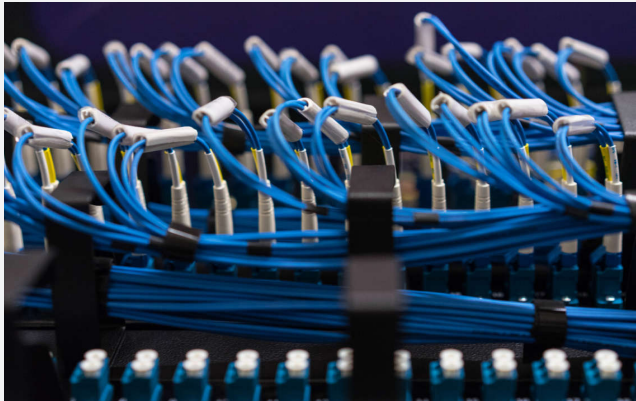


» FOCUS



CNAF IS IN THE GLOBAL RESEARCH NETWORK AT 200 GBPS

With an unprecedented speed of 200 Gigabits per second (Gbps), CNAF, the INFN national computing centre, is the first site in Italy to have a connection to the global geographical network, thanks to the GARR research network. The link now allows CNAF to be interconnected with the entire global system of research networks, in particular with CERN in Geneva, where the enormous amount of data from the LHC accelerator is produced, and with the other national centres where the scientific data produced by the experiments is distributed and analysed. In the case of CERN, we are talking about a volume of data exchanged in 2018, to date, equal to 61 PBs, so much as to require a 200 Gbps link, i.e. a capacity over 200 thousand times higher than the average capacity - calculated on the basis of data from the DESI (Digital Economy and Society Index) Report 2018 - of an Internet connection in Italy.

The result is the crowning glory of a series of enhancement interventions which concerned, on the one hand, the national GARR network and, on the other, the availability of storage space and computing power by the INFN. The work on the GARR network has made it possible to create a backbone that currently reaches a total capacity of approximately 3 Tbps, thanks to the doubling of capacity in the connections of its main nodes located in the cities of Milan, Bologna and Rome, nodes that, alone, can now count on a total capacity of 800 Gbps. This was achieved by exploiting the results of the GARR experiment on "alien lambda". The technique is named so because it allows the transport of light signals on an optical platform different from the one that generated them and allows different devices to talk to each other, maximising performance. A technique that has allowed the capacity of the network to be increased in a short time, and with marginal costs, since it has not required the updating of all the equipment along the infrastructure.

At the same time, INFN has enhanced its overall computing and big data management capabilities by making available to its scientific users, in particular CERN's LHC experiments, more than 60,000 cores of

» FOCUS

computational power and approximately 150 PBs of experimental data storage capacity, divided between fast access systems (disks) and slow storage systems (tapes).

The 200 Gigabit per second link to the national scientific computing networks means that CNAF is now able to make full use of its computing and storage resources internationally, thus facilitating the development of high-performance distributed computing models on a global scale. A result that allows CNAF to be increasingly closely integrated with CERN and places it, in terms of connectivity, at the same level as the most important American scientific computing centres, such as Fermilab and the Brookhaven National Laboratory.

The synergy in terms of technological innovation between GARR and INFN does not end with this important result and has already moved to the next step, foreseeing for the near future the doubling of the international connection with CERN and the creation of the so-called "data lake", data storage distributed on a geographical scale where data can be "fished", regardless of the place where it will be processed. ■