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A long term storage solution for Tango attribute data at SKAO

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At the Square Kilometre Array Observatory (SKAO), monitoring data is ingested from distributed subsystems via the Tango Controls archiver, with attribute data stored in the Engineering Data Archive (EDA). The EDA uses a PostgreSQL database with the TimescaleDB extension, offering a performant solution for time-series storage. However, as SKAO infrastructure scales, PostgreSQL becomes impractical for long-term retention due to cost and operational complexity. This paper outlines a long-term storage strategy based on S3-compatible object storage. The solution decouples operational and archival storage by exporting and serializing Tango attribute data into efficient formats like Apache Parquet for storage in S3. Metadata indexing ensures the data remains discoverable and retrievable over time. The approach draws from the MeerKAT telescope's experience, a precursor to SKAO operated by SARAO. MeerKAT faced similar challenges archiving large volumes of telemetry data and adopted a database and long term storage model. We also describe supporting tools and processes for managing data lifecycle transitions. The paper concludes with open challenges and future directions for integrating this approach into observatory-wide data access frameworks, ensuring engineering telemetry remains accessible throughout the SKAO system lifecycle.

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