

# **Joint seminar of the NPI of the CAS**

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**The Worldwide LHC Computing Grid: A little bit of history, current challenges in the preparations for HL-LHC and the contribution of the Czech Tier-2 computing center to the overall WLCG performance**

The current era of Exascale computing brings ever growing demands on the amount of available computing performance, storage capacity and network throughput. This affects also the massive computing infrastructure for management of data produced by the experiments at the Large Hadron Collider (LHC), the Worldwide LHC Computing Grid (WLCG).

The concept of LHC computing using regional centres managed as a grid was agreed on already in 2000 based on the conclusion, that the data volume anticipated to be produced during the LHC operations will exceed the capacity of the CERN Computing Center. As a best solution was evaluated the infrastructure consisting of computing centers distributed world-wide, connected via high-throughput network links and managed using a special toolkit called grid middleware. The centers are rated according their size and performance into a Tier-like structure: Tier-0 is CERN, 15 Tier-1s are large computing centers and 160 Tier-2s are smaller size centers. All the sites provide services according to their hardware resources and connectivity level. Although Tier-2s are seemingly inferior to Tier-1s, their role in the WLCG ecosystem is crucial: in total they deliver the same amount of resources as Tier-1s.

In this presentation, we will shortly describe the history of the WLCG, its constant growth and expansion and the challenges connected with the ever rising LHC luminosity and thus also growing volumes of data produced by the LHC experiments. We will also shortly describe the Czech Tier-2 center in Prague and Řež which provides computing and storage resources for experiments ALICE and ATLAS.

The seminar will take place on Thursday, April 20, 2023 at 10:00 a.m. in the NPI conference room.