

# Installing and Configuring **virt-manager** on CentOS 8

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# Install and Configure

## Virtual Machine Manager (**virt-manager**)

- Install **virt-manager** and associated packages.
- Validate the installation and **KVM** support.
- Take a quick tour of **virt-manager**.





In this  
lesson, we  
covered:



- Installation of **virt-manager** and associated packages
- Validating the installation and **KVM** support
- A quick tour of **virt-manager**



**Tom Dean**  
Linux Training Architect

# Creating a Virtual Machine Using `virt-manager`

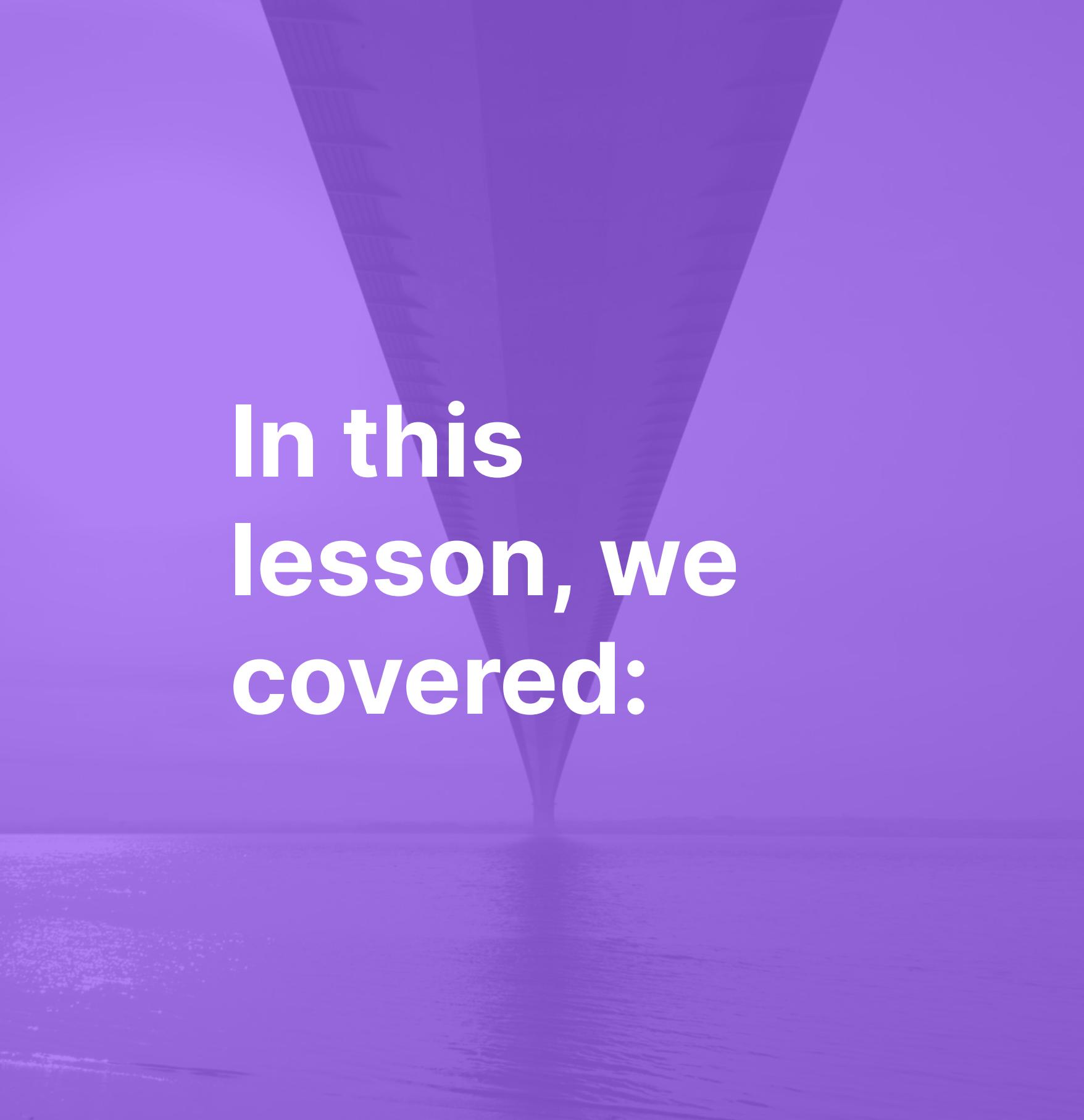
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# Creating a Virtual Machine

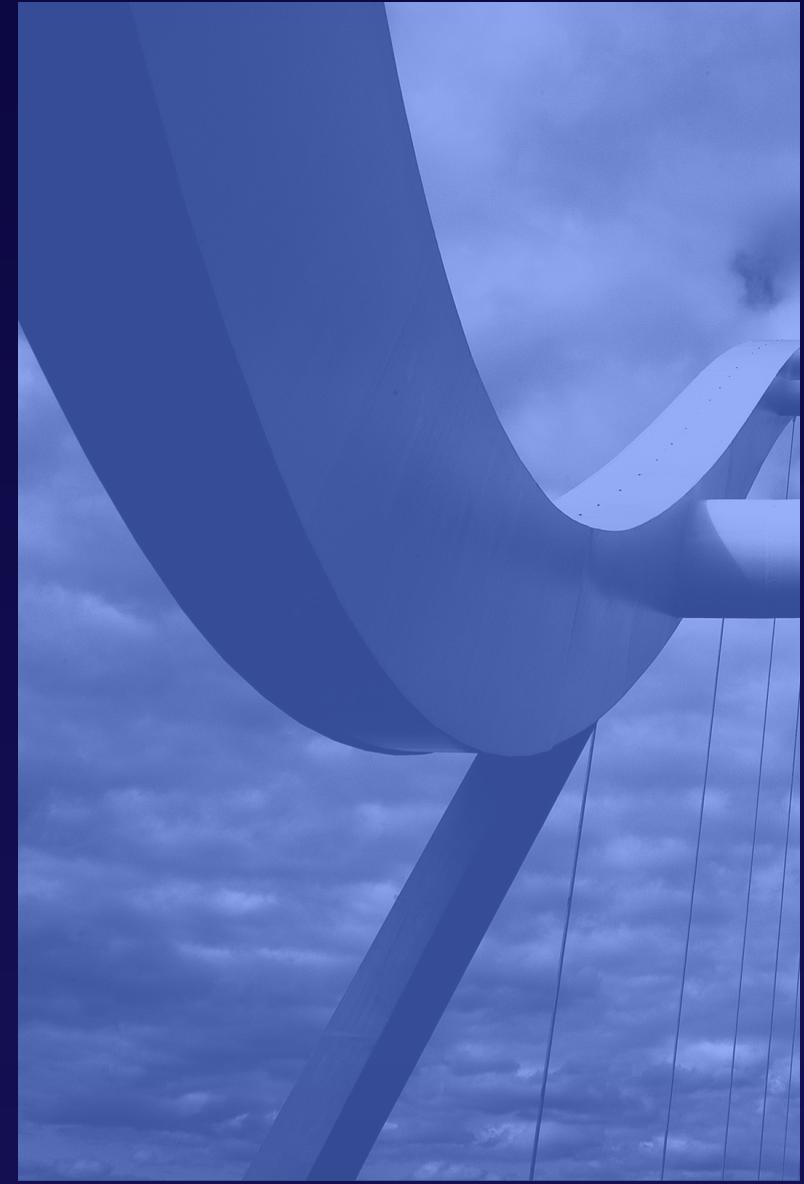
## Virtual Machine Manager (**virt-manager**)

- Use **virt-manager** to create a new guest VM.
- Perform a **minimal** installation of **CentOS 8**.





In this  
lesson, we  
covered:



- Using **virt-manager** to create a new guest VM
- A **minimal** installation of **CentOS 8**



**Tom Dean**  
Linux Training Architect

# Managing a Virtual Machine Using `virt-manager`

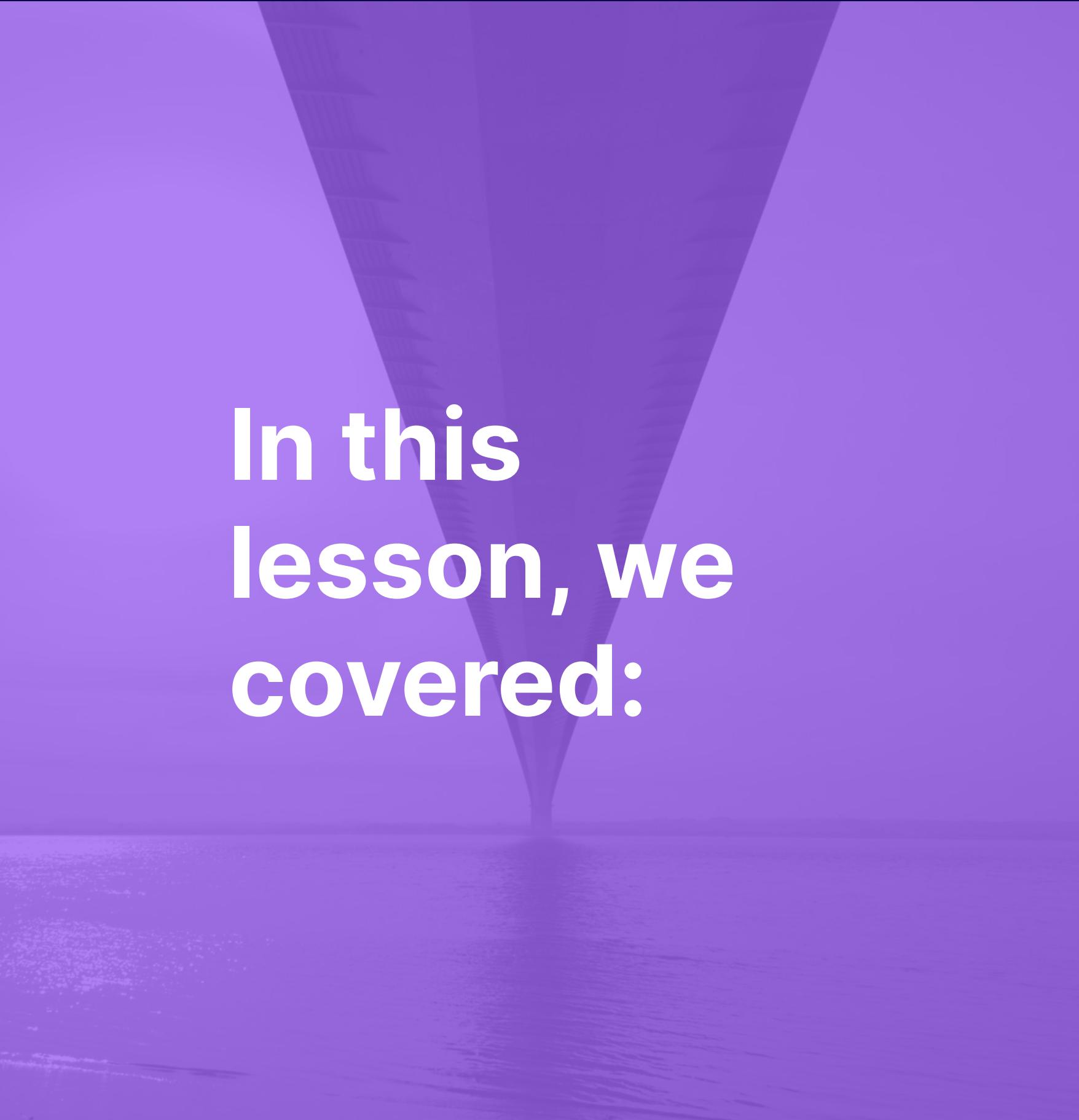
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# Managing a Virtual Machine

