LXC support in LAVA

Senthil Kumaran S

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Agenda

- Introduction to LXC
- Considerations for LAVA
- LXC device type
- Android testing use case
- LXC in LAVA V2
- LXC device dictionary
- LXC samples

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Introduction to LXC

- LXC - Linux Containers - OS level virtualization
- Linux kernel support
  - cgroups (2.6.24 version of Linux kernel)
  - isolated namespaces
  - uses same kernel as host
- Lightweight
  - own process
  - network space
- Security
  - unprivileged containers
  - privileged containers
  - no direct access to hardware

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Considerations for LAVA

- Multiple Distribution / Distro
- Multi-arch support
- Sandbox
- Transparent
- Lightweight
  - starts on same dispatcher as device
- Access to peripherals
- Complex networking support
- Features
  - persistence
  - scratch hack-boxes
  - hacking sessions with security
- Scope for future use-cases such as openstack testing

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LXC as a device type

- Dedicated devices in LAVA
- Aids testing in different distros
- Alternative to kvm devices

lxc status

Current state

Running jobs	0	**Active devices**	0
Queued jobs	0	**Idle**	2
Checks/failures	Graphical reports	**Offline**	0
Health Checks	one every 10 jobs	**Retired**	0

Devices list

Show 50 entries Search

Hostname	Worker Host	status	Submissions restricted to	Health	JSON jobs	Pipeline jobs	tags
lxc01	dispatcher01.lavalab	Idle		Pass	✖	✔	
lxc02	dispatcher01.lavalab	Idle		Pass	✖	✔	

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Android Testing Use Case

- Start container dynamically
- Interface between dispatcher and DUT
- Same dispatcher as DUT is connected
- Direct adb and fastboot commands
- Sandbox
- No requirement for MultiNode
- Less wait time - only DUT availability is required
- lava-test-shell on different distros

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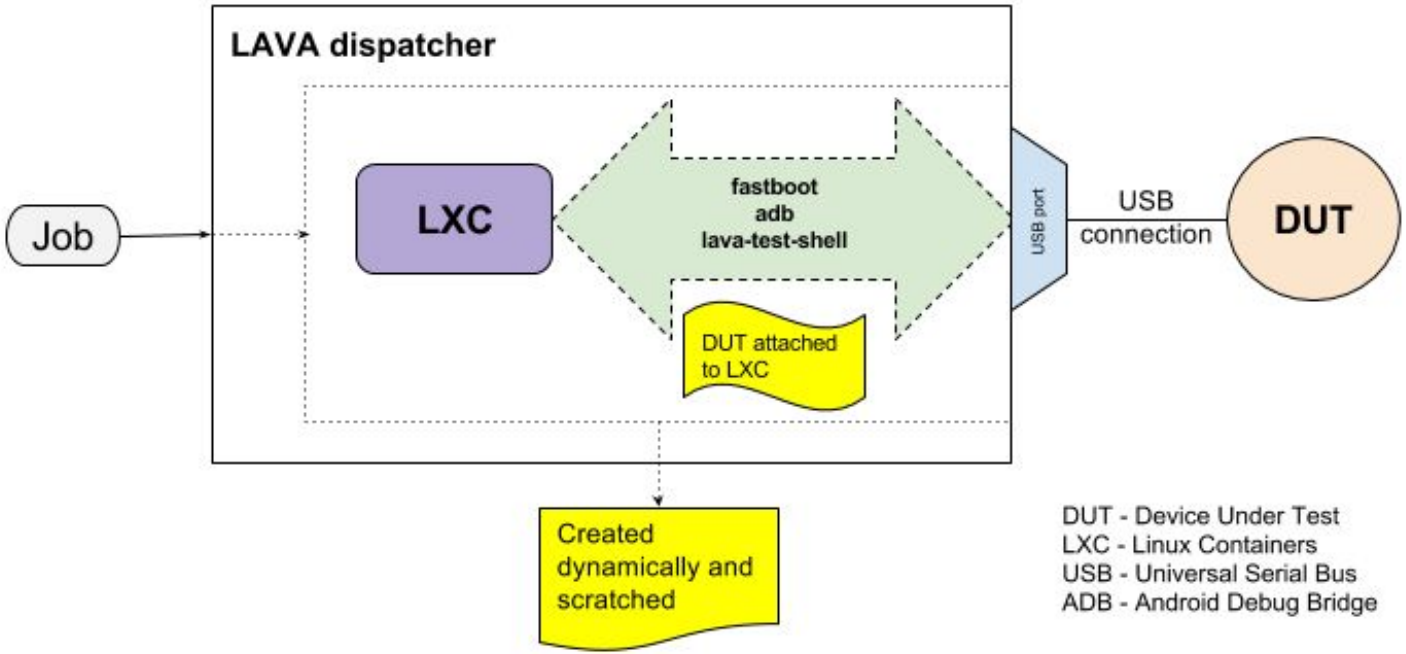
Android Testing with LXC



LXC in LAVA V2

- LXC is a protocol like multinode and vland
- Protocol options:
  - `name: pipeline-lxc-test`
  - `template: debian`
  - `distribution: debian`
  - `release: sid`
  - `arch: amd64`
  - `mirror: http://ftp.us.debian.org/debian/`
  - `security_mirror: http://mirror.csclub.uwaterloo.ca/debian-security/`
- Containers gets created from cache
- Introduces ‘namespace’
  - Ties related actions together
  - Aids execution of actions in the desired order

LXC Nexus device dictionary

```
{% extends 'nexus4.jinja2' %}
{% set adb_serial_number = '04f228d1d9c76f39' %}
{% set fastboot_serial_number = '04f228d1d9c76f39' %}
{% set device_path = ['/dev/bus/usb/001'] %}
```

- Complete device configuration
  - https://git.linaro.org/lava/lava-dispatcher.git/blob_plain/HEAD:/lava_dispatcher/pipeline/devices/nexus4-01.yaml

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LXC Sample - Jobs and Job Runs

- Sample LXC job
  - https://git.linaro.org/lava-team/refactoring.git/blob_plain/HEAD:/lxc-debian-mirror.yaml
- Sample LXC Nexus job
  - https://git.linaro.org/lava-team/refactoring.git/blob_plain/HEAD:/nexus9-simple.yaml
- Sample LXC HiKey job
  - https://git.linaro.org/lava-team/refactoring.git/blob_plain/HEAD:/hi6220-hikey.yaml
- Sample LXC job run
  - https://staging.validation.linaro.org/scheduler/job/154667
- Sample LXC Nexus job run
  - https://staging.validation.linaro.org/scheduler/job/151868

Limitations

- Architecture support
  - Depends on underlying kernel architecture
  - For armel, armhf, etc. dispatcher should run on these architectures
- Each distro has its own template
  - The distro templates does not have common options
  - Difficult to have generic support for all distros
  - Download template
    - Tries to unify the options

Thank You

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For further information: www.linaro.org

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senthil.kumaran@linaro.org