

How to control virtual machines using a KVM network switch

Article Overview

You can control KVM virtual machines over a network by configuring virtual network switches, bridges, or VLANs, and managing vNICs through libvirt or virt-manager.

Understanding KVM Virtual Network Switches

A KVM virtual network switch is a software-based switch that allows virtual machines (VMs) to connect to the host network or each other. On Linux hosts, libvirt creates a default virtual switch (e.g., virbr0) that operates in NAT mode, allowing VMs to access external networks using the host's IP address while isolating them from direct inbound connections. Each virtual switch can provide DHCP-assigned IP addresses to connected VMs using dnsmasq.

Network Models for KVM VMs

- o NAT (Default Virtual Network): VMs share the host IP for outbound traffic. Simple to configure and suitable for development or testing.
- o Bridge Networking: Connects VMs directly to the host's physical network interface, allowing them to appear as full network peers with their own IP addresses. This is ideal for LAN access or when VMs need public IPs.
- o VLANs: Virtual LANs can be configured on the physical switch and mapped to VM interfaces, providing network isolation and flexible segmentation.
- o Passthrough (SR-IOV or PCIe): Maps a physical NIC directly to a VM for near-native performance, bypassing the host network stack.

Configuring VM Network Interfaces

- o Using libvirt/virsh: You can attach or detach virtual NICs (vNICs) to running VMs without downtime. Commands include:
 - o virsh attach-interface --domain --type bridge --source --config --live to add a vNIC.
 - o virsh detach-interface to remove a vNIC.
- o Bridge Setup: Create a bridge on the host (e.g., br0) and connect VM interfaces to it. This allows VMs to obtain IPs from the same DHCP server as the host.
- o VLAN Setup: Configure VLANs on the physical switch, then create VLAN interfaces on the KVM host and assign them to VMs during creation or via virt-manager.

Managing VM Network Traffic

- o IP Assignment: Use DHCP or static IPs depending on network requirements. For public IPs, bridge or

How to control virtual machines using a KVM network switch

VLAN configurations are recommended .

- o Monitoring and Control: Use `virsh net-list`, `virsh net-info`, and `virsh net-dumpxml` to view and manage virtual networks .
- o Security and Isolation: VLANs or separate bridges can isolate VM traffic, while NAT provides basic isolation from external networks .

Practical Tips

- o For general-purpose servers, bridge networking is preferred for flexibility and LAN access .
- o For high-performance or latency-sensitive workloads, consider NIC passthrough with SR-IOV .
- o Always verify network connectivity after configuration using `ping`, `ip addr`, or `virsh domiflist` . By combining virtual switches, bridges, VLANs, and libvirt management commands, you can effectively control VM network connectivity, assign IPs, and manage traffic across multiple virtual machines in a KVM environment .

Configure KVM host networking with NetworkManager `nmcli`. Create bridges, add interfaces, set static IPs, and attach

When you deploy a virtual machine in KVM, you connect the virtual machine to the default virtual network, acting as a

In this blog, we will guide you step by step on how to set up a KVM switch. If you have multiple computers but only

A KVM (Keyboard, Video, Mouse) over IP system allows you to control multiple PCs

In this guide, we will dive deep into the "why" and "how" of network bridging. We will then use Netplan, Ubuntu's

Install and Configure KVM on Ubuntu 24.04 KVM can mean two things: a KVM switch, which lets you control multiple

As for software KVM switches, they're also a bit of a misnomer, as they usually don't

This guide walks through setting up a network bridge on a KVM host using `nmcli`, which is the default networking

Firstly, libvirt uses the concept of a virtual network switch. This is a simple software construction on a host

How to control virtual machines using a KVM network switch

server, that your virtual

A KVM switch (short for Keyboard, Video, and Mouse switch) is a hardware device that

By the end of this guide, you'll understand everything about KVM switch technology - from the basics of what a KVM

This process involves configuring network bonds on the host, and then attaching a virtual network interface such as a network bridge

QEMU/KVM: This hypervisor and virtual machine monitor lets us create and manage VMs. Open vSwitch (OVS): This

This will facilitate controlling up to 256 computers. The KVM switch is divided into two types: the ones with display and

A KVM bridge network is a software-based solution that creates a virtual switch. This virtual switch

If you're using virtual machines (VMs) with a hypervisor like KVM or QEMU, you may need

Web: <https://morwarreconst.co.za>