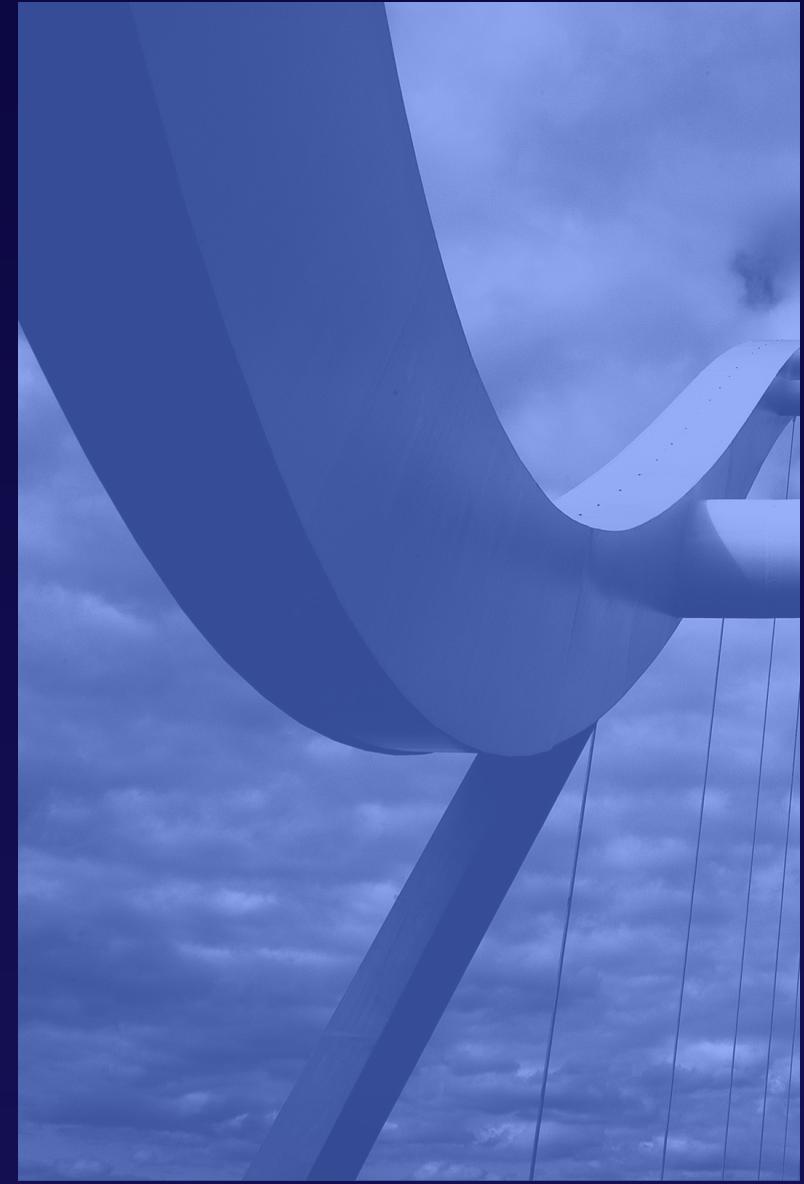
## Virtual Machine Manager (**virt-manager**)

- Use **virt-manager** to **change the state** of a guest VM.
- **Clone** a virtual machine with **virt-manager**.
- **Manage VM snapshots** with **virt-manager**.
- **Modify virtual hardware settings** with **virt-manager**.





In this  
lesson, we  
covered:



- Using **virt-manager** to **change the state** of a guest VM.
- **Cloning** a virtual machine with **virt-manager**.
- **Managing VM snapshots** with **virt-manager**.
- **Modifying virtual hardware settings** with **virt-manager**.



**Tom Dean**  
Linux Training Architect

# Managing Networking Using **virt-manager**

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# Managing Networking

## Virtual Machine Manager (**virt-manager**)

- Use **virt-manager** to add a **virtual network interface**.
- Create a new **virtual network** with **virt-manager**.
- Connect the **VM** to the new **virtual network**.





In this  
lesson, we  
covered:



- Using **virt-manager** to add a **virtual network interface**
- Creating a new **virtual network** with **virt-manager**
- Connecting the **VM** to the new **virtual network**



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Linux Training Architect

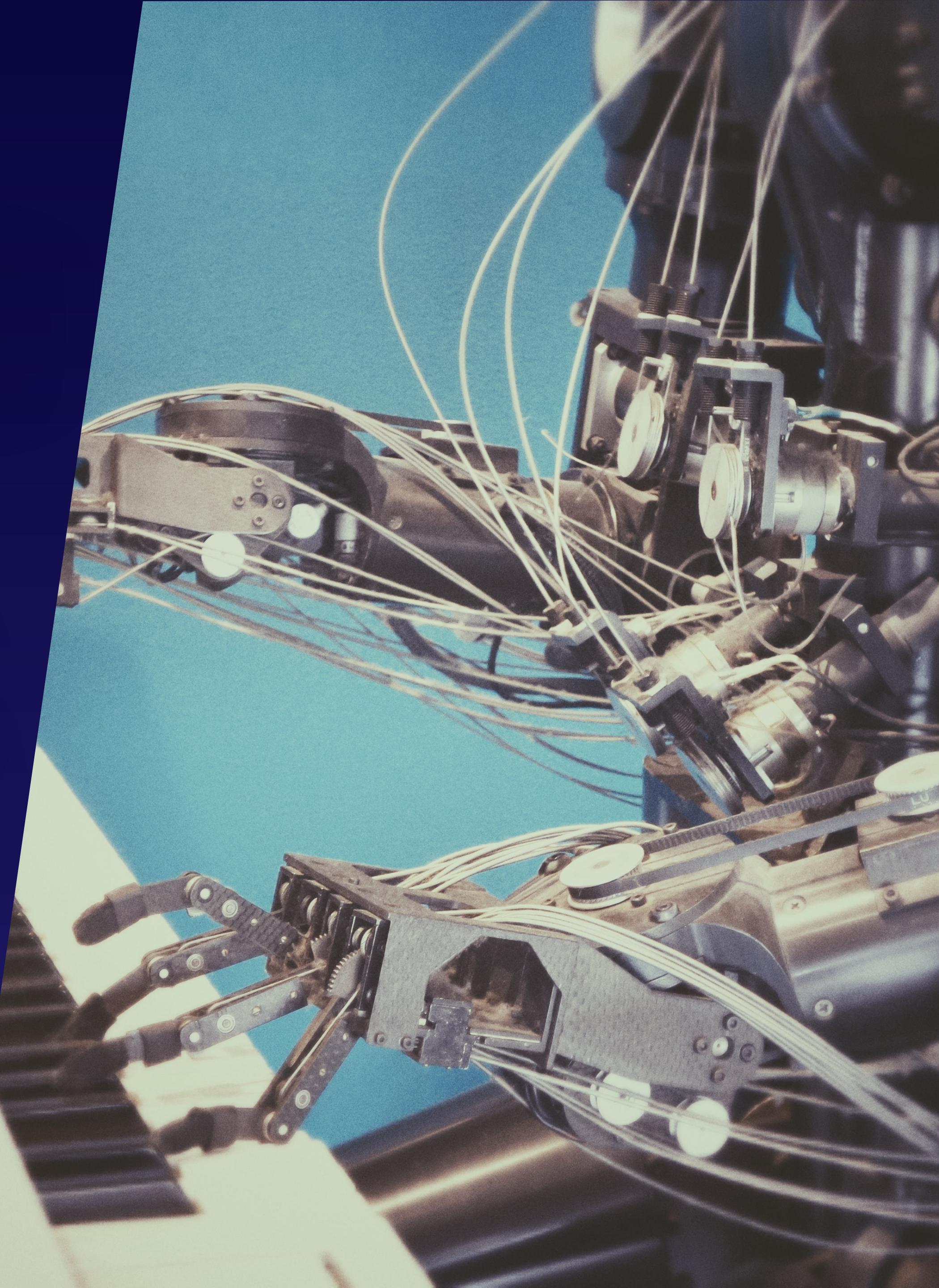
# Managing Storage Using **virt-manager**

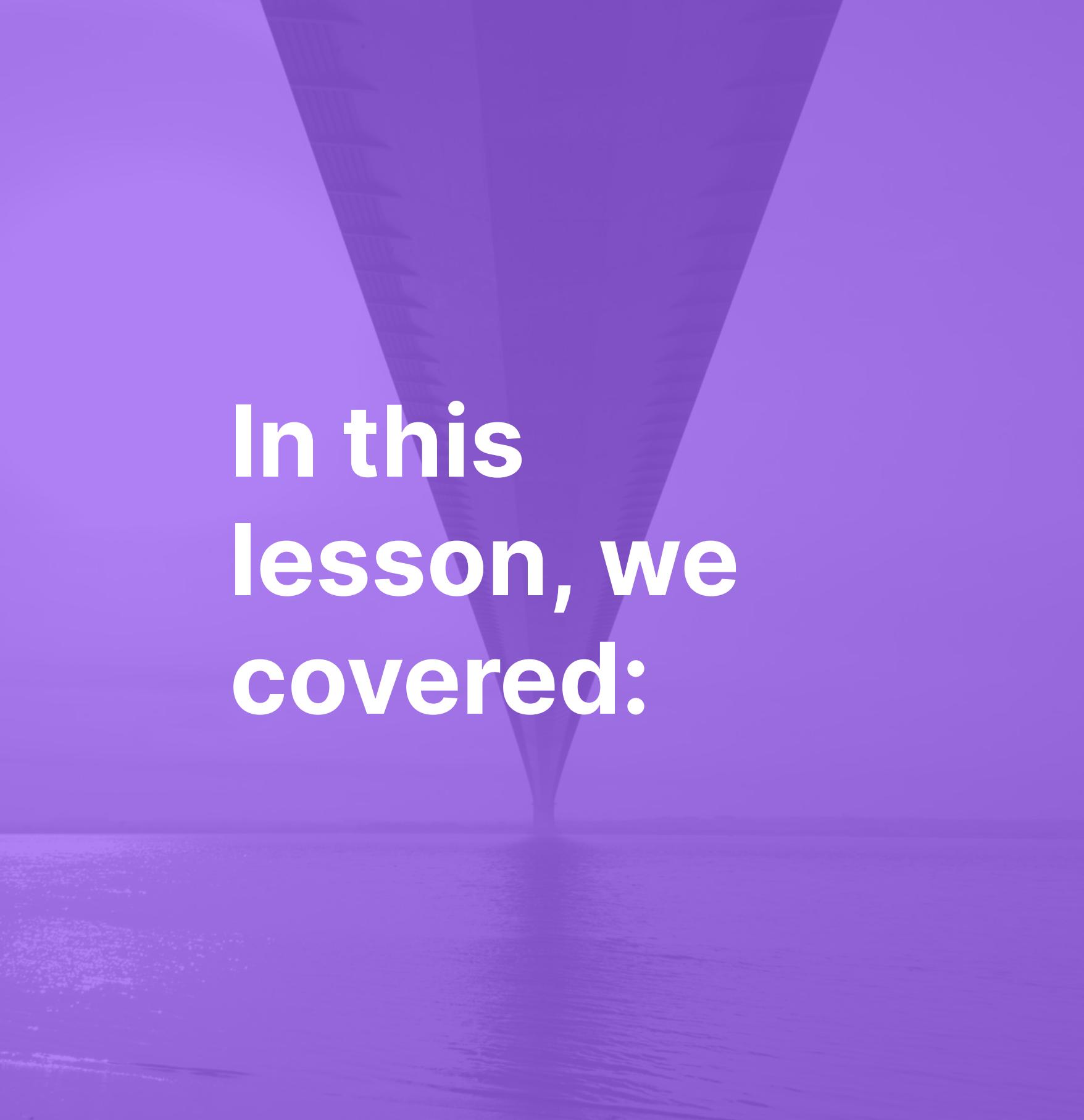
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# Managing Storage

## Virtual Machine Manager (**virt-manager**)

- Use **virt-manager** to add a **virtual disk**.
- Configure the new **virtual disk** using **LVM**.
- Format and mount the new **logical volume**.
- Connect an **ISO** file to the **virtual media drive** and mount it.





