TESTING IN QEMU AND LIBVIRT

Beyond make and make check

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AGENDA

- What
- Why
- How
- Where
AGENDA

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

<table>
<thead>
<tr>
<th><strong>QEMU</strong></th>
<th><strong>libvirt</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests included in qemu source are unit tests</td>
<td>test suite present in source code runs unit tests</td>
</tr>
<tr>
<td>CI environments build QEMU from source using 'make' and run 'make check'</td>
<td>CI environment uses the autogenerated.sh script to build and runs gmake</td>
</tr>
<tr>
<td>Sub-system tests such as iotests, coverity, and dynamic code analysis</td>
<td>'check' ensures XML can run qemu</td>
</tr>
</tbody>
</table>
STATE OF QEMU TESTING

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

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

- 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

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

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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
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

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```
====== Add repo ======
$sudo curl
  https://avocado-project.org/data/repos/avocado-fedora.repo
  -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 to draw an owl

1. Draw some circles
2. Draw the rest of the owl
HOW WILL IT WORK?

• QEMU
  ▪ Functional tests added to developer workflow
  ▪ Have access to a predefined “VM”
    o self.vm
  ▪ The VM is a QEMUMachine instance (from scripts/qemu.py)
    o Add command line arguments with add_args()
    o Launch the VM with launch()
    o 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
    - nwfiltet, 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 on board with Fedora's CI initiative

• 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
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?
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