KVM FORUM

TESTING IN QEMU AND LIBVIRT

Beyond make and make check

YASH MANKAD

RED HAT INC.

26th October 2018

redhat.

AGENDA

- **What**
- **Why**
- **How**
- **Where**

AGENDA

- **What** is the state of testing in QEMU and libvirt ?
- **Why**
- **How**
- **Where**

AGENDA

- **What** is the state of testing in QEMU and libvirt ?
- **Why** should we change ?
- **How**
- **Where**

AGENDA

- **What** is the state of testing in QEMU and libvirt ?
- **Why** should we change ?
- **How** will it work ?
- **Where**

AGENDA

- **What** is the state of testing in QEMU and libvirt ?
- **Why** should we change ?
- **How** will it work ?
- **Where** will it run ?

STATE OF VIRT TESTING

- QEMU
  - Tests included in qemu source are unit tests
  - CI environments build QEMU from source using 'make' and run 'make check'
  - Sub-system tests such as iotests, coverity, and dynamic code analysis

- libvirt
  - test suite present in source code runs unit tests
  - CI environment uses the autogen.sh script to build and runs gmake
  - 'check' ensures XML can run qemu

STATE OF QEMU TESTING

:patchew

- Runs for every patch sent to qemu-devel
- ubuntu, fedora, centos on docker
- checkpatch.pl
- Runs make check

Travis CI

- Ubuntu 12/14.04 x86_64 hosts, MAC OS X
- Runs make
- No functional tests

shippable

- Runs Debian, Ubuntu amd-64
- Runs make
- No functional tests

STATE OF LIBVIRT TESTING

Travis CI

- Runs Ubuntu in docker
- make syntax-check
- make install
- make dist

on

- Runs CentOS, Debian, Fedora, rawhide and freebsd
- make and make install

WHY SHOULD WE CHANGE ?

WHY SHOULD WE CHANGE ?

Why look beyond make, make check, make install, etc ?

- Run more functional tests
- Run on baremetal nodes
- Run on different architectures

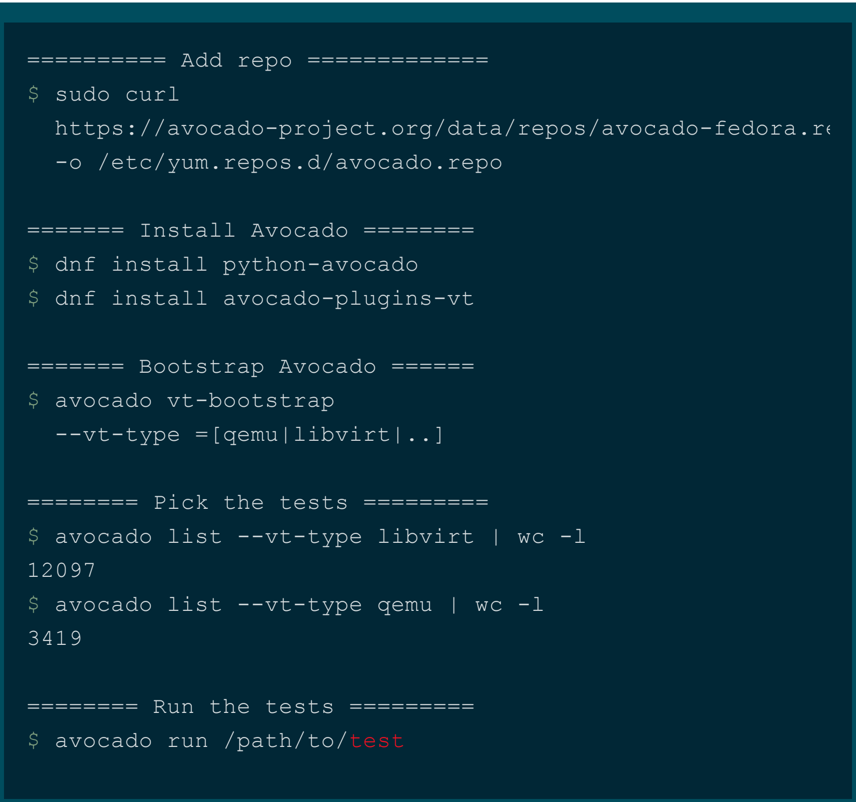
arm

POWER

IBM Z

WHY SHOULD WE CHANGE ?

