



Webinar

Introduction to ISA100 Wireless

Presentation will begin
at 11:05am EDT
(GMT -6)

Jay Werb
WCI Technical Director

29 July 2015

ISA100 Wireless News and Updates

- September 2014 ISA100 Wireless approved as IEC 62734
- ISA100 Wireless is compliant with ETSI EN 300 320 v1.8.1
- April 2015 GasSecure GS-01 gas detector achieves a world first with SIL-2 Certification in Wireless Gas Detection
- Availability of ISA100 Wireless Modules / Stacks (see contact details on www.isa100wci.org)
 1. Nivis
 2. Murata
 3. Yokogawa
 4. Honeywell

ISA100 Devices Added January – June 2015

Total ISA100 Wireless device portfolio = 44 50+ by Q4 2015

Total Certified ISA100 Wireless Devices = 25 33 by Q4 2015

	Device Type / Manufacturer	Month	Certified
1	Yokogawa Stack	Feb	Yes
2	Yokogawa Adapter	Feb	Yes
3	Yokogawa Adapter	Feb	Yes
4	TLV Steam Trap	Feb	Yes
5	TLV Steam Trap	Feb	Yes
6	Armstrong Steam Trap	April	Yes
7	Spirax-Sarco Steam Trap	May	Yes
8	Cosasco Corrosion Sensor	June	Q3 2015
9	Scott Safety Gas Detector	June	Q3 2015
10	Flowserve Valve Positioner	June	Q3 2015
11	SKF Vibration Sensor	June	Q3 2015
12	CDS Vibration Sensor	June	Q4 2015
13	Murata Comm. Module	June	Q4 2015
14	Bitherm Steam Trap Monitor	June	Q3 2015
15	Nexcom ISA100 to WIFI bridge	June	Q4 2015

Visit the ISA100 Wireless Website

- ISA100 Wireless Whitepaper available for download from website authored by Jay Werb, Technical Director
- News and details about the ISA100 Wireless Demo at the June 2015 Achema exposition in Frankfurt
 - 3 live networks with 36 devices from 17 vendors
- Full list of certified/registered ISA100 Wireless devices
- Use cases and customer stories
- ISA100 WCI website receiving over 20,000 visitors per month

www.isa100wci.org

Introduction to ISA100 Wireless Webinar Overview

- Applications
- Network Architecture
- Overview of IEC 62734 standard

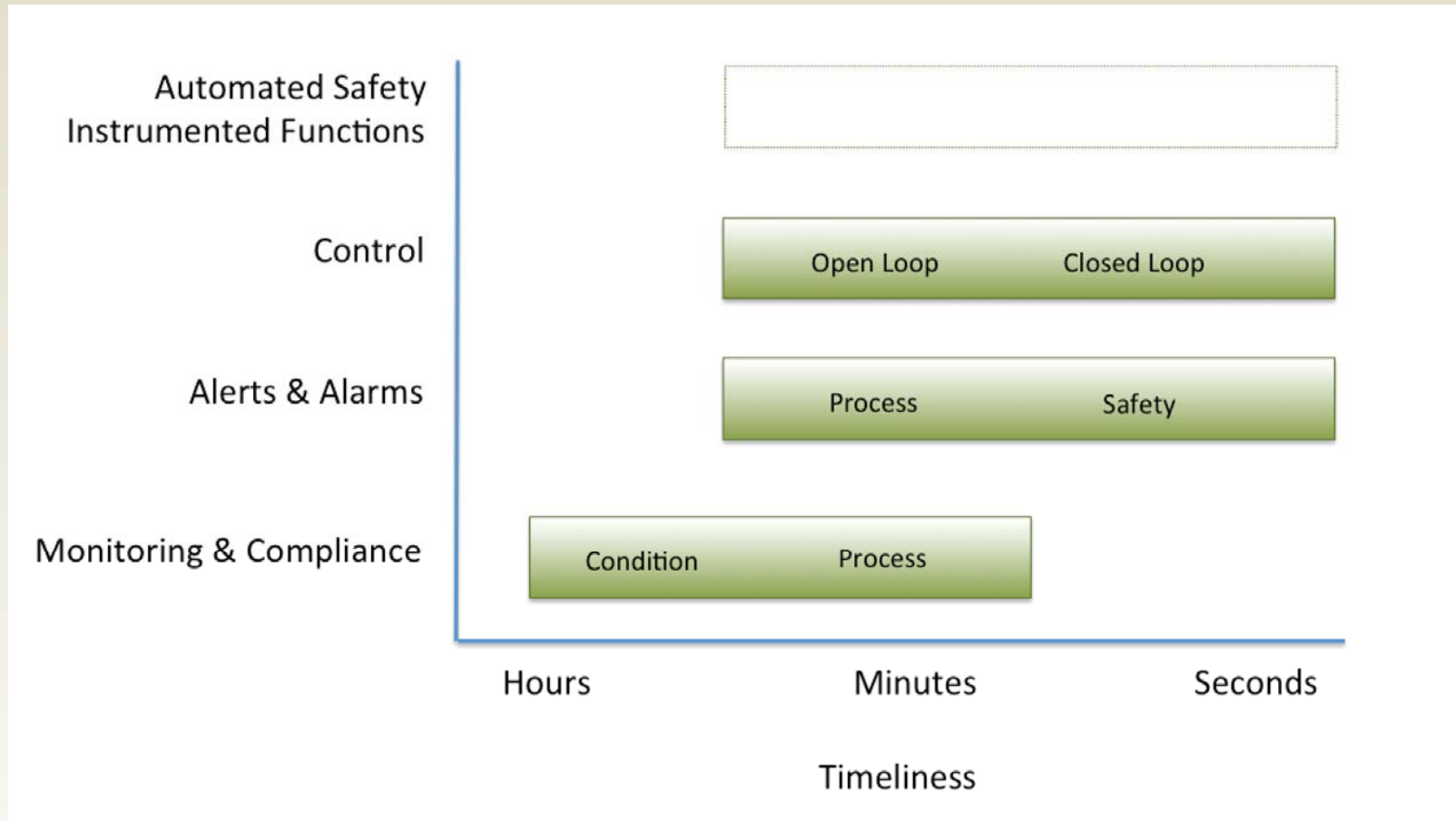
Applications



General Benefits of Wireless Instrumentation

Cost Savings	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Wired sensors may be prone to failure in difficult environments.• Wireless can add redundancy to a wired solution.
Improved Control	<ul style="list-style-type: none">• Add wireless to existing processes for more optimal control.

