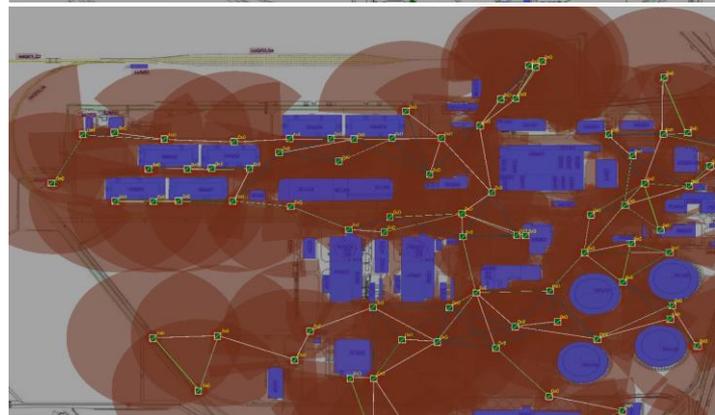
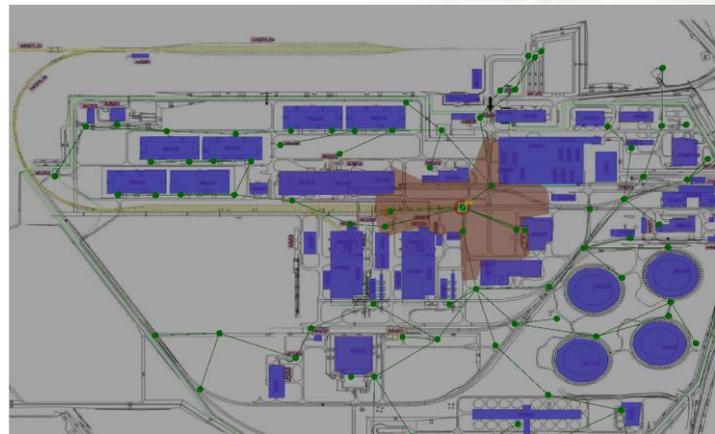


# Deploying ISA100 Wireless Distributed Networks

# Current Status Quo

- Recent trend - deployments require
  - Increased scalability
  - Support for higher network throughput
- Due to the emergence of novel ISA100 Wireless compliant instruments such as
  - Stream trap monitoring
  - Safety – gas detection
  - Corrosion monitoring
  - Condition monitoring



# Technical Primer – Logical Roles



## Field Network

<b>I/O Device</b>	Sources or consumes data. Does not route.
<b>Router</b>	Routes messages for other devices operating in the wireless subnet.



## Infrastructure

<b>Backbone Router</b>	Routes data over the backbone infrastructure.
<b>System Manager</b>	Provides policy controlled management for all network devices.
<b>Security Manager</b>	Enables, controls and supervises the secure operation of all devices.
<b>Gateway</b>	Provides an application interface between the wireless and the plant network.



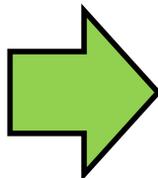
## Operational

<b>Provisioning</b>	Provisions devices with configurations required for network operation.
<b>System Time Source</b>	Responsible for maintaining the master time source of the network.

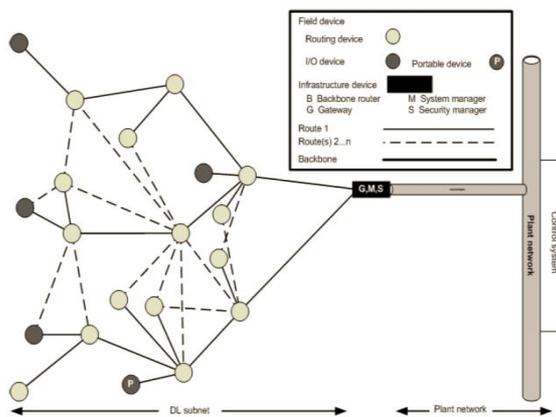
*Note: Devices typically incorporate multiple logical roles.*

