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# Prototyping a 10Gigabit-Ethernet Event-Builder for a Cherenkov Telescope Array

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We present the prototyping of a 10Gigabit-Ethernet based UDP data acquisition (DAQ) system that has been conceived in the context of the Array and Control group of CTA (Cherenkov Telescope Array). The CTA consortium plans to build the next generation ground-based gamma-ray instrument, with approximately 100 telescopes of at least three different sizes installed on two sites. The genuine camera dataflow amounts to 1.2 GByte/s per camera. We have conceived and built a prototype of a front-end event builder DAQ able to receive and compute such a data rate, allowing a more sustainable level for the central data logging of the site by data reduction. We took into account characteristics and constraints of several camera electronics projects in CTA, thus keeping a generic approach to all front-end types. The big number of telescopes and the remoteness of the array sites imply that any front-end element must be robust and self-healing to a large extent. The main difficulty is to combine very high performances with a good reliability and rude environmental conditions. We will present the iterations we made to maximize the performances and the results we obtained with hundreds of IP nodes connected to a switch simulating the camera elements.

## Summary

We present the prototyping of a 10Gigabit-Ethernet based UDP data acquisition (DAQ) system that has been conceived in the context of the Array and Control group of CTA (Cherenkov Telescope Array). The CTA consortium plans to build the next generation ground-based gamma-ray instrument, with approximately 100 telescopes of at least three different sizes installed on two sites. The genuine camera dataflow amounts to 1.2 GByte/s per camera. We have conceived and built a prototype of a front-end event builder DAQ able to receive and compute such a data rate, allowing a more sustainable level for the central data logging of the site by data reduction. We took into account characteristics and constraints of several camera electronics projects in CTA, thus keeping a generic approach to all front-end types. The big number of telescopes and the remoteness of the array sites imply that any front-end element must be robust and self-healing to a large extent. The main difficulty is to combine very high performances with a good reliability and rude environmental conditions. We will present the iterations we made to maximize the performances and the results we obtained with hundreds of IP nodes connected to a switch simulating the camera elements.

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