Top Use Classes for Wireless Instrumentation



Courtesy AIW LLC

ISA100 Wireless Major Application Types

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

Process Monitoring & Control

Applications

- Temperature
- Pressure
- Flow
- pH
- Dissolved O₂
- Valve Position
- Etc...

Wireless Requirements

- Highly Scalable Network
- Low and Deterministic Latency
- Flexible Configuration
- Predictable Battery Life
- Multi-Vendor Interoperability



Asset Health Monitoring & Analytics

Applications

- Vibration
- Corrosion
- Steam Trap
- Etc...

Wireless Requirements

- Scalability with wide range of data rates
- Prioritize data flows
- Support for large waveforms
- Flexible network configuration



Safety Alarms

Applications

- Gas Detection
- Fire Prevention
- Level Detection
- Etc...

Wireless Requirements

- Controlled Quality of Service
- Low and Deterministic Latency
- Layered Open Architecture
 - e.g. ProfiSAFE



Network Architecture

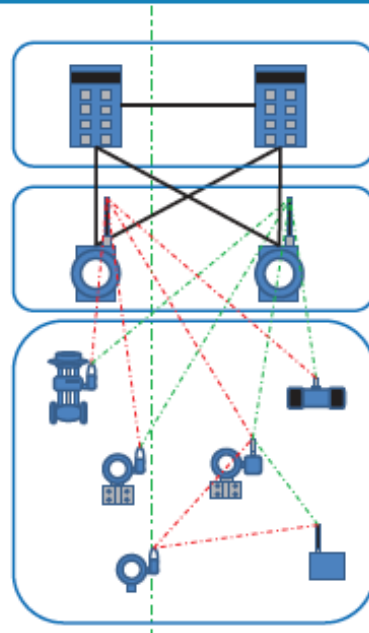


ISA100 Wireless Network Architecture

Redundant Gateway,
System Manager,
Security Manager

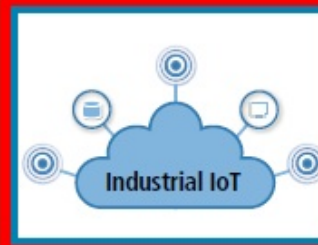
Redundant Access Point
(Backbone Router)

Wide variety of
Field Devices



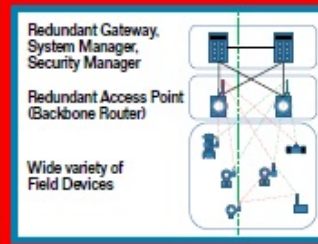
Enterprise Scalability

IPv6 to the Devices



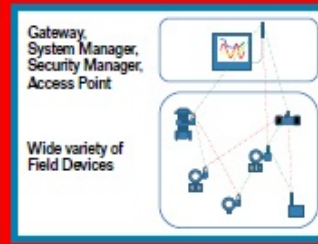
Enterprise Networks

Big Data Aggregation from
Multiple Sites



Plant-wide Network

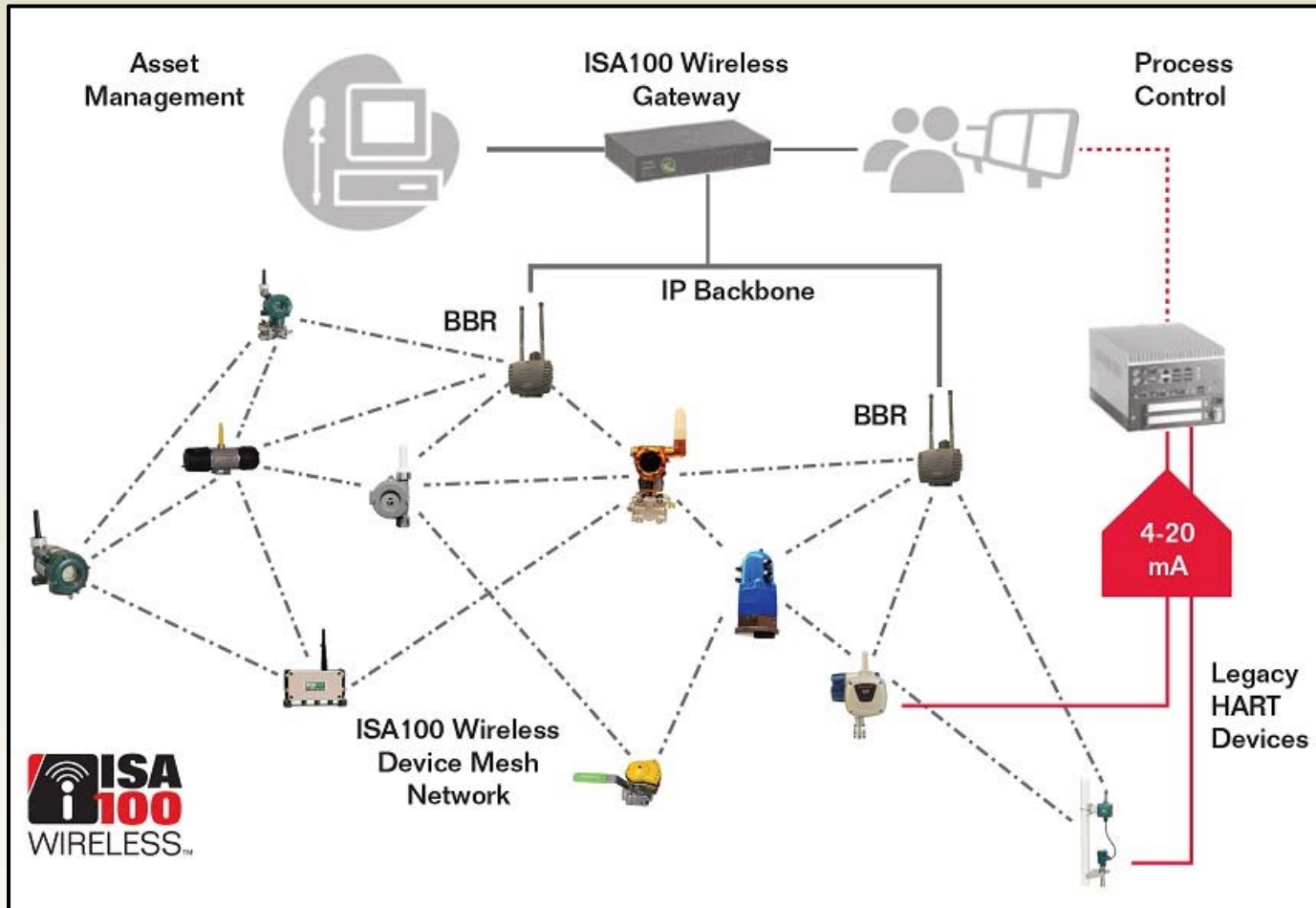
High Reliability and Availability
Duocast for redundancy
Scales to 1000s of devices