# Technical Primer – Network Topologies

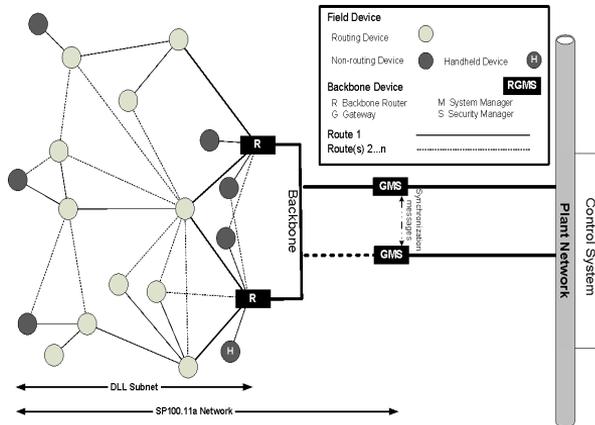
ISA100 standard inherently supports various different network topologies



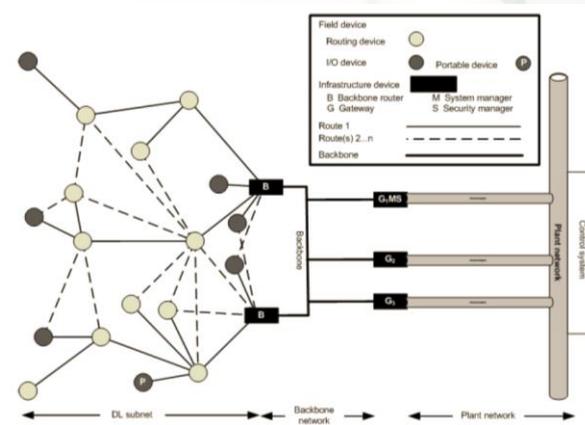
Infrastructure devices can support a combination of logical roles



Single Subnet – “All-In-One”



Multiple Subnets – “Distributed”



Multiple Gateways

# IPv6 Connectivity

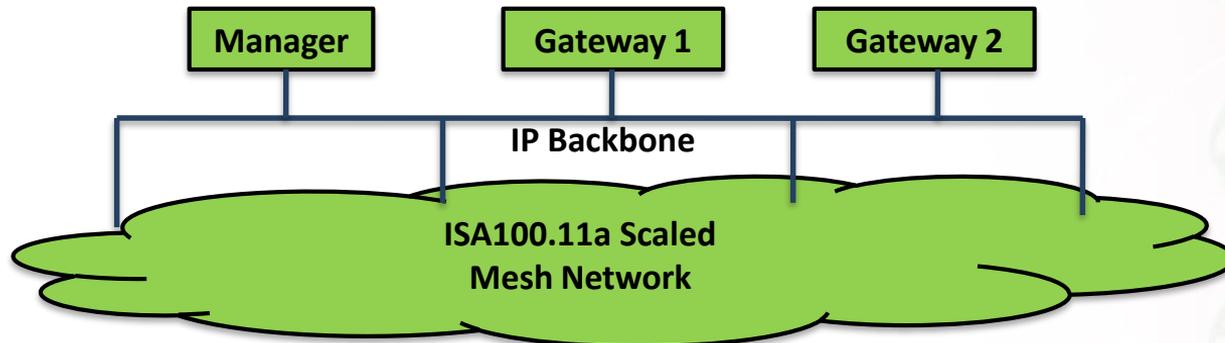
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- ISA100 mandates that all entities support native IPv6 addressability and connectivity
- Internet backbones are transitioning to native IPv6 connectivity
- Backbone can utilize any communication technology/protocol as long as it supports IPv6 connectivity
- ISA100 Wireless Infrastructure devices are IPv6 ready
- Support for standards based IPv4 encapsulation of IPv6 payloads

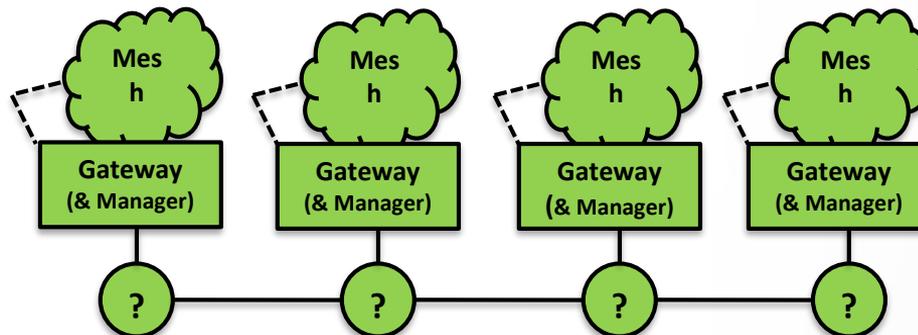
# ISA100 Wireless Network Topology

ISA100 Wireless networks – versatile topologies and scaling due to IPv6 based backbone infrastructure

