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A TimescaleDB and Grafana framework for ATLAS DCS data flow

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Atlas DCS Data Tools (DDT) offers a complementary data flow alongside the existing Oracle-based infrastructure, providing easy access to Detector Control System (DCS) data. Its architecture comprises a TimescaleDB database for efficient storage of both live and historical data (including a bridge to ingest over a decade of archived Oracle records), Grafana for intuitive visualization, and a backend server to manage traffic across multiple databases while maintaining backward compatibility with the existing Oracle schema. High-performance C++ and user-friendly Python APIs enable detector and operations experts—whose work is essential to ATLAS safety and performance—to improve their workflows. DDT's modular design facilitates straightforward extension to additional subsystems and ensures scalable performance as data volumes grow. By addressing user-derived requirements, DDT enhances operational workflows, streamlines detector-monitoring studies, and supports the ATLAS community in maintaining robust and safe experiment operations.

Footnotes

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