Stand Alone Network/Point Solution

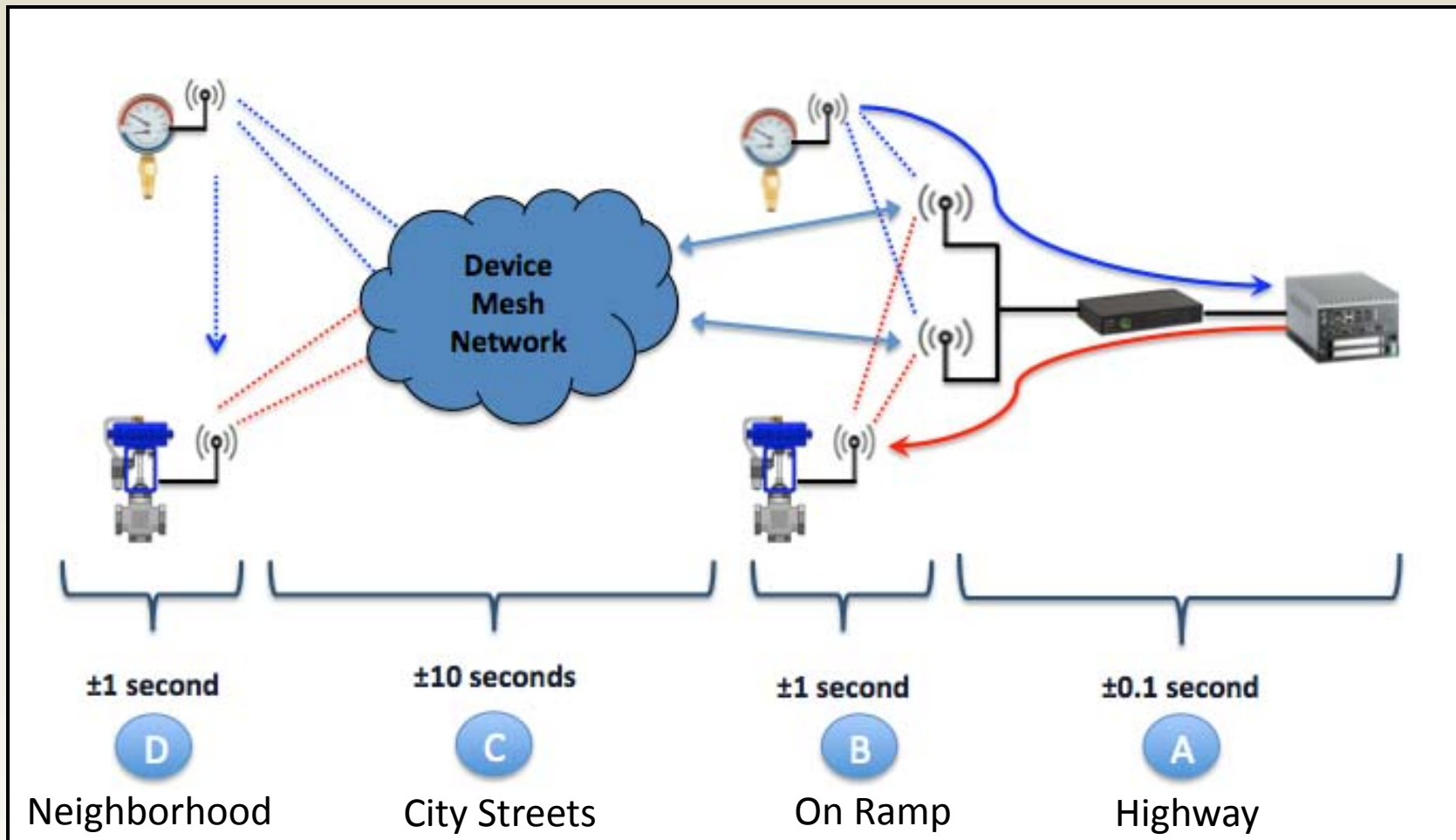
Simple and Easy
Able to Grow

ISA100 Wireless Network Overview

