

# Enabling Interoperability and Extensibility of Future SCADA Systems

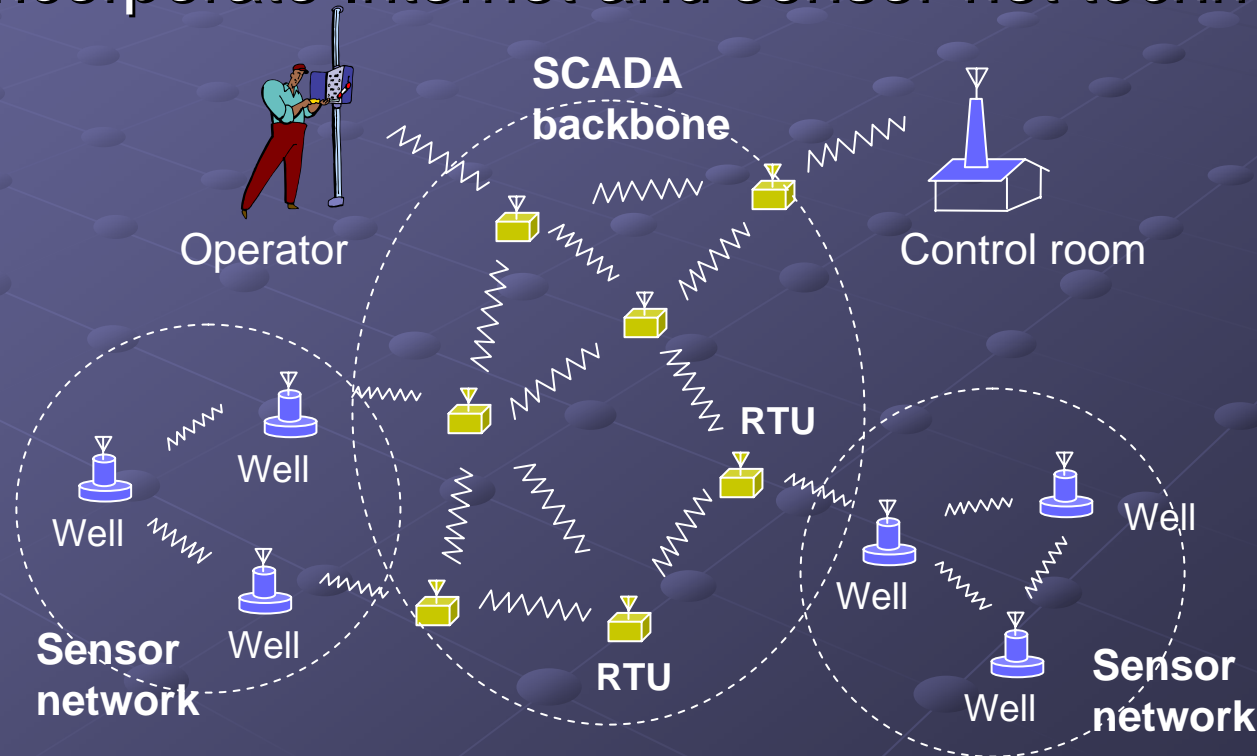
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# Applications and Challenges

- Applications – oil/gas field monitoring
  - Improve productivity, safety, etc.
- Limitations of current SCADA
  - Difficult to interoperate with complementary systems
    - Sensor networks, mesh networks
    - Due to inflexible and centralized architecture
  - Difficult to add new applications
    - Currently designed for reactive data collection
    - Safety alarm needs real-time, proactive operation

# Need Flexible Communication Architecture

- Tiered, multi-hop network
  - Data sharing and interaction between RTUs
  - Incorporate Internet and sensor-net technologies



# Need Open and Interoperable Protocols

## ● Communication protocols

- Interoperate across different tiers
  - RTUs serve as bridge point of sensor networks
- Improve performance in heterogeneous system
  - RTUs help resource-constrained sensor nodes

## ● Data management protocol

- Collect and process data at different tiers
- Forward different data to different users
- Automatic sensor discovery and configuration

# Need Smart Remote Terminal Units

- Put more intelligence to the field
  - Coordinate sensor activity
  - Verify data integrity
  - Preliminary data processing
  - Interact with mobile users
- Summary
  - Oil production heavily depends on SCADA
  - Large benefit to enable interoperability and extensibility of future SCADA systems