



The Next Generation GMRT M&C System - An Exploratory Prototype for the SKA Telescope Manager

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Extended Abstract

The Giant Metrewave Radio Telescope (GMRT), is being upgraded with a modern Monitor & Control (M&C) system. The central supervisory M&C system remotely controls and coordinates the activity of all 30 antennas, distributed over a radial distance of ~ 15 km. The Next Generation M&C System being developed as part of the upgrade, aims to provide an end-to-end radio telescope software solution, ranging from auto execution of scheduled observing proposal to meta-data generation for supporting science data analysis. It is being developed in close synergy with the SKA Telescope Manager (TM) work package, to act as a pathfinder activity for the SKA, in several aspects of design and technology. The work is being done in a close collaboration between the GMRT team members (with rich experience in the domain over the last 15 years) and the industry partners (such as Tata Consultancy Services, India).

A core M&C system is developed using the TANGO Software Framework to control and monitor GMRT antennas. The idea of a specification driven generic control node has been developed, wherein a generic control node's role in the control hierarchy can be identified based on the configuration defined in the Tango database and custom RDBMS schema which is aligned with the TANGO DB. The GMRT M&C System development follow agile software development principles. A complete road-map of the project was laid out in terms of a definition phase like User Requirement specifications (URS), Software Requirement specification (URS), Software Architecture description document.

This paper describes many of the learning and experiences from the Tango based Next Generation GMRT M&C System, such as implementation of the Tango framework, specification driven system to promote loose coupling, aggregation node implementation of antenna array/sub-arrays, custom state handling in the Tango framework, context based fully featured GUIs using Taurus etc.