ISA100 WIRELESS COMPLIANCE INSTITUTE

Introduction to ISA100 Wireless

(in 20 minutes)

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1 March 2016

Presenter

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Introduction to ISA100 Wireless

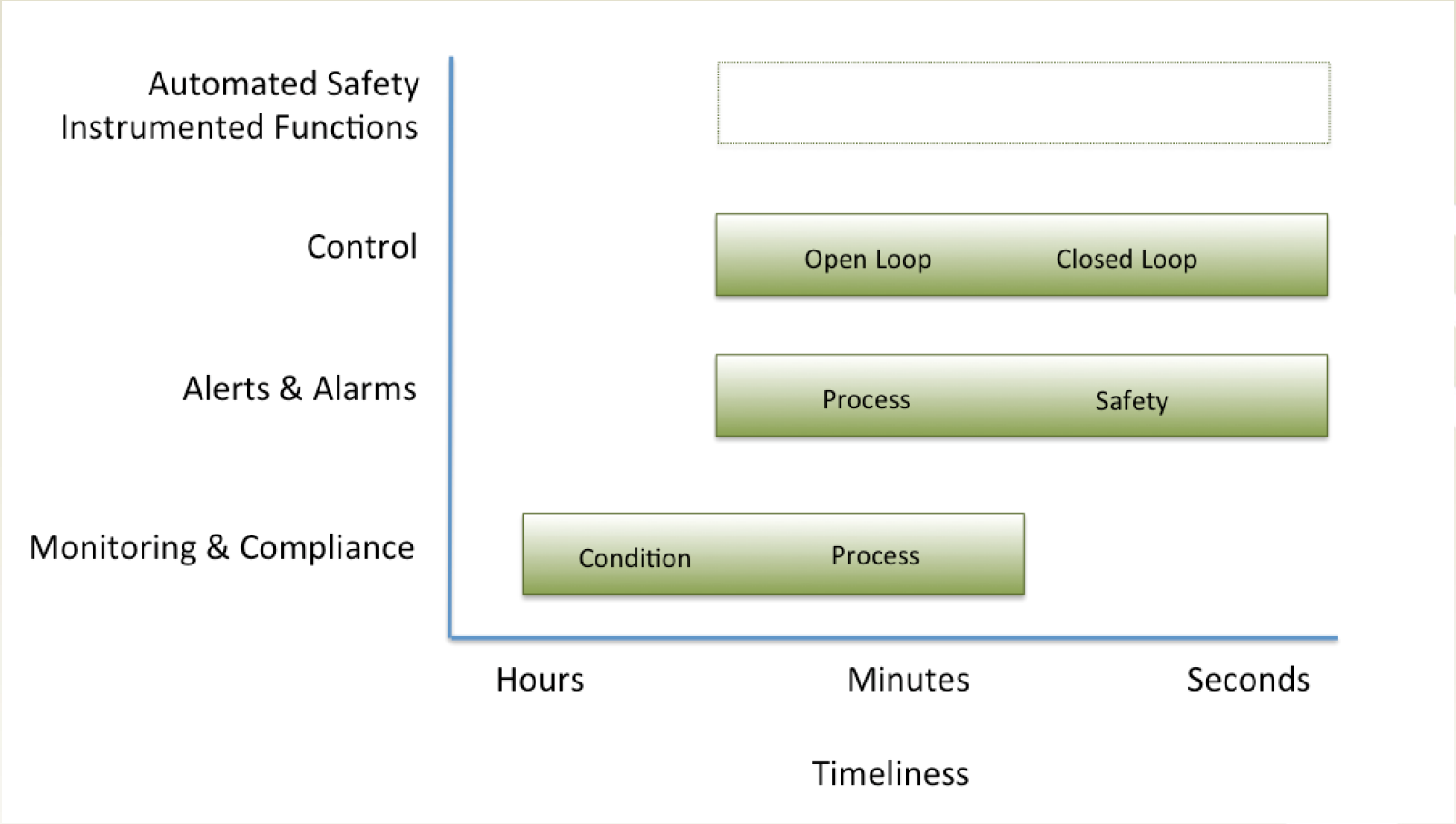
- Applications
- Network Architecture
- Overview of IEC 62734 standard

