

ARMv8 and Lava in a (virtual) Box

This was originally conceived as a "hello world" for Lava with a Lava server set up in a VBox image. It allows you to take an aarch64 kernel and boot test it on qemu in Lava using the lava server web interface. You can see the boot test pass in the lava dashboard.

The box contains

Debian Jessie (testing) install
Lava install via apt
qemu installed via apt

Scripts and images to invoke

1. qemu-system-aarch64 to boot the kernel build from sources with ubuntu rootfs
2. the lava-dispatcher to boot the image in #2 above but using qemu through lava
3. A boot test json job file which can be pasted into the lava web interface and runs the job in #3

How to use it

Install the VM
Configure VBox networking (one NAT adapter and one Host-only adapter)
Configure a shared folder
Boot the VM and login
Browse to 192.168.56.2 on your host and see the Lava server home page
Login to Lava as 'default'

Submit a job via the Scheduler pull-down for the device qemu-aarch64-001
Paste the file boot_test.json into the job window.
Click 'Submit' and poll the web interface for completion

Debian login:

User: jessie, Password: jessie
User: root, Password: jessie

Lava server web login:

User: default, Password: jessie

Screen Shots

The Lava server with a qemu-aarch64 device type highlighted

The screenshot shows the LAVA Scheduler interface. The 'Device Type Overview' section is active. It displays overall status (1/1 online devices, 0/0 passing health checks) and a table of device types. The 'qemu-aarch64' device type is highlighted with a red circle. Below this, the 'Active Jobs' section is empty, and the 'Workers' section shows one worker named 'lavademolocal' with IP 127.0.1.1 and architecture 'x86_64'.

Name	Idle	Offline	Busy	Restricted	Queue
qemu-aarch64	1				

Hostname	IP Address	Status	Is Master?	Host Uptime	Architecture	Last Master Scheduler Tick
lavademolocal	127.0.1.1	up	True	1:09:11	x86_64	01/21/2015 11:12 a.m.

Submit a job via the scheduler pull-down

The screenshot shows the LAVA Scheduler interface with the 'Scheduler' pull-down menu open. The 'Submit Job' option is highlighted with a red circle. Below the menu, the 'Job information' section shows details for a job named 'qemu-aarch64-kernel-boot'. The 'Logs' section shows the job's execution logs, including the download of the kernel and the successful boot of the test image.

Description	Status	Priority	Submitter	Name	Type	Owner	Physical access	Submitted	Started	Finished	Duration
qemu-aarch64-kernel-boot	Complete	Medium	default	qemu-aarch64-001 (reports)	qemu-aarch64 (reports)	Unknown		6 minutes	6 minutes	6 minutes	0 minutes

```
11:16:32 AM INFO: [ACTION-B] deploy_linaro_kernel is started with {u'username': u'root', u'kernel': u'file:///home/jessi...
11:16:32 AM INFO: Downloading image: file:///home/jessie/images/ubuntu-core-14.04-core-arm64.img
11:16:34 AM INFO: md5sum of downloaded content: 1c669e7fa20feba5b9781d32dde0b6c
11:16:34 AM INFO: Downloading image: file:///home/jessie/images/rtage
11:16:34 AM INFO: md5sum of downloaded content: c4243381f2f0d74d22511cfba4f15d6a
11:16:34 AM INFO: [ACTION-E] deploy_linaro_kernel is finished successfully.
11:16:34 AM INFO: [ACTION-B] boot_linaro_image is started with {u'test_image_prompt': u'root@localhost:~#'}
11:16:34 AM INFO: Boot the test image.
11:16:34 AM INFO: Booting the test image. Attempt: 1
11:16:34 AM INFO: Loading boot_cmds from device configuration
11:16:34 AM INFO: Launching qemu with command u'/usr/local/bin/qemu-system-aarch64 -M virt -cpu cortex-a57 -device virti...
11:16:44 AM INFO: System is in test image now
11:16:47 AM INFO: [ACTION-E] boot_linaro_image is finished successfully.
```

Pasting the file boot_test.json into the job window

LAVA Home Dashboard Scheduler API Help Instance: localdemo default

LAVA / Scheduler / Submit Job

Submit Job

You can use the Job Submission Wizard GUI for submitting jobs.
Otherwise, paste your job definition JSON here. Alternatively, you can paste a URL to your job definition file:

```
1 {
2   "timeout": 180,
3   "job_name": "qemu-aarch64-kernel-boot",
4   "device_type": "qemu-aarch64",
5   "target": "qemu-aarch64-001",
6   "logging_level": "DEBUG",
7   "actions": [
8     {
9       "command": "display_linaro_kernel",
10      "parameters": {
11        "kernel": "file://home/jessie/images/image",
12        "login_prompt": "qemu-aarch64-001 login:",
13        "rootfs": "file://home/jessie/images/ubuntu-core-14.04-core-arm64.img",
14        "username": "root",
15        "password_prompt": "Password:",
16        "password": "root"
17      }
18    }
19  ]
20 }
```

Valid JSON.

Add to my favorite jobs

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You have the right to obtain source code of any server side installations of this software that you interact with.

