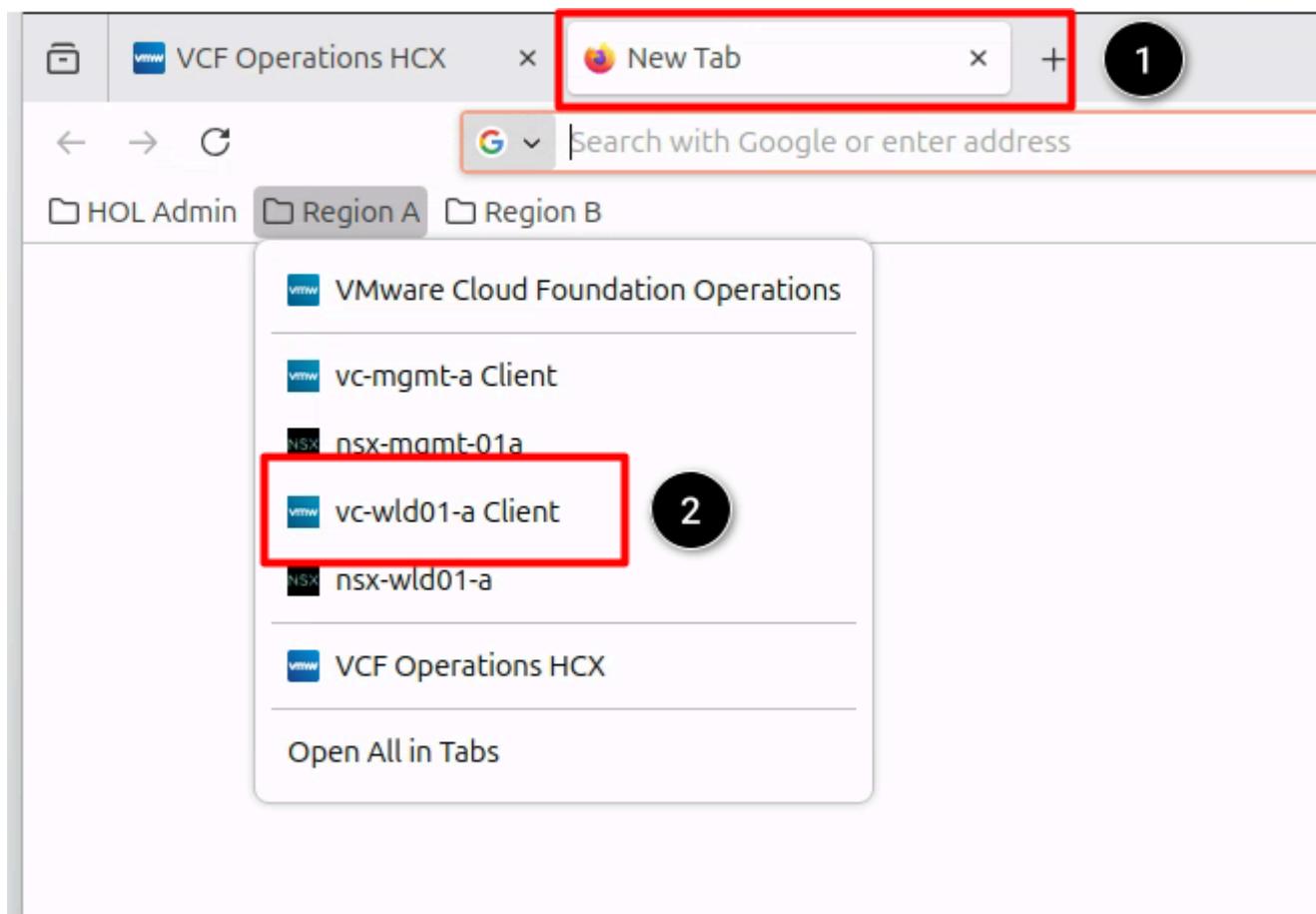
The main area displays a list of migrations. One entry for 'ubuntu-osam' is selected and expanded. A large red box highlights the 'Switchover In Progress' status bar at the top of the expanded view. Below it, there are tabs for 'Summary', 'Migration Options', 'Placement Options', 'Network Mappings', 'Schedule', and 'Events'. The 'Events' tab is selected, showing a timeline of migration events:

- Aug 12, 2025, 1:56:00 PM (16 minutes ago) + 1m 29s: 1. Preparing destination vSphere environment
- Aug 12, 2025, 1:57:53 PM (15 minutes ago) + 2m 29s: 6. Starting initial sync (checkmark)
- Aug 12, 2025, 2:11:58 PM (1 minute ago) + 16m 34s: 7. Completed initial sync (checkmark)

A note at the bottom states: '* All times are displayed in UTC-0700'.

1. See the switchover to vCenter is in progress.

Validate the VM in vCenter



1. Open a new tab in the Firefox Browser.
2. Click **vc-wld01-a-Client**.

Log In to vCenter



1. Click **LOG IN**. The credentials will be automatically populated.

Verification

From the Inventory view in the Region A vCenter Server, we will verify that the VMs were successfully migrated from the Remote site.

Name	State	Status	Provisioned Space	Used Space	Host CPU	Host Mem
HOL-1-OX-R1	Powered On	Normal	20.46 GB	14.5 GB	105 MHz	1.44 GB
HOL-1-NE-R1	Powered On	Normal	17.63 GB	14.67 GB	105 MHz	1.06 GB
HOL-1-OSAM-SRG-II	Powered On	Normal	38.08 GB	30.12 GB	42 MHz	6.04 GB
SupervisorControlPlaneVM	Powered On	Normal	15.44 GB	9.947 GB	3.78 GHz	13.65 GB
ubuntu-osam	Powered On	Normal	104.43 GB	30.62 GB	42 MHz	825 MB
AP_VCF-0000000000000000-Red-4900-55be601d914	Powered On	Normal	0 B	0 B	0 Hz	129 MB
vCLS-595e0142-00f3-b448-2020-07234bb5955	Powered On	Normal	0 B	0 B	0 Hz	129 MB

1. On the left menu, expand the arrows for vc-wld01-a.site-a.vcf.lab, wld-01a-DC, and then cluster-wld01-01a.
2. Select **VMs** in the right pane
3. Use the scroll bar on the right to scroll down.
4. Notice the VM **ubuntu-osam** is on this cluster just as we expected

Lab Conclusion

In this module you have completed the following tasks:

1. You reviewed what VMware Operations HCX is
2. Prepared an HCX Service Mesh
3. Prepared an HCX Network Extension
4. Created a Migration Plan and sent it to HCX

From here you can:

- Take this quick survey to provide feedback about your experience with VCF 9.0
- Click [vlp:table-of-contents]Show Table of Contents] to jump to any module or lesson in this lab.
- End your lab and return in the future.

End of Lab Manual (08/25)

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