Marconi
very first performance assesment

Carlo Cavazzoni

Cineca

Marconi – A1 HPL

Single node Linpack:

1 MPI task, 36 threads
perf range: 1.19 - 1.3TFlops
N = 104832, NB = 192 (90GByte)

Full system Linpack:

1 MPI task per node
perf range: 1.6 – 1.7PFs. Max Perf: 1.72389PFs
with Turbo-OFF.

Turbo-ON -> throttling

```
================================================================================
T/V                N    NB     P     Q               Time                 Gflops
--------------------------------------------------------------------------------
WC06C2C4     4320000   192    30    50           31178.23            1.72389e+06
HPL_pdgesv() start time Mon May 30 16:43:07 2016

HPL_pdgesv() end time   Tue May 31 01:22:46 2016

--------------------------------------------------------------------------------
||Ax-b||_oo/(eps*(||A||_oo*||x||_oo+||b||_oo)*N)=        0.0007856 ..... PASSED
================================================================================

Finished      1 tests with the following results:
              1 tests completed and passed residual checks,
              0 tests completed and failed residual checks,
              0 tests skipped because of illegal input values.
--------------------------------------------------------------------------------

End of Tests.
================================================================================
```

Marconi: Intel E5-2697 v4
Broadwell, 18 cores @ 2.3GHz.

Stream Benchmark

Memory: 9GByte
N= 400000000
NTIMES=50
Compilers= icc –O3 –xhost openmp & gcc –O3
Performance in MB/s

threads	Eurora (gnu)	Pico (gnu)	Galileo (intel)	Broadwell 2699v4	Marconi
1	14400	12600	20000	20000	17000
2	26830	25000	40000	36000	33500
4	41930	41700	73000	58000	59000
8	45200	48300	57000	76000	90800
10	44560	50700	61000	66000	97300
12	47000	45460	71000	83000	117600
16	47210	49180	82000	53000	101700
18	-	-	-	-	106000
20	-	60700	-	71000	102000
22	-	-	-	89000	99200
24	-	-	-	-	115000
36	-	-	-	-	110000
44	-	-	-	93000	-

Marconi: Intel E5-2697 v4 Broadwell, 18 cores @ 2.3GHz.

HPCG
intel binary (ver. 11.3), results in GFlops

Size (per task)	task	threads	Eurora	Pico	Galileo	BDW - 2699v4	Marconi
192	1	8	-	-	-	-	8.7
192	1	16	-	-	-	-	13
192	1	24	-	-	-	-	12
192	1	36	-	-	-	-	11.4
192	2	8	11	15	15	16	17
192	4	4	11	15	14	16	17
192	4	8	-	-	-	17	20
192	4	11	-	-	-	17	-
192	4	9	-	-	-	-	20
192	8	2	-	15	14	16	17
192	8	4	-	-	-	-	17
192	8	5	-	-	-	14	-

Marconi: Intel E5-2697 v4 Broadwell, 18 cores @ 2.3GHz.

Very First application results!!!

QE benchmark	Galileo(haswell)	Marconi
W64@64pe	13.50s WALL	10.76s WALL
W256@1024	37.38s WALL	38.83s WALL*
W256@1024	37.38s WALL	28.23s WALL**
W256@1024	37.38s WALL	30.81s WALL
W256@2048	---	22.79s WALL***
W256@512	---	45.05s WALL
W256@256	1m 7.78s WALL	1m11.62s WALL

* Without tuning parallelization parameters

** 32 proc per node

*** 1024-MPI x 2-OpenMP

Galileo: Intel E5-2630v3
8 core @ 2.4GHz.
Marconi: Intel E5-2697 v4
18 cores @ 2.3GHz.