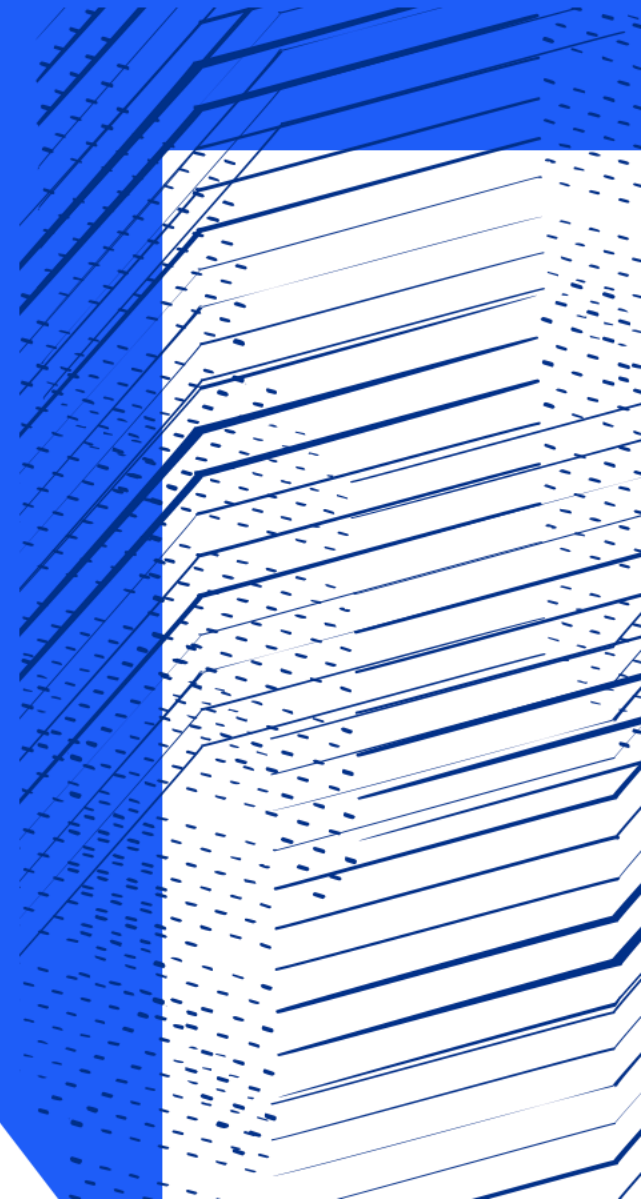




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HEPScore at RAL

Alastair Dewhurst



Introduction

- On April 1st 2023, the official benchmark for the WLCG became HEPScore 23 (HS23).
- To ease the transition HS23 has been normalized to equal HS06 for a reference CPU:
 - “Intel CPU Gold 6326 CPU @ 2.90GHz - 64 cores SMT ON”
 - All existing HS06 benchmarks will be just be assumed to be the HS23 score.
- An update was given at the recent [WLCG Operations Coordination meeting](#).
 - [Instructions to run HS23](#).
 - [Changes required](#).