Applications

General Benefits of Wireless Instrumentation

Cost Savings	• Up to 90% of installed cost of conventional measurement technology can be for cable conduit and related construction. • Typically: 1/5 the time, 1/2 the cost. • New and scaled applications are now economically feasible.
Improved Reliability	• Wired sensors may be prone to failure in difficult environments. • Wireless can add redundancy to a wired solution.
Improved Visibility	• Condition monitoring (equipment) • Process monitoring
Improved Control	• Add wireless to existing processes for more optimal control.
Improved Safety	• Safety related alarms

Top Use Classes for Wireless Instrumentation



Courtesy AIW LLC

ISA100 Wireless
Major Application Types

- Asset Health Monitoring & Analytics
- Process Monitoring & Control
- Safety Alarms

- *One network, all at the same time!*

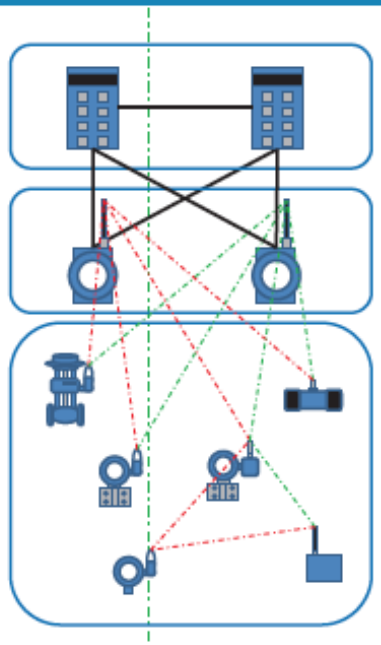
Network Architecture

ISA100 Wireless Network Architecture

Redundant Gateway, System Manager, Security Manager

Redundant Access Point (Backbone Router)

Wide variety of Field Devices

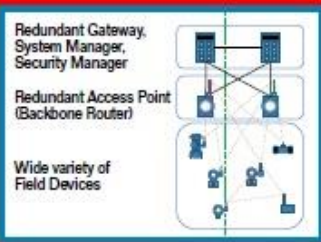


Enterprise Scalability

IPv6 to the Devices

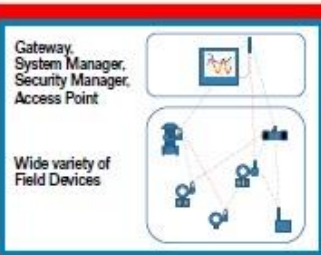
Enterprise Networks

Big Data Aggregation from Multiple Sites



Plant-wide Network

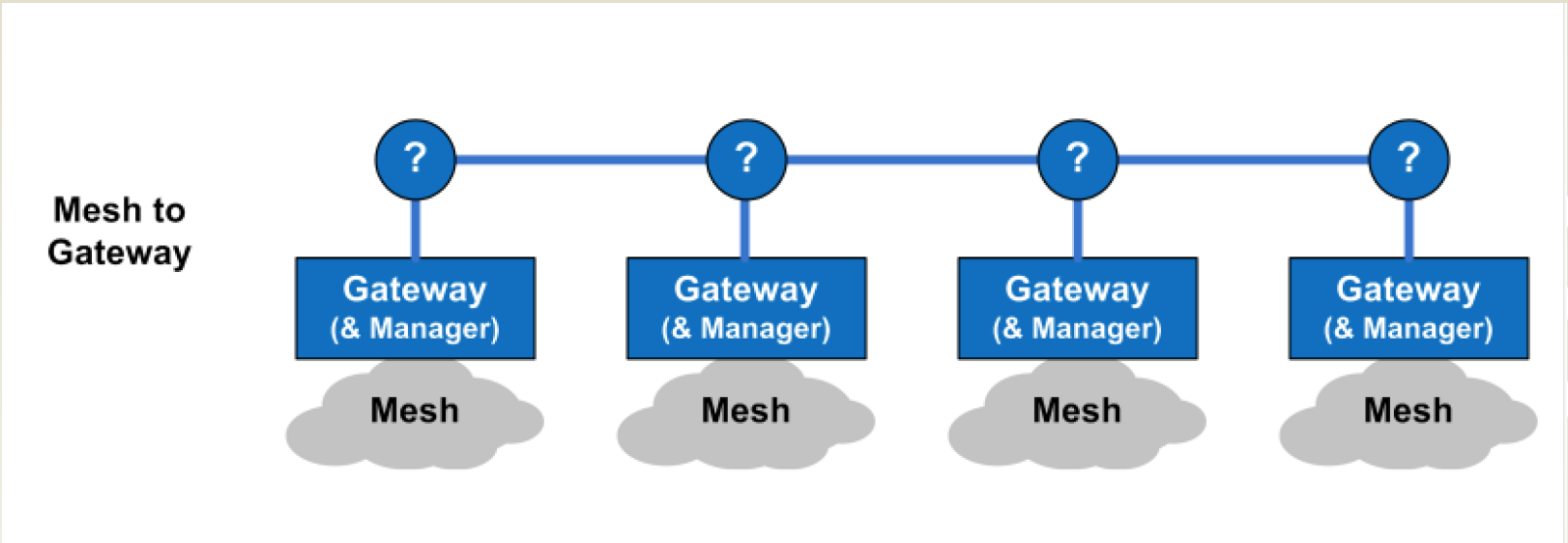
High Reliability and Availability
Duocast for redundancy
Scales to 1000s of devices