In this  
lesson, we  
covered:



- Using **virt-manager** to add a **virtual disk**
- Configuring the new **virtual disk** using **LVM**
- Formatting and mounting the new **logical volume**
- Connecting an **ISO** file to the **virtual media drive** and mounting it



**Tom Dean**  
Linux Training Architect

# Introduction to Cockpit/Web Console

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# What Is Cockpit/Web Console?

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# Cockpit/Web Console

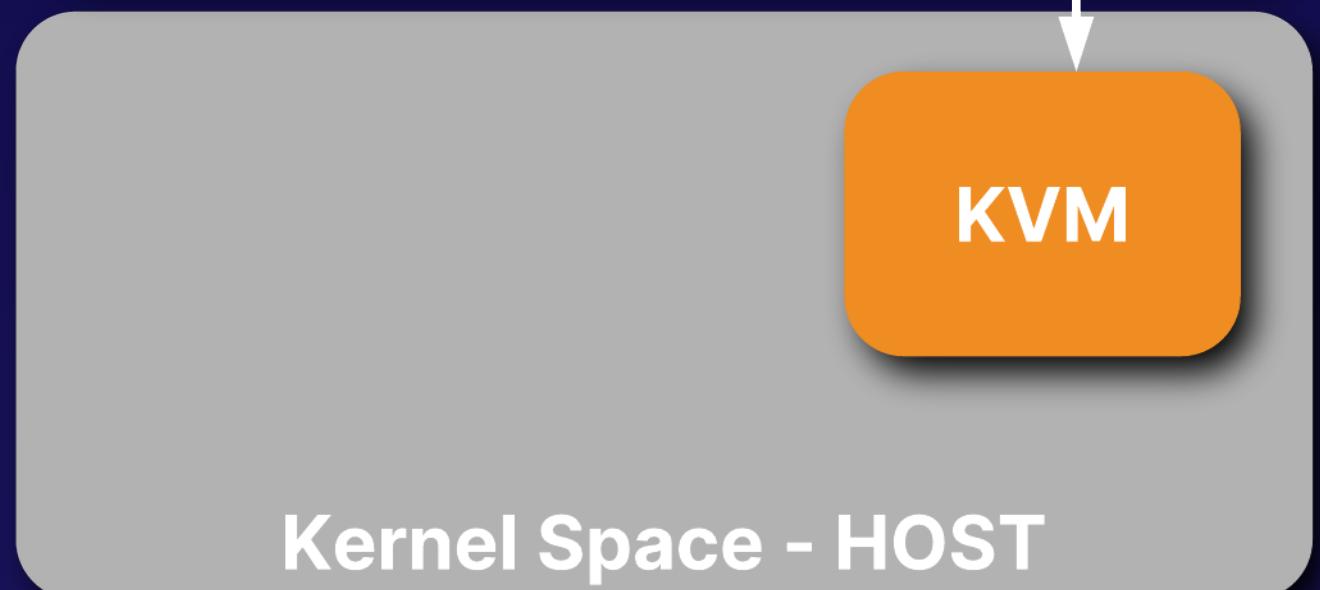
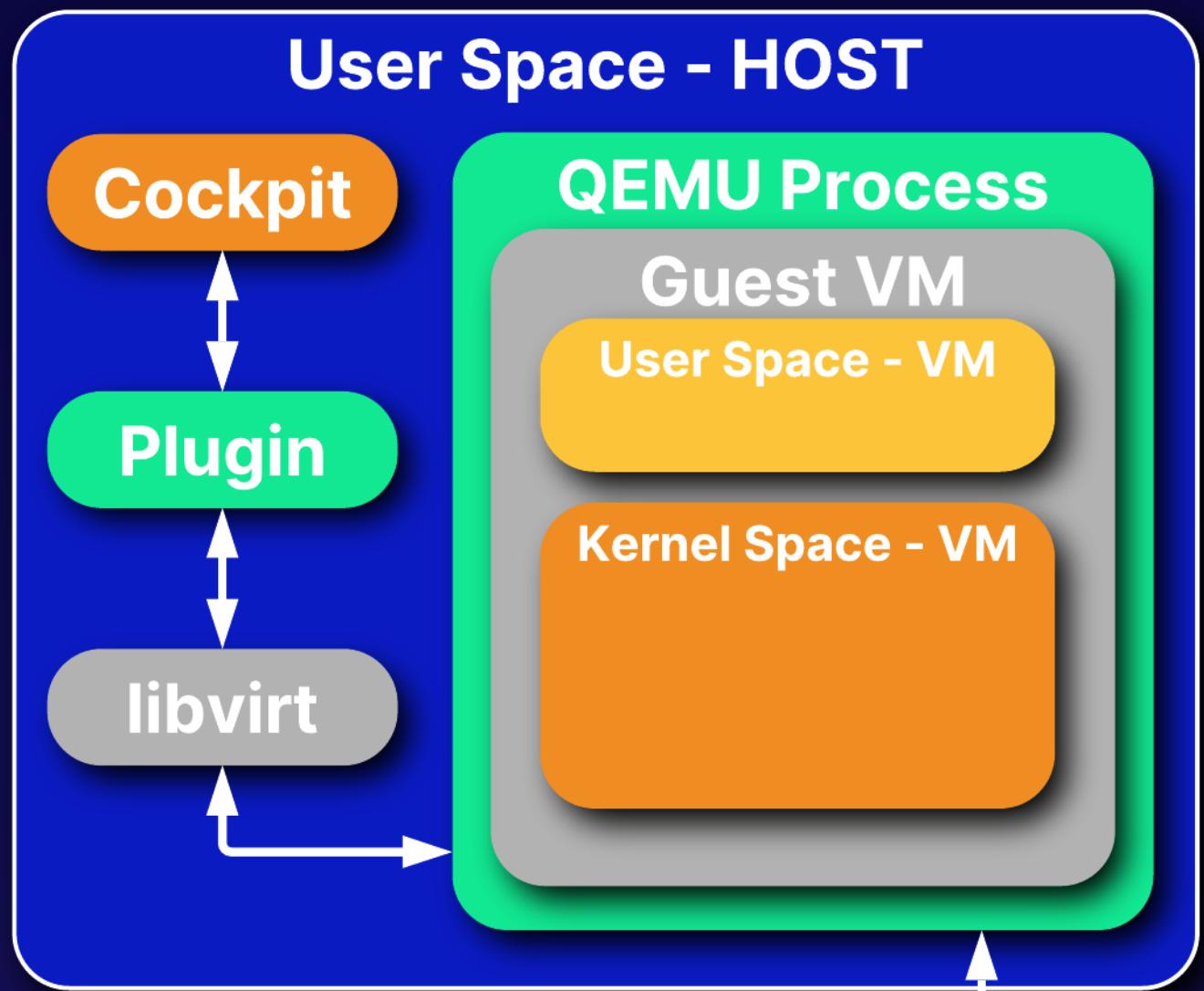
From the **Cockpit Project** website:

“The easy-to-use, integrated, glanceable,

and open **web-based** interface for your

servers.”

**Cockpit and Web Console are the same thing. Cockpit is the upstream project that feeds Web Console in the RHEL offering.**



If Linux  
virtualization  
were a  
Corvette...



**Cockpit** would be  
the handy  
smartphone app  
that lets you unlock  
your doors when  
your keys are  
locked inside.



# Cockpit Functionality

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# Functionality

# Cockpit/Web Console can:

- Create, edit, start, and stop guest VMs
  - Provide console access for guest VMs
  - Provide basic operating metrics for guest VMs
  - Display the current status of guest VMs
  - Provide a choice of hypervisors
    - SSH connection/keys
    - Manual configuration
  - Support LXC containers
    - CentOS 7, not 8 yet



# How Does It Work?

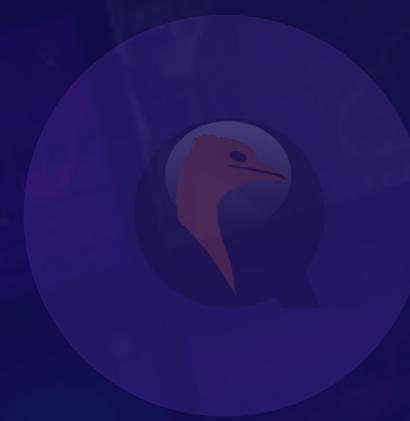
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# KVM/QEMU/libvirt