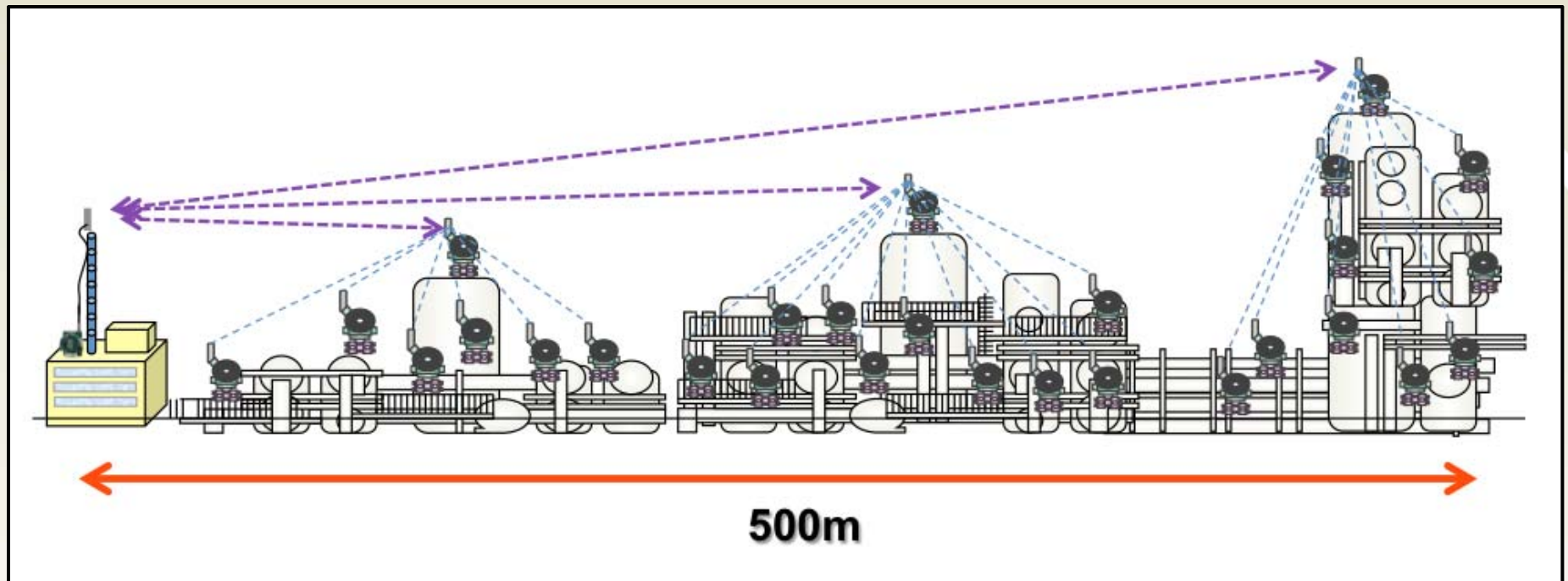


Device Mesh Networks

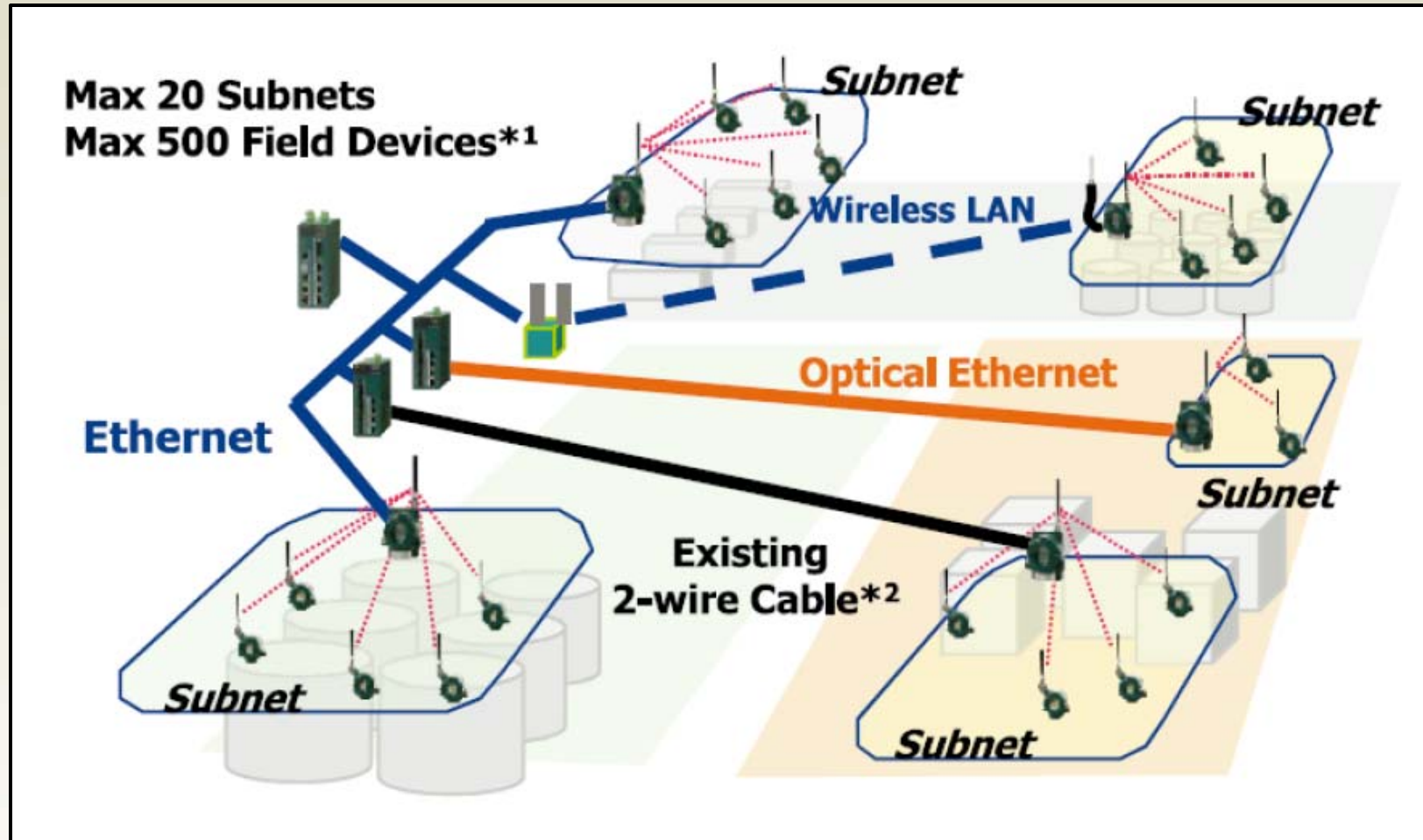
Performance Considerations



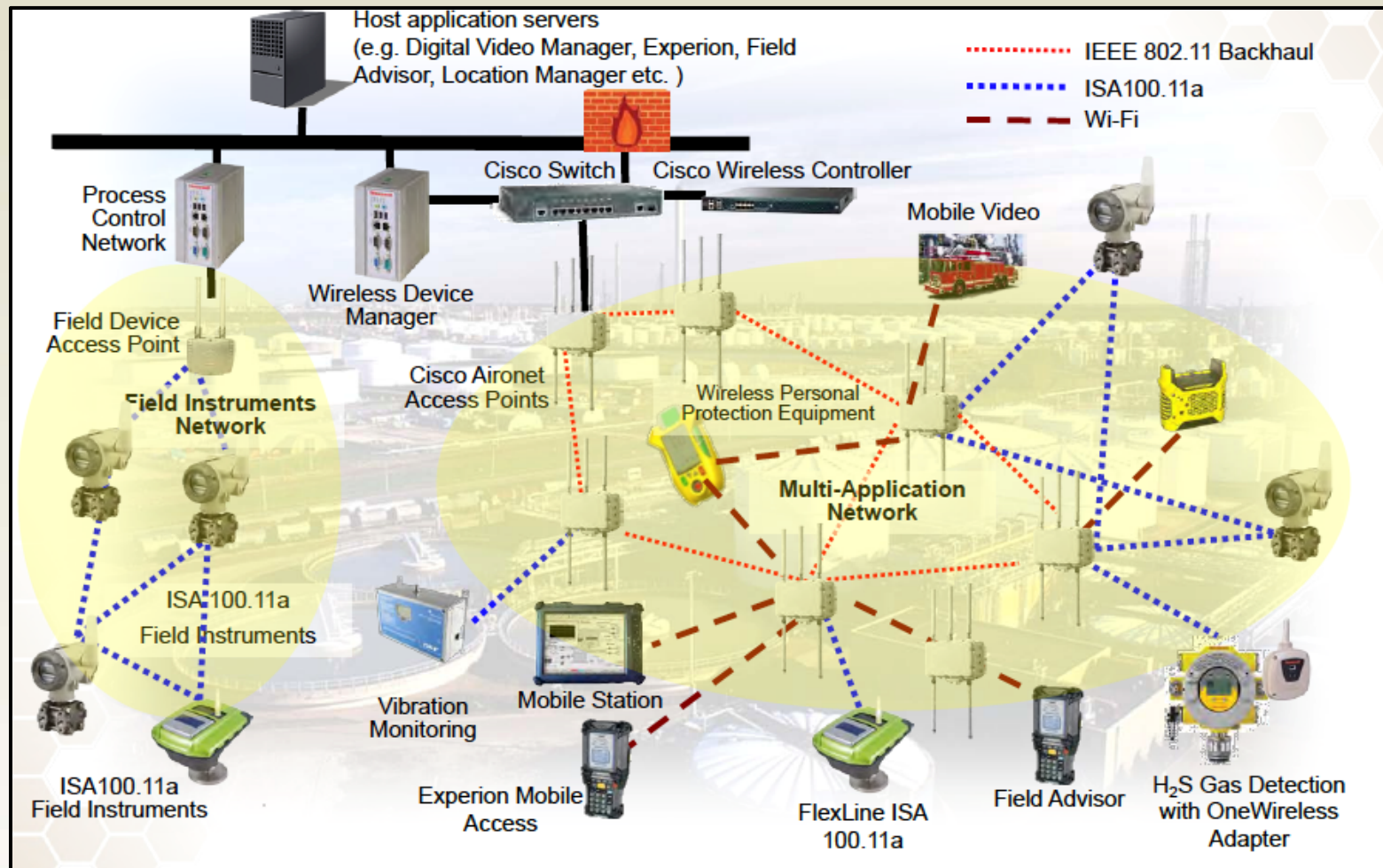