Stand Alone Network/Point Solution

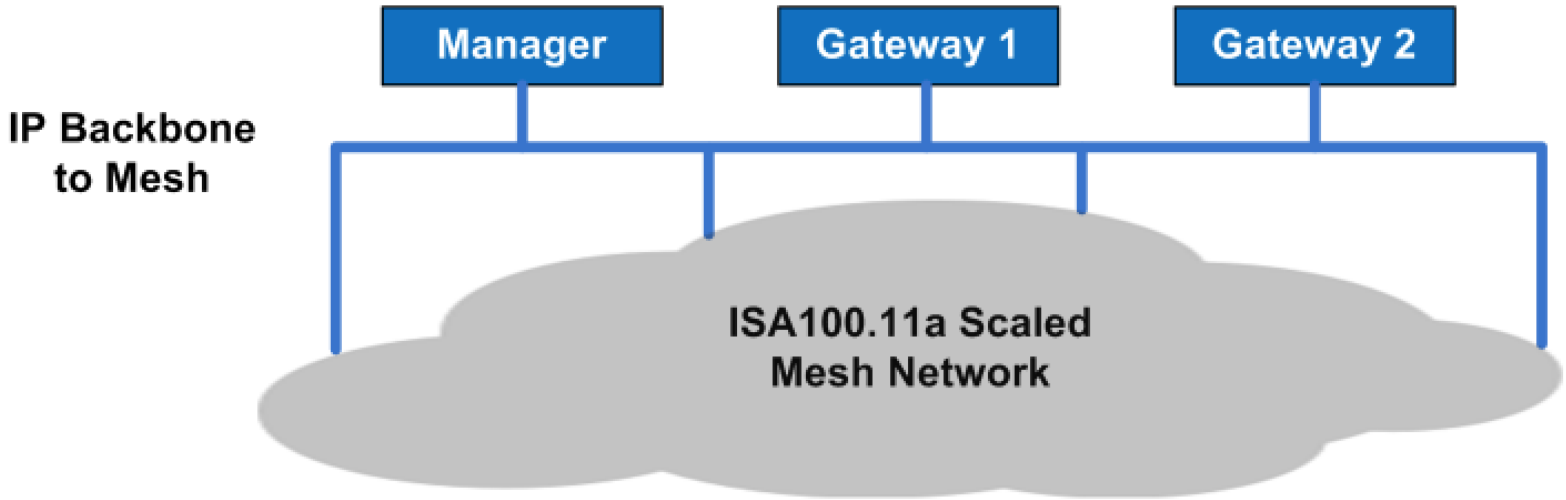
Simple and Easy
Able to Grow

Legacy Network Architectures



Scale by Duplication

ISA100 Wireless IoT Network Architecture



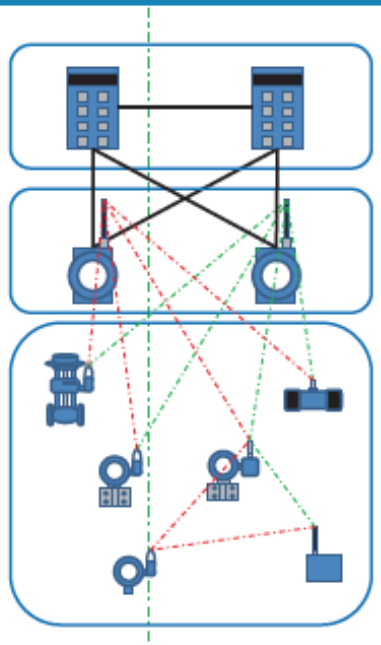
Plant-Wide Network
Scale Through IP

ISA100 Wireless Network Architecture

Redundant Gateway, System Manager, Security Manager

Redundant Access Point (Backbone Router)

