

Designing the RAL Tier-1 Network for HL-LHC and Future data lakes

Wednesday, 19 May 2021 18:32 (13 minutes)

The Rutherford Appleton Laboratory (RAL) runs the UK Tier-1 which supports all four LHC experiments, as well as a growing number of others in HEP, Astronomy and Space Science. In September 2020, RAL was provided with funds to upgrade its network. The Tier-1 not only wants to meet the demands of LHC Run 3, it also wants to ensure that it can take an active role in data lake development and the network data challenges in the preparation for HL-LHC. It was therefore decided to completely rebuild the Tier-1 network with a Spine / Leaf architecture. This paper describes the network requirements and design decision that went into building the new Tier-1 network. It also includes a cost analysis, to understand if the ever increasing network requirements are deliverable in a continued flat cash environment and what limitations or opportunities this may place on future data lakes.

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Session Classification: Facilities and Networks

Track Classification: Distributed Computing, Data Management and Facilities