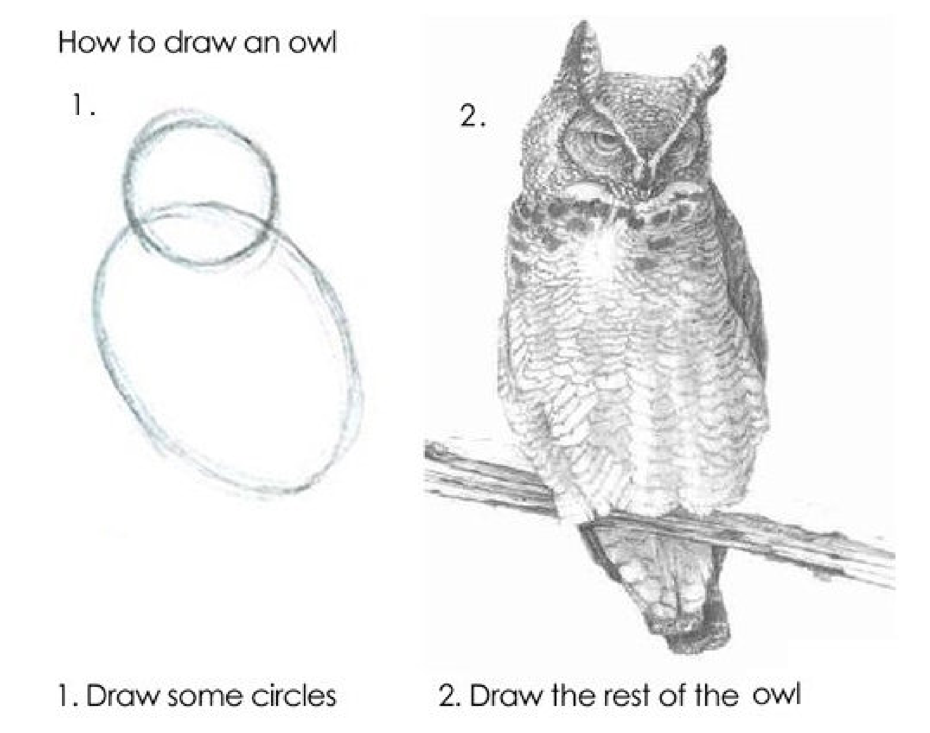
- Lack of integrated test frameworks for Virtualization
- Avocado and Avocado-VT
  - Pros
    - Can run in bare metal or virtual environment
    - Has extensive functional and regression tests
  - Cons
    - Not packaged for all distros
    - Lot of dependencies



```
========== Add repo =============
$ sudo curl
  https://avocado-project.org/data/repos/avocado-fedora.re
  -o /etc/yum.repos.d/avocado.repo

======= Install Avocado ========
$ dnf install python-avocado
$ dnf install avocado-plugins-vt

======= Bootstrap Avocado ======
$ avocado vt-bootstrap
  --vt-type =[qemu|libvirt|..]

======== Pick the tests =========
$ avocado list --vt-type libvirt | wc -l
12097
$ avocado list --vt-type qemu | wc -l
3419

======== Run the tests =========
$ avocado run /path/to/test
```

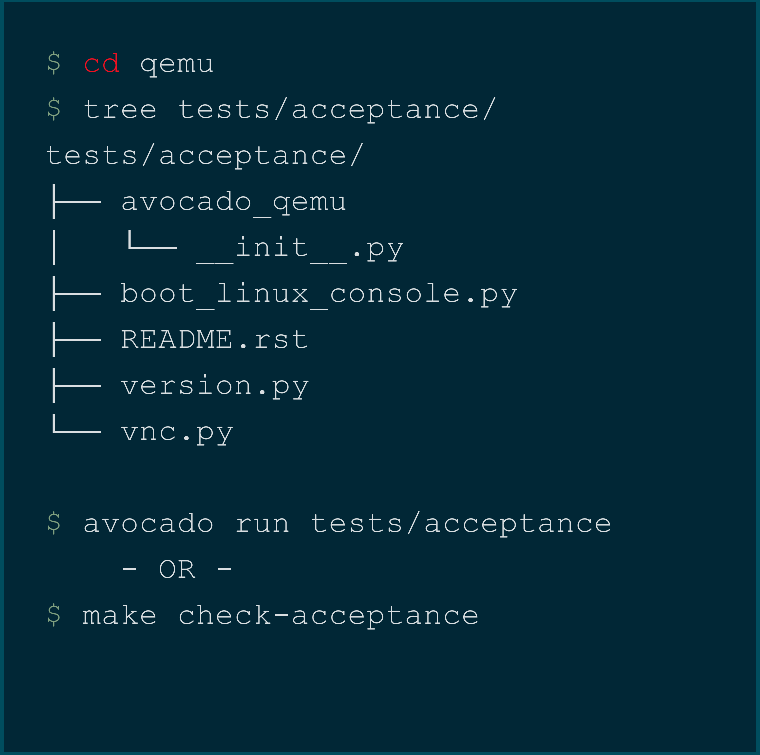
HOW WILL IT WORK ?

