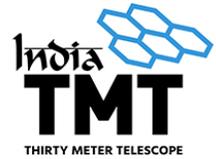




Project: Thirty Meter Telescope (TMT)

Dr. Mushtaq Ahmed, Architect, ThoughtWorks, Pune
Building Distributed Telescope Control System for TMT



Abstract:

- TMT(Thirty Meter Telescope) is going to be world's largest optical telescope once operational. ThoughtWorks is building distributed control system for TMT. This talk will provide an overview the middleware capabilities, the architecture, as well as team collaboration structure between ThoughtWorks, IIA and TMT-Pasadena. The telescope comprises of multiple hardware components each supporting a custom communication protocol at firmware level. Telescope observation requires coordination across these components for a higher level tasks such as mirror rotation, filter selection etc. The control-system middleware provides a homogenous higher level protocol for submitting commands that are then be mapped to heterogenous underlying hardware protocols. The middleware also provides infrastructure-level services for publishing events, raising alarms, and knowing the "current time" with high accuracy and precision. The architecture includes a service discovery mechanism that will be used by components to discover each other. The underlying technology is the Akka-toolkit which hugely simplifies creating event-based reactive-systems. The implementation language of the platform is Scala, but APIs are provided for both Scala and Java. The team is distributed across 5 geographies : Pune, Pasadena, Bengaluru and Germany. We will also talk about Agile processes and toolsets that enabled us to work effectively across different time-zones and still manage to deliver on time and stay within the budget.

About the Speaker:

- Mushtaq is working in the IT industry for more than 17 years. He has played various roles: domain expert in life sciences, business analyst, tech-lead and architect. He has keen interest in Scala/Akka which he is evangelising for past many years. Curiously, he is a medical doctor by undergraduate training (BJ Medical College, Pune) and masters in Biomedical Engg (IIT Bombay). He is currently with ThoughtWorks, Pune and playing the role of architect on TMT project from India side.