## KVM

Provides acceleration through access to hardware virtualization extensions



## QEMU

Type-2 hypervisor that utilizes KVM for type-1 hypervisor acceleration



## libvirt

Toolkit to manage virtualization platforms, like QEMU/KVM

# KVM/QEMU/libvirt



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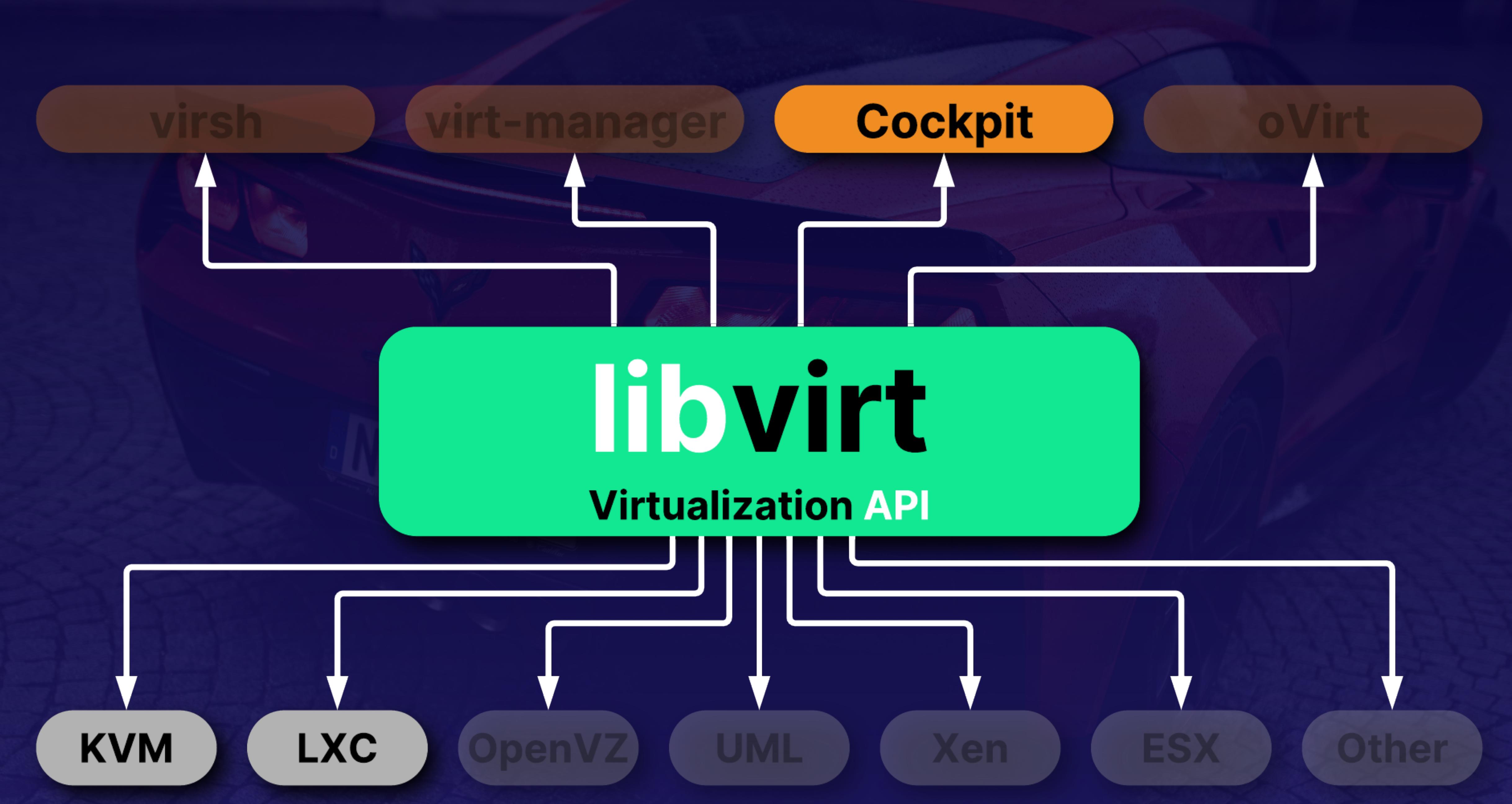
## QEMU

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## libvirt

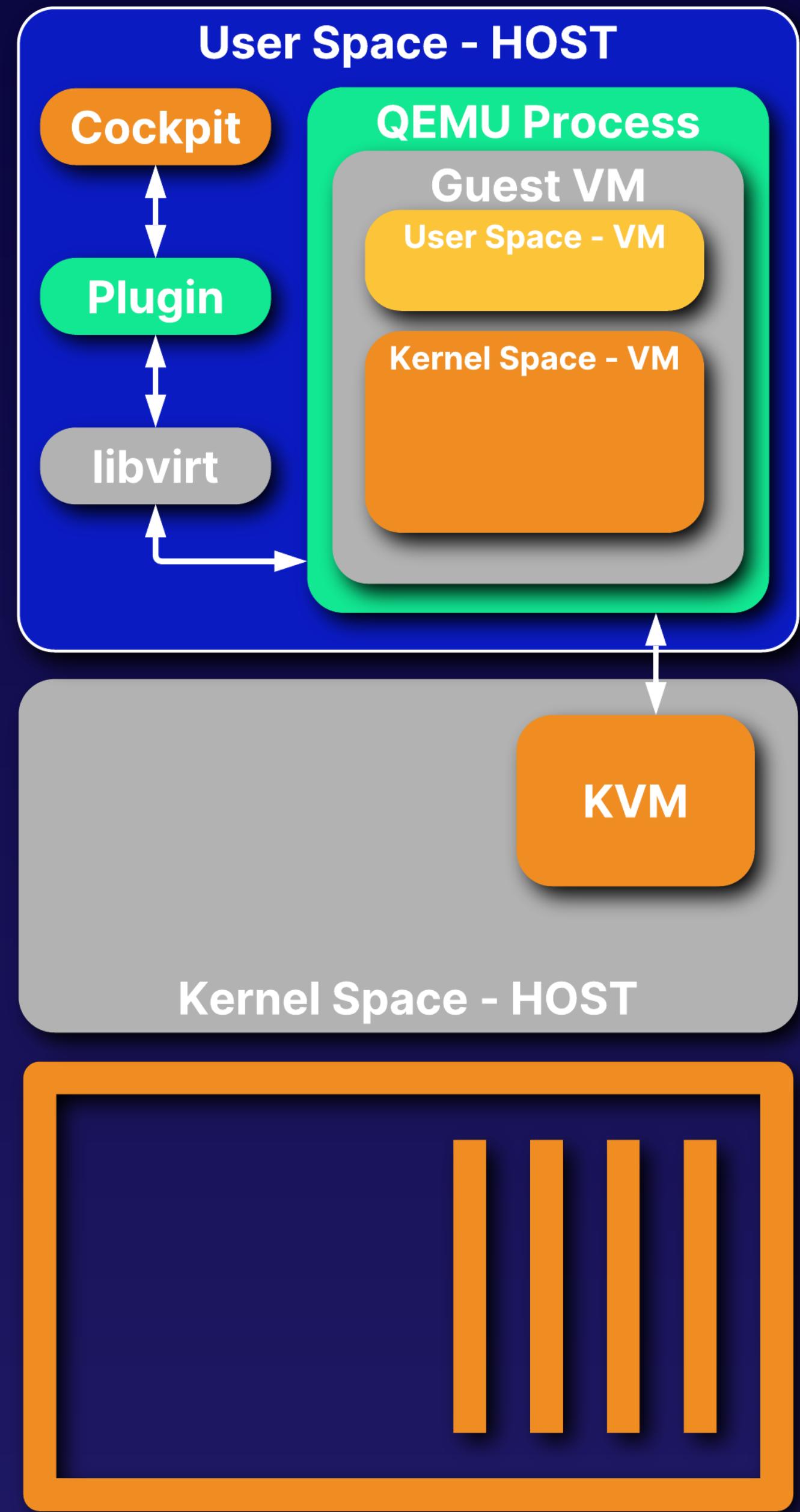
Toolkit to manage virtualization platforms, like QEMU/KVM



# Cockpit/Web Console

How does **Cockpit** work?

**Cockpit** runs in user space and leverages a **plugin** to use **libvirt** to access the underlying **hypervisor**. Because of this, **Cockpit** doesn't have to know how to “**talk to**” the **hypervisor** — it only has to communicate with **libvirt** via the **libvirtd** service.

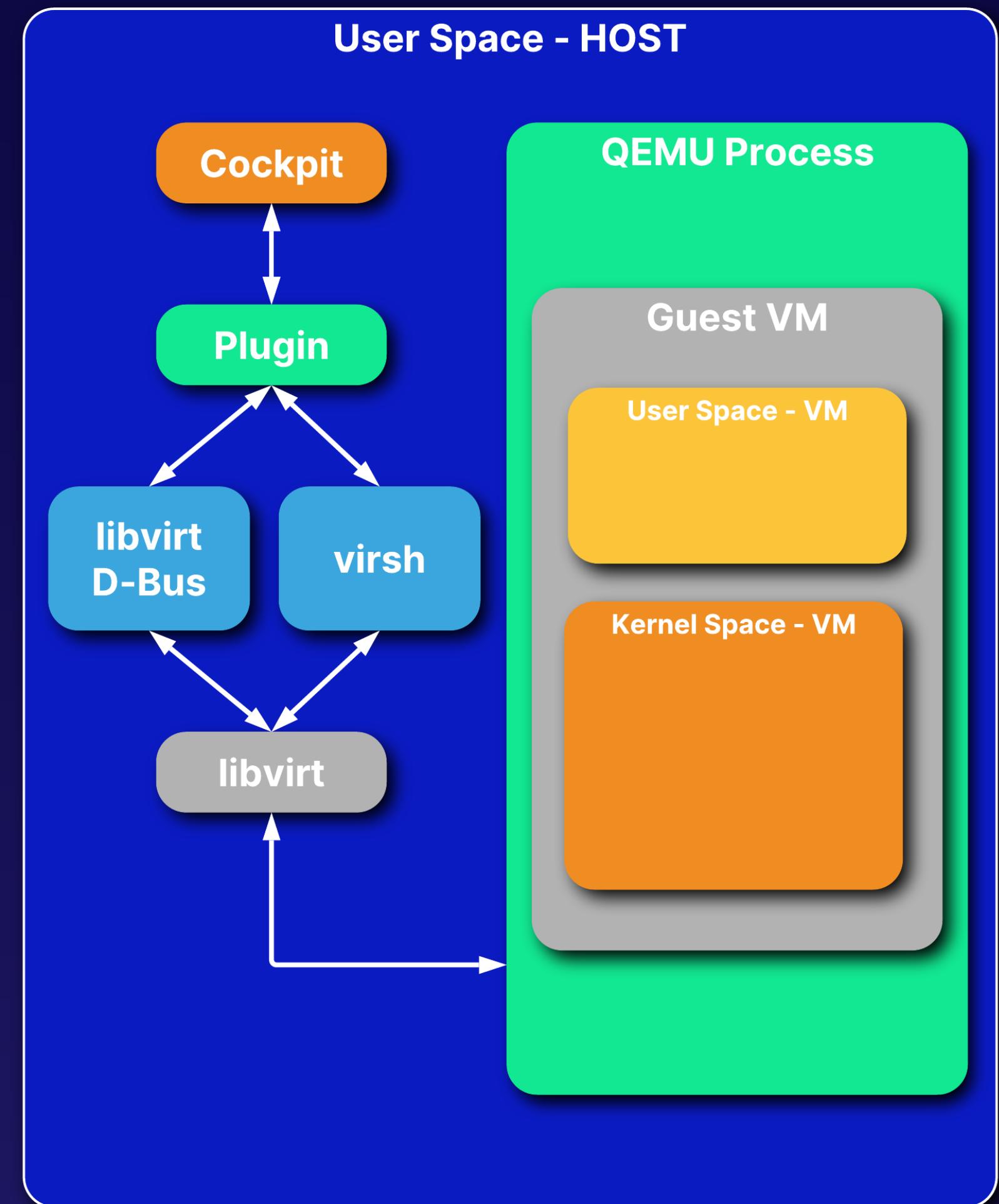


# Cockpit/Web Console

**How does Cockpit plugin work?**

“Access to **Libvirt** is wrapped either by the **virsh** tool or **libvirt D-Bus API** bindings, depending if the latter is installed on the system.”