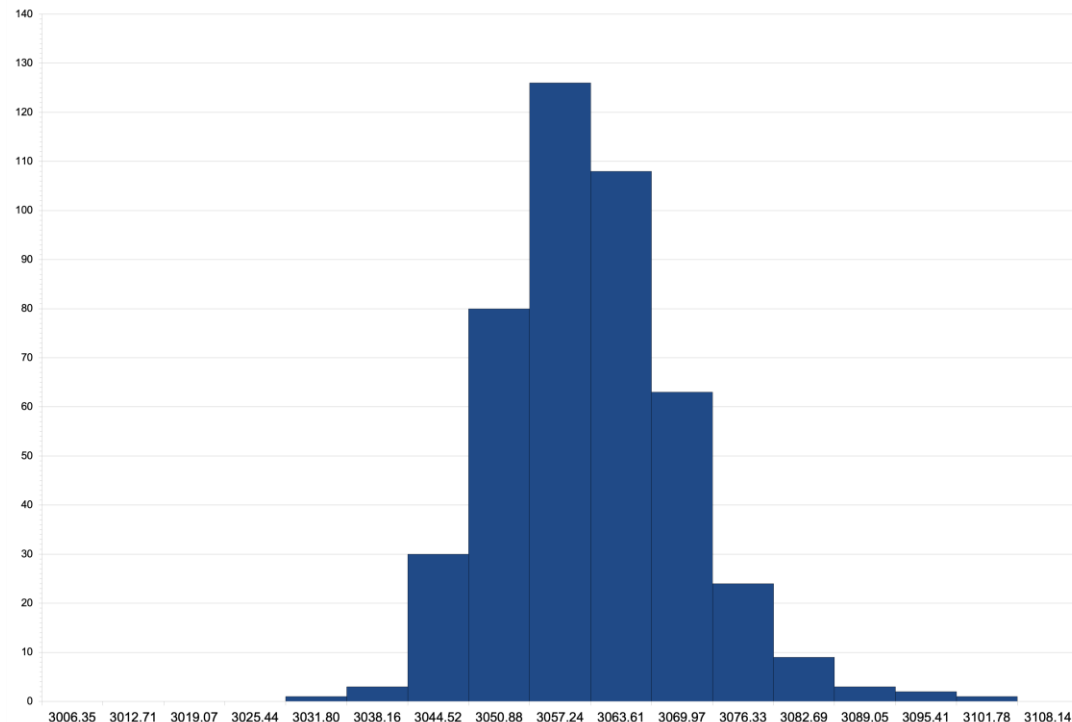
HEPScore at RAL

- In FY22/23 RAL purchased 48 servers from Lenovo with:
 - Dual AMD EPYC 7763
 - 1024 GB Memory
 - 25Gb/s NIC
 - 1 x 480GB SSD for the OS
 - 1 x 6.4TB NVMe for scratch (3 DWPD for 5 years durability).
- These were benchmarked with both HS06 and HS23.

