

A vertical graphic on the left side of the slide, rendered in various shades of red. It features a collage of icons related to IT and virtualization: a cloud with a keyhole, a database cylinder, a server rack, a computer monitor, a large upward-pointing arrow, and several 'X' marks. The background of the entire slide is white, with a solid red vertical bar on the far left.

Migration Toolkit for Virtualization

DevConf.CZ

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Martin Nečas

mnechas@redhat.com



linkedin.com/company/red-hat



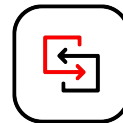
facebook.com/redhatinc



youtube.com/user/RedHatVideos

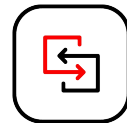


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Migration Toolkit for Virtualization

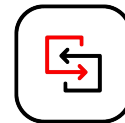




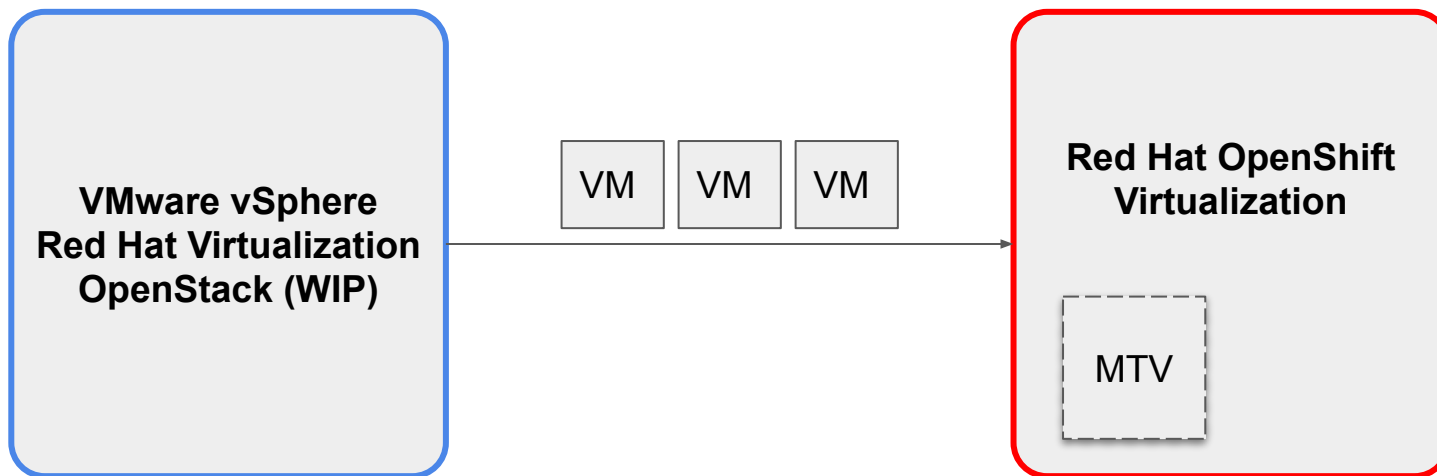
Forklift

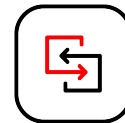
<https://github.com/kubev2v/forklift>



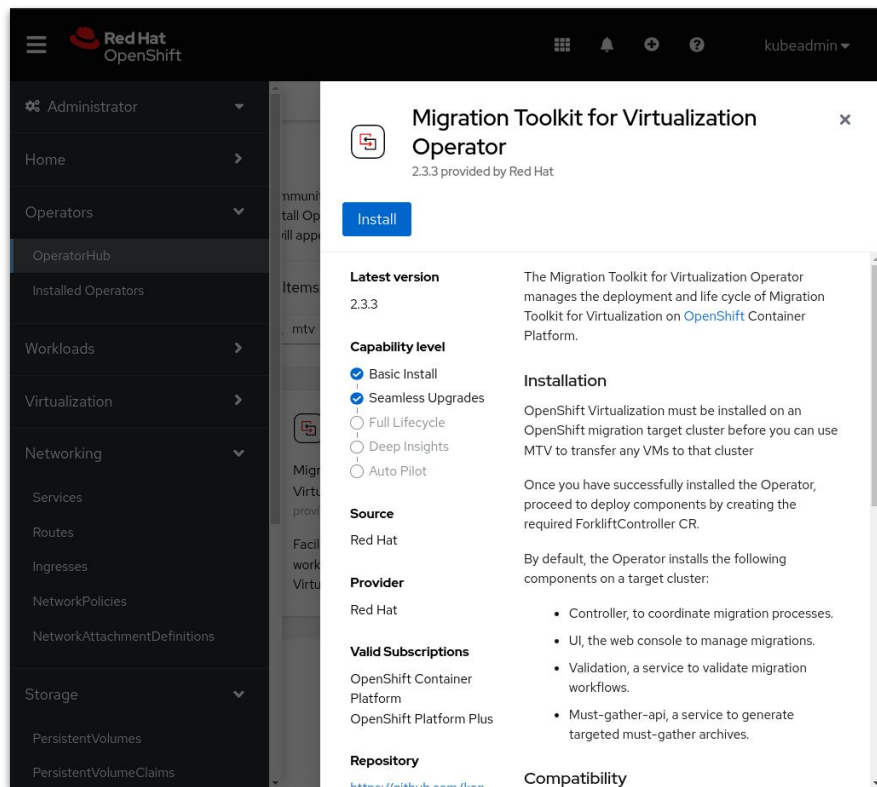


Migration Toolkit for Virtualization

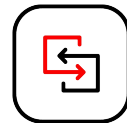




Installation



- The MTV can be installed from OperatorHub
