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Benchmarking XRootD-HTTPS on 400Gbps Links with Variable Latencies

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In anticipation of the High Luminosity-LHC era, there's a critical need to oversee software readiness for upcoming growth in network traffic for production and user data analysis access. This paper looks into software and hardware required improvements in US-CMS Tier-2 sites to be able sustain and meet the projected 400 Gbps bandwidth demands, while tackling the challenge posed by varying latencies between sites. Specifically, our study focuses on identifying the performance of XRootD HTTP third-party copies across multiple 400 Gbps links and exploring different host and transfer configurations.

Our approach involves systematic testing with variations in the number of origins per cluster and CPU, Memory allocations for each origin. By replicating real network conditions and creating network "loops" that traverse multiple switches across the wide area network, we are able to replicate authentic network conditions.

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