Wide variety of Field Devices



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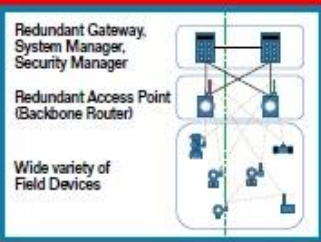

Plant-wide Network

High Reliability and Availability

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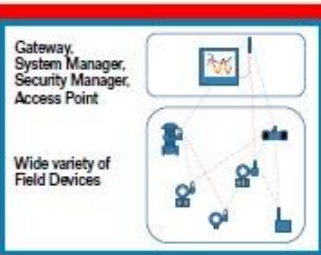

Stand Alone Network/Point Solution

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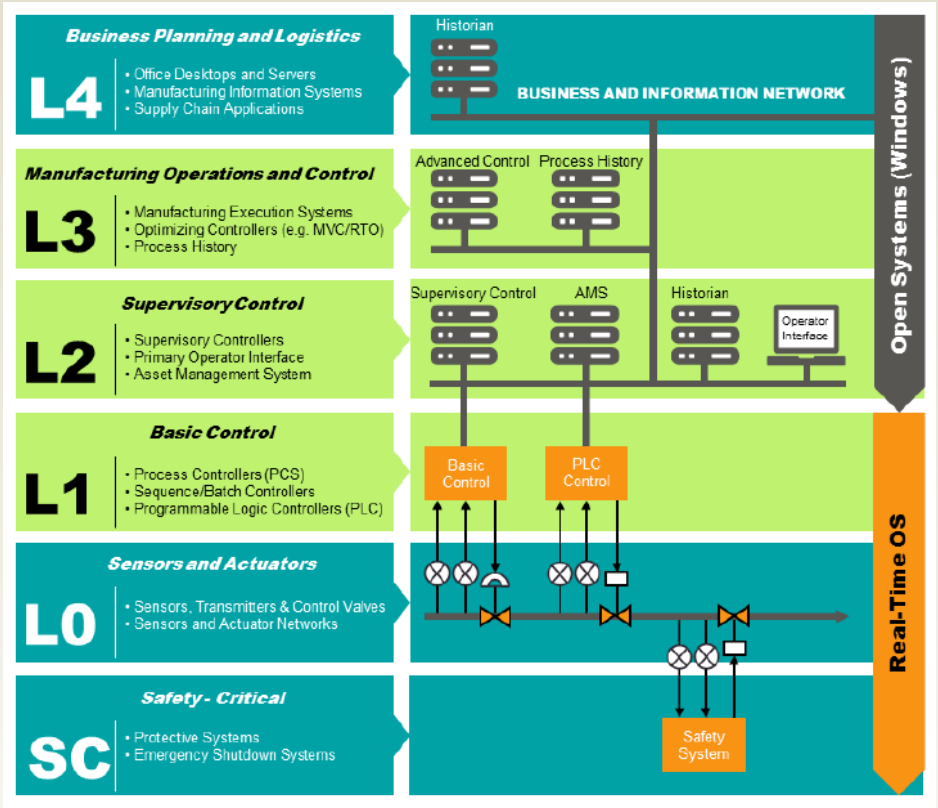
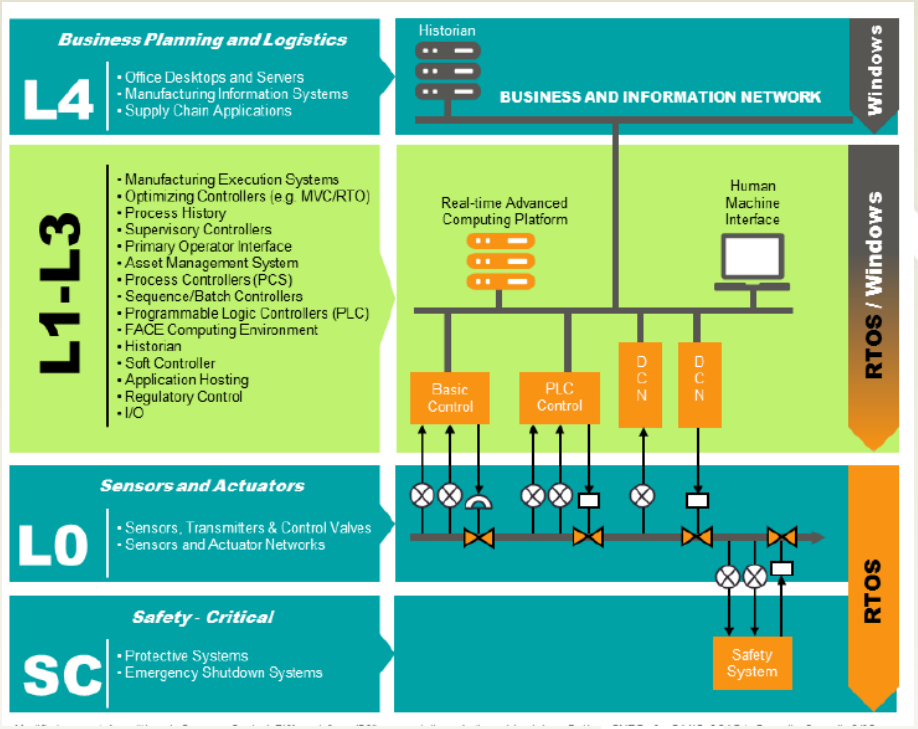
Able to Grow

