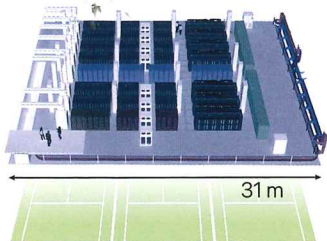


The MareNostrum 5 supercomputer

Millions of millions of millions of calculations per second to accelerate European science

Occupied area

The supercomputer occupies a room with an area of 800 m², equivalent to about 3 tennis courts.



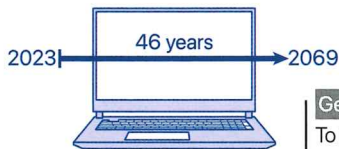
Services (e.g. refrigeration and electrical transformers) occupy almost three times as much: 2,000 m²

Electricity

Reaches each of the rows using aluminium bars, which are more efficient than cables.

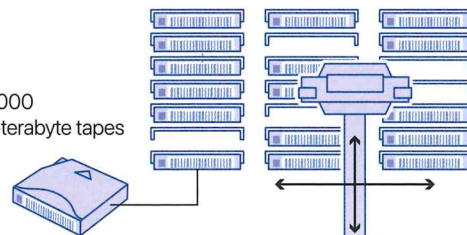
Electric panels

They distribute electricity in each row.



Computing power
The computing capacity of MareNostrum 5 is equivalent to about 380,000 high-end laptops. It does calculations in 1 hour that would take a laptop 46 years.
Peak performance: 314 Petaflops/s. (314,000 billion operations per second) with more than 2 petabytes of RAM.

20,000
20-terabyte tapes



Magnetic tapes

Slow to access, they are used because they consume less electricity. They store long-term data that is consulted less frequently.

General purpose partition

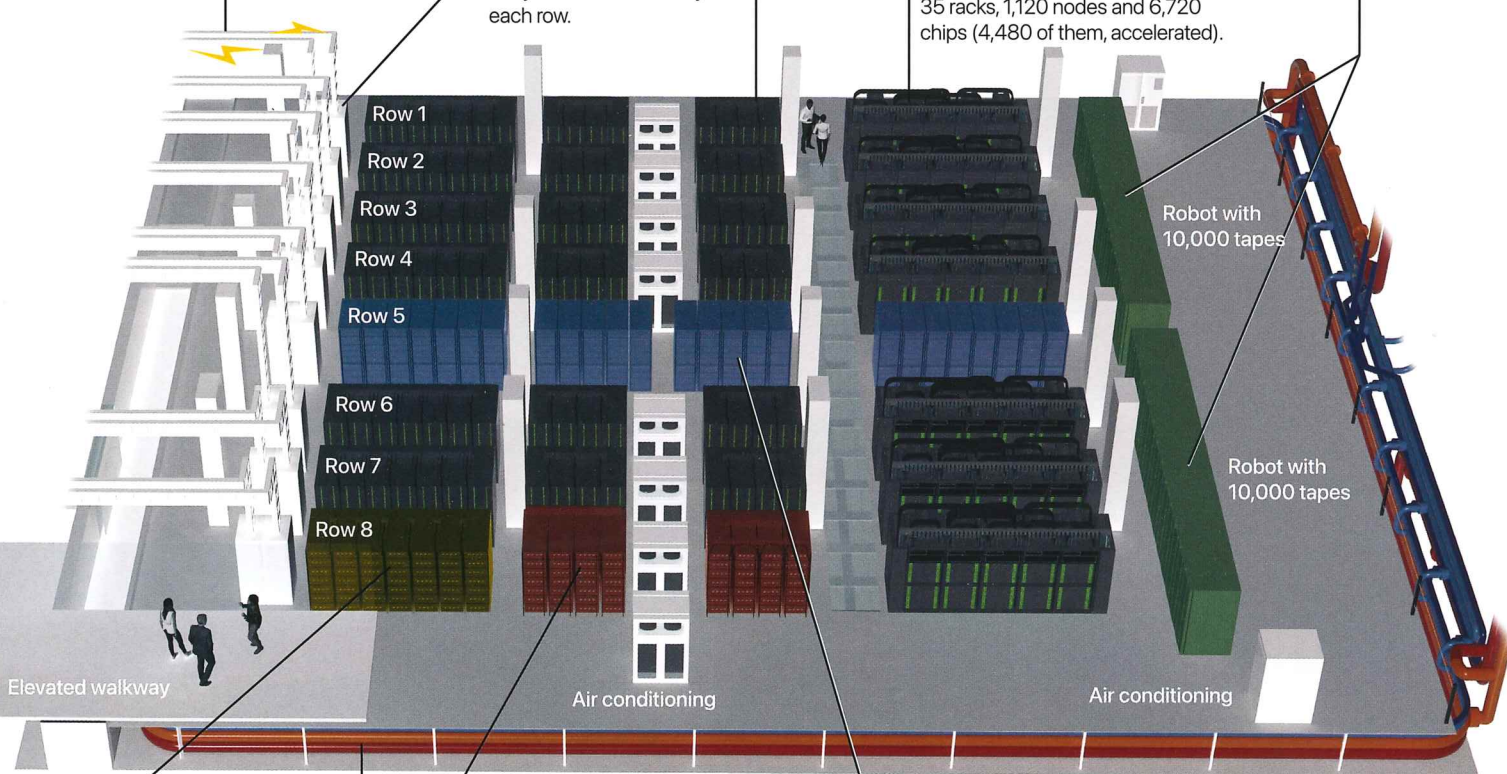
To help solve major scientific problems. 90 racks, 6,480 nodes and 12,960 chips.

Accelerated partition to make advances in Artificial Intelligence

35 racks, 1,120 nodes and 6,720 chips (4,480 of them, accelerated).

Robot with 10,000 tapes

Robot with 10,000 tapes



Experimental partitions

Research into technologies that will be part of the supercomputers of the future.

Management and communications

It connects all nodes to each other, sends the results to storage units and allows external queries.

Hard drives

The results of the calculations carried out are stored in 25 racks, each containing 816 18-terabyte hard drives. Total net space: 248,000 TB.

False floor

Underneath the computers is a basement floor of cables, water pipes and network cabling. MareNostrum 5's copper and fibre optic cables have a total length of 160 km.



Rack

There are over 180 racks. They contain nodes with chips, network cards, RAM and hard drives.

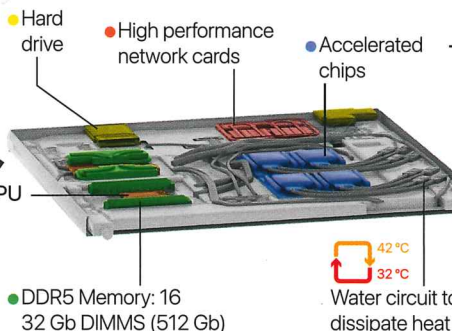
Water circuit in the rear door to cool the air expelled from the rack.



Copper and fibre optic cables

36 nodes in each rack

Accelerated node



They could store 1,280 copies of every book catalogued throughout history.



Each of the 4,480 accelerated chips has more power than the entire MareNostrum 1 (from 2004).

2023:
8 cm²

