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Red Hat OpenShift Virtualization

La piattaforma cloud native per applicazioni e carichi di lavoro containerizzati e virtualizzati

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Nice to meet you!

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Application Offering
Lutech

Agenda

- About Lutech
- Customer needs & Virtualization Evolution
- Openshift Virtualization
- Demo

About Lutech

Lutech is national leader in Digital and Artificial Intelligence (AI)

3rd
DIGITAL PLAYER IN ITALY

+35
DATA & AI PROJECTS

+5.500
PROFESSIONALS

0

1B €
BOOKING € FY2023

0

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About Lutech

Cloud is a serious thing for Lutech

CLOUD END-TO-END

The Lutech Cloud Infrastructure & Application Services (CIAS) Group is a unit composed of more than 600 highly specialized professionals, dedicated to providing high value solutions in the field of Public and Private Cloud on Advisory, Infrastructural and Application topics, Supporting customers throughout the customer journey towards adopting the most innovative and scalable technologies.

+600
PROFESSIONALS

+400
CERTIFICATIONS

+200
CUSTOMERS

Customer Needs & Virtualization Evolution

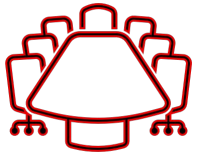
From traditional virtualization to cloud native model

BIG-BANG

Face a migration to Cloud Native models cannot always be approached with a disruptive approach, on the contrary, almost never!

HYBRID LANDSCAPE

current infrastructure an application landscape is often represented by hybrid, complex and inhomogeneous situations



MULTI-VENDOR

The trend towards a multi-vendor approach adds complexity to solutions and licensing cost management

OPTIMIZATION

The optimization of resources (operational teams, costs, time) is a necessity that presses on the agendas of the customers daily

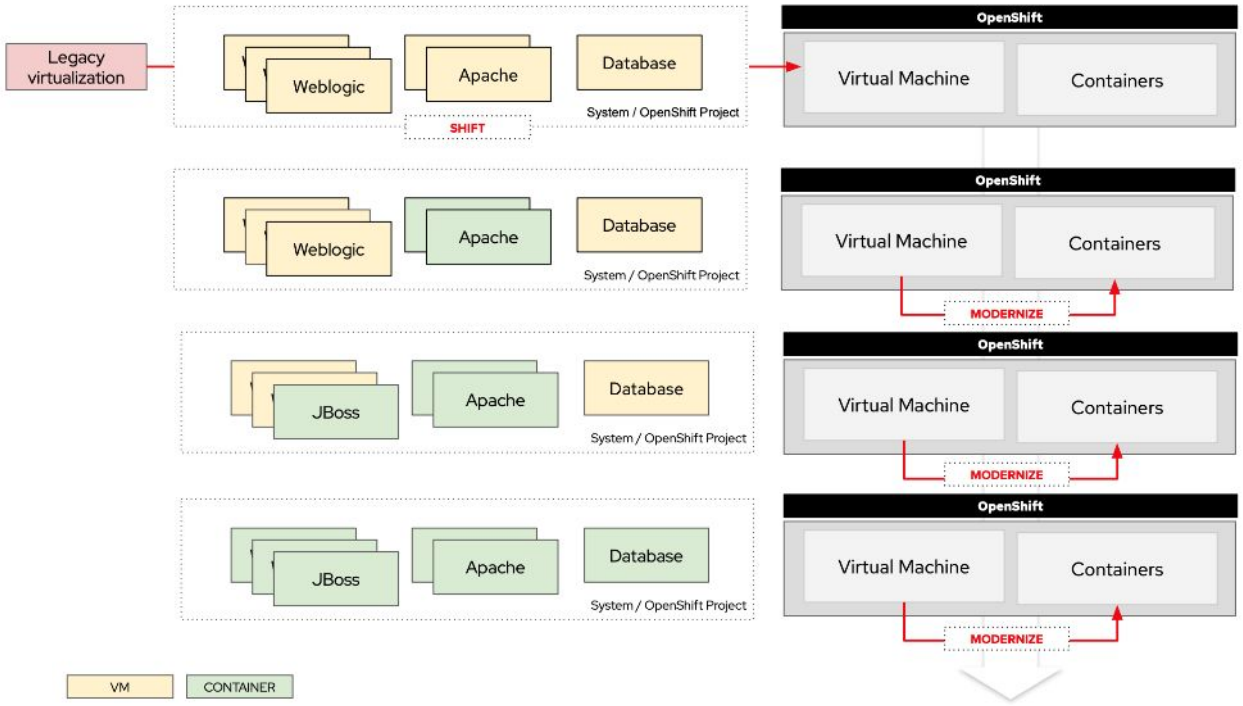
Customer Needs & Virtualization Evolution

