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Planning for predictable network performance in the ATLAS TDAQ

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The Trigger and Data Acquisition System of the ATLAS experiment is currently being installed at CERN. A significant amount of computing resources will be deployed in the Online computing system, in the close proximity of the ATLAS detector. More than 3000 high-performance computers will be supported by networks composed of about 200 Ethernet switches. The architecture of the networks was optimised for the particular traffic profile generated by data transfer protocols with real-time delivery constraints. In this paper, we summarise the operational requirements imposed on the TDAQ networks. We describe the architecture of the network management solution that fulfils the complete set of requirements. We show how commercial and custom-developed applications will be integrated to provide a maximum of relevant information to the physics operator on shift and enable the networking team to analyse trends and predict the network performance. An active, application-driven, network reconfiguration service will facilitate a rapid partial network topology change with the aim of providing guarantees on the amount of traffic to be supported for a particular data acquisition role (data taking, calibration, monitoring).

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