**ISA100 Wireless Network Topology**



**WirelessHART Network Topology**



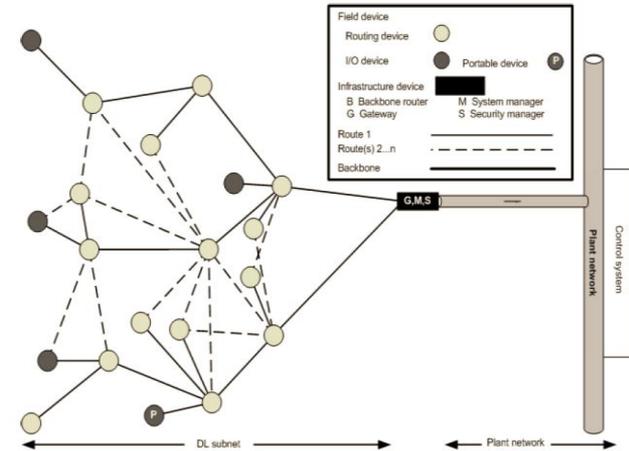
# “All-in-One” Topology



- Simple network deployment
- Low cost installation and maintenance



- Limited scalability
- Deeper mesh networks result in
  - Increased power consumption results in shorter field instrument battery life
  - Increased communication latency
  - Decreased network throughput
- Limited geographic coverage



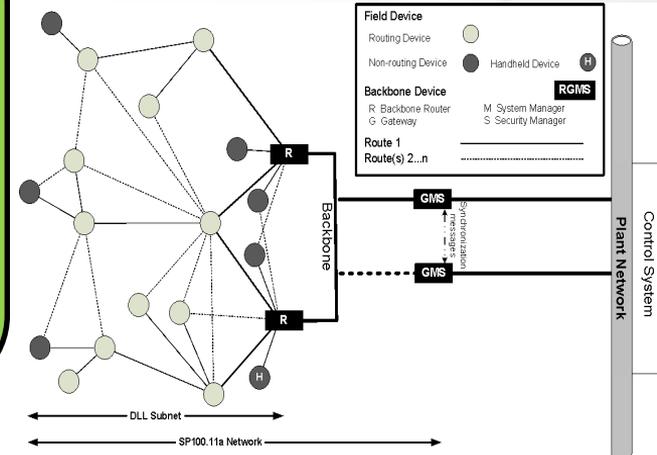
# Distributed Topology



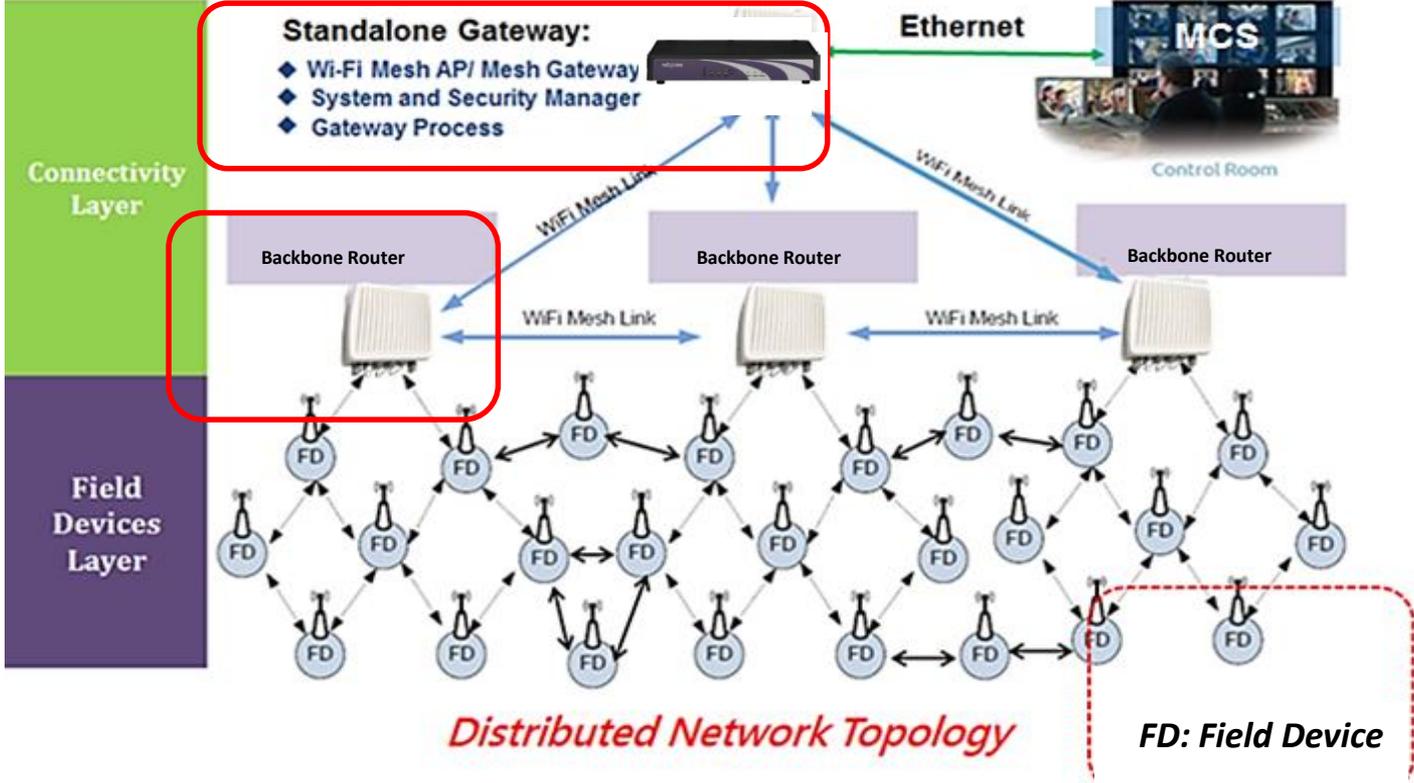
- Increased scalability
- Shallow mesh networks result in
  - Optimized power consumption results in increased field instrument battery life
  - Lower communication latency
  - Increased network throughput
- Extended geographic coverage



