

SUMMARY

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KNL

- KNL has some interesting hardware in it
 - Most of the time quadrant and cache or quadrant and flat is the way to go
 - Don't use alltoall, SNC-2, hemisphere
 - MCDRAM has potential to help a lot of codes
 - You can manually manage it but you can work up to this
 - ARCHER KNLs are integrated with the rest of the ARCHER systems
 - Apart from the RDF
 - Same /home shared between knl-login and ARCHER login
- Currently usage is free
 - Will start charging at some point
 - 1 node hour will cost same as 1 node hour on ARCHER (i.e. 0.36 kAUs)

Suggestions

- Pure MPI is fine for some codes, hybrid better for others
- If hybrid need a minimum number of MPI processes for memory and network bandwidth
 - i.e. quadrant mode would want 1 MPI process per quadrant
- If hybrid then need good second level parallelism
 - Serial code is still slower than standard multi-core
 - Need to make sure as much code is OpenMP'd or equivalent
- Cache mode is a good place to start
 - Compare flat mode with cache mode to see performance impact of MCDRAM
- Quadrant mode is a good place to start
- Vectorisation is key for performance (but not as hard as KNC)
- Hyperthreads can be beneficial
 - Not required by can give performance boost

Access to ARCHER KNLs

- Not an ARCHER user: Take the “ARCHER KNL Driving Test”
 - www.archer.ac.uk/training/course-material/online/driving_test.php
 - successful completion allows you to apply for an account on KNL system
 - backed up by online training materials
 - www.archer.ac.uk/training/course-material/online/



Access to ARCHER

- Various ways to apply for time on ARCHER
 - Standard research grant
 - Request Technical Assessment using form on ARCHER website
 - Submit completed TA with notional cost in Je-S
 - Apply for time for maximum of 2 years
 - ARCHER Resource Allocation Panel (RAP)
 - Request Technical Assessment using form on ARCHER website
 - Submit completed TA with RAP form
 - Every 4 months
 - Application for computer time only
 - Instant Access – Pump-Priming Time
 - Request Technical Assessment using form on ARCHER website
 - Submit completed TA with 2 page description of work
 - see <http://www.archer.ac.uk/access/>
- All require justification of resources
 - Instant Access has the lowest barrier to entry
 - designed for exploratory work, e.g. in advance of a full application
- Or take the “ARCHER Driving Test”
 - www.archer.ac.uk/training/course-material/online/driving_test.php
 - successful completion allows you to apply for an account for 12 months with an allocation of around 80,000 core-hours
 - backed up by online training materials
 - www.archer.ac.uk/training/course-material/online/



Support and Documentation

Helpdesk

Email support@archer.ac.uk

via ARCHER SAFE <http://www.archer.ac.uk/safe>

phone: +44 (0)131 650 5000

By post, to:

ARCHER Helpdesk

EPCC

James Clerk Maxwell Building

Peter Guthrie Tait Road

EDINBURGH EH9 3FD

<http://www.archer.ac.uk/community/techforum/>

<http://www.archer.ac.uk/documentation/>

<http://www.archer.ac.uk/documentation/knl-guide/>

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Training opportunities

- ARCHER Training (free to academics)
 - <http://www.archer.ac.uk/training/>
- Online sessions (using *Blackboard Collaborate*)
 - Technical Forum meetings (normally 15:00 last Wednesday of month)
 - technical presentations of interest to ARCHER users
 - <http://www.archer.ac.uk/community/techforum/>
 - Virtual tutorials (normally 15:00 second Wednesday of month)
 - opportunity for discussion with ARCHER staff on **any** topic
 - usually starts with a presentation of general interest
 - <http://www.archer.ac.uk/training/virtual/>
- EPCC MSc in HPC (scholarships available)
 - <http://www.epcc.ed.ac.uk/msc/>



Funding calls

- Embedded CSE support
 - Through a series of regular calls, Embedded CSE (eCSE) support provides funding to the ARCHER user community to develop software in a sustainable manner for running on ARCHER. Funding will enable the employment of a researcher or code developer to work specifically on the relevant software to enable new features or improve the performance of the code
 - Apply for funding for development effort
 - Happen every 4 months
- See <http://www.archer.ac.uk> for details

Feedback and follow-up

<http://www.archer.ac.uk/training/feedback/>

<http://www.archer.ac.uk/training/virtual/>

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Intel's IPCC program

- Collaboration between Intel and leading Universities around the world
- “Intel® Parallel Computing Centers are universities, institutions, and labs that are leaders in their field, focusing on modernizing applications to increase parallelism and scalability through optimizations that leverage cores, caches, threads, and vector capabilities of microprocessors and coprocessors.”