Internet of Things Enables Next Generation Automation Systems

Systems Today

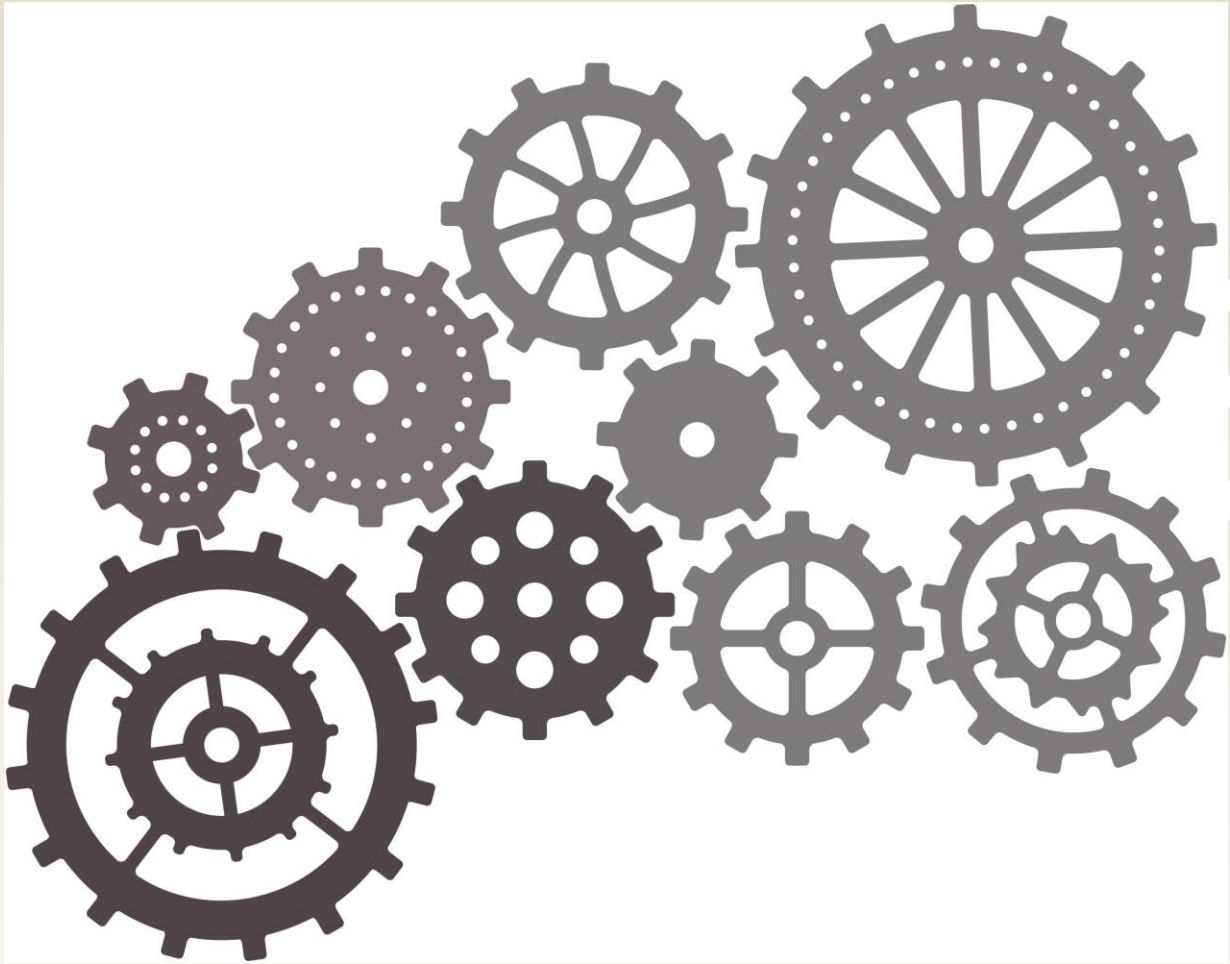


Systems Tomorrow



XOM diagrams from Lockheed Martin PIRA#OWG20161002

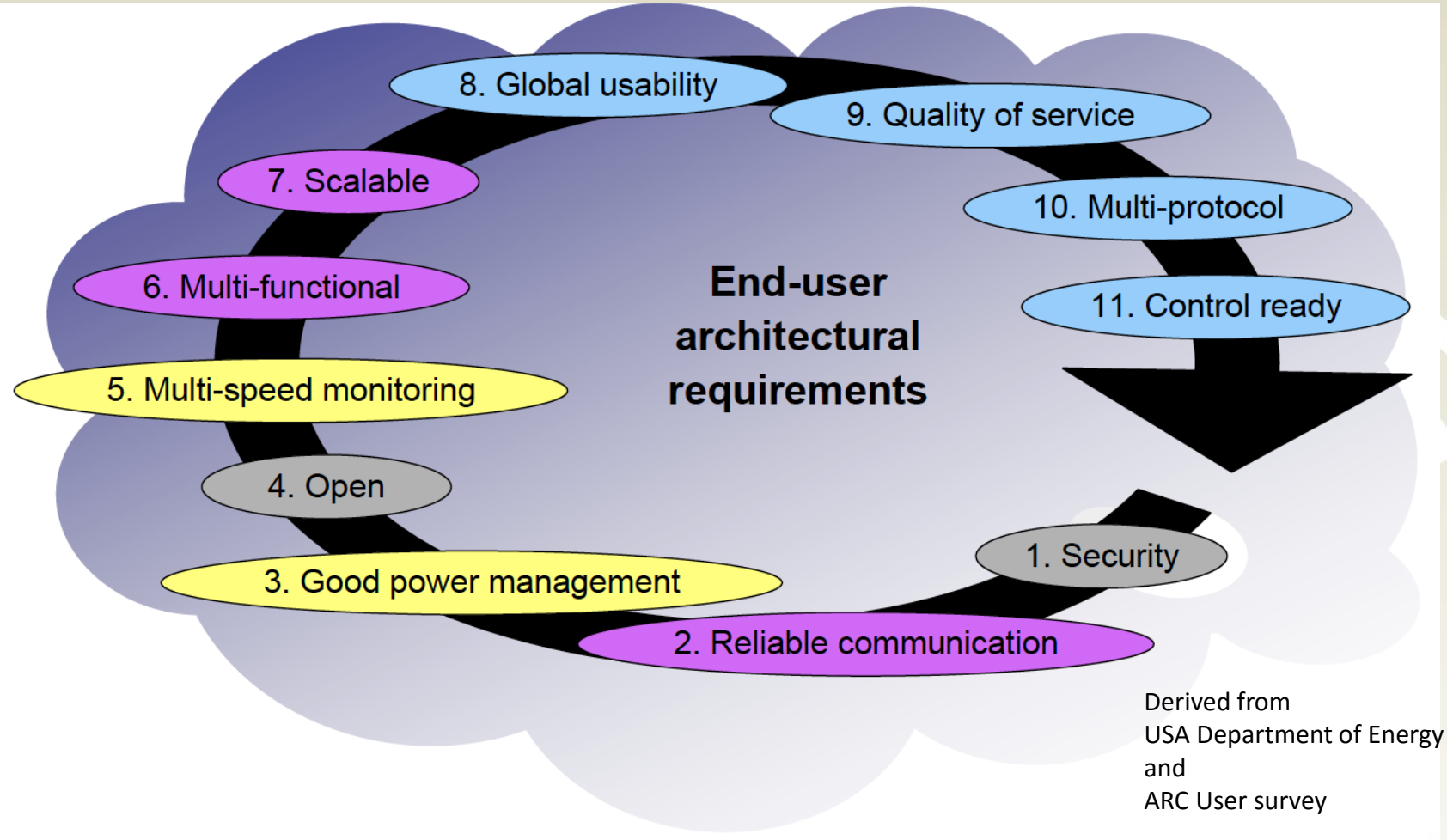
IEC 62734 Standard



Main Features of IEC 62734

IEEE 802.15.4 Radio	• Available from multiple high quality sources.
ETSI Compliant	• Compliant to new ETSI 300.328 v1.8.1 • Various modes of compliance, described in the standard
Robust	• Advanced coexistence and resiliency mechanisms at all levels
Secure	• Two layer AES 128 cryptography
IP based	• Future Proof
Object based	• Compact and Extensible • Supports Tunneling