- Managed by Operator Lifecycle Manager
- Installed CRDs
 - Provider - RHV/VMware/CNV
 - NetworkMap
 - StorageMap
 - Plan
 - Hook
 - Migration



Installation

Red Hat OpenShift

Project: openshift-mtv

Routes

Filter Name Search by name...

Name	Location
forklift-inventory	https://forklift-inventory-openshift-mtv.apps-crc.testing
virt	https://virt-openshift-mtv.apps-crc.testing

Red Hat OpenShift

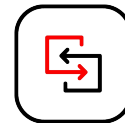
Project: openshift-mtv

Pods

Create Pod

Filter Name Search by name...

Name	Status	Ready	Restarts
forklift-controller-6cbc77c4b8-9mtxl	Running	2/2	2
forklift-must-gather-api-749684855d-rvcv4	Running	1/1	1
forklift-operator-6cc48c66f-vx2vv	Running	1/1	0
forklift-ui-564db6c78c-q5ft4	Running	1/1	1
forklift-validation-7bb8564556-g5bxx	Running	1/1	1



Usage

Migration Toolkit for Virtualization

Providers [Add provider](#)

OpenShift Virtualization

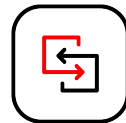
Select migration network

1 - 1 of 1

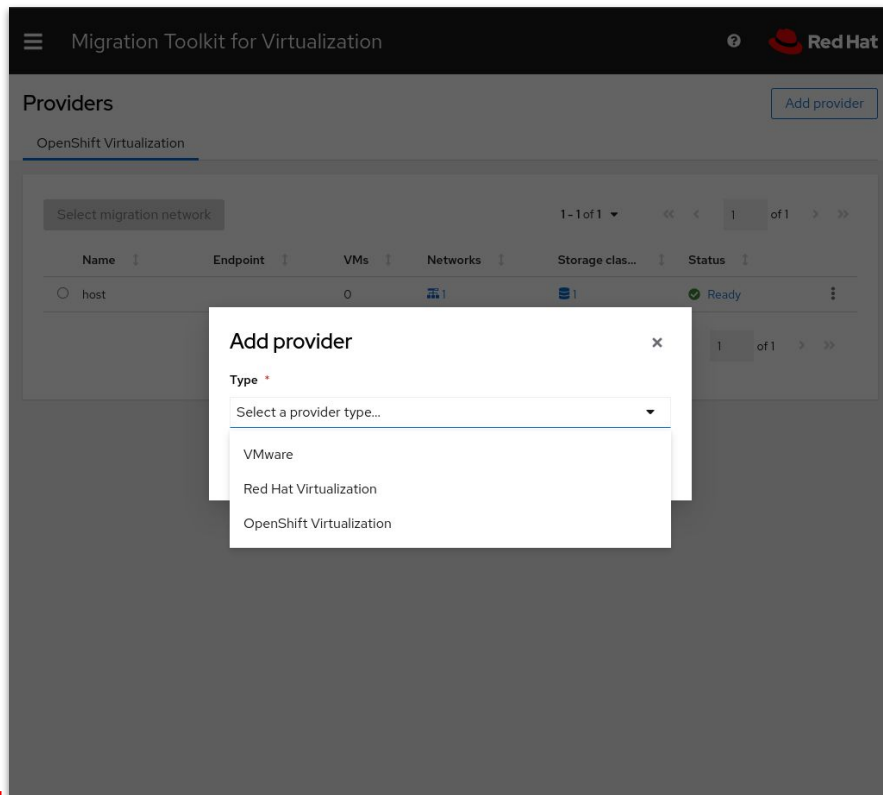
Name	Endpoint	VMs	Networks	Storage clas...	Status
<input type="radio"/> host		0	1	1	Ready