From traditional virtualization to cloud native model

STEP-BY-STEP APPROACH

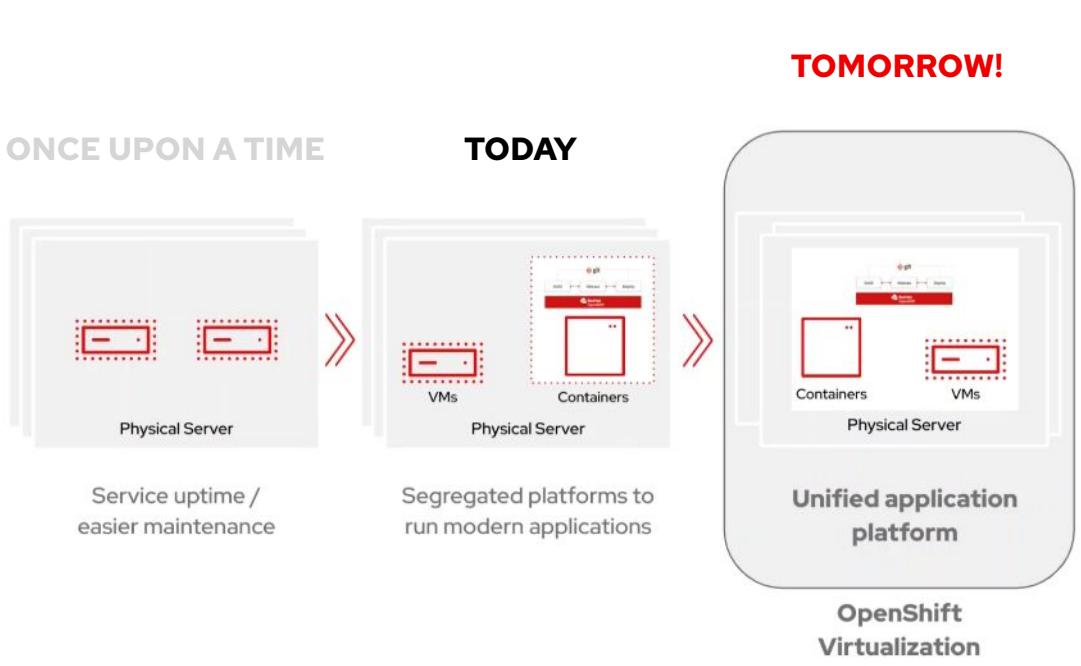
The modernisation of systems requires a non-disruptive process that can be carried out in a safe, continuous and even exploratory way:

- Turning off legacy virtualization
- Partially migrating services into the container ecosystem
- Completely turning off the dependencies from the virtualization devices (optional)



Customer Needs & Virtualization Evolution

From traditional virtualization to cloud native model



Virtual machines

VMs have been built for decades, and they will not go away overnight.

Containers

Containers solve certain use cases and will continue to rise, but some VMs will remain.

Applications

VMs and containers will be used to build applications, and some might even build on both.

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Openshift Virtualization Advantages