HOW WILL IT WORK ?



HOW WILL IT WORK ?

- QEMU
  - Functional tests added to developer workflow
  - Have access to a predefined “VM”
    - self.vm
  - The VM is a QEMUMachine instance (from scripts/qemu.py)
    - Add command line arguments with add_args()
    - Launch the VM with launch()
    - Send QMP commands with command()
  - Called using make check-acceptance
  - Cleber Rosa's talk: https://sched.co/Fzud



```
$ cd qemu
$ tree tests/acceptance/
tests/acceptance/
├── avocado_qemu
│   └── __init__.py
├── boot_linux_console.py
├── README.rst
├── version.py
└── vnc.py

$ avocado run tests/acceptance
    - OR -
$ make check-acceptance
```

HOW WILL IT WORK ?

- libvirt
  - libvirt-tck test suite from Perl-Sys-Virt-TCK
  - Functional, integration tests for libvirt drivers
  - Wasn't actively maintained....we will be changing that
  - Supports and runs a wide range of tests
    - domain
    - storage
    - nwfilter, etc.
- Packaged for Fedora

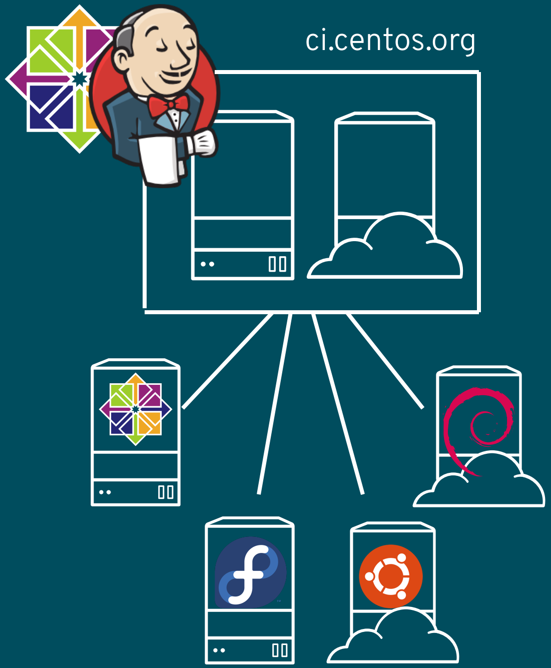
```
====== Install the TCK tests =========
$ dnf install perl-Sys-Virt-TCK
  --enablerepo=updates-testing

====== Run the tests ==========
$ libvirt-tck -v
```

WHERE WILL IT RUN ?

WHERE WILL IT RUN ?

- I strongly encourage the use of bare metal environments of Virt testing

- CentOS CI infrastructure
  - They have **38** x86_64 **bare metal** nodes available for CI
  - Also have **64** aarch64 and ppc64le VMs
  - Can be requested using duffy
  - CentOS is working on adding aarch64 hardware to this infrastructure.



WHERE WILL IT RUN ?

- Get onboard with Fedora's CI initiative

+ ANSIBLE

- Tie in functional tests with existing environments
  - Both avocado_qemu and libvirt-tck can run in virtual environments
  - Create a meaningful feedback loop for developers and feature owners

Travis CI

shippable

:patchew

LAVA

SUMMARY

- QEMU and libvirt CI runs a lot of 'make'
  - Only unit and basic acceptance tests

- Let's start running functional, integration tests for QEMU and libvirt
  - Will provide more coverage, run on additional architectures

- Have a functional CI for Virt packages

THANK YOU

QUESTIONS ?

More questions ?

Yash Mankad <ymankad@redhat.com>

redhat.