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China-Europe data transfer challenge under upgrading LHCONE Network at IHEP

The Institute of High Energy Physics data center stores a large amount of experimental data from major scientific instruments, including the Jiangmen Underground Neutrino Observatory (JUNO), which is transmitted and backed up among collaborating data centers. The data center of the Institute of High Energy Physics has upgraded the transmission link of LHCONE from the original 10Gbps to 100Gbps. In order to prevent large-scale transmission failures and ensure transmission quality, it is necessary to conduct transmission testing to understand the transmission performance. Currently, there is a lack of understanding of the performance under long-term transmission and under high-load pressure testing. To address this issue, this project has conducted research on transmission and developed a data injection tool, which has achieved functions such as adjusting the amount of transmitted data and transmission intervals. It can also visualize the test results, allowing for long-term transmission testing to observe whether there is a decrease in performance, an increase in failure rate, or other issues during continuous operation. Additionally, it can conduct stress testing to observe whether the transmission can maintain stable performance under high load. Through testing, it is possible to understand the quality and performance of transmission under long-term and stress testing, in order to better optimize transmission and improve its quality.

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