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128 lines (94 sloc) 4.46 KB

qemu-rpi-kernel

Emuation using Qemu's native raspi2/3 machine

Follow instructions under `native-emulation` subfolder in order to use Qemu's native raspi2/3 machine to emulate raspberry pi.

Emulation using pre-compiled versatilepb kernels

Ready-made kernels that can be used to emulate a Raspberry Pi using QEMU.

They are compiled from the same [kernel sources](#) used for official Raspian images, with tweaks to make them suitable for use with QEMU, and are supposed to be used along with official Raspbian images.

Obtaining Raspbian

Before starting, you should download a [Raspbian image](#) from the Raspberry Pi website

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- `kernel-qemu-4.*.*-buster` are the most recent images, which are compatible with Raspbian Buster and Stretch. To use these images, you'll need a compiled device tree file (.dtb) which is also contained in this repository. Use `versatile-pb-buster.dtb` for Buster, or use `versatile-pb.dtb` for Stretch. Unless you are positive you need a different kernel, the most recent of these images is probably what you want.
- `kernel-qemu-4.*.*-stretch` are images compatible with Raspbian Stretch and Jessie. To use these images, you'll need the `versatile-pb.dtb` file which is also contained in this repository.
- `kernel-qemu-4.4.*-jessie` are images compatible with Raspbian Jessie and Wheezy.
- `kernel-qemu-3.10.25-wheezy` is the original image from xecdesign.com, which is compatible with Raspbian Wheezy only.

Using kernel images with QEMU

The QEMU command line will look like

```
$ qemu-system-arm \
-M versatilepb \
-cpu arm1176 \
-m 256 \
-hda ../../2019-09-26-raspbian-buster-lite.img \
-net user,hostfwd=tcp::5022-:22 \
-dtb ../../versatile-pb-buster.dtb \
-kernel ../../kernel-qemu-4.19.50-buster \
-append 'root=/dev/sda2 panic=1' \
-no-reboot
```

For the kernel 5.4.51 please use (Tested with Raspbian Buster Lite):

```
$ qemu-system-arm \
-M versatilepb \
-cpu arm1176 \
-m 256 \
-drive "file=../../2020-05-27-raspbian-buster-lite-armhf.img,if=none,index=0,media=disk,format=raw,id=disk0" \
-device "virtio-blk-pci,drive=disk0,disable-modern=on,disable-legacy=off" \
-net "user,hostfwd=tcp::5022-:22" \
```

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There is a Docker image available to automate this whole process:

```
docker run -it lukechilds/dockerpi
```

More information: <https://github.com/lukechilds/dockerpi>

Using kernel images with libvirt

Assuming your libvirt version is at least 5.0.0, you can use something like

```
$ virt-install \
  --name pi \
  --arch armv6l \
  --machine versatilepb \
  --cpu arm1176 \
  --vcpus 1 \
  --memory 256 \
  --import \
  --disk /.../2019-09-26-raspbian-buster-lite.img,format=raw,bus=virtio \
  --network user,model=virtio \
  --video vga \
  --graphics spice \
  --rng device=/dev/urandom,model=virtio \
  --boot 'dtb=/.../versatile-pb-buster.dtb,kernel=/.../kernel-qemu-4.19.50-
buster,kernel_args=root=/dev/vda2 panic=1' \
  --events on_reboot=destroy
```

to create a new libvirt guest called `pi`. You'll be able to manage the guest with all the usual tools, such as `virsh` and `virt-manager`.

Building your own kernel image

See the contents of the `tools/` directory, where the build scripts and instructions on how to use them are stored.

Origin of this repository

While searching the Internet for information on emulating a Raspberry Pi using QEMU in Jun 2015, most of the guides pointed to kernel images hosted on xecd.com; however, at the time the resource was no longer online, and that's still the case as of Feb 2019.

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Additional documentation can be found on the [wiki](#).

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