— Cockpit Project



# Cockpit/Web Console

**How do you access Cockpit?**

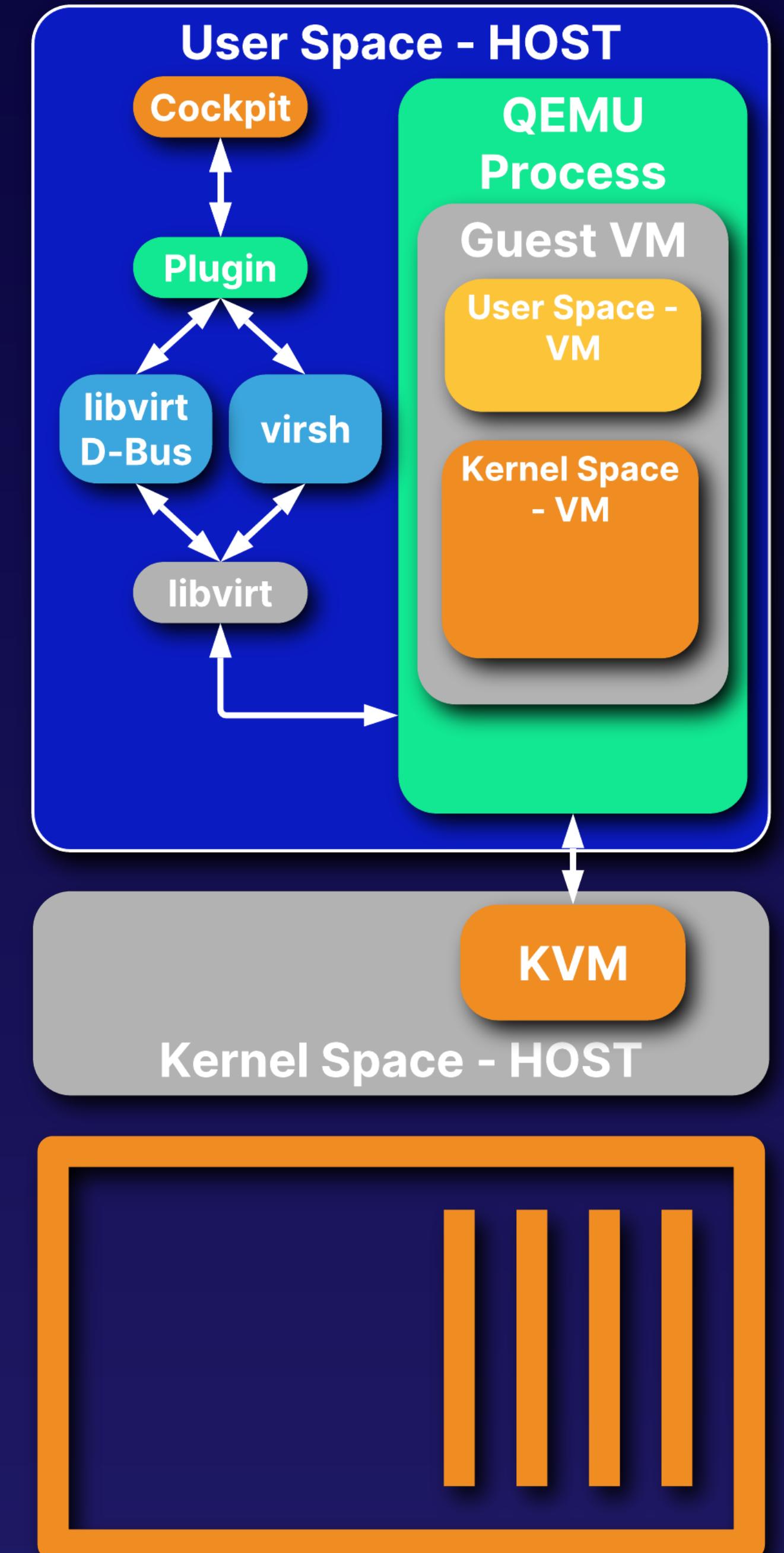
**Cockpit** can be accessed via **web browser**

on port **9090** on the host machine.

Recommended browsers include **Mozilla**

**Firefox**, **Google Chrome**, and **Microsoft**

**Edge**.



# Linux Distribution Support

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## The **Cockpit** package is available for:

- Fedora
- RHEL
  - Web Console
- CoreOS
- Atomic
- CentOS
- Debian
- Ubuntu
- Clear Linux
- Arch Linux



In this  
lesson, we  
covered:



- What **Cockpit/Web Console** are
- The functionality of **Cockpit**
- How **Cockpit** works
- Linux distribution support for **Cockpit**



**Tom Dean**  
Linux Training Architect

# Installing and Configuring Cockpit on CentOS 8

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# Install and Configure

## Cockpit/Web Console

- Install **cockpit**, **cockpit-machines**, and associated packages.
- Connect to the **Cockpit** web interface.
- Take a quick tour of **Cockpit**.





In this  
lesson, we  
covered:



- Installing **cockpit**, **cockpit-machines**, and associated packages
- Connecting to the **Cockpit** web interface
- A quick tour of **Cockpit**



**Tom Dean**  
Linux Training Architect

# Creating a Virtual Machine Using Cockpit

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# Create a Virtual Machine

## Cockpit/Web Console

- Log in to **Cockpit**
- Add the **Virtual\_Machines** directory to the **storage pools**
- Create a new **virtual machine**
- Install **CentOS 8** “Minimal”
- **Patch** the new VM





# In this lesson, we covered:



- Logging in to **Cockpit**
- Adding the **Virtual\_Machines** directory to the **storage pools**
- Creating a **new virtual machine**
- Installing **CentOS 8** “Minimal”
- Patching the new VM



**Tom Dean**  
Linux Training Architect

# Managing Virtual Machines Using Cockpit

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# Manage Virtual Machines

## Cockpit/Web Console

- Add **CPU cores/memory** to the virtual machine
- Add a **disk** to the virtual machine





In this  
lesson, we  
covered:



- Adding **CPU cores/memory** to the virtual machine
- Adding a **disk** to the virtual machine



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Linux Training Architect

# Introduction to Linux CLI Utilities

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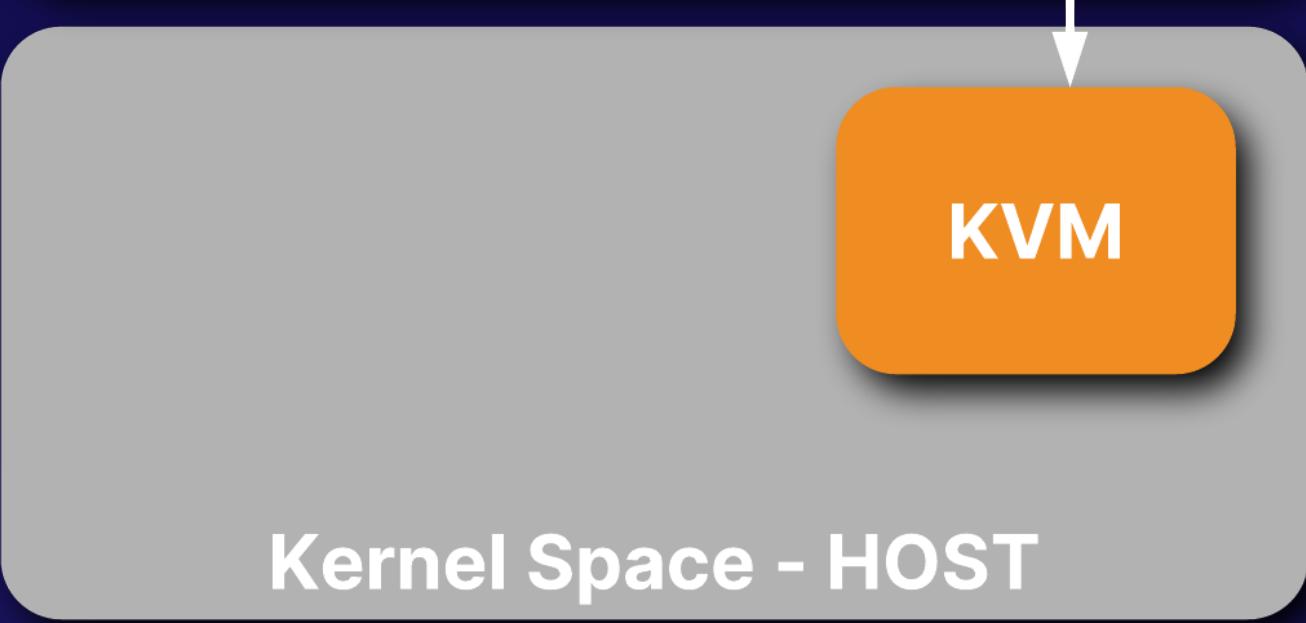
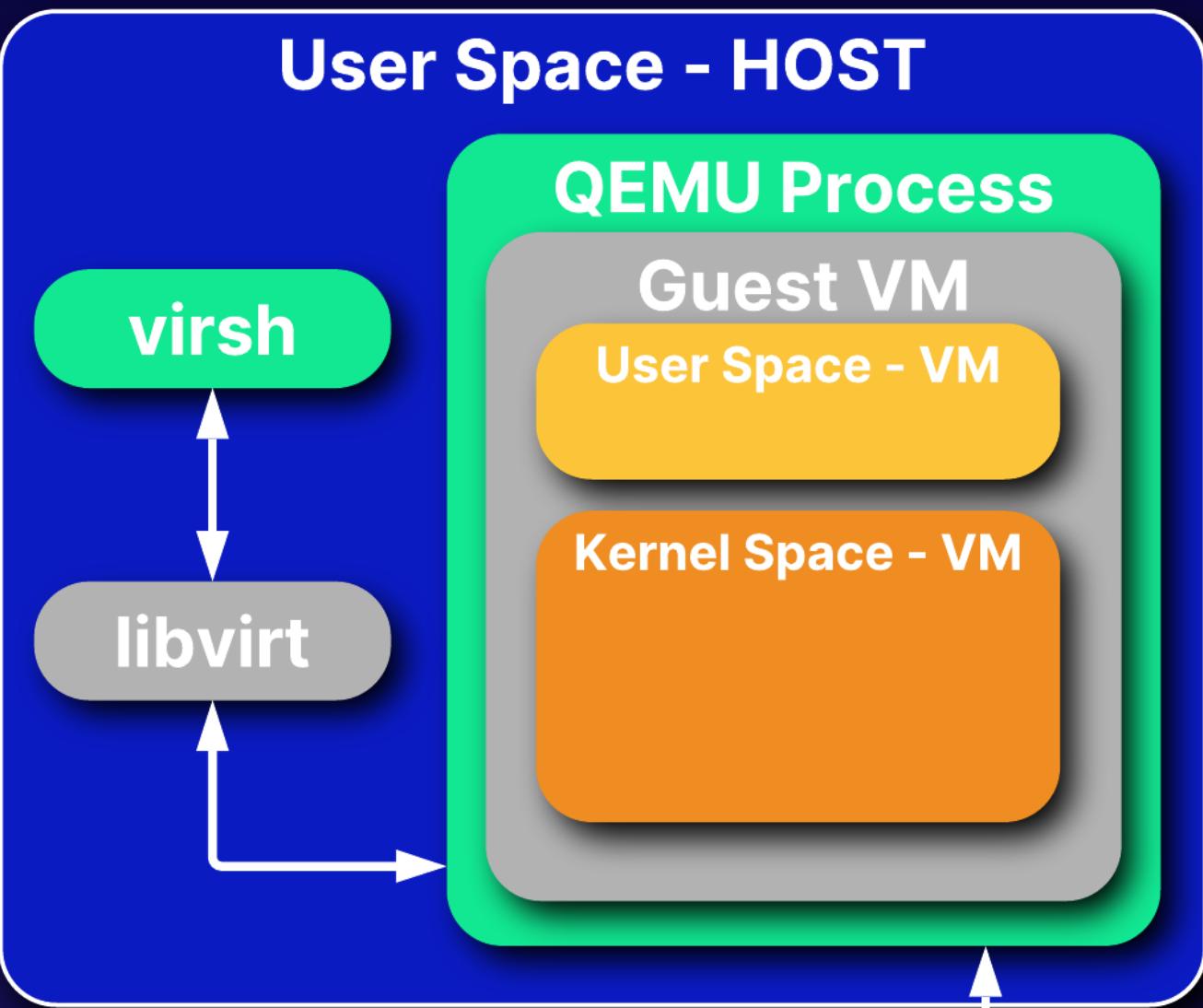
# virsh

From the **libvirt** website:

“The **virsh** program is the **main interface** for managing **virsh** guest

*domains.*”

virsh is installed when you install the libvirt package



If Linux  
virtualization  
were a  
Corvette...



