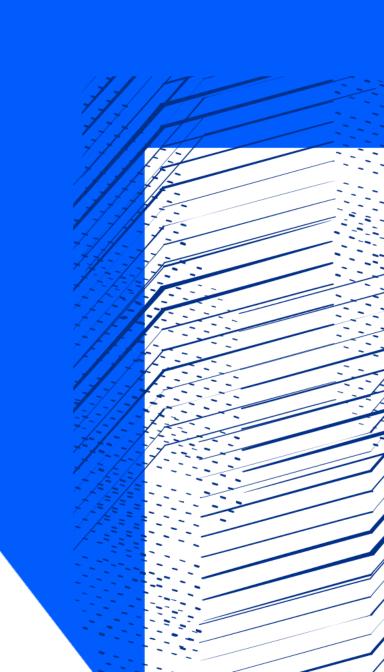# Benchmarking at RAL

Alastair Dewhurst

Context

- RAL had some travel budget available at the end of last year!!

- We paid a vendor to benchmark the new generation of CPUs with HEPSCORE and HS06 (and SPEC17) to help with procurement.

- Results came through in the last week, now discussing pricing with Vendors.

- Hope to place orders by the end of July.

Setup

- Vendor installed the machine with CentOS7 and ran the HEPSCORE 2.0.

- Tested a variety of new AMD Milan and Intel Ice lake CPUs the Vendor had available.
  - Each machine has dual CPUs.

- Ran machine with memory fully populated as well as with the memory channels only 50% populated.

- The machine had an SSD, although we also tested NVMe storage.

- Measured the average power usage as well.

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Results - AMD

Dual SKU	Memory	HEPSCORE	SPEC2006	SPEC2017	Average Power (Watts)
75F3 (32C / 64T)	1024 GB	2492	2592	324	
7313 (16C / 32T)	512GB	1183	1299	167	431
	1024GB				463
7543 (32C / 64T)	512GB	2181	2328	300	577
	1024GB				615
7763 (64C / 128T)	512GB	3507	2855	395	674
	1024GB	3654	2938	401	693

- Variety of the Milan CPU tested.
- For reference, last years 7452 has 1800 HS06.

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Results - Intel

Dual SKU	Memory	PRELIMINARY HEPSCORE	SPEC2006	SPEC2017	Average Power (Watts)
6342 (24C / 48T)	512GB	1430	1533	201	820
	1024GB	1418	1546	201	845
6330 (28C / 56T)	512 GB	1445	1513	197	882
	1024 GB	1455	1543	199	915

- These are preliminary results as they were completed over the weekend.
- These intel don't appear competitive, although we still need to benchmark the 8xxx generation of Intel CPU.

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SSD

- The benchmarking tried using both SSD and NVMe disks.
  - Performance was within 2% for all benchmarks.

- From looking at our production machines we are seeing a write usage of between 0.4 and 0.5MB/s per thread.
  - We need to purchase SSDs with 3 DWPD for 5 years.