ISA100 Wireless Installation Example



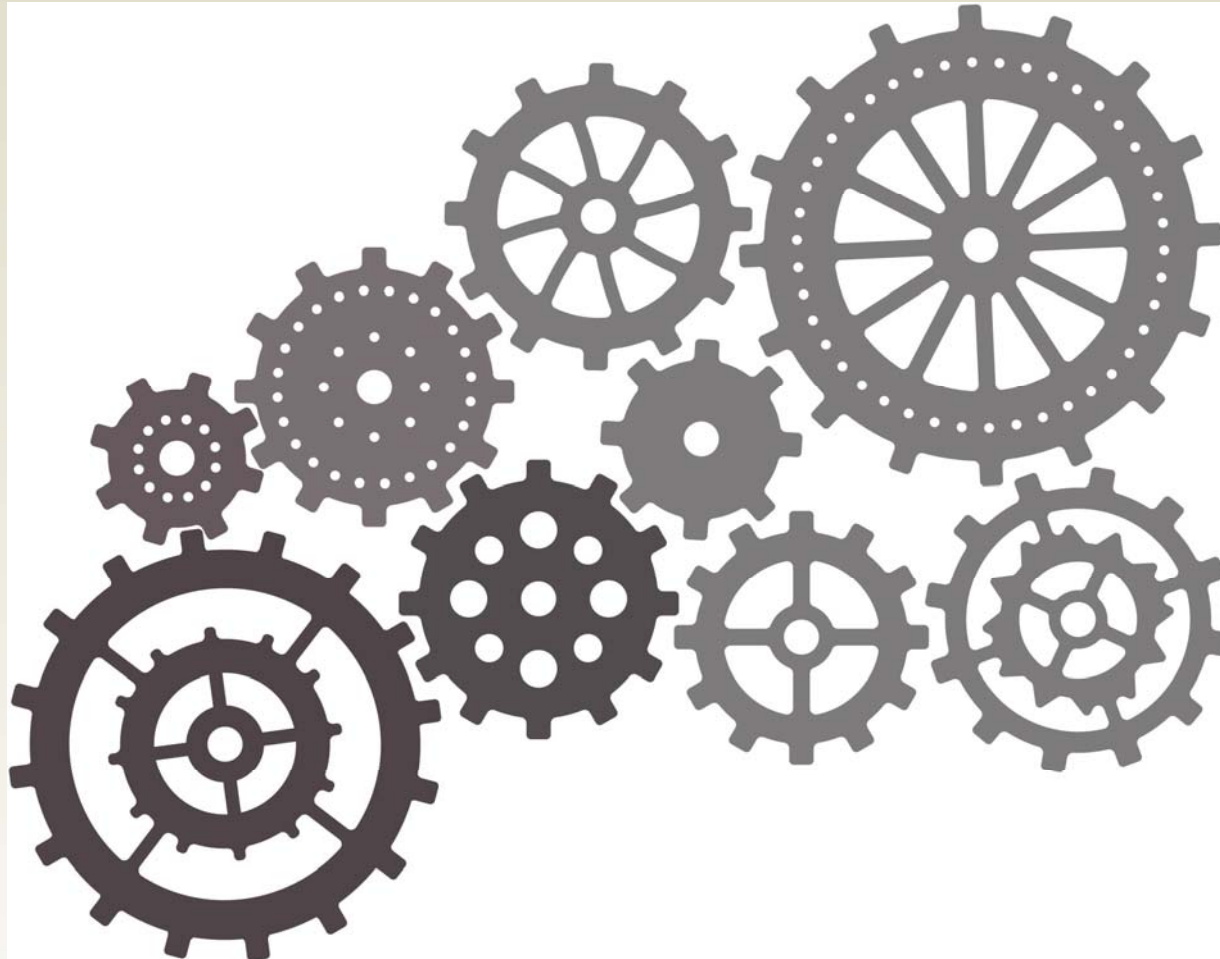
ISA100 Wireless Network Architecture Example



