Why I moved away from LAVA for ART CI

Vishal Bhoj <vishal.bhoj@linaro.org>
Agenda

- ART CI setup from testing point of view
- Issues faced with LAVA
- Current ART CI setup
- Issues with current ART CI setup
- Possibility of moving back to LAVA?
Test setup in ART CI with Nexus Devices

- **ART Target Tests**
  - Set of tests which are invoked from AOSP build system
  - Requires a rooted Android device connected to the same machine

- **MicroBenchmarks**
  - Suite of benchmarks maintained by ART team
  - Can be run on any Android device to benchmark the ART VM in different configurations
Target Tests

- The device under test (DUT) needs to be connected to the build machine
- Using LAVA for these tests were ruled out:
  - Repackaging these tests to be run inside LAVA is a non-trivial task
  - Maintaining the same would be a big task in itself
  - Running tests within LAVA and on developer’s desk would not be the same procedure
  - Building on Jenkins and then running in LAVA would just take too much time
- 2 build machines set up in the lab with Nexus 9 connected
MicroBenchmarks setup back then

- Independent of the build system
- Could be run in LAVA ... but in a multinode environment (host driven)
- Target Device: Nexus 9, Nexus 5X (added later)
Issues we ran into with LAVA

- Multinode didn’t support Nexus kind of device with ADB over USB
- Moved to setup with 1 NUC + Nexus 9
- Finally reached a point of stable setup with 1 NUC + 1 Nexus 9
- Started seeing instability with 1 NUC with 2 Nexus 9

Fragile setup:
- Devices battery discharged quickly
- Device detection failed with USB errors
- Cambrionix hub did not solve all the issues
- Health checks failed
- Difficult to detect in which state the device was after the job due to battery discharge/USB errors on host/usb errors on the device itself
- Jobs were lost before health check failed and put the device offline

Thanks to lab guys who would fix the device whenever we reported it to them!
<table>
<thead>
<tr>
<th>Timestamp</th>
<th>State Change</th>
<th>User</th>
<th>Action</th>
<th>Timestamp</th>
<th>State Change</th>
<th>User</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-05-28 09:45</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>admin action</td>
<td>2016-05-20 08:56</td>
<td>Running → Going offline</td>
<td></td>
<td>Admin action</td>
</tr>
<tr>
<td>2016-05-20 14:32</td>
<td>Going offline → Offline</td>
<td></td>
<td></td>
<td>2016-05-17 12:24</td>
<td>Going offline → Offline</td>
<td></td>
<td>Job 890761 completed</td>
</tr>
<tr>
<td>2016-05-20 14:30</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>flock timeout - back online</td>
<td>2016-05-15 11:09</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>Battery died - recharged</td>
</tr>
<tr>
<td>2016-05-20 14:02</td>
<td>Going offline → Offline</td>
<td></td>
<td></td>
<td>2016-05-15 11:09</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>Battery died - recharged</td>
</tr>
<tr>
<td>2016-05-20 14:02</td>
<td>Running → Going offline</td>
<td></td>
<td></td>
<td>2016-05-12 20:24</td>
<td>Going offline → Offline</td>
<td></td>
<td>Job 882316 completed</td>
</tr>
<tr>
<td>2016-05-20 11:54</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>fastboot check complete</td>
<td>2016-05-12 20:24</td>
<td>Running → Going offline</td>
<td></td>
<td>Health Check Job Failed</td>
</tr>
<tr>
<td>2016-05-20 11:26</td>
<td>Running → Going offline</td>
<td>dave.pigott</td>
<td>check simultaneous fastboot</td>
<td>2016-05-12 19:47</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>Reported low battery</td>
</tr>
<tr>
<td>2016-05-20 11:26</td>
<td>Running → Going offline</td>
<td>dave.pigott</td>
<td>check simultaneous fastboot</td>
<td>2016-05-03 14:39</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>Battery died - recharged</td>
</tr>
<tr>
<td>2016-05-20 11:14</td>
<td>Offline → Idle</td>
<td>dave.pigott</td>
<td>battery died - recharged</td>
<td>2016-05-01 16:09</td>
<td>Running → Going offline</td>
<td></td>
<td>Job 859473 completed</td>
</tr>
</tbody>
</table>
Current ART CI setup

- Target Tests and MicroBenchmarks are run from the build system itself
Issues with current ART CI setup

- 2 build machines provide connection to the 4 Nexus devices
  - One adb server can be running at a time due to an adb bug.
- Static config data on build machine about Nexus device to use
- It doesn’t scale
- It isn’t cost effective
- There’s a cost in maintenance of list of devices and serial number connected
Possibility of moving back to LAVA?

- Why?
  - Provides us scalability at lower cost and lower maintenance (if done right)
  - Use LAVA as a device allocator (cost effective)
  - Dogfooding
  - Improve LAVA product for its usage in Android use cases

- How?
  - Stability of device needs to be guaranteed
  - Need mechanism for external world to connect remotely to devices allocated by LAVA
Let’s Discuss the Possibilities...
Thank You

#LAS16
For further information: www.linaro.org
LAS16 keynotes and videos on: connect.linaro.org