**virsh** would be the  
ultimate set of  
tools that can fix it  
all.



# **virsh** Functionality

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# Functionality

**virsh can:**

- Create, edit, start, and stop guest VMs
- Provide console access for guest VMs
- Provide basic operating metrics for guest VMs
- Display the current status of guest VMs
- Manage virtual networks
- Manage virtual storage
- And more



# Functionality

Additional **CLI** utilities:

- **virt-install**
- **virt-sysprep**
- **virt-clone**
- **virt-v2v**



# Functionality

## Why use **CLI** utilities?

- More control than other methods
- Enable scripting/automation
- No **GUI/web browser** required:
  - Less overhead
  - Easier to access the CLI
- Many management utilities leverage **virsh**:
  - Easier to troubleshoot issues



# How Does It Work?

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# KVM/QEMU/libvirt



## KVM

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## QEMU

Type-2 hypervisor that utilizes KVM for type-1 hypervisor acceleration



## libvirt

Toolkit to manage virtualization platforms, like QEMU/KVM

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## libvirt

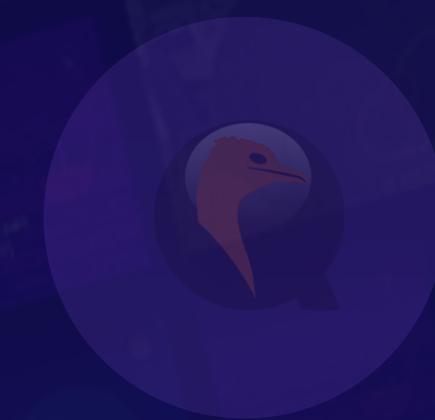
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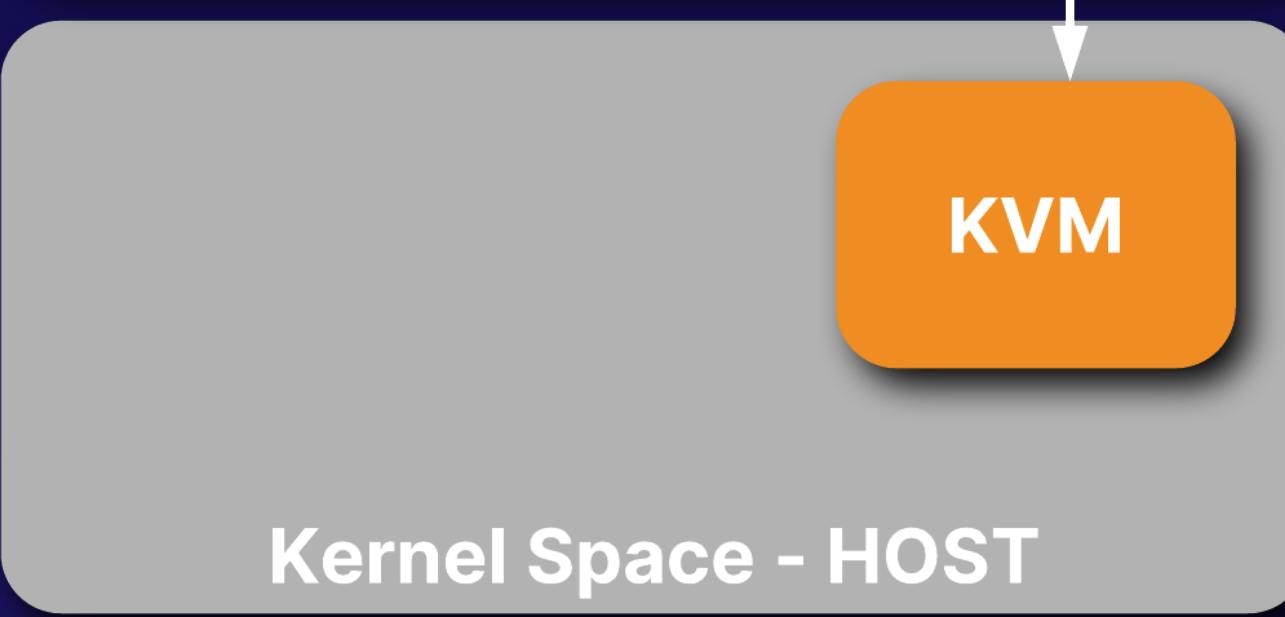
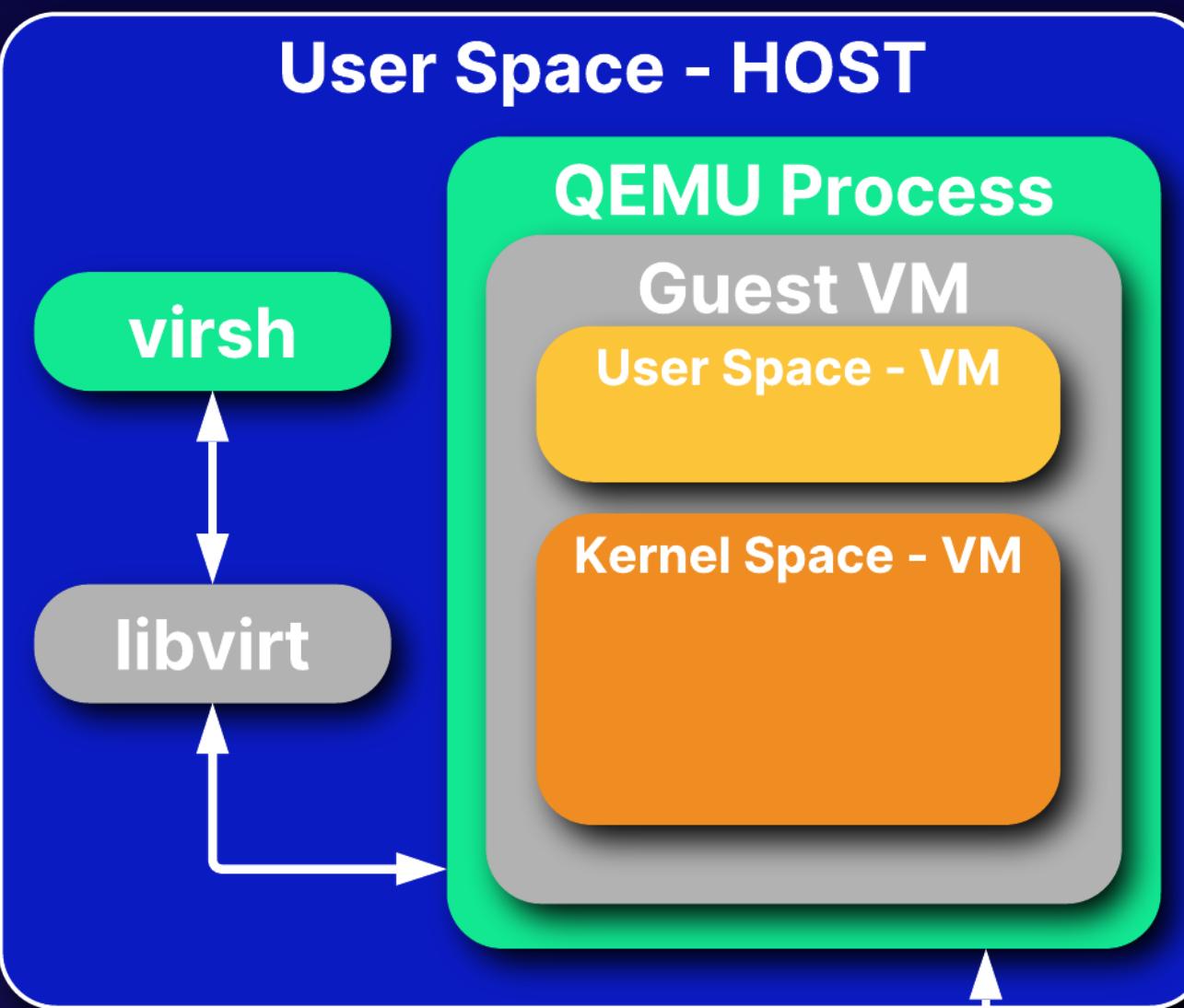
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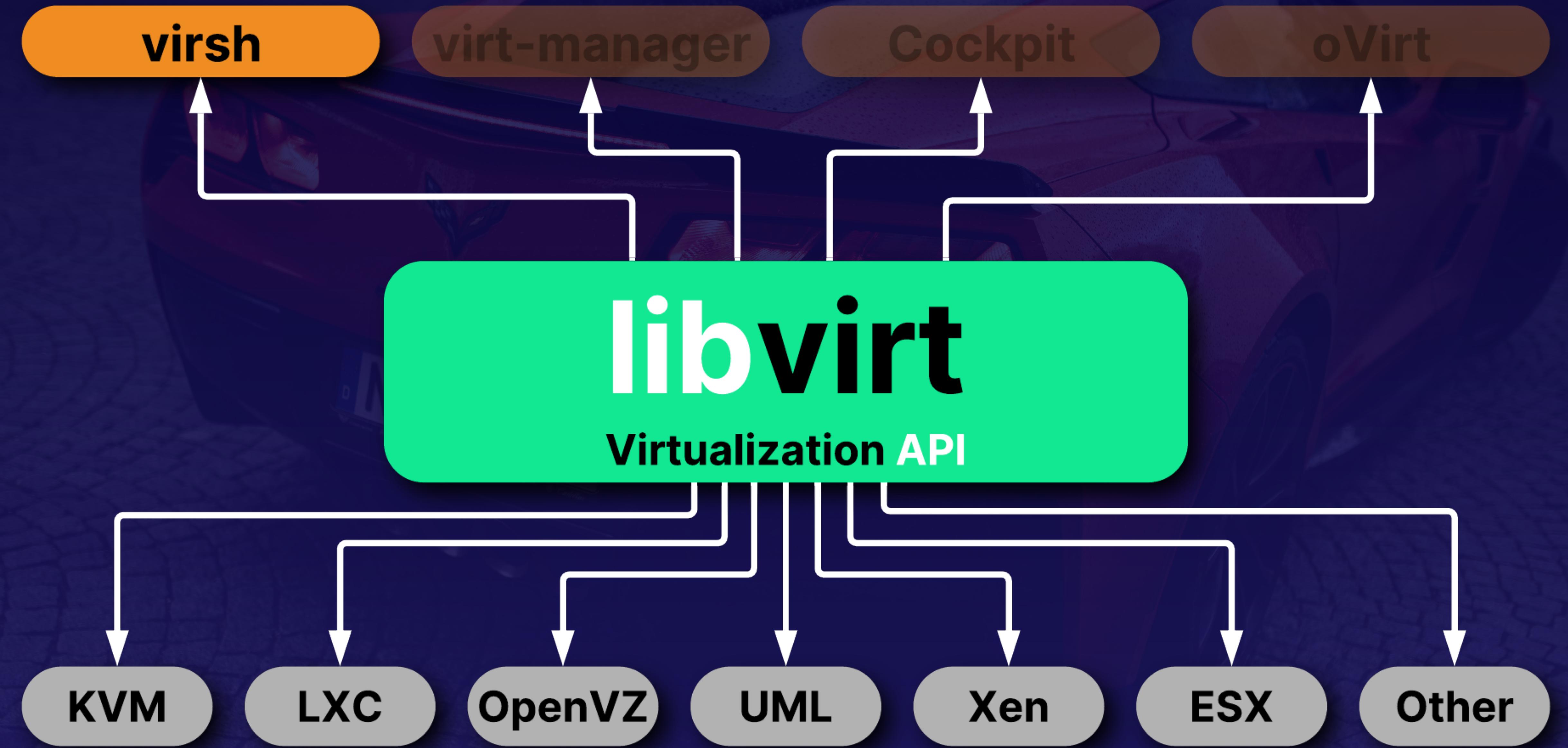
# virsh

## How does **virsh** work?

**virsh** runs in user space and leverages **libvirt** to access the underlying **hypervisor**.

Because of this, **virsh** doesn't have to know how to “**talk to**” the **hypervisor** — it only has to communicate with **libvirt** via the **libvirtd** service.



