



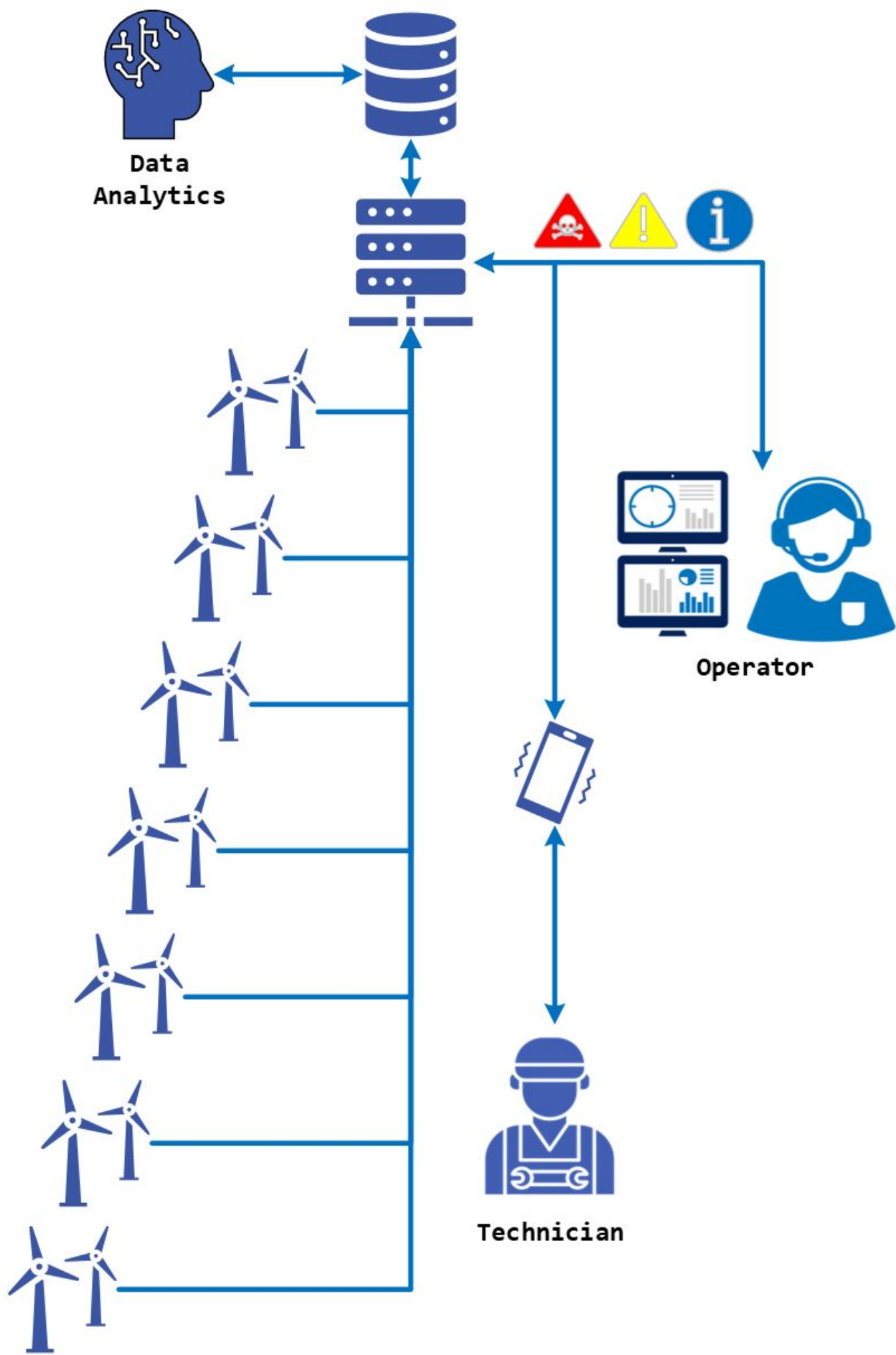
Description

The Wind Farm Management System uses a data model that store data collected from SCADA and manage operations of wind turbines. It shows information, warning and alerts necessary to schedule maintenance and report incidents.

Constraints

- Unique technician and maintenance schedule to avoid assigning a technician to a maintenance twice.
- Unique technician and incident to avoid assigning a technician to a incident twice.
- Unique turbine and reported timestamp to avoid duplicate SCADA data.
- Unique turbine latitude and longitude to avoid register the same turbine twice.
- Unique values for integrity of the status and types:
 - Maintenance status
 - Incident status
 - Incident severity
 - Turbine shutdown type

System Workflow



Business Intelligence applications

The Wind Farm Management System support business intelligence application by providing the necessary data for reporting and data analytics.

Applications

- **Performance Monitoring:** SCADA data can show energy / power generated by a certain turbine or the entirely wind farm.
- **Predictive Maintenance:** historical SCADA data and data from Incidents and Maintenance Scheduled tables is used by machine learning algorithms to predict the best date for schedule a new maintenance.
- **Operational Optimisation:** storing turbine shutdowns allows calculation of idle time and, with SCADA data, enables planning for optimal turbine operation.
- **Energy Price:** with the support of other systems, use production power report to predict the most profitable time to operate.

SCADA  MariaDB  PyTorch  Grafana

Entity Relationship Diagram

