# QEMU Plans and Ideas

Presented to HPP Arch council meeting:
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HPP QEMU POR

- Generic HPP QEMU machine
  - default : 4x A53 + 2x M3 + 2x R5
  - command line options to change to M33 or M55
  - MMR based run/stop per core
  - Mailbox IPC HW
  - Selectable boot core
- Does not include adding new cores but should be updated as new cores are available. Core of interest are:
  - R82 & R55
  - Armv8.4 A, Armv9.1 A
- All cores running in TCG
- All cores are Arm based

Idea File
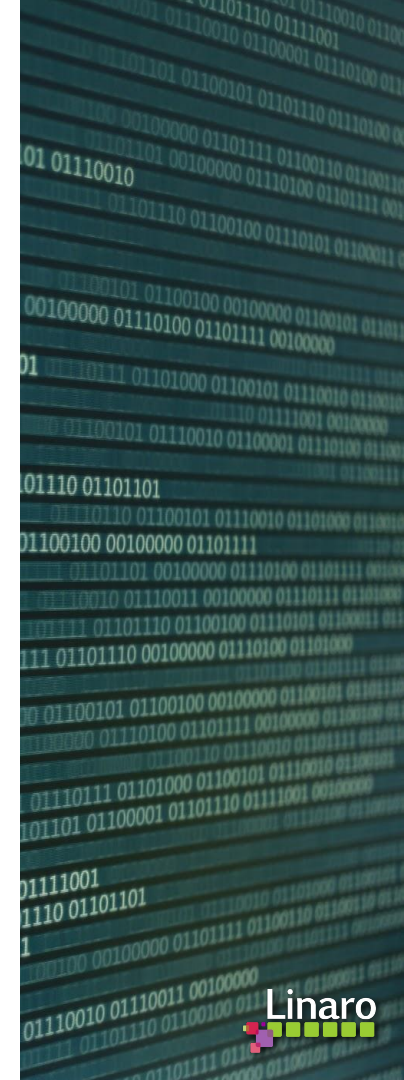
Idea: Asymmetric core performance

- Have different performance levels for different cores
  - BIG.little, 3 GHz A core + 50 MHz M core
- Two levels of difficulty
  - All cores in TCG
  - Some cores in KVM and others in TCG

- Today's icount option is not really suitable
  - Disables multicore simulation, only has factor of 2 scaling that applies to all cores
- TCG only
  - Add new instruction count throttle option per core
- TCG + KVM
  - Requires advances in co-existence or advances in multiprocess QEMU
- Pros: Idea promoted by Francois based on conversations with AWS and others
  - Provide a good Automotive simulation
  - Allow some ballpark BIG.little simulation
- Cons:
  - Is the BIG.little good enough?
  - RTOS & control cores tend to run from timer events, is CPU performance important?

Idea: Better Generic SOC Simulation

- Create a better generic SOC model
  - Target for vendor neutral demos and examples systems
  - Keep low level firmware honest
  - Modeling a real SOC gets very complex but current models like virt are too simple
- DDR should not work before it is initialized or while in self refresh
  - For ECC DDR, reading a location before it is written should cause a fault
- Peripherals should not work without power and clocks
  - Allow the full power framework to be tested in the abstract
- Peripherals should have firewalls just like real SOCs
  - Firewalls are not just for memory; already exists on for QEMU MCU targets
- A real eMMC emulation
  - and/or secure SPI, UFS
- A eFUSE model
  - Allow the full device commissioning & security flow to be tested

- This is definitinity nice to have, is it more?

Thank you