Dual vendor strategy

Reduce lockin from other virtualization vendors

Cost saving

Reduce operating costs

One team to operate

Dev /Test Environments

Simple self-service infrastructure

Boost new apps and legacy integration

Integrate New and legacy

Windows workloads lift and shift

Simplify the architecture

Same operations

Infrastructure as Code also for VMs

Edge

Branch Offices

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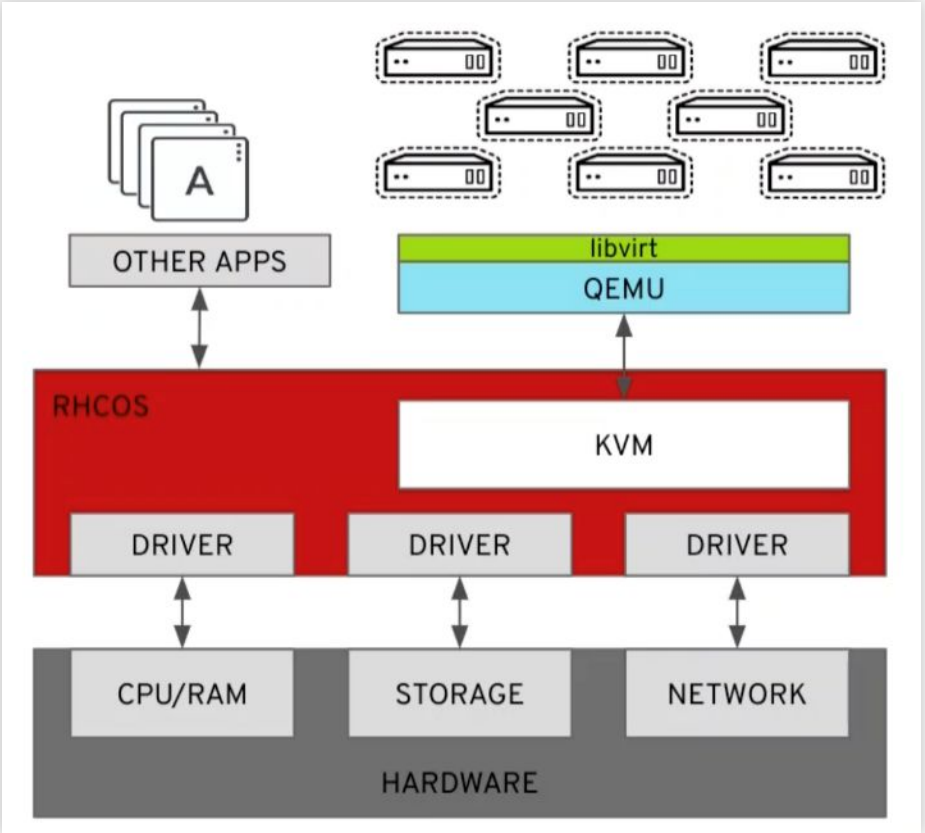
Openshift Virtualization Uses KVM

- OpenShift Virtualization uses **KVM**, the Linux kernel hypervisor
- KVM is a core component of the Red Hat Enterprise Linux kernel
- KVM has 10+ years of production use: Red Hat Virtualization, Red Hat OpenStack Platform, and RHEL all leverage KVM, QEMU, and libvirt
- QEMU uses KVM to execute virtual machines
- libvirt provides a management abstraction layer
- Available on Bare Metal and AWS
- Windows Server Virtualization Validation Program (**SVVP**) certification



Red Hat Openshift Virtualization

Openshift Virtualization is Powered by Kubervirt

« A virtualization API and runtime for Openshift, built on Kubevirt, to run and manage virtual machines using a Kubernetes-native way»

- **Virtual machines**
  - **Running in containers**, managed as **Pods**
  - Using the **KVM** hypervisor
- Scheduled, deployed, and managed by Kubernetes
- **Integrated** with container **orchestrator** resources and services
  - **Networking connectivity**
  - **Persistent storage**

Powered by KUBEVIRT

- Open Source, written in Go
- Initiated in 2016 by Red Hat
- Contributions by other companies e.g (v)GPU support by Nvidia
- CNCF sandbox project since 2019
- Provides an API for running KVM based virtual machines in Kubernetes
- Goal: run those VMs alongside with containerized workloads

