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The GÉANT network: addressing current and future needs for the High Energy Physics community.

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The GÉANT infrastructure is the backbone that serves the scientific communities in Europe for their data movement needs and their access to international research and education networks. Using the extensive fibre footprint and infrastructure in Europe the GÉANT network delivers a portfolio of services aimed to best fit the specific needs of the users, including Authentication and Authorization Infrastructure, end-to-end performance monitoring, advanced network services (dynamic circuits, L2-L3VPN, MD-VPN).

This talk will outline the factors that help the GÉANT network to respond to the needs of the High Energy Physics community, both in Europe and worldwide.

The Pan-European network provides the connectivity between 40 European national research and education networks. In addition, GÉANT also connects the European NRENs to the R&E networks in other world region and has reach to over 110 NREN worldwide, making GÉANT the best connected Research and Education network, with its multiple intercontinental links to different continents e.g. North and South America, Africa and Asia-Pacific.

The High Energy Physics computational needs have always had (and will keep having) a leading role among the scientific user groups of the GÉANT network: the LHCONE overlay network has been built, in collaboration with the other big world REN, specifically to address the peculiar needs of the LHC data movement. Recently, as a result of a series of coordinated efforts, the LHCONE network has been expanded to the Asia-Pacific area, and is going to include some of the main regional R&E network in the area.

The LHC community is not the only one that is actively using a distributed computing model (hence the need for a high-performance network); new communities are arising, as BELLE II. GÉANT is deeply involved also with the BELLE II Experiment, to provide full support to their distributed computing model, along with a Perfsonar-based network monitoring system. GÉANT has also coordinated the setup of the network infrastructure to perform the BELLE II Trans-Atlantic Data Challenge, and has been active on helping the BELLE II community to sort out their end-to-end performance issues.

In this talk we will provide information about the current GÉANT network architecture and of the international connectivity, along with the upcoming upgrades and the planned and foreseeable improvements. We will also describe the implementation of the solutions provided to support the LHC and BELLE II experiments.

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