Virtualizacija IT infrastrukture

KVM NETWORKING

KVM Hardware Support

- KVM / QEMU provide device emulation for several types of devices:
  - IDE disks
  - SCSI disks
  - USB, Parallel, Serial
  - VirtIO for accelerated network and disk performance
- KVM / QEMU also several forms of host networking:
  - User networking
  - Private bridge networking
  - Public bridge networking
  - Virtual distributed Ethernet

Instalacija iz tekstualne linije

- Guests can be installed from DVDs and ISO images, or though your favorite network installaLon method
- To create a new guest, you can pass one or more parameters to the virt-install command:

```
# virt-install --connect qemu:///system --name puppet --ram 512 --file
/nfs/vms/puppet.img --network=bridge:br0 --accelerate -s 36 --pxe -d
--noautoconsole --mac=54:52:00:53:20:00 --nographics --nonsparse
```

Adding NICs to KVM guests

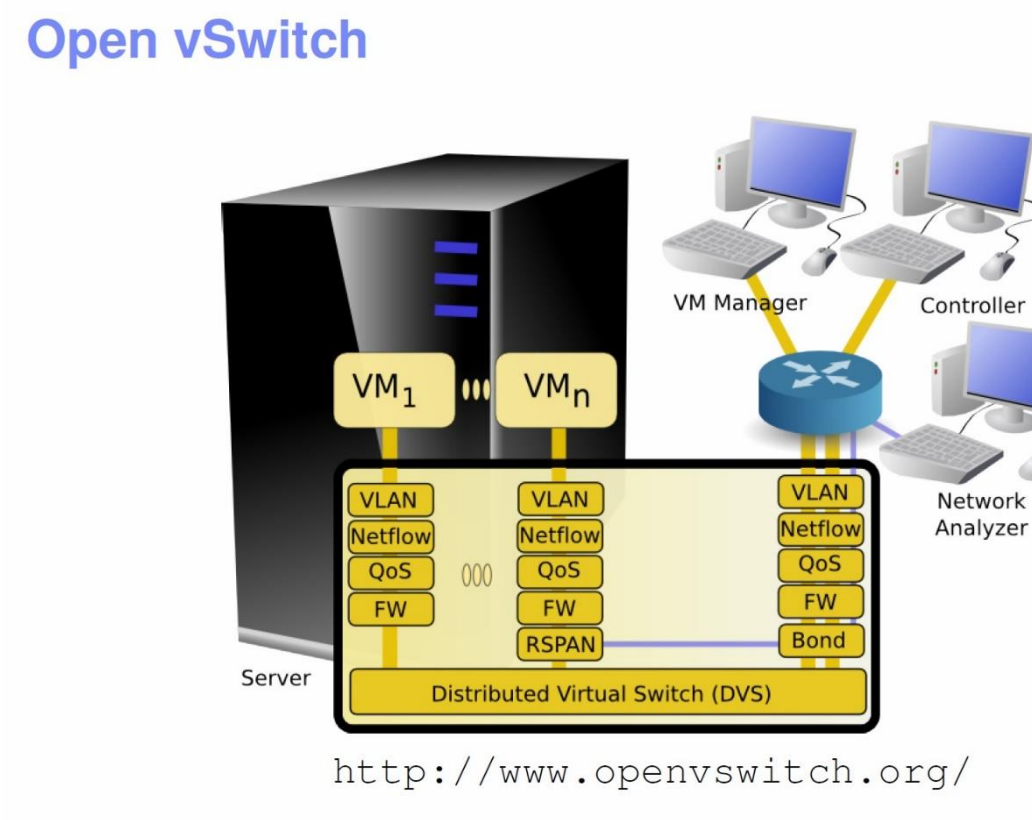
- NICs can be added at guest creation time by appending several “--network” options to the virt-install command line:

```
# virt-install --network=bridge:br0 –mac=X --network=bridge:br0 –max=Y …
```

- For existing guests, the virsh “edit” command can be used to edit the guest configuration, and a stanza similar to the following can be added to create a new NIC:

```
<interface type='bridge'>
<mac address='54:52:00:53:20:00'/>
<source bridge='br0'/>
</interface>
```

Dodatne opcije za virtual networking



Open vSwitch

http://www.openvswitch.org/

Tipično konfiguriranje virtualne mreže

- By default, VMs will only have network access to other VMs on the same server (and to the host itself) via private network 192.168.122.0. If you want the VMs to have access to your LAN, then you must create a network bridge on the host. Follow these steps to create a network bridge:
- 1. Turn off NetworkManager (the network bridge does not like it) and use the „network" service instead. Be sure to set NM_CONTROLLED=NO in your network controller configuration file (presumably /etc/sysconfig/network-scripts/ifcfg-em1):
- # chkconfig NetworkManager off
- # chkconfig network on
- # service NetworkManager stop
- # service network start
- 2. Add to your network controller configuration file the following line:
- BRIDGE=br0

Tipično konfiguriranje virtualne mreže - 1

- 3. Create /etc/sysconfig/network-scripts/ifcfg-br0 and add:
- DEVICE="br0"
- # BOOTPROTO is your preference. It can be “dhcp” or “static”.
- # If “static”, be sure to specify the IP address, netmask and gateway.
- BOOTPROTO="dhcp"
- IPV6INIT="yes"
- IPV6_AUTOCONF="yes"
- NM_CONTROLLED="no"
- ONBOOT="yes"
- TYPE="Bridge"
- DELAY="0"

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- 3. Create /etc/sysconfig/network-scripts/ifcfg-br0 and add:
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- # BOOTPROTO is your preference. It can be “dhcp” or “static”.
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- IPV6_AUTOCONF="yes"
- NM_CONTROLLED="no"
- ONBOOT="yes"
- TYPE="Bridge"
- DELAY="0"

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- 4. Create a FORWARD firewall rule for the bridge br0 so that VM network traffic can be forwarded through it. This rule works for all bridge devices:
- `# iptables -A FORWARD -m physdev --physdev-is-bridged -j ACCEPT`
- `# service iptables save`
- 5. Enable forwarding. Edit /etc/sysctl.conf:
- `inet.ipv4.ip_forward = 1`
- And read the file:
- `# sysctl -p /etc/sysctl.conf`
- 6. Restart the „network" service so that the network bridge you just created can get an IP address:
- `# service network restart`

RHEL6.4: Para-virt End-of-Interrupt (PV-EOI)

- Improved performance!
- Optimization for interrupt-intensive workloads
- Up to 10% less CPU usage in some scenarios
- Reduces the number of context switches between the VM and the hypervisor.
- Works out-of-the-box with all I/O types
- Particularly useful for high incoming network traffic
- Guest OS = RHEL 6.4 (PV calls in guest kernel)

Open vSwitch

- OpenFlow standard based
- Alternative to bridge, macvlan/macvtap
- Use cases:

- Distributed Layer 3 switch
- Security Appliance
- drivers/staging