End-user requirements for Industrial wireless sensing

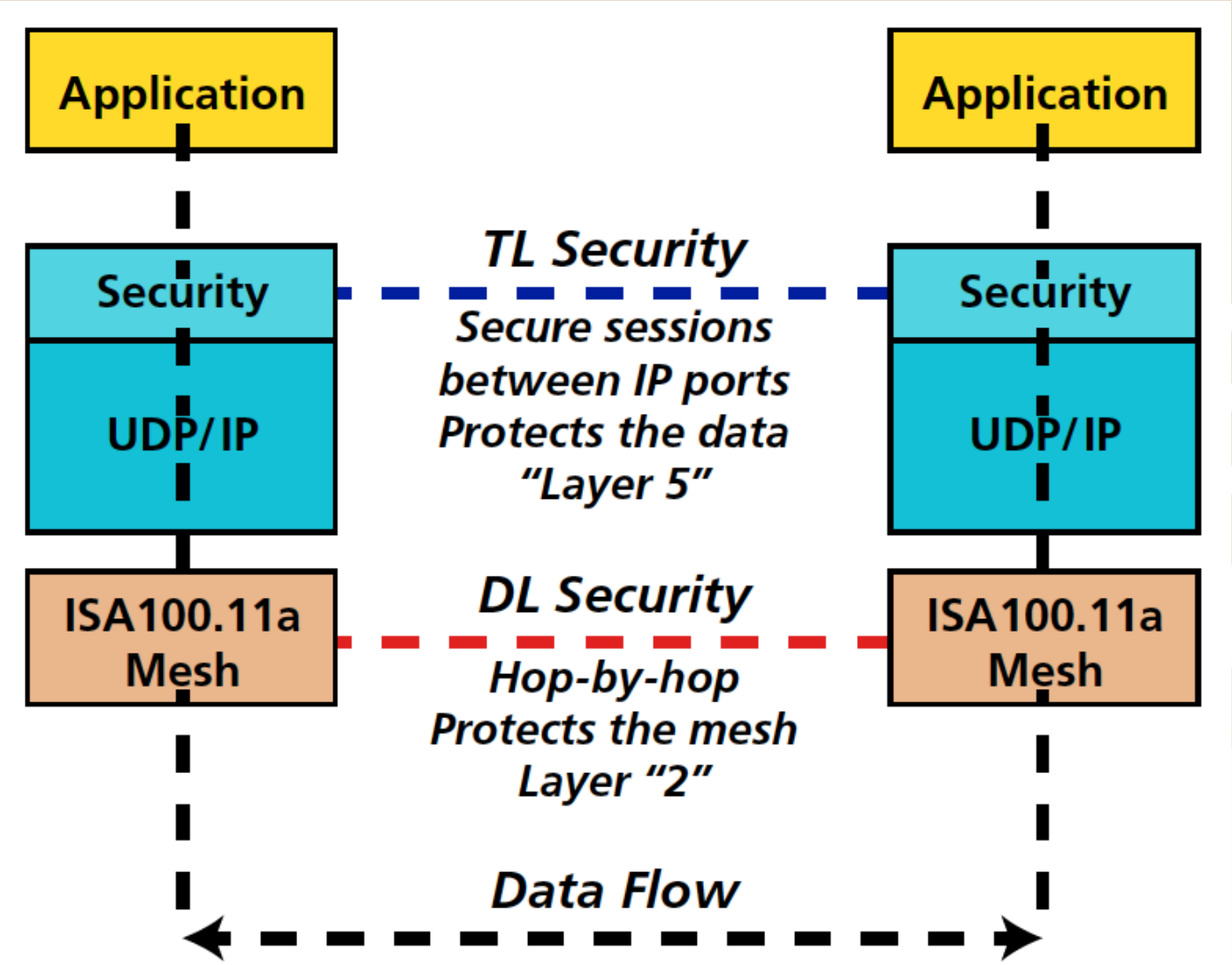


ISA100 solutions must meet all requirements simultaneously

Technical requirements for Industrial wireless sensing

1. Rate and Latency	• Publication rates 1-2 seconds • Capable of 100 ms latency • Controlled latency, ~50% publication rate • 4 Hz publication in constrained configurations
2. Mesh Networking	• IP Backbone: Engineered and scalable • Mesh and non-mesh topology; access points and field devices • Peer-to-peer communication • Objects = Function blocks at device level • Long and deterministic battery life
3. Reliability	• Wireless transmission is deterministic • Wireless transmission is received • Wireless transmission is accurate • Redundant communication paths to process control network
4. Security	• Wireless transmission is secure; prevention & detection

