GridPP
UK Computing for Particle Physics

UNIVERSITY of GLASGOW

ARM at Glasgow

GDB
CERN
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Glasgow Site

- Around 16k x86 cores (HT'ed) of varying age; mostly AMD.
- Two ARM clusters
  - 1760 cores dual socket Altra Q80-30 (80x2 cores). Been used by all four LHC Experiments.
  - 2304 cores single socket Altra-Max Q128-30. Just installed and being commissioned.
- Multiple CE's
  - For initial tests we had separate CE for ARM in addition to 4 x86 CE's.
  - Now migrating to Condor-10 and EL9 and reconfiguring…
- Around 10PB (usable) storage (CEPH; similar to RAL's ECHO). Sites is an ATLAS nucleus site.

Glasgow Experience

Quotes from team lead:

- *Fundamentally, the ARM nodes are operationally a bit of a non-issue.*
- *Some peculiarities, but every new batch of machines has its own idiosyncrasies.*
- *Tiny bit more work to do, e.g. maintaining OS images for both x86 and ARM, but that's an extra few minutes here or there.*
- *There were a few very minor one-off issues:*
  - *Needed to update our Ansible config to distinguish between hardware architectures.*
  - *There are some differences between Grub, with the aarch64 version using commands with slightly different names, which in turn required a bit of tweaking in our provisioning system.*
  - *Found a few things were missing, e.g., WLCG EL9 ARM repo didn't contain some VOMS / IAM config RPMs, but this was quickly provided.*
- *Running an ARM queue alongside our x86 queue added four lines to our ARC configuration, but most of the work was at the experiment end. While a unified queue would be ideal, it would require all the VOs to be able to act appropriately on both architectures; I've no doubt LHC clients could cope, but I have less confidence that non-LHC VOs have the effort available.*

No issue getting normal NBD on-site service for ARM kit as normal.

Conclusion

- Adding an ARM cluster was no big deal, even though we were one of the first to do it.
- There is no significant on-going increase in effort; an ARM cluster is little different from a new generation of x86.
- We have a simple set-up that is fine/functional for now.
- Happy to have the choice for future procurements and be able to help drive competition towards affordable and efficient hardware.