1 - 1 of 1

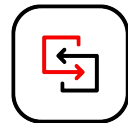
- Main page for adding providers
- The OpenShift cluster needs to have already configured storage and networking



Adding provider



- VMware and RHV are migration **sources**
- OpenShift Virtualization is migration **target**
 - Can be a different OpenShift cluster



Adding a provider

Migration Toolkit for Virtualization

Providers

OpenShift Virtualization

Select migration network

Name

host

Add provider

Add provider

Type *

Red Hat Virtualization

Name *

rhv-provider

User specified name to display in the list of providers

RHV Manager host name or IP address *

rhv.example.com

RHV Manager user name *

admin@internal

RHV Manager password *

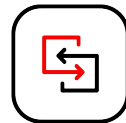
.....

CA certificate ⓘ

pki-resource (2).cer Browse... Clear

-----BEGIN CERTIFICATE-----
MIIEMjCCAxqgAwIBAgICEAAwDQYJKoZIhvcNAQELBQAwbDELM
AkGA1UEBhMCVVMxJDAIBgNVBAoM
G3JoZXZybGFiLmVuzY5icnEuclmVkaGF0LmNvbTE3MDUGA1UE
AwwuMTAtMzctMTQwLTg1LnJoZXZy

Add Cancel



Gathering information

Migration Toolkit for Virtualization

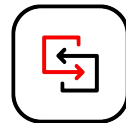
Providers

OpenShift Virtualization Red Hat Virtualization

Add provider

Name	Endpo...	Clusters	Hosts	VMs	Netwo...	Storag...	Status
rhv-provider	https://10-37...	2	1	2	1	2	Ready

- Validating the provider is ready for migration
- Gather all information about provider
 - Cluster
 - Hosts
 - VMs
 - Networks
 - Storages



Adding a migration plan

Migration Toolkit for Virtualization

Migration plans > Create

Create migration plan

- 1 General
- 2 VM selection
 - Filter
 - Select VMs
- 3 Network mapping
- 4 Storage mapping
- 5 Type
- 6 Hooks
- 7 Review

General settings

Give your plan a name and a description

Plan name *

migration-plan

Plan description

Select source and target providers

Source provider *

rhv-provider

Target provider *

host

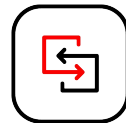
Target namespace *

default

The migration transfer network for this migration plan is: **Pod network.**

[Next](#) [Back](#) [Cancel](#)

- Source provider
- Target provider
- Target namespace
 - The namespace in which the VMs should be defined in the target OpenShift cluster



Validation

Migration Toolkit for Virtualization

Migration plans > Create

Create migration plan

- 1 General
- 2 VM selection**
 - Filter
 - Select VMs
- 3 Network mapping
- 4 Storage mapping
- 5 Type
- 6 Hooks
- 7 Review

Select VMs

Select VMs for migration. The Migration assessment column highlights conditions related to migrating a particular VM, as determined by Red Hat's migration analytics service.