ISA100 Wireless Network Architecture Example



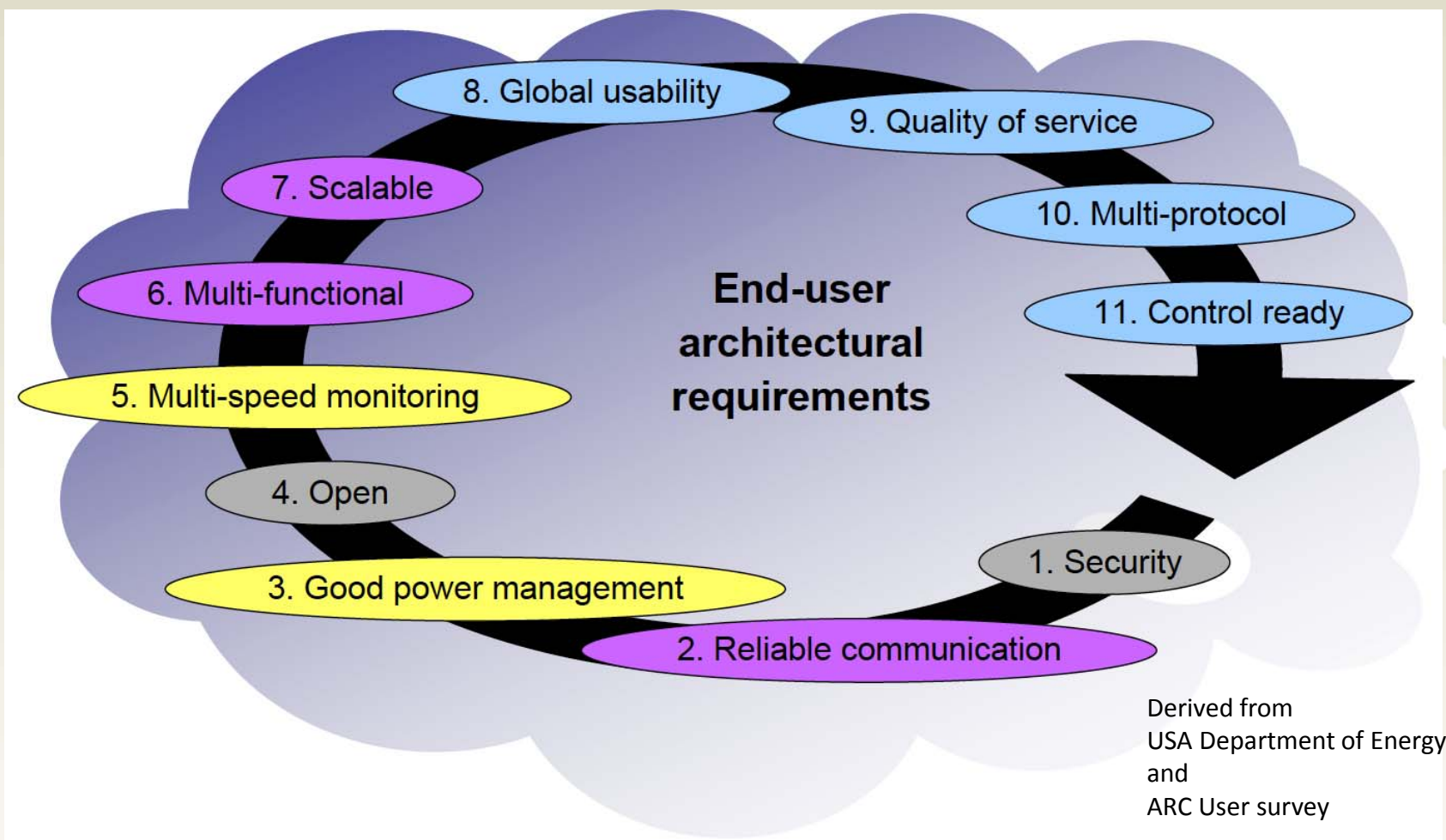
IEC 62734 Standard



Main Features of IEC 62734

IEEE 802.15.4 Radio	<ul style="list-style-type: none">• Available from multiple high quality sources.
ETSI Compliant	<ul style="list-style-type: none">• Compliant to new ETSI 300.328 v1.8.1• Various modes of compliance, described in the standard
Robust	<ul style="list-style-type: none">• Advanced coexistence and resiliency mechanisms at all levels
Secure	<ul style="list-style-type: none">• Two layer AES 128 cryptography
IP based	<ul style="list-style-type: none">• Future Proof
Object based	<ul style="list-style-type: none">• Compact and Extensible• Supports Tunneling