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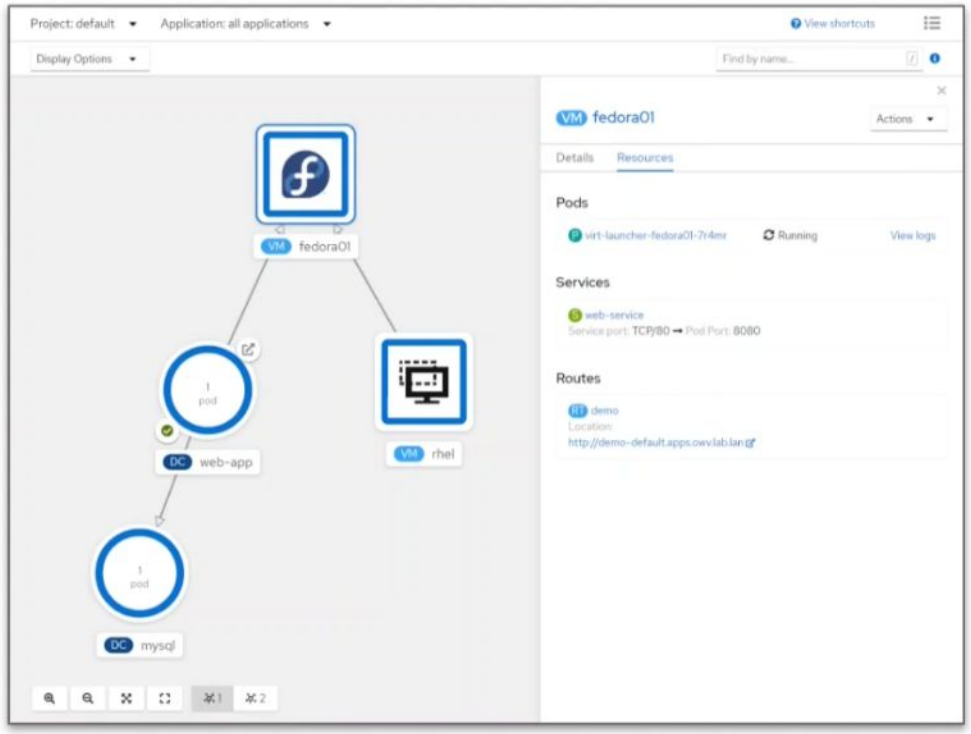
Using VMs and containers together

«You can continue to apply all best practices at all levels»

- Virtual Machines connected to pod networks are accessible using standard Kubernetes methods:
  - Service
  - Route
  - Pipelines
  - etc.
- Network policies apply to VM pods the same as application pods
- VM-to-pod, and vice-versa, communication happens over SDN or ingress depending on network connectivity



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Using VMs and containers together

Dedicated API

vm.yaml

```yaml
apiVersion: kubevirt.io/v1alpha3
kind: VirtualMachine
metadata:
  name: testvm
spec:
  running: false
  template:
    metadata:
      labels:
        team: Tiger
    spec:
      domain:
        devices:
          disks:
          - disk:
              bus: virtio
            name: rootfs
          interfaces:
          - name: default
        resources:
          requests:
            memory: 1GB
```

Declarative

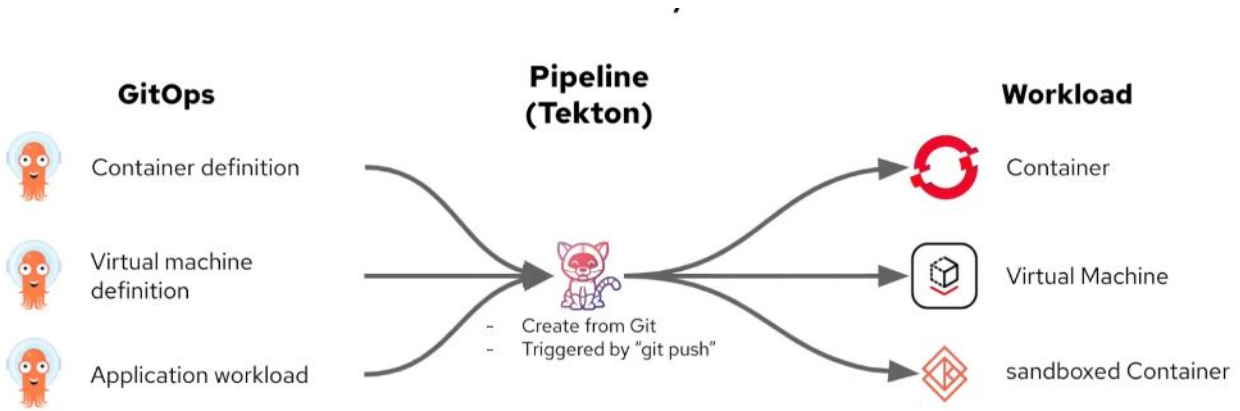
Like anything in Kubernetes, the KubeVirt API is declarative, and follows Kubernetes API conventions.

Domain-specific

VMs are inherently differently defined than containers. Reusing the pod API is not explicit enough for all the necessary details–and due to differences.