1 selected 1-1 of 1

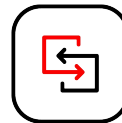
Migration...	VM name	Datacent...	Cluster	Host
<input checked="" type="checkbox"/> Warning	vm-for-migr...	Default	Test	N/A

Conditions have been identified that make this VM a **moderate risk** to migrate.

- Placement policy affinity:** The VM has a placement policy affinity setting that requires live migration to be enabled in OpenShift Virtualization for compatibility. The target storage classes must also support RWX access mode.
- VM has memory ballooning enabled:** The VM has memory ballooning enabled. This is not currently supported by OpenShift Virtualization.
- NIC with network filter detected:** The VM is using a vNIC Profile configured with a network filter. These are not currently supported by OpenShift Virtualization.
- VM Display Type:** The VM is using the SPICE protocol for video display. This is not supported by OpenShift Virtualization.
- Cluster has KSM enabled:** The host running the source VM has kernel samepage merging enabled for more efficient memory utilization. This feature is not currently supported by OpenShift Virtualization.

Next Back Cancel

- Open Policy Agent
- Prespecified rules to inform you about the VMs
 - Check if the migration is possible
 - Show what can change during migration or limitations



Mappings

Migration Toolkit for Virtualization

Migration plans > Create

Create migration plan

1 General

2 VM selection

3 Network mapping

4 Storage mapping

5 Type

6 Hooks

7 Review

Network mapping

Select an existing network mapping to modify or create a new network mapping.

Filter

networking

Select target networks. The OpenShift pod network is the default target network. You can select a different target network from the network list.

Source networks

ovirtmgmt
Default/ovirtmgmt

Target namespaces / networks

Pod network (default)

Next

Back

Cancel

Migration Toolkit for Virtualization

Migration plans > Create

Create migration plan

1 General

2 VM selection

3 Network mapping

4 Storage mapping

5 Type

6 Hooks

7 Review

Storage mapping

Select an existing storage mapping to modify or create a new storage mapping.

Filter

storage

Select target storage classes.

Source storage domains

test
Default/test

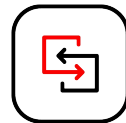
Target storage classes

ocp-storage-set

Next

Back

Cancel



Migration type

The screenshot shows the 'Create migration plan' wizard in the Migration Toolkit for Virtualization. The 'Type' step is selected, showing two options: 'Cold migration' (selected) and 'Warm migration'. The 'Cold migration' option includes the sub-point 'Source VMs are shut down while all of the VM data is migrated.' The 'Warm migration' option includes two sub-points: 'VM data is incrementally copied, leaving source VMs running.' and 'A final cutover, which shuts down the source VMs while VM data and metadata are copied, is run later.' The wizard has a sidebar with steps 1 through 7, and a bottom bar with 'Next', 'Back', and 'Cancel' buttons.

Migration Toolkit for Virtualization

Migration plans > Create

Create migration plan

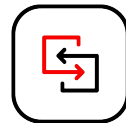
- 1 General
- 2 VM selection
 - Filter
 - Select VMs
- 3 Network mapping
- 4 Storage mapping
- 5 Type
- 6 Hooks
- 7 Review

Migration type

- ☒ Cold migration
 - Source VMs are shut down while all of the VM data is migrated.
- ☐ Warm migration
 - VM data is incrementally copied, leaving source VMs running.
 - A final cutover, which shuts down the source VMs while VM data and metadata are copied, is run later.

Next Back Cancel

- Cold
 - Shutdown VM
 - Migrate disks
- Warm
 - Create a snapshot(s)
 - Copy a snapshot(s)
 - Shutdown VM
 - Create final snapshot
 - Copy final snapshot



Ansible hooks

- Pre-migration
- Post-migration

The screenshot shows the 'Create migration plan' dialog in the Migration Toolkit for Virtualization. The 'Hooks' step is selected, and an 'Add hook' modal is open. The modal has a dropdown for 'Step when the hook will be run' with 'Pre-migration' selected. Below the dropdown is a text area for the hook script, containing an Ansible playbook snippet. The script has a red circle with the number '1' next to the 'Ensure apache is at the latest version' task. At the bottom of the modal are 'Add' and 'Cancel' buttons.