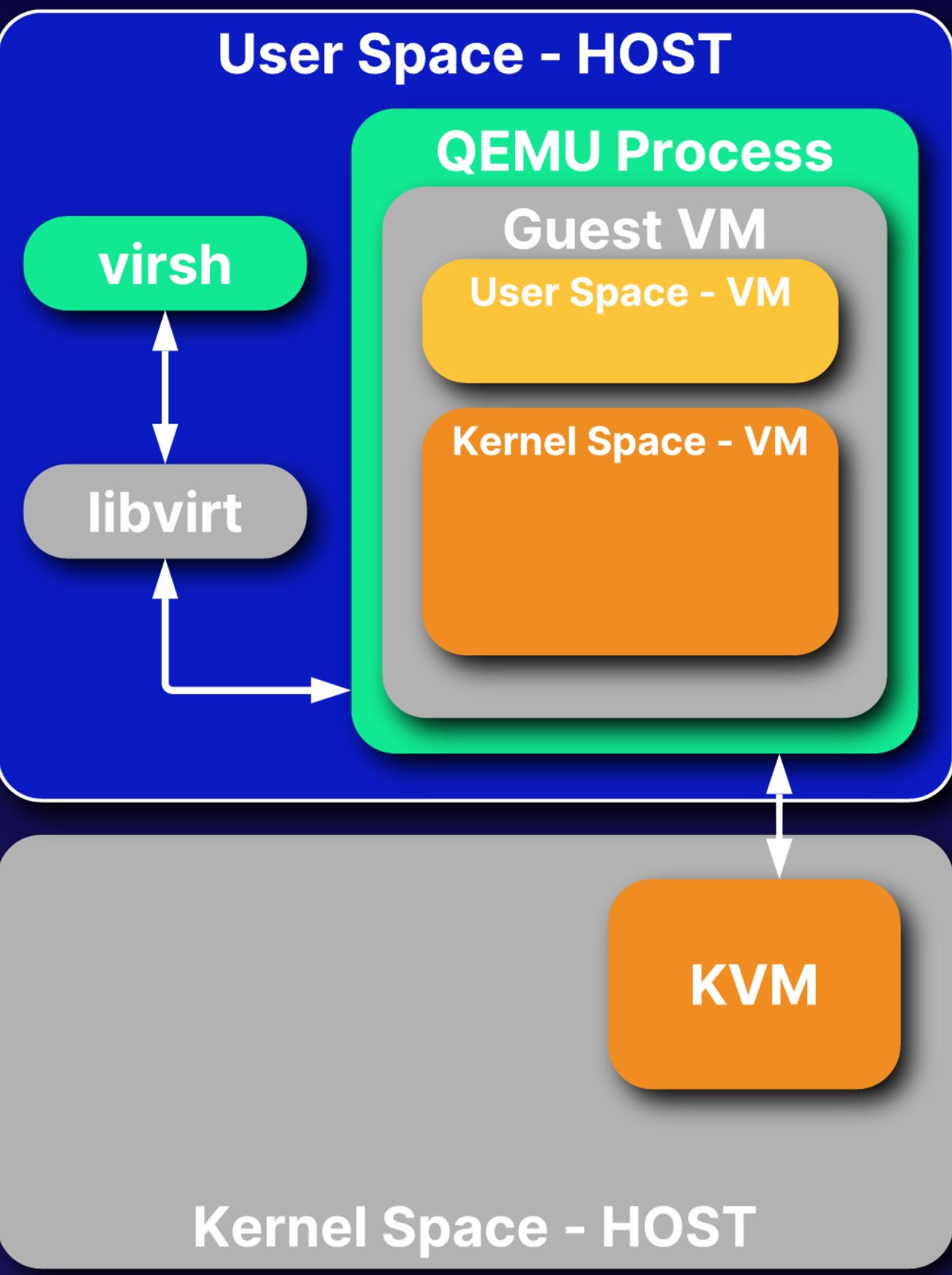


# virsh

## Interacting with virsh

You can use **virsh** in one of *two ways*:

- From the **Linux shell**
- As its own **interactive shell**:
  - The **virsh shell**

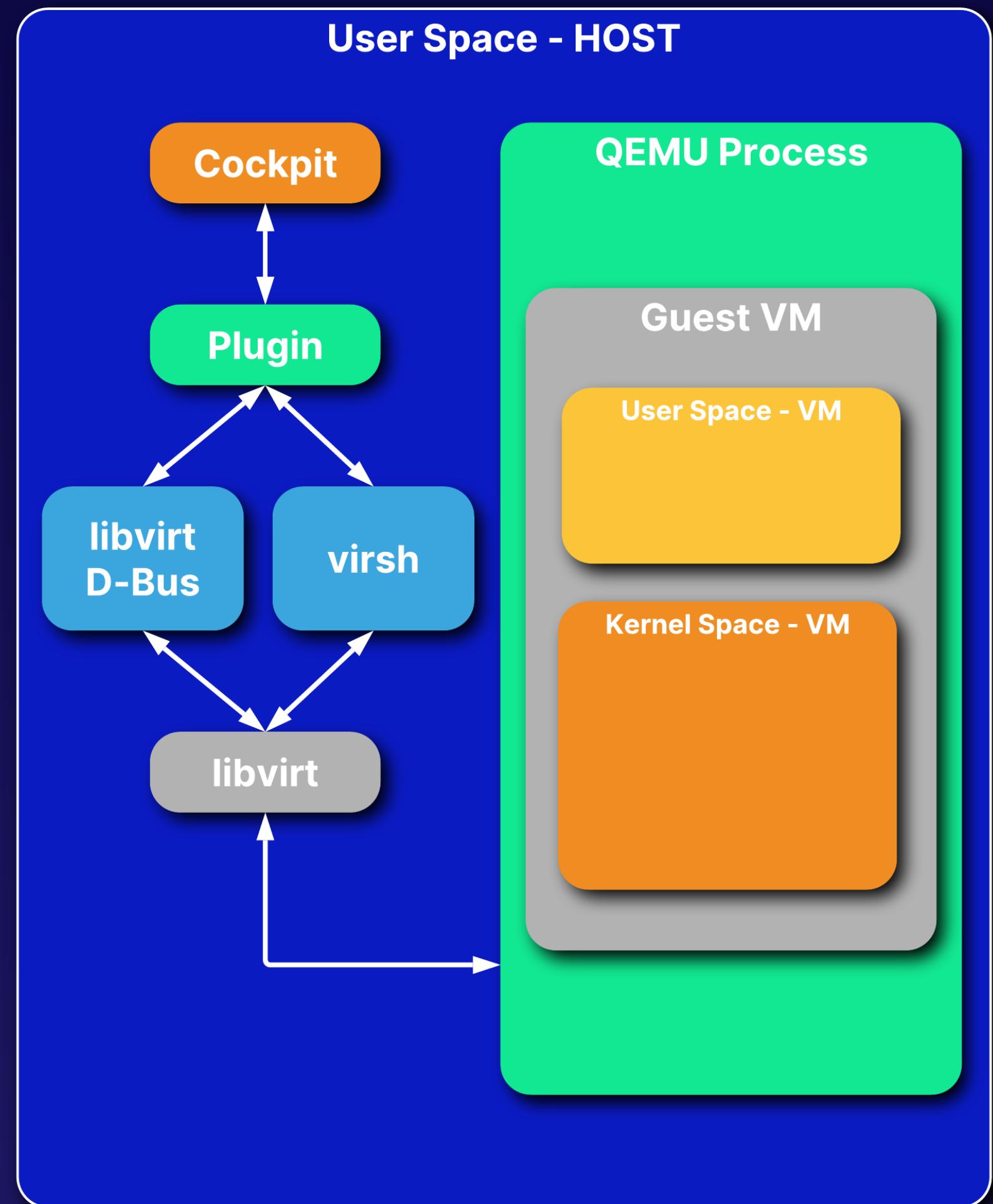


# virsh is underneath it all

How does the **Cockpit plugin** work?

“Access to **Libvirt** is wrapped either by the **virsh** tool or **libvirt D-Bus API** bindings, depending if the latter is installed on the system.”

— Cockpit Project





In this  
lesson, we  
covered:



- What **virsh** is
- Companion utilities to **virsh**
- The functionality of **virsh**
- How **virsh** works



