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Process orchestration and system configuration in the MeerKAT radio telescope

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The Control and Monitoring (CAM) system of the MeerKAT telescope is highly distributed, necessitating a reliable and automated framework for configuring, deploying, and managing the lifecycle of its many software processes. System configuration follows a hybrid approach using static and dynamic configuration that define the telescope's operational parameters and hardware setups. General functionality can be extended or customized through configuration adjustments, minimizing the need for code modifications. The *katlauncher* application serves as the entry point for initialising the CAM software infrastructure processes for logging and serving configuration information prior to the rest of the CAM system. The *katsyscontroller* application acts as the overall system coordinator, responsible for the sequenced startup and controlled shutdown of the entire system, as well as managing interventions and operator commands. The processes on each node are monitored and managed by the *katnodemanager* application, which exposes sensors and requests to control processes via a Karoo Array Telescope Communication Protocol (KATCP) interface. These components work together to ensure that the MeerKAT telescope operates efficiently and reliably, with clear separation of responsibilities for configuration, process management, and system-wide orchestration.

Footnotes

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