End-user requirements for Industrial wireless sensing

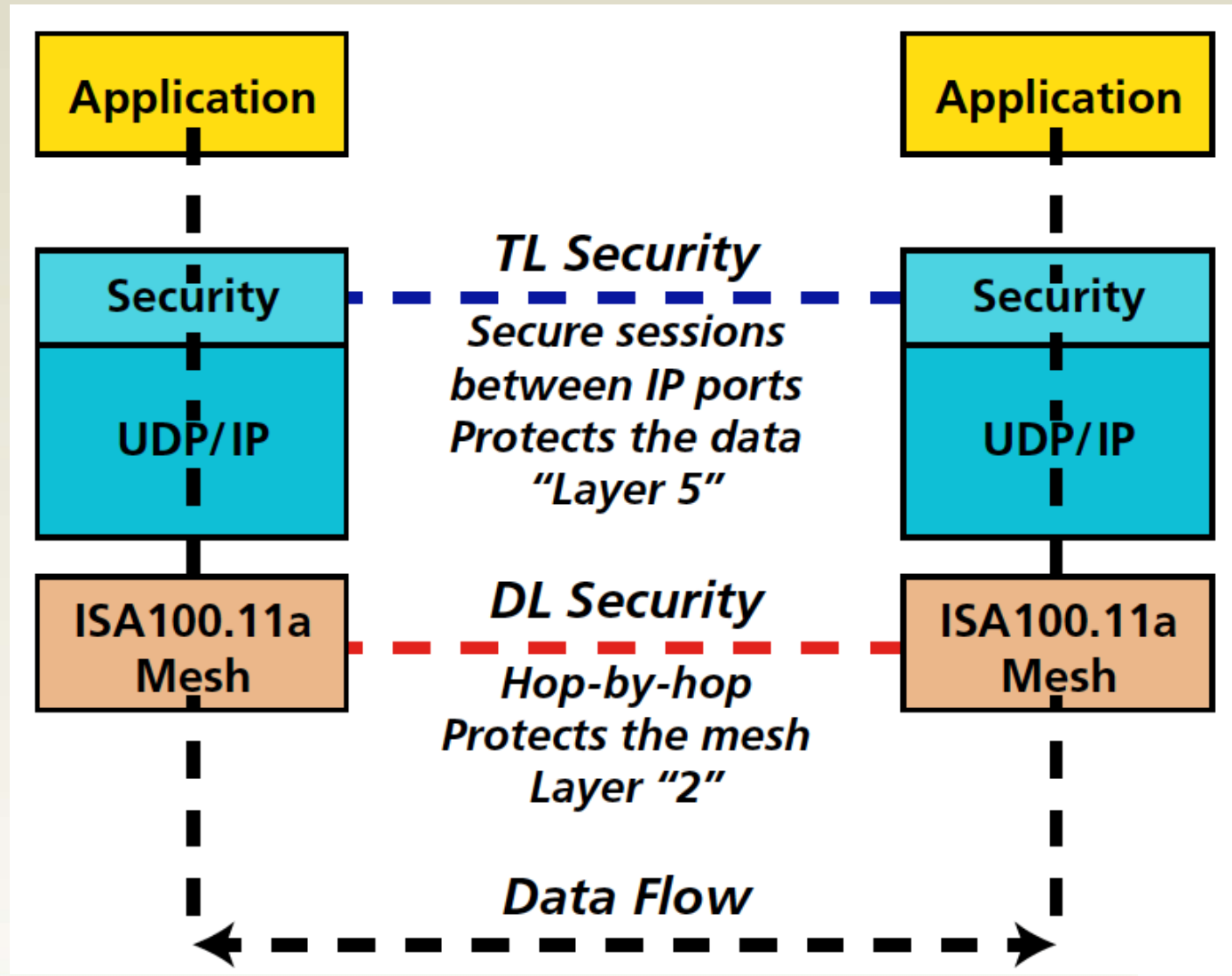


ISA100 solutions must meet all requirements simultaneously

Technical requirements for Industrial wireless sensing

1. Rate and Latency	<ul style="list-style-type: none">• Publication rates 1-2 seconds• Capable of 100 ms latency• Controlled latency, ~50% publication rate• 4 Hz publication in constrained configurations
2. Mesh Networking	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Wireless transmission is deterministic• Wireless transmission is received• Wireless transmission is accurate• Redundant communication paths to process control network
4. Security	<ul style="list-style-type: none">• Wireless transmission has not been hacked

Two Levels of Security



Robust Communications

Spectrum Analysis

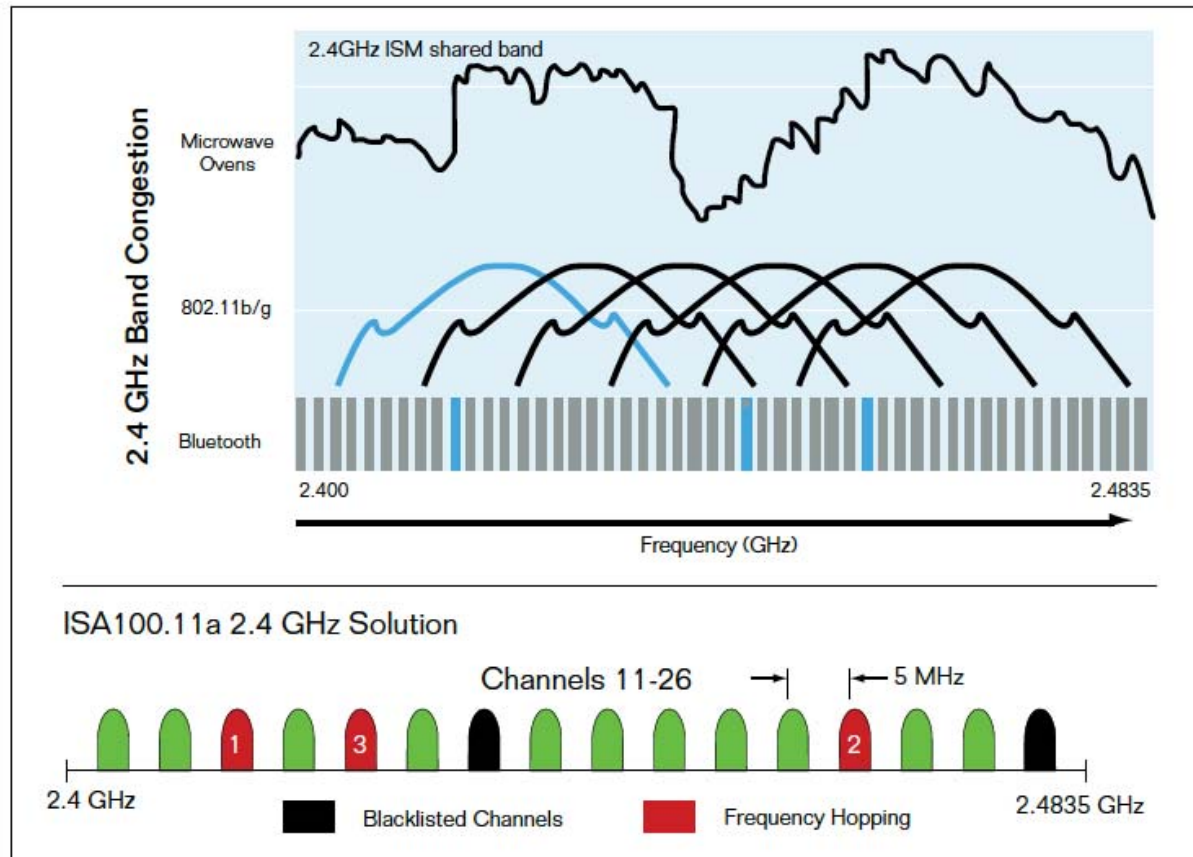
Identifying Interferers
Monitoring Saturation