- Network deployment more complex
- Increased cost of installation and maintenance

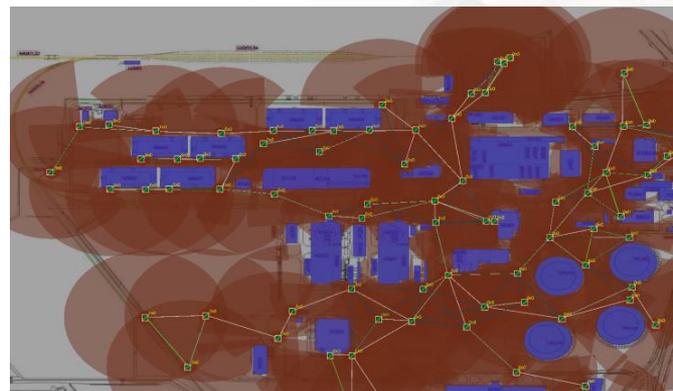
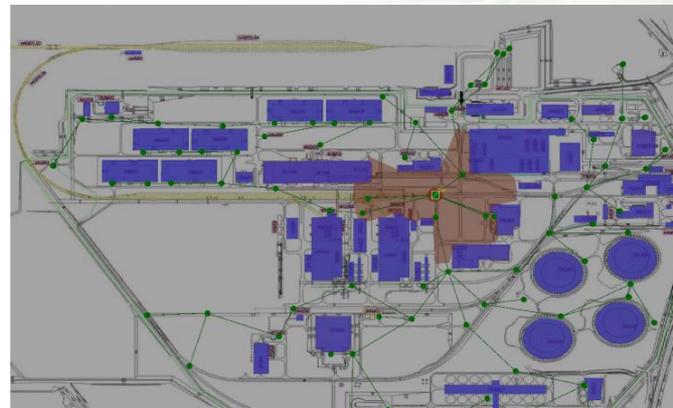


# Distributed Deployment – WiFi Mesh Backbone



# Deployment Considerations

- “All-in-One” deployments
  - Gateway is installed outdoors
  - Typically close to the control room
  - Determining optimal location is vital
- Distributed deployments
  - Gateway is installed in the control room
  - BBRs deployed throughout the facility
  - Wi-Fi Mesh backbone simplifies deployments



# Benefits

Supports distributed network topologies



Cost-effective, extended geographic coverage

Supports multiple subnets managed by the same Gateway



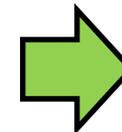
Increased scalability lowers CAPEX and ensures swift ROI