HS06 Results

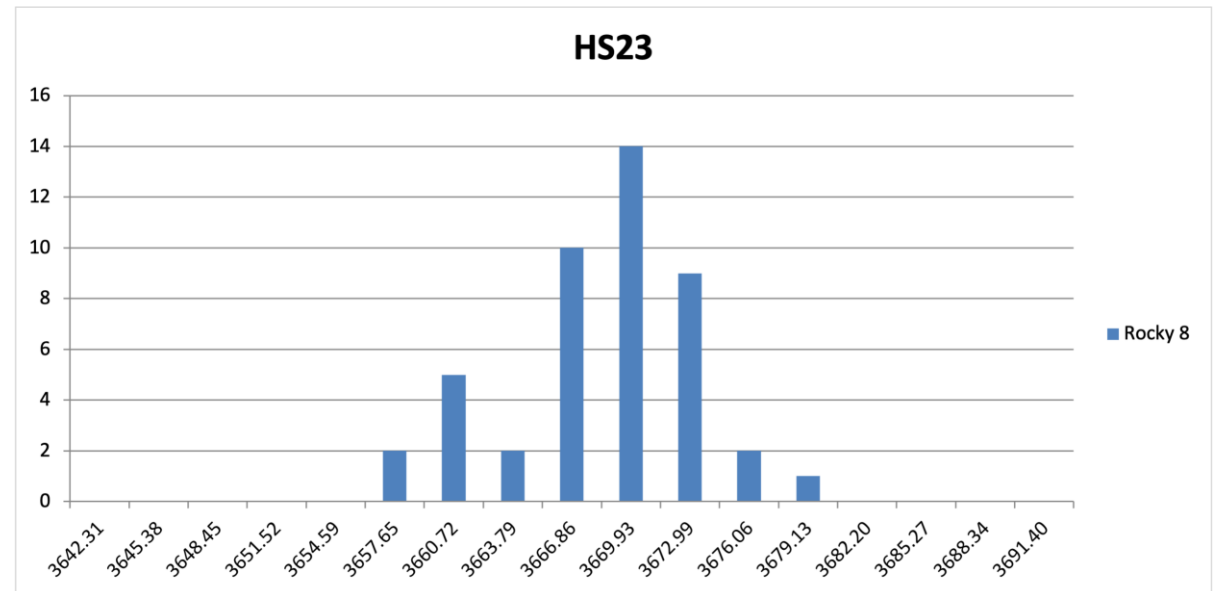
Host	1	2	3	4	5	6	7	8	9	10	Mean	StdDev
lcg2643.gridpp.rl.ac.uk	3052.39	3072.25	3046.19	3050.10	3060.52	3057.51	3050.1	3057.62	3051.49	3061.9	3056.00	7.63
lcg2645.gridpp.rl.ac.uk	3051.40	3056.73	3059.59	3054.41	3041.24	3057.79	3050.58	3054.59	3064.69	3050.43	3054.14	6.34
lcg2646.gridpp.rl.ac.uk	3059.34	3063.63	3045.47	3060.49	3065.21	3068.41	3068.77	3055.06	3095.72	3064.65	3064.65	12.92
lcg2647.gridpp.rl.ac.uk	3044.98	3053.38	3069.62	3062.37	3050.36	3056.52	3052.84	3049.94	3059.84	3052.31	3055.21	7.11
lcg2648.gridpp.rl.ac.uk	3050.31	3058.10	3050.55	3050.31	3055.72	3061.46	3062.63	3054.30	3058.02	3060.48	3056.18	4.71
lcg2649.gridpp.rl.ac.uk	3067.70	3051.39	3051.40	3058.15	3065.94	3047.15	3064.82	3062.49	3061.15	3058.8	3058.90	6.92
lcg2650.gridpp.rl.ac.uk	3054.68	3067.74	3058.79	3081.79	3056.73	3058.05	3047.91	3061.76	3071.76	3061.3	3062.05	9.58
lcg2651.gridpp.rl.ac.uk	3065.51	3054.84	3054.65	3048.71	3064.95	3056.50	3046.13	3048.27	3051.86	3074.07	3056.54	8.97
lcg2652.gridpp.rl.ac.uk	3084.71	3074.33	3050.94	3052.51	3053.94	3067.62	3064.51	3066.02	3053.30	3072.7	3064.05	11.30
lcg2653.gridpp.rl.ac.uk	3058.08	3051.32	3073.44	3053.14	3065.25	3063.81	3055.77	3063.73	3089.42	3072.19	3064.60	11.46
lcg2654.gridpp.rl.ac.uk	3053.08	3056.94	3049.03	3053.19	3049.49	3073.35	3061.29	3060.86	3053.27	3065.00	3057.54	7.64
lcg2655.gridpp.rl.ac.uk	3058.09	3072.63	3059.28	3060.03	3063.50	3057.82	3053.59	3041.85	3070.41	3063.42	3060.05	8.64
lcg2656.gridpp.rl.ac.uk	3049.40	3052.60	3058.27	3044.63	3051.72	3045.49	3051.21	3030.03	3039.51	3049.55	3047.23	7.90
lcg2657.gridpp.rl.ac.uk	3054.14	3064.38	3049.02	3039.32	3069.35	3060.78	3064.47	3077.42	3057.78	3045.71	3058.22	11.50
lcg2658.gridpp.rl.ac.uk	3058.88	3047.40	3073.99	3044.32	3043.36	3049.31	3052.64	3062.97	3061.05	3054.43	3054.82	9.55
lcg2659.gridpp.rl.ac.uk	3066.97	3056.08	3042.37	3071.49	3062.62	3041.02	3054.7	3054.20	3080.95	3057.61	3058.78	12.32
lcg2660.gridpp.rl.ac.uk	3050.15	3057.47	3065.43	3067.60	3055.11	3053.25	3058.97	3056.62	3072.45	3052.60	3058.96	7.24
lcg2661.gridpp.rl.ac.uk	3071.44	3067.70	3046.97	3052.74	3067.65	3060.15	3061.36	3076.11	3068.33	3053.55	3062.59	9.29
lcg2662.gridpp.rl.ac.uk	3042.98	3059.89	3052.42	3052.75	3050.75	3046.29	3060.56	3039.64	3056.51	3053.80	3051.55	6.88
lcg2663.gridpp.rl.ac.uk	3062.10	3060.16	3057.13	3064.99	3071.08	3051.25	3058.55	3067.94	3062.88	3067.84	3062.39	5.91
lcg2664.gridpp.rl.ac.uk	3042.54	3050.02	3049.63	3053.51	3056.07	3060.64	3052	3053.86	3073.60	3043.18	3053.49	8.93
lcg2665.gridpp.rl.ac.uk	3050.14	3050.39	3045.18	3046.28	3045.33	3063.50	3049.78	3057.68	3063.42	3050.37	3052.20	6.93
lcg2666.gridpp.rl.ac.uk	3047.47	3071.23	3061.66	3067.61	3069.98	3063.37	3064.22	3062.83	3043.95	3065.50	3061.77	9.05
lcg2667.gridpp.rl.ac.uk	3051.69	3053.84	3054.82	3065.33	3052.87	3050.97	3065.6	3060.49	3043.95	3060.3	3055.98	6.86
