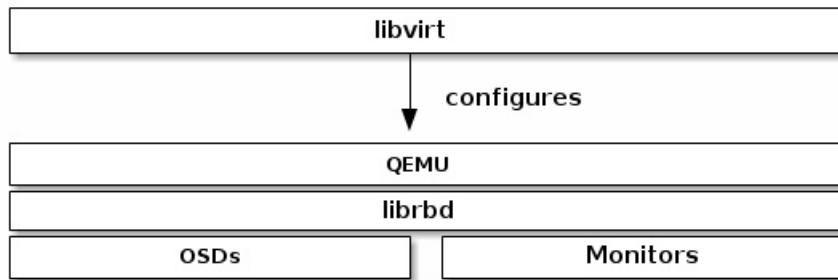# INSTALL VIRTUALIZATION FOR BLOCK DEVICE

If you intend to use Ceph Block Devices and the Ceph Storage Cluster as a backend for Virtual Machines (VMs) or Cloud Platforms the QEMU/KVM and `libvirt` packages are important for enabling VMs and cloud platforms. Examples of VMs include: QEMU/KVM, XEN, VMWare, LXC, VirtualBox, etc. Examples of Cloud Platforms include OpenStack, CloudStack, OpenNebula, etc.

INSTALL QEMU

QEMU KVM can interact with Ceph Block Devices via `librbd`, which is an important feature for using Ceph with cloud platforms. Once you install QEMU, see QEMU and Block Devices for usage.

DEBIAN PACKAGES

QEMU packages are incorporated into Ubuntu 12.04 Precise Pangolin and later versions. To install QEMU, execute the following:

```
sudo apt-get install qemu
```

RPM PACKAGES

To install QEMU, execute the following:

1. Update your repositories.

    ```
    sudo yum update
    ```

2. Install QEMU for Ceph.

    ```
    sudo yum install qemu-kvm qemu-kvm-tools qemu-img
    ```

3. Install additional QEMU packages (optional):

    ```
    sudo yum install qemu-guest-agent qemu-guest-agent-win32
    ```

BUILDING QEMU

To build QEMU from source, use the following procedure:

```
cd {your-development-directory}
git clone git://git.qemu.org/qemu.git
cd qemu
./configure --enable-rbd
make; make install
```

To use `libvirt` with Ceph, you must have a running Ceph Storage Cluster, and you must have installed and configured QEMU. See Using libvirt with Ceph Block Device for usage.

DEBIAN PACKAGES

`libvirt` packages are incorporated into Ubuntu 12.04 Precise Pangolin and later versions of Ubuntu. To install `libvirt` on these distributions, execute the following:

```
sudo apt-get update && sudo apt-get install libvirt-bin
```

RPM PACKAGES

To use `libvirt` with a Ceph Storage Cluster, you must have a running Ceph Storage Cluster and you must also install a version of QEMU with `rbd` format support. See Install QEMU for details.

`libvirt` packages are incorporated into the recent CentOS/RHEL distributions. To install `libvirt`, execute the following:

```
sudo yum install libvirt
```

BUILDING `LIBVIRT`

To build `libvirt` from source, clone the `libvirt` repository and use AutoGen to generate the build. Then, execute make and `make install` to complete the installation. For example:

```
git clone git://libvirt.org/libvirt.git
cd libvirt
./autogen.sh
make
sudo make install
```

See libvirt Installation for details.