Poll the test until complete

LAVA Home Dashboard Scheduler API Help Instance: localdemo default

LAVA / Scheduler / All Jobs

All Jobs

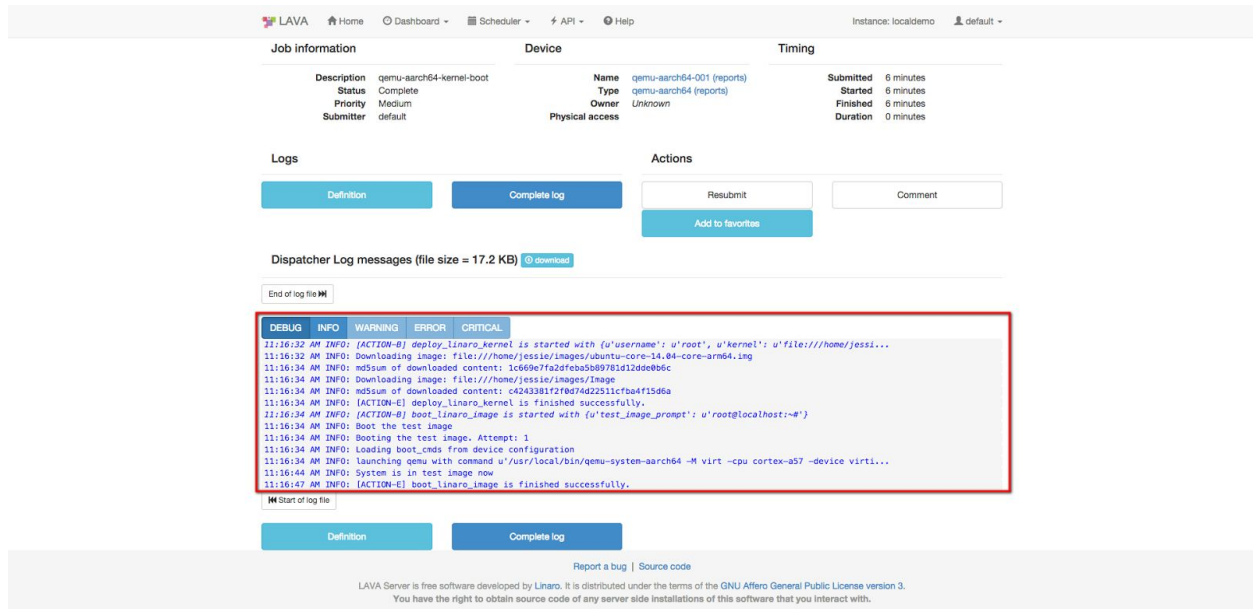
Show 25 entries Search

ID	Status	Priority	Device	Description	Submitter	Submit Time	End Time	Duration
3	Complete	Medium	qemu-aarch64-001	qemu-aarch64-kernel-boot	default	Jan. 21, 2015, 11:16 a.m.	Jan. 21, 2015, 11:16 a.m.	0:00:19.318235

[Report a bug](#) | [Source code](#)

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Click on the Job ID # to see the log of the job. Note that it passed :-)



The screenshot shows the LAVA web interface for a job with ID 'qemu-aarch64-kernel-boot'. The job is in a 'Complete' state. The log viewer shows the following messages:

```
11:16:32 AM INFO: [ACTION-B] deploy_Linaro_kernel is started with {'username': 'u'root', 'u'kernel': 'u'file:///home/jessi...
11:16:32 AM INFO: Downloading_image: file:///home/jessie/images/ubuntu-core-14.04-core-arm64.img
11:16:34 AM INFO: md5sum of downloaded content: 1c669e7fa20feba5b89781d12de0b6c
11:16:34 AM INFO: Downloading_image: file:///home/jessie/images/1nagc
11:16:34 AM INFO: md5sum of downloaded content: c42433812f807482251c1ba4f15d6a
11:16:34 AM INFO: [ACTION-E] deploy_Linaro_kernel is finished successfully.
11:16:34 AM INFO: [ACTION-B] boot_Linaro_image is started with {'test_image_prompt': 'u'root@localhost:~#'}
11:16:34 AM INFO: Boot the test_image
11:16:34 AM INFO: Booting the test_image. Attempt: 1
11:16:34 AM INFO: Loading_boot_cmds from device configuration
11:16:34 AM INFO: Launching qemu with command u'/usr/local/bin/qemu-system-aarch64 -M virt --cpu cortex-a57 --device virti...
11:16:44 AM INFO: System is in test_image now
11:16:47 AM INFO: [ACTION-E] boot_Linaro_image is finished successfully.
```

Configuration Notes

The Linux image has two network adaptors, one for NAT and one to serve the lava server to the host. The second adapter is configured for 192.168.56.2 on the host. It needs a consistent configuration between /etc/interfaces and virtual box.

The default qemu-aarch64 device in Lava expects to boot from a multi-partition image, but lava uses a mixture of partition definitions in .conf and parted to find the offset. To make it easy to build new rootfs images I made a 1 character change to the lava device file to boot from an image with a single partition.

Guest additions are installed. You need to set up a shared folder in virtual box if you want to get files in and out.

Known Issues

1. Rootfs images are mounted read/write. Use shutdown -h to tidily close any qemu sessions.
2. Networking is not enabled in any of the test images.
3. There may be non-fatal issues with the boot, but not enough to stop the boot test passing
4. The virtual box window size is probably not ideal for you. It's changed in /etc/default/grub using GRUB_CMDLINE_LINUX_DEFAULT="splash vga=xxx" and remember to update grub.

Acknowledgements

The original qemu aarch64 set up and buildroot initramfs was heavily based on Alex Bennee's
<http://www.bennee.com/~alex/blog/2014/05/09/running-linux-in-qemus-aarch64-system-emulation-mode/>

Bill 21 Jan 2015 - updated 14 Sep 2015