lcg2668.gridpp.rl.ac.uk	3060.67	3061.16	3055.82	3054.43	3066.65	3064.10	3048.89	3061.96	3080.88	3065.52	3062.00	8.59
lcg2669.gridpp.rl.ac.uk	3051.70	3057.76	3049.51	3050.20	3058.53	3066.44	3046.56	3048.24	3060.07	3057.08	3054.60	6.33
lcg2670.gridpp.rl.ac.uk	3052.01	3054.99	3068.63	3061.95	3073.63	3058.75	3075.37	3069.31	3072.87	3065.34	3065.28	8.11
lcg2671.gridpp.rl.ac.uk	3061.29	3046.55	3052.86	3054.35	3043.16	3039.15	3057.04	3045.88	3054.35	3048.18	3050.27	6.82
lcg2672.gridpp.rl.ac.uk	3045.68	3057.33	3057.26	3062.63	3066.54	3061.31	3062.61	3053.19	3055.70	3050.58	3057.28	6.30
lcg2673.gridpp.rl.ac.uk	3054.89	3043.87	3046.57	3059.45	3034.44	3052.40	3049.8	3045.85	3043.99	3054.19	3048.54	7.15
lcg2674.gridpp.rl.ac.uk	3057.52	3049.65	3074.26	3060.20	3048.01	3047.15	3040.22	3080.76	3065.11	3043.98	3056.66	13.42
lcg2675.gridpp.rl.ac.uk	3065.14	3060.00	3053.04	3052.11	3054.47	3059.43	3054.73	3055.06	3059.64	3049.80	3056.34	4.60
lcg2676.gridpp.rl.ac.uk	3062.74	3056.82	3055.73	3065.30	3038.45	3069.43	3062.94	3042.52	3069.66	3062.45	3058.59	10.60
lcg2677.gridpp.rl.ac.uk	3049.71	3075.66	3057.29	3052.18	3055.29	3069.91	3060.9	3055.99	3041.16	3053.4	3057.14	9.85
lcg2678.gridpp.rl.ac.uk	3047.91	3047.91	3053.27	3046.97	3065.39	3063.70	3083.5	3061.16	3054.75	3059.72	3058.41	11.09
lcg2679.gridpp.rl.ac.uk	3041.23	3062.70	3084.83	3055.83	3045.33	3053.70	3050.07	3044.27	3064.32	3042.35	3054.44	13.41
lcg2680.gridpp.rl.ac.uk	3047.10	3046.77	3034.59	3041.79	3038.12	3051.01	3050.82	3047.36	3044.50	3052.34	3045.44	5.79
lcg2682.gridpp.rl.ac.uk	3050.21	3061.75	3077.84	3056.52	3062.97	3063.16	3051.49	3080.88	3054.68	3045.16	3060.45	11.56
lcg2683.gridpp.rl.ac.uk	3065.81	3054.91	3058.37	3046.44	3082.47	3056.78	3067.5	3057.24	3064.97	3040.00	3059.43	11.77
lcg2685.gridpp.rl.ac.uk	3067.74	3056.59	3058.68	3066.64	3047.28	3041.50	3053.72	3057.05	3052.50	3057.64	3055.92	7.93
lcg2686.gridpp.rl.ac.uk	3050.69	3052.78	3069.26	3053.50	3065.35	3057.88	3049.97	3062.29	3055.32	3059.67	3057.66	6.44
lcg2687.gridpp.rl.ac.uk	3051.59	3047.18	3062.70	3054.95	3052.37	3063.53	3055.51	3055.68	3052.33	3063.48	3055.93	5.61
lcg2688.gridpp.rl.ac.uk	3053.65	3056.93	3064.44	3056.37	3061.98	3050.37	3056.11	3076.52	3090.66	3058.33	3062.51	12.23
lcg2689.gridpp.rl.ac.uk	3052.73	3053.78	3056.22	3050.45	3058.47	3059.56	3046.54	3069.62	3051.20	3050.57	3054.91	6.51
lcg2690.gridpp.rl.ac.uk	3061.19	3061.61	3057.57	3054.81	3052.76	3052.84	3046.95	3055.50	3059.53	3062.02	3056.47	4.85

HS06 / server = 3057.24 ± 9.54
 HS06 / thread = 11.94



HS23 Results

- Rob Johnson ran the HS23 tests thoroughly using version 1.4, which was unfortunately not the final version.
- He repeated a short set of tests using 1.5:
 - HS23 / server = 3666.86 ± 4.6
 - HS23 / thread = 14.32





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Questions?