System Management

Device Configuration
Element Provisioning
Performance Monitoring

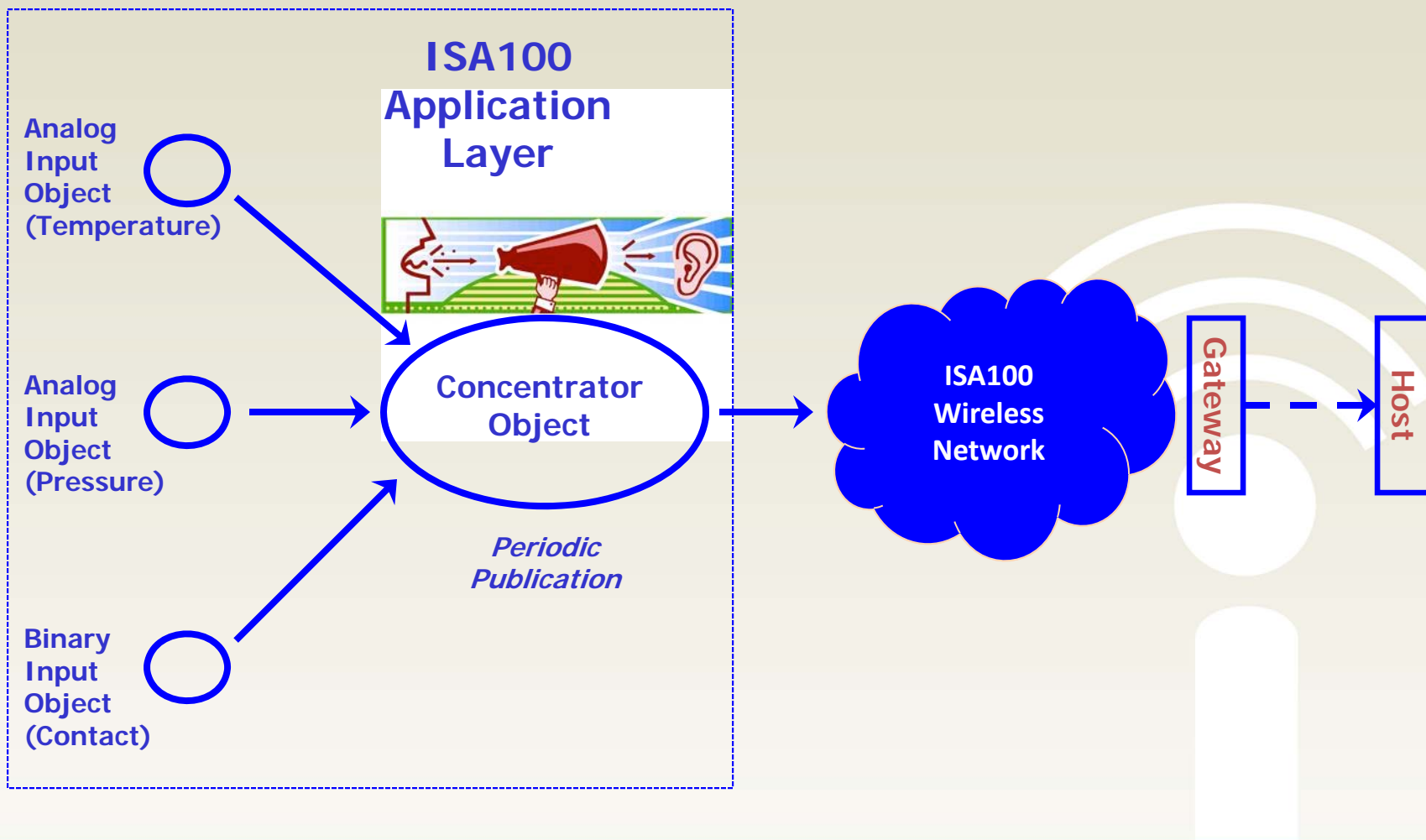
Policy Enforcement

Channel Allocation
Rules Creation
Blacklisting

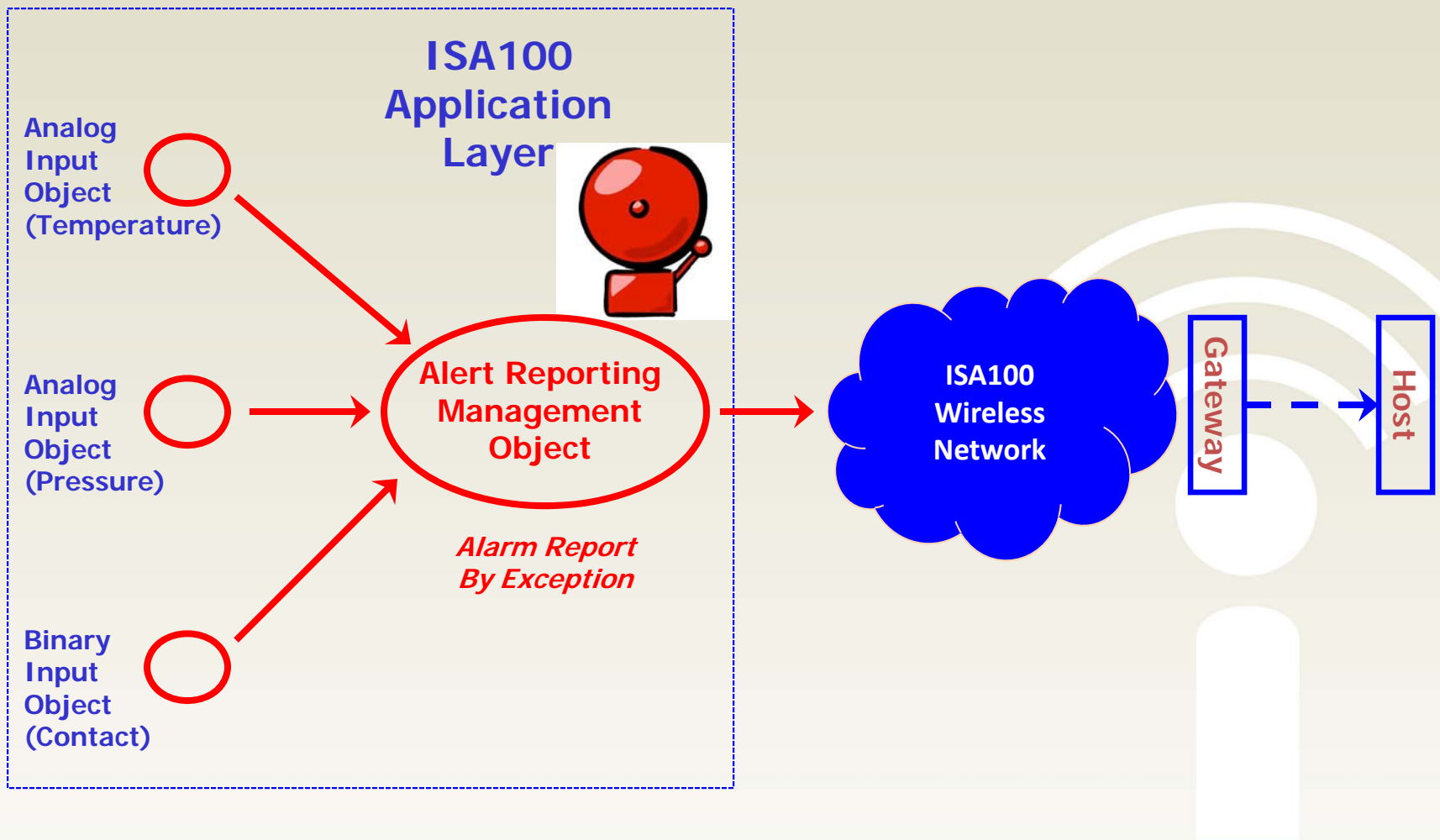


ISA100 – Ensured Coexistence with Many Wireless Networks

ISA100 Application Layer Publication



ISA100 Application Layer Alarms



Conclusion

Cost Savings	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Troublesome wired sensors replaced by wireless counterparts.• Wireless may serve as a backup for wired technology
Improved Control	<ul style="list-style-type: none">• Add wireless to existing processes for more optimal control.
Improved Safety	<ul style="list-style-type: none">• Safety related alarms