

Secure Remote Monitoring and Diagnosis of CNC Machines



Problem Statement

The client is a global automotive OEM, a leading manufacturer of trucks and buses. The manufacturing facilities of the client are filled with hundreds of CNC machines, working around the clock to machine complex vehicle parts. With the manufacturing facilities located in multiple countries, the central quality team lacked a consolidated view of the machine(s) usage and other operational parameters for decision making to improve maintenance and quality of the machines and machined parts.



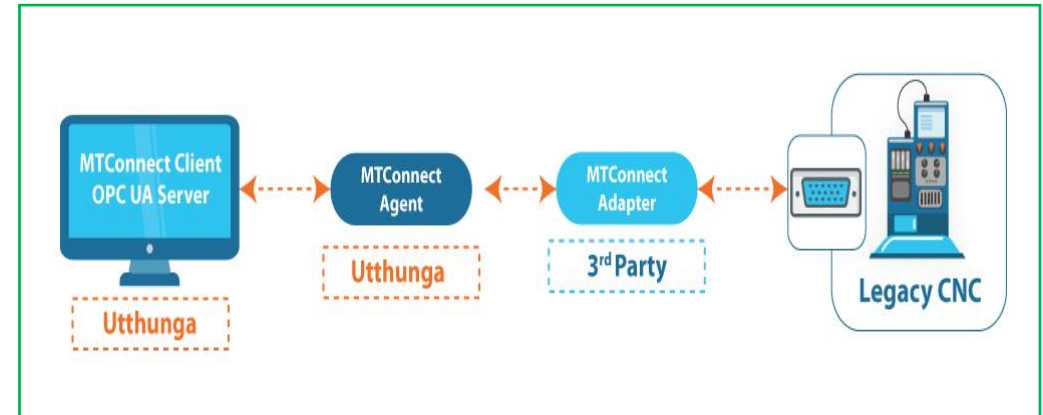
Challenges

- Frequent downtimes due to ineffective maintenance of the CNC machines. This was leading to significant production loss
- The reject rate was in double digits, way more than the management mandated range of 1-2%
- Unavailability of data for clear reports



Solution

- Developed MTConnect Agent module with HTTPS support. The Agents integrated with the MTConnect Adaptors created by a 3rd party
- Developed OPC UA server with MTConnect Client as a driver
- REST service to configure and establish connection between MTConnect OPC UA server and MTConnect Agent during runtime
- Support for WCF REST Service with LDAP authentication in OPC UA
- Support SQLite database for local storage and forward to MS-SQL Server as per MTConnect XML schema to ensure no data loss
- Provide OPC UA Redundancy server with Data Access, Alarms & Events and Historical Data Access to eliminate data loss over OPC UA communication
- Built-in OPC UA security algorithms with X509 certificate to ensure data security



Benefits



- Access to instantaneous alerts from CNC machines to on-site maintenance team to take immediate action
- Increase in order-fulfillment rate as a result of increased machine(s) availability. Down-time reduced by 30% in the 6 months period after the project implementation
- Rejection rates down by 6% in the same period as above
- Availability of complete data to the existing 3rd party analytics application for comprehensive analysis. Recommendations from this analytics application now taken seriously by the quality team

