SUMMARY

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Xeon Phi

- High potential performance
  - Acheiveable performance lower but can still be x2 a compute node (i.e. 2 x multicore processor)
- GPU'd codes
  - Offloading can match GPU kernels
  - Good performance model
- Porting straightforward
  - Achieving good performance harder
  - Low memory per core also can limit what jobs can be run
- Tools available to help with optimisation
  - Intel vtune and vector advisor
  - Allinea map

KNL – Knights Landing

High-bandwidth In-Package Memory

Source: http://newsroom.intel.com

- Successor to Xeon Phi (Knights Corner)
  - ~3 TFLOP/s double precision
  - 72 Airmont cores
  - 2 vector units per core
  - Two cores share 1MB L2 cache form a tile
  - A mesh fabric routes between the tiles
  - On package-DDR4 memory controller support for up to 384 GB main memory
  - 16GB of on-package stacked RAM
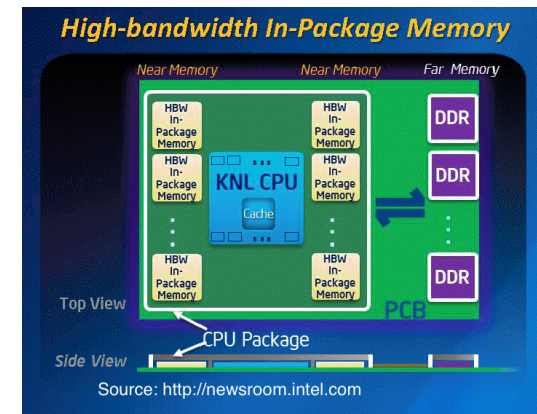
KNL choices

Xeon Phi	Clock Speed	Cores / Threads	Peak DP TFLOPS	DDR4 Memory	MCDRAM Memory Capacity	Speed	TDP (Watts)	1K Tray Unit Price	$ / TFLOPS
Knights Landing									
7290	1.5 GHz	72 / 288	3.46	384 GB	16 GB	7.2 GT/sec	245	$6,254	$1,810
7250	1.4 GHz	68 / 272	3.05	384 GB	16 GB	7.2 GT/sec	215	$4,876	$1,601
7230	1.3 GHz	64 / 256	2.66	384 GB	16 GB	7.2 GT/sec	215	$3,710	$1,393
7210	1.3 GHz	64 / 256	2.66	384 GB	16 GB	6.4 GT/sec	215	$2,438	$916

Xeon Phi	Clock Speed	Cores / Threads	Peak DP TFLOPS	Cache Memory	GDDR5 Memory Capacity	Speed	TDP (Watts)	1K Tray Unit Price	$ / TFLOPS
Knights Corner									
7120P	1.24 GHz	61 / 61	1.21	30.5 MB	16 GB	5.5 GT/sec	300	$4,129	$3,412
7120X	1.24 GHz	61 / 61	1.21	30.5 MB	16 GB	5.5 GT/sec	300	$4,129	$3,412
5110P	1.05 GHz	60 / 60	1.01	30 MB	8 GB	5.0 GT/sec	225	$2,649	$2,623
5120D	1.05 GHz	60 / 60	1.01	30 MB	8 GB	5.5 GT/sec	245	$2,759	$2,732
3120A	1.10 GHz	57 / 57	1.0	28.5 MB	6 GB	5.0 GT/sec	300	$1,695	$1,695
3120P	1.10 GHz	57 / 57	1.0	28.5 MB	6 GB	5.0 GT/sec	300	$1,695	$1,695

Getting access to 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

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
  - Regular calls are every 4 months
    - actively encouraging applications from New Scientific Communities

- See http://www.archer.ac.uk for details

Support

- 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/

Training opportunities

- ARCHER Training (free to academics):
  - http://www.archer.ac.uk/training/

- EPCC MSc in HPC
  - http://www.epcc.ed.ac.uk/msc/

Virtual Tutorials

- Live online interactive sessions
  - a forum for users of ARCHER to ask any questions you may have about the ARCHER service.

- Q&A sessions, starting with short lecture on specific topic
  - An opportunity for attendees of ARCHER training courses to discuss any issues related to a course or questions about course material that may have arisen since attending the course.

- Broadcast using Blackboard Collaborate.

- Every second Wednesday of the month
  - http://www.archer.ac.uk/training/virtual/.

What now?

- You can attempt the ARCHER driving test
  - www.archer.ac.uk/training/course-material/online/driving_test.php

- On successful completion, eligible users can apply for
  - account on ARCHER
  - 1,200 kAUs of time (80,000 core-hours) over 12 months

- Further information
  - This online material: www.archer.ac.uk/training/course-material/online/.
  - Documentation: http://www.archer.ac.uk/documentation/.
  - Helpdesk: support@archer.ac.uk
  - Training: http://www.archer.ac.uk/training/.