## 7.3 KVM

### Work in Progress

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### Requirements

Currently KVM on OpenIndiana only supports recent Intel chipsets with VT and EPT instructions. It is also a very fresh port so bugs are to be expected.

### Installing KVM

```
pkg install \
  driver/i86pc/kvm \
  system/qemu \
  system/qemu/kvm
```

### Using KVM

First create a zvol for the guest:

```
zfs create -p -V 10G rpool/kvm/myguest/disk0
```

Create a vnic (assumes e1000g0 as your primary NIC, substitute as necessary):

```
dladm create-vnic -l e1000g0 vnic0
MAC=$(dladm show-vnic -po macaddress vnic0)
```

Invoke the `qemu-kvm` command, for example:

```
pfexec /usr/bin/qemu-kvm \
  -boot cd \
  -enable-kvm \
  -vnc 0.0.0.0:1 \
  -smp 2 \
  -m 2048 \
  -no-hpet \n  -localtime \
  -drive file=/dev/zvol/rdsk/rpool/kvm/myguest/disk0,if=ide,index=0 \n  -drive file=/path/to/some/cdimage.iso,media=cdrom,if=ide,index=2 \n  -net nic,vlan=0,name=net0,model=e1000,macaddr=$MAC \n  -net vnic,vlan=0,name=net0,ifname=vnic0,macaddr=$MAC \n  -vga std
```

### Fresh example

- Recent changes in illumos has caused malfunction of VirtualBox package on OI /hipster, thus making it unusable (it is crashing whole system).
  Since I already had few VB guests, all using zfs volumes, I have decided to try KVM instead...
  - Opening bug at VirtualBox for compiling problems did not show any progress
  - KVM (which also was failing because same illumos change) was easily fixed (see #4410) and OpenIndiana forum could not offer solution for VirtualBox failure problem.

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The `/usr/bin/qemu` command is vanilla QEMU with no KVM support. You **must** use `/usr/bin/qemu-kvm` to use KVM.
I was using Windows guest, so I can run some s/w which is missing for OI platform: Skype, TeamViewer, Zoom, etc... (like recent browser versions, since OI Firefox 52 has lack of some ciphers support, for example). This example has purpose to give an idea how to use it, w/o spending hours on digging it from internet...

qemu-kvm has several limitations (as far as I can tell):
- it has no support of spice libraries, which provide clipboard sharing
- graphical cards support is poor (maximum I could get is 1024x768, which is really not enough)

Using guest GUI also has limitations:
- both native vga and vnc support are lacking interaction with host MATE environment (shared folders and clipboard)
- vnc support offers password protection, but you have to use `change vnc password` command to set it after guest boot (so no other people can access VM)

Decided to enable remote desktop “server” on windows (so, user MUST have password set) and to access guest with rdesktop (present in OI; support both shared folder and clipboards) or xfreerdp (self compiled; supports shared clipboards, but I could not manage to get support for shared folders) utility

First, we need to start guest:

```
$ qemu-kvm -m 1536M \
  -cpu host \
  -drive file=/dev/zvol/rdsk/mypool/VBoxGuests/WinHD \
  -k de \
  -smp 1 \
  -localtime \
  -clock unix \
  -soundhw all \
  -no-hpet \
  -bios /usr/share/qemu/bios.bin \
  -usbdevice tablet \
  -enable-kvm \
  -device e1000,netdev=user.0 \
  -netdev user,id=user.0,hostfwd=tcp::3389-:3389 \
  -nographic \
  -daemonize
```

NOTES:

- port 3389 is forwarded to guest (RDP)
- nographics option can be used ONLY after you were able to have GUI access to guest and enable remote desktop access
- also, you have to wait a bit, until guest is booted before you try to connect to it
- RDP window geometry is something you might want to experiment with (1900x1000 fits to my needs)
- windows NLA security has to be disabled (did not investigated further if there is another way to access to guest via RDP)

Connection options (guest has to be booted, obviously, example assume windows user predrag zecevic)

```
rdesktop

:; rdesktop -k de -z -m -x b -u "predrag zecevic" -p <PASSWORD> -g 1900x1000 -a 16 -T Win -r disk:PZ=/nobackup/shared_folder -r clipboard:PRIMARYCLIPBOARD 0.0.0.0 &
```

```
xfreerdp

:; xfreerdp -sec-nla -themes -wallpaper -glyph-cache +clipboard /u:"predrag zecevic" /p:<PASSWORD> /kbd:German /audio-mode:1 /compression /bpp:16 /async-update /async-input /geometry /dynamic-resolution /size:1900x1000 /t:Win /v:0.0.0.0 &
```

Various references:
- this page
- http://www.frijid.net/blog/index.php/2015/08/10/installing-windows-7-kvmqemu-guest-onto-a-zfs-zvol-on-a-linux-host/

Hope this will help someone. My personal favorite is xfreerdp (even w/o shared folder support, because it is somehow "faster" and offers better font rendering). Predrag Zeevi 2018/10/02

- Audio problems fixed (see https://unix.stackexchange.com/a/396468)
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