Control Networking and Automation in the IoT Age
Realizing Value of the IoT is Difficult and Costly

Multiple field protocols present a challenge

- Many Legacy Requirements
- Backward Compatibility is a “Must”
- Long Product Life Cycles
- Failure: “Costly” and “Disruptive”

Energy Optimization
Predictive Maintenance
Space Utilization
Personalization & Productivity

Network Integration
Data Integration
Application Development

$\text{LonMark}^\text{R}$
There is not one IoT cloud
There may be more than one cloud per system
The clouds don’t communicate
Imagine every cloud connected to every subsystem – no don’t!
Extensible Data and Services Fabric Is Required

- Connectivity interoperability
  - Bridge physical media
  - Connect to legacy and emerging network protocols
- Data interoperability
  - Events seamlessly flow between devices and cloud services
- Service interoperability
  - Share common scheduling, logging, and alarming services
IoT Web Services Comparison

Data and Services Model Completeness
Simplifies connectivity to IoT services

Field Protocol Flexibility
Enables support for multi-protocol systems

General Purpose IoT Web Services
Complex IoT Service Integration

Field Protocol Specific Web Services
Complex Subsystem Integration

Data Model
- Data Types
- Data Semantics
- Data Priorities
- Device Interface Definition
- Configuration Data Definition
- Data Flow Definition

Services Model
- Device Discovery
- Device Provisioning
- Connection Management
- Scheduling
- Logging
- Alarming
Deeper Look at Data and Services Model

Planning
- Custom App Development
- System Design
- Device Type Import
- Device Type Discovery
- Device Type Definition

Installation
- Edge Server Network Installation

 Provisioning
- Device Discovery
- Device Definition
- Device Configuration

System Integration
- Services
- Controls
- Visualization
- Data Management

Handoff/Ongoing
- Maintenance
Deeper Look at Open Architecture

Enable analytics and applications to run anywhere and talk to anything
LonMark task group is developing the web services standard

Join the task group to participate in the standard development
Summary

- Realizing the value of the IoT is difficult and costly
- IoT cloud siloes bring on the tears of the IoT
- An extensible data and services fabric is required
- The IAP LonMark web services standard unlocks the value of IoT
- Join the LonMark web services task group to contribute to the solution