**Tom Dean**  
Linux Training Architect

# Installing the CLI Utilities on CentOS 8

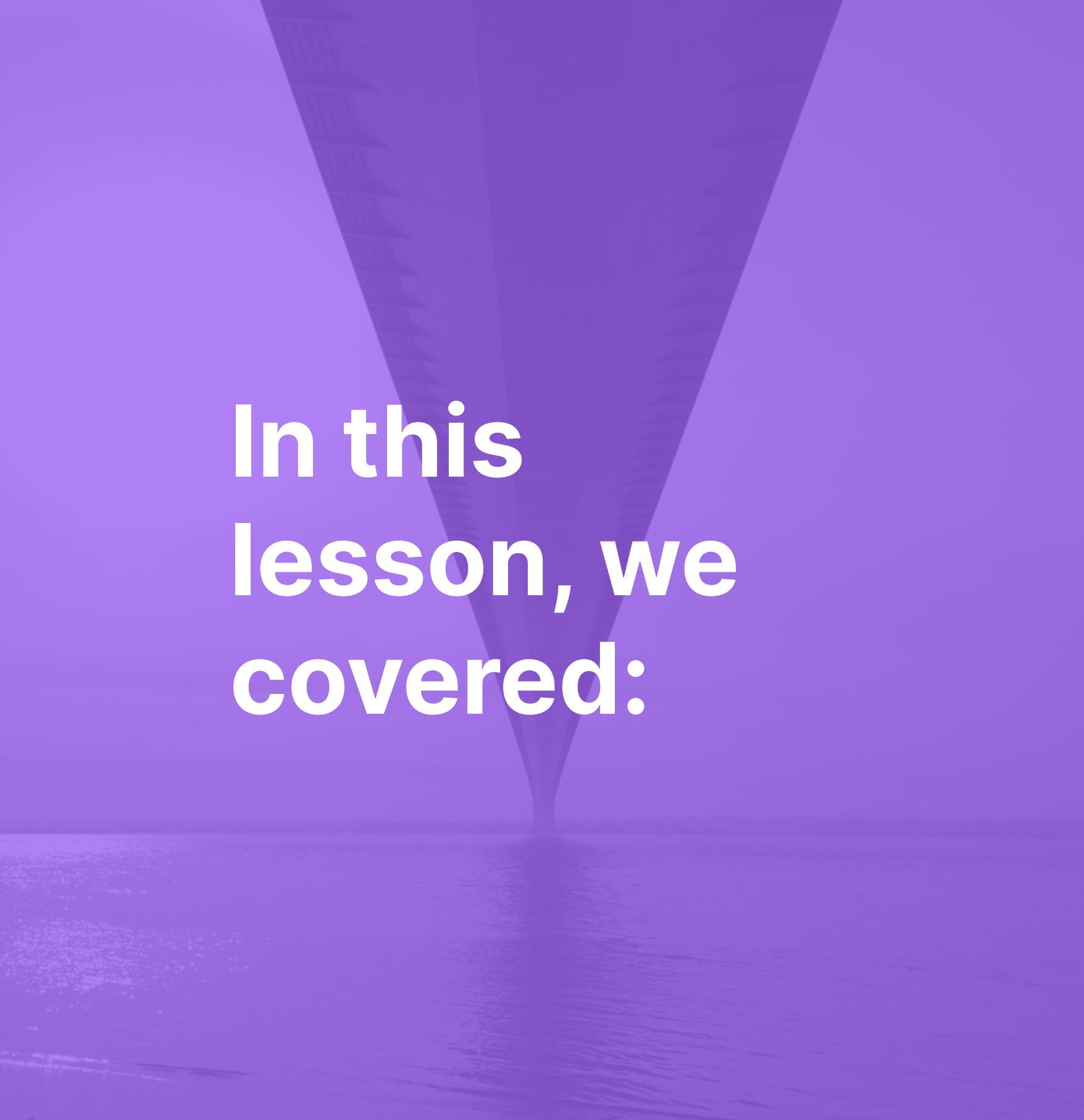
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# Install and Configure

## libvirt CLI Utilities

- Install `libvirt`, `virt-install`, and other associated packages
- Validate the installation





In this  
lesson, we  
covered:



- Installing `libvirt`, `virt-install`, and other associated packages
- Validating the installation



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Linux Training Architect

# Introduction to the **virsh** Shell

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# The **virsh** Shell

**virsh**

- Using the **virsh** shell
- Basic **virsh** commands
- Domain monitoring commands
- Host and hypervisor commands





In this  
lesson, we  
covered:



- **Using** the **virsh** shell
- **Basic virsh** commands
- **Domain monitoring** commands
- **Host and hypervisor** commands



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Linux Training Architect

# Using `virt-install` to Create a Virtual Machine

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# Install CentOS 7

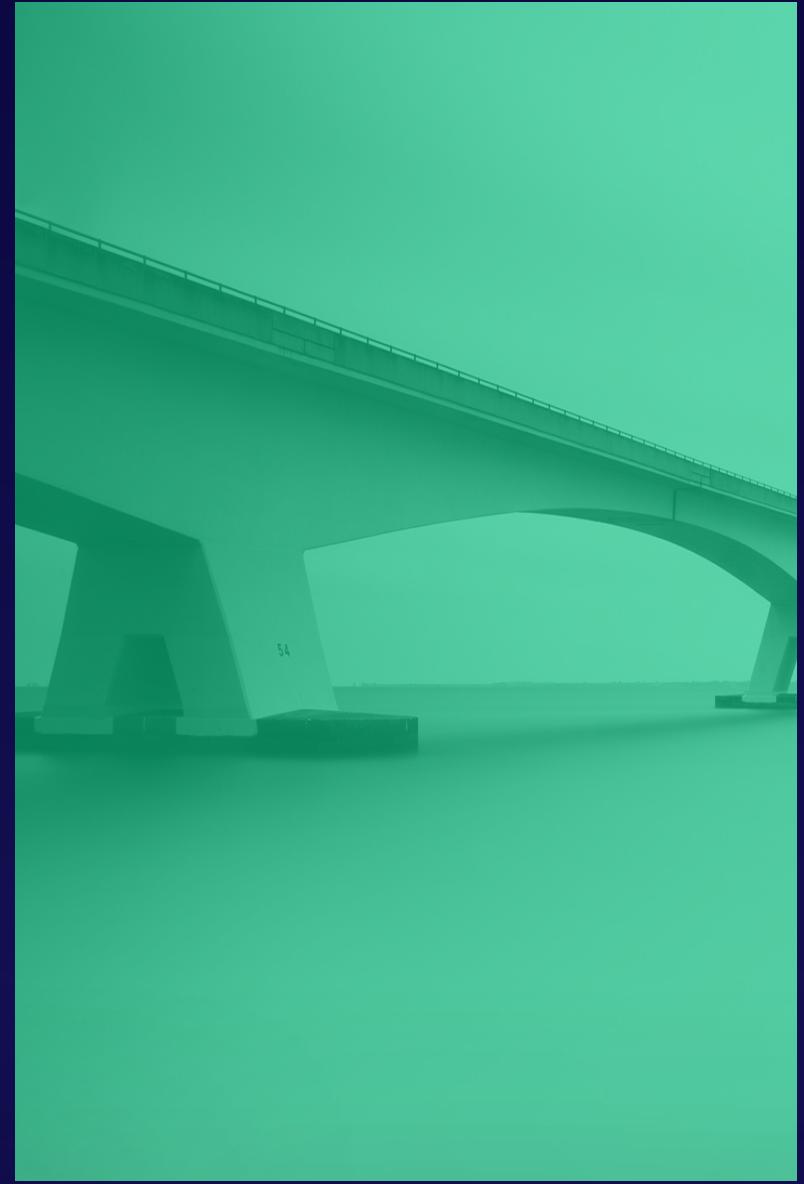
## virt-install

- Use **virt-install** to create a new virtual machine
- Launch *text-mode OS install* in the **virsh** serial console
- Install **CentOS 7** Minimal
- Check out the new VM:
  - **virsh**
  - **Cockpit**





In this  
lesson, we  
covered:



- Using **virt-install** to create a new virtual machine
- Launching a *text-mode OS install* in the **virsh** serial console
- Installing **CentOS 7** Minimal
- Checking out the new VM:
  - **virsh**
  - **Cockpit**



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# Using `virsh` to Manage Virtual Devices

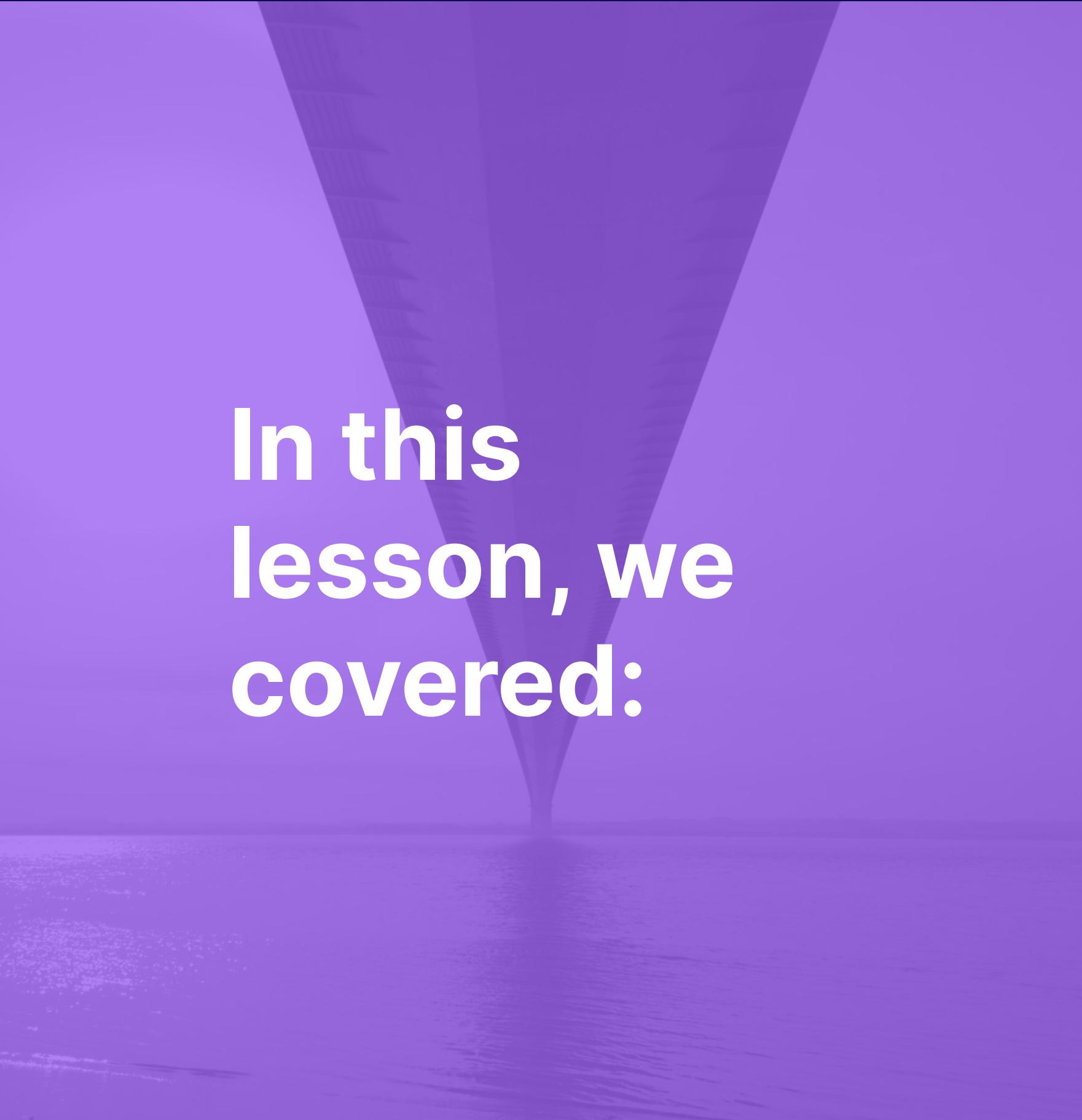
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# Manage Virtual Devices

**virsh**

- **Connect** to the **virsh serial console**
- **Attach** an **ISO file** to a virtual machine
- **Edit** a guest domain **XML** file
  - **Change** the **virtual memory** size
  - **Adjust** the number of **vCPUs**





In this  
lesson, we  
covered:



- **Connecting** to the **virsh serial console**
- **Attaching** an **ISO file** to a virtual machine
- **Editing** a guest domain **XML** file
  - **Changing** the **virtual memory** size
  - **Adjusting** the number of **vCPUs**



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Linux Training Architect

# Using `virsh` to Manage Virtual Storage

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# Manage Virtual Storage

virsh

- Managing **storage pools** using **virsh**
- Managing **volumes** using **virsh**
- Managing **snapshots** using **virsh**





In this  
lesson, we  
covered:



- Managing **storage pools** using **virsh**
- Managing **volumes** using **virsh**
- Managing **snapshots** using **virsh**



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Linux Training Architect

# Creating a Virtual Machine from a **RAW** Disk File

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