Mesh Wi-Fi enabled backbone



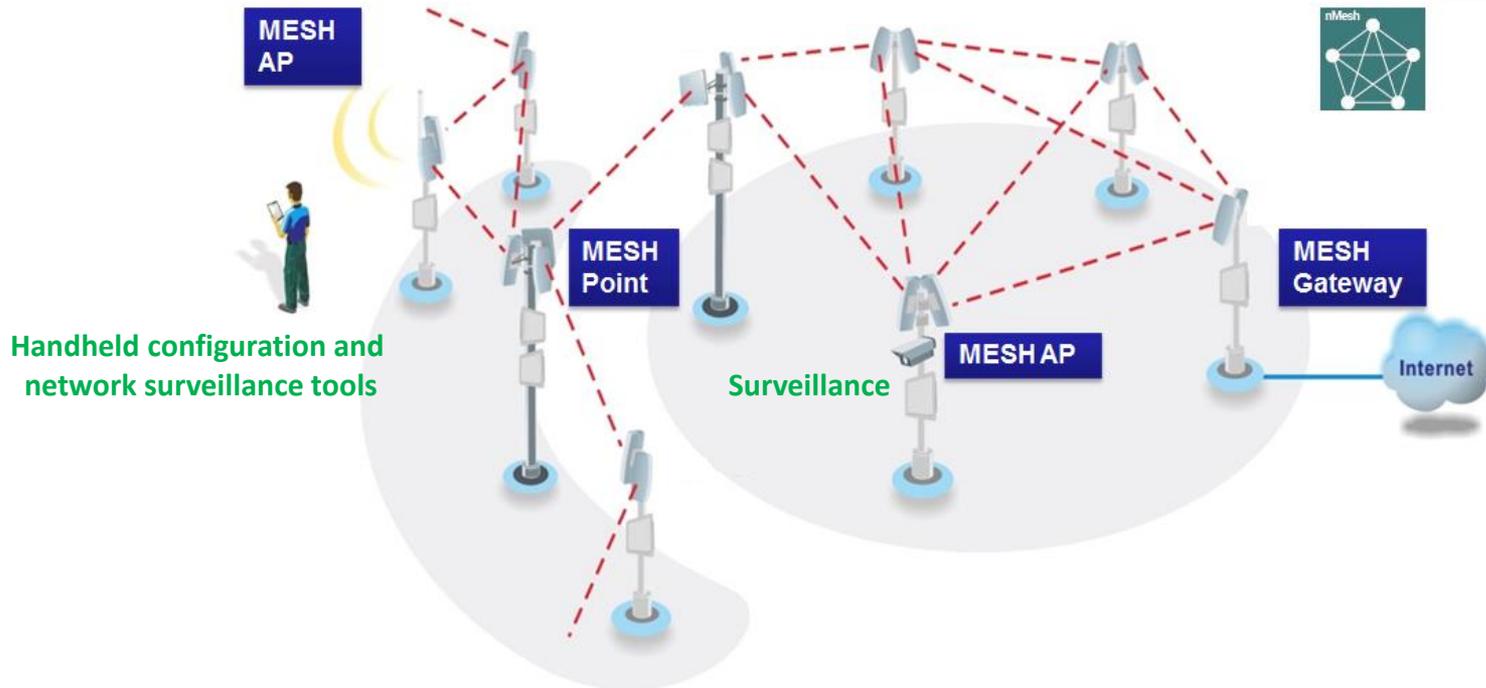
Reliable, robust wireless backbone infrastructure reduces installation and maintenance costs

Mesh Wi-Fi enabled backbone



Reduced TCO when compared to wired backbone solutions

# Support for Other Applications



Plant-wide wireless coverage supports a multitude of other applications.

# The NIO200 Product Family



## **NIO200IAG – All-in-1-Gateway**

- ISA100 compliant System/Security Manager, Gateway and Backbone Router
- Manages an ISA100 subnet composed of field instruments arranged in a multi-hop wireless mesh configuration
- EZ Mesh Wi-Fi Backbone infrastructure connectivity to the control room + perfect triple play infrastructure video surveillance



## **NIO210IDG – Distributed Gateway**

- ISA100 compliant System/Security Manager, Gateway and Backbone Router
- Manages multiple ISA100 subnets federated by NIO200IWR Backbone Routers
- Allows for distributed network topologies that maximize geographic
- EZ Mesh Wi-Fi Backbone infrastructure connectivity + perfect triple play infrastructure video surveillance



## **NIO