Two Levels of Security

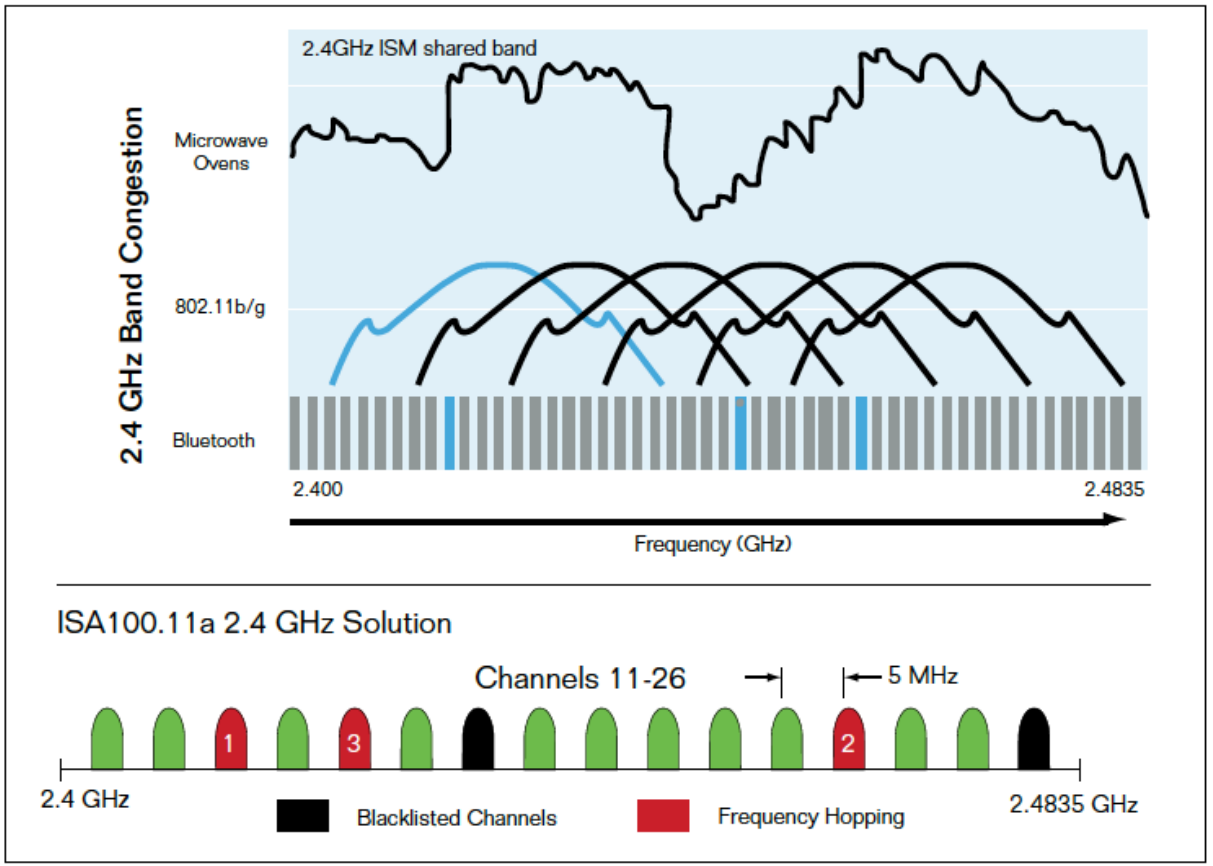


Robust Communications

Spectrum Analysis
- Identifying Interferers
- Monitoring Saturation

System Management
- Device Configuration
- Element Provisioning
- Performance Monitoring

Policy Enforcement
- Channel Allocation
- Rules Creation
- Blacklisting



ISA100 – Ensured Coexistence with Many Wireless Networks

Conclusion

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