Divide and conquer

Due to the dedicated API, it is straightforward to add virtualization-specific functionality



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Migration Toolkit

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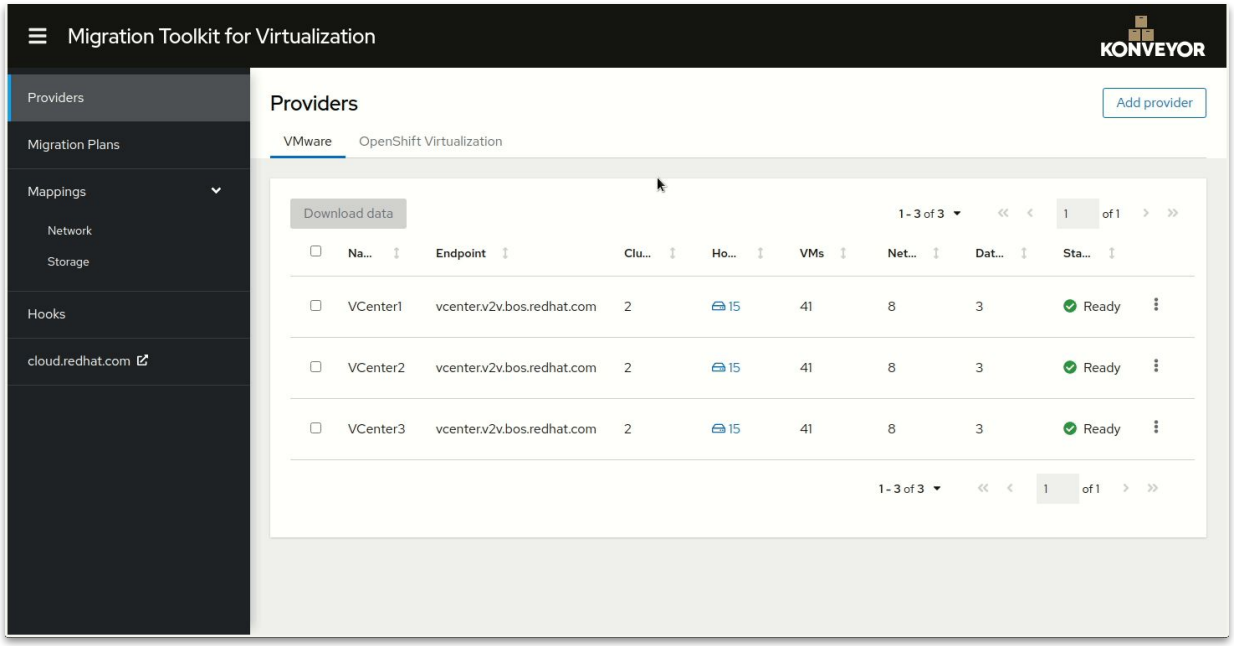
Using VMs and containers together

The Provider section allows you to **configure credentials for the source and destination clusters**.

You can add **multiple sources and destinations**, and the provider's general information can also be optionally uploaded to cloud.redhat.com for more information about your overall environment, helping you better plan for large-scale migration.



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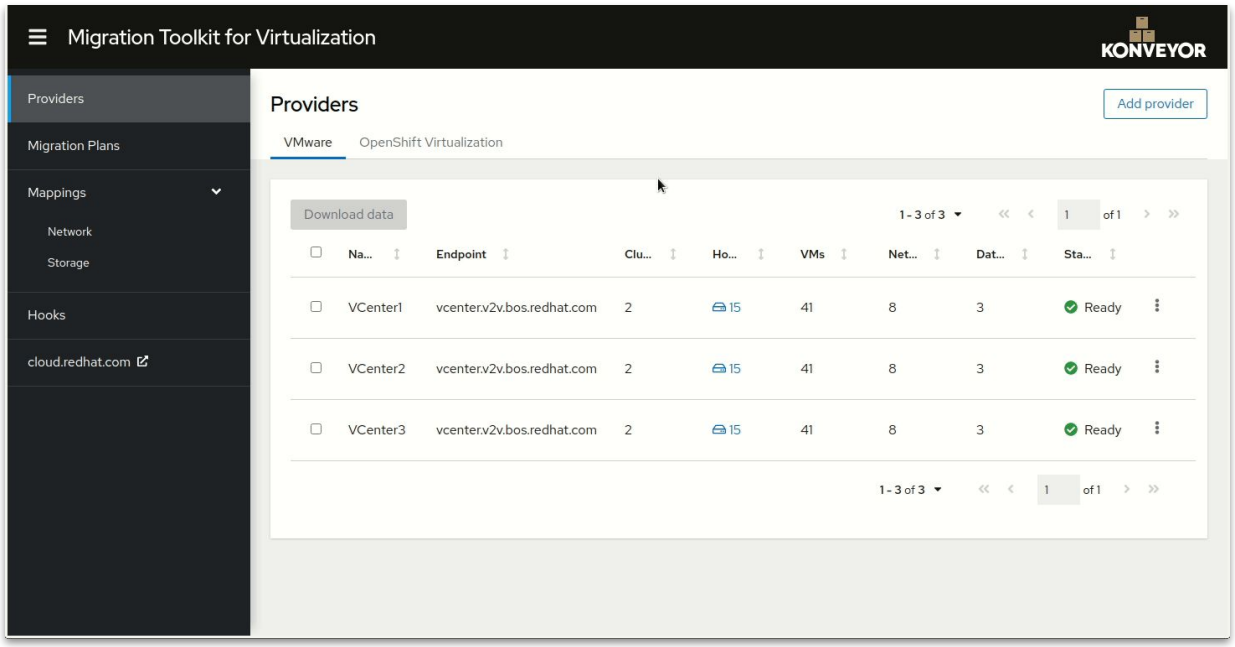
Guided infrastructure mapping allows you to configure the origin and destination of VMs from a network and storage perspective.

