

Machine specifications



The system, situated on a cold island which maintains the optimal temperature conditions, is set up by two different pieces of equipment: a shared-memory Bull Sequana X800 of 16 processors with 384 computing cores, 9.2 TB of memory and 39.6 TB of disk; and a Bull Sequana X550 of heterogeneous-distributed-memory, integrated by 60 computing nodes with a total of 2,688 computing cores. Of the 60 nodes, 4 are equipped with 2 GPGPU and 4 with Knight's Landing processors. The cluster has 13.44 TB of memory and 240 TB of disk. Peak performance will increase by 316.86 Tflop/s.

All the cluster is integrated in a single queue system, *SLURM Workload Manager_ext-link*, which automatically assigns the jobs to computing nodes depending on demanded resources and availability. A starter's guide to SLURM can be found [here_ext-link](#).

Canigó

Bull Sequana X800 is a shared-memory machine, with a peak performance (R_{peak}) of 33.2 Tflop/s and a maximum performance of 28.6 Tflop/s. The Sequana X800 has 16 processors Intel® Xeon® Platinum 8168 of 64 bits with 24 cores each and a frequency of 2.7 GHz, giving a total of 384 calculation cores. It has 9.2 TB of memory and 39.6 TB of disk. This system is a multiprocessor with a shared-memory design that provides a flexible and competitive work environment for a wide range of applications.

Among its advantages, it should be noted that the degree of parallelism is not limited at the number of processors of the nodes, and it does not present memory restrictions (24 GB/core), which is shared in an efficient way.

Regarding software, Sequana X800 runs RHEL 7.3 (Red Hat Enterprise Linux), offering to the users a work environment and performance suitable for this kind of high performance systems.

Model:

Bull Sequana X800

Specifications:

Operating System: Red Hat Enterprise Linux 7.3

Shared memory

Connected using Infiniband (100 Gbps) to BeeGFS cluster (shared storage /scratch).

24 cores x 16 Intel® Xeon® Platinum 8168 CPU at 2.7 GHz

9 TB RAM

40 TB storage

Pirineus II:

Bull Sequana X550 cluster is a heterogeneous-distributed-memory machine with a peak performance (R_{peak}) of 283.66 Tflop/s, connected through an Infiniband interconnection network with a bandwidth of 100 Gb/s. The cluster is formed by 46 nodes with 192 GB of memory (4 GB/core), 6 nodes with 384 GB (8 GB/core), 4 nodes with 192 GB equipped with two GPGPU with 3,584 CUDA cores and 12 GB of memory, and 4 nodes with 384 GB of memory equipped with Intel Knight's Landing (KNL) processors 7250. Regarding processors, 54 nodes are equipped with 2 Intel® Xeon® Platinum 8168 processors of 24 cores at a frequency of 2.7 GHz and 19 nodes are equipped with 2 Intel® Xeon® Platinum 8268 processors of 24 cores at a frequency of 2.9 GHz. KNL node processors have 68 cores with 4 physical threads each at a frequency of 1.4 GHz. All cluster nodes have a disk capacity of 4 TB.

The heterogeneous architecture of this cluster will allow the execution of many different types of calculations with an optimal efficiency: calculations with a high degree of parallelism, those with great need of memory, those that take advantage of the computing power of GPGPU or KNL processors, etc.

Regarding the software, the cluster runs under the same operating system as the other Bull Sequana X800, the RHEL 7.3 (Red Hat Enterprise Linux), suitable for this type of high performance systems.

Model:

Bull Sequana X550

Specifications:

Operating System: Red Hat Enterprise Linux 7.3

Heterogeneous cluster

Connected using Infiniband (100 Gbps) to BeeGFS cluster (shared storage /scratch).

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12 GB RAM

Peak performance: 4.7 Tflop/s

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Collserola:

Model:

Hybrid Bull

Specifications:

10 nodes with:

24 cores x 2 Intel® Xeon E5-2697

60 cores Intel® Xeon Phi 5120P

512/256 GB main memory (InfiniBand connected)

20.78 TB disk space

Peak performance: 15.29 Tflop/s