Migration Toolkit for Virtualization

Migration plans > Create

Create migration plan

1 General 2 VM selection 3 Network 4 Storage 5 Type 6 Hooks 7 Review

Add hook

Step when the hook will be run *

Pre-migration

Pre-migration ✓

Post-migration

Drag a file here or browse to upload

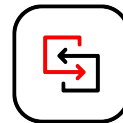
Browse... Clear

```
---
- name: Update web servers
  hosts: localhost
  tasks:
    - name: Ensure apache is at the latest version
```

Custom container image

Add Cancel

Next Back Cancel



Review

Migration Toolkit for Virtualization

?

Red Hat

Migration plans > Create

Create migration plan

1 General

2 VM selection

3 Network mapping

4 Storage mapping

5 Type

6 Hooks

7 Review

Review the migration plan

Review the information below and click Finish to create your migration plan. Use the Back button to make changes.

Plan name migration-plan

Source provider rhv-provider

Target provider host

Target namespace default

Migration transfer network Pod network

Selected VMs 1

Network mapping

Source networks

ovirtmgmt
Default/ovirtmgmt

Target namespaces / networks

Pod network

Storage mapping

Source storage domains

test
Default/test

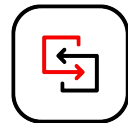
Target storage classes

ocp-storage-set



Finish

Back


Cancel





Plans

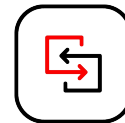
 Migration Toolkit for Virtualization 

Migration plans

 [Create plan](#) ☐ Show archived 1-1 of 1 << < 1 of 1 > >>

Name	Type	Plan status
> migration-plan	Cold	 Ready Start 

1-1 of 1 << < 1 of 1 > >>



Migration

Migration Toolkit for Virtualization

Migration plans > migration-plan

Migration details by VM

Cancel

1 - 1 of 1

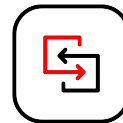
Name	Star...	End ...	Data copied	Status
vm-fo...	25 Oct 2...	25 Oct 2...	8.00 / 8.00 GB	Complete

Get logs

Step	Elapsed time	State
Initialize migration	00:00:42	Completed
Transfer disks	00:00:33	Completed
Convert image to kubevirt	00:01:19	Completed

1 - 1 of 1

- Example of cold migration
- Create CNV VM
- Copy the disk to the created VM
- Convert vSphere image to OpenShift Virtualization with virt-v2v



Results

Red Hat OpenShift

Project: default

VirtualMachines

Create

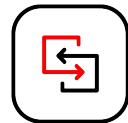
Filter Name Search by name... /

Name ↑	Status ↑	Conditions	Node
VM vm-for-migration	Stopped	Ready=False	-

Guest login credentials

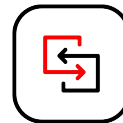
VNC console Send key

```
CentOS Linux 7 (Core)
Kernel 3.10.0-1160.el7.x86_64 on an x86_64
vm-for-migration login:
```



Ongoing / planned (technical) efforts

- Replacing the standalone UI with a plugin to Openshift console
- RHV 4.4 compatibility
 - Examples: uefi/secure boot, dedicated CPUs
- Adding OpenStack provider
- Add continuous integration



Integrated console

The screenshot displays the Red Hat OpenShift console interface. The left sidebar contains a navigation menu with the following items: Administrator, Home, Operators, Workloads, Virtualization (expanded), Providers for VM Import (selected), Plans for VM Import, Mappings for VM Import, Networking, Storage, Builds, Compute, User Management, and Administration. The main content area is titled 'Providers' and shows the 'KubeVirt' provider. A table lists the providers, with one entry 'host' showing 0 VMs, 1 network, and 0 storage classes, with a status of 'Ready'. The table has columns for Name, Endpoint, VMs, Networks, Storage classes, and Status. The user 'kubeadmin' is logged in, as indicated in the top right corner.

Red Hat OpenShift

Providers

KubeVirt

Select migration network

1-1 of 1

Name	Endpoint	VMs	Networks	Storage classes	Status
host		0	1	0	Ready

1-1 of 1

Thank you

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