RIAPS Roadmap

Last update: 2/4/20

Apps

• Energy Management App
  • Aggregator node acting as gateway between EV chargers, data center servers, building management systems and a microgrid controller
  • Aggregator collects current and projected energy demands and energy availability, computes scheduled allocations and disseminates
  • Integrated Microgrid Control Platform – 24m
    • Complete suite of microgrid control functions implemented, based on proposed standard functions
    • Reference implementation of a generic microgrid controller

Interfaces

• RIAPS Device Interface Components for:
  • IEEE 2030.5, DNP3, IEC 61850, and SunSpec – standard interfaces
  • Gridlab-D, OpenDSS: power system sims, useful in training and app development
  • Generic, customizable 'bridge' to: Edge-X, OpenFMB (nats.io), MQTT
  • Generic, customizable interface to
    • InfluxDB (to store time-series data)
    • PVBrowser (open source SCADA)

Platforms ports

• Raspberry PI 4 / ARM- 64 bit
• NVIDIA Jetson Nano (ML platform)
• RISC-V

Features

• Fine-grain scheduling of component operations (priority, round-robin)
• Real-time actors running at real-time priority and with scheduling policy
• Direct inter-thread (component) messages
• App-to-app communication / multi-app deployment
• Leader election algorithm parameterization via architecture model
• Improved fault management: restart policies, checkpointing, etc.
• Synchronize C++ distributed coordination with Python version
• Fine-grain per-app security policy control
• Better logging framework, log management
• Better app packaging: tooling for deploying large libraries
• Security review – NIST ICS security requirements
• Improved documentation, tutorials, hackathon materials