Through the Toolkit, you can save technical "resources" by only xthe technical behaviour (avoiding redundant engagements during the execution of migrations).



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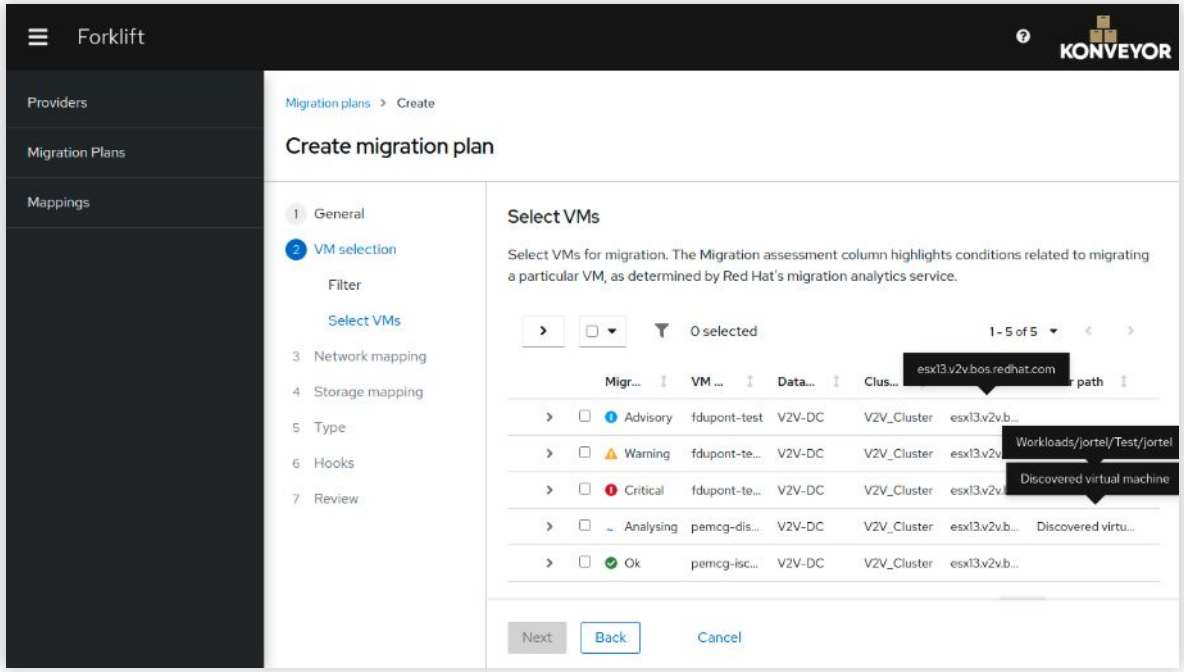
Using VMs and containers together

Thanks to the **migration analysis features** the Toolkit helps you find potential migration issues before you start.

When you select your virtual machines, you will automatically be informed of any potential known issues and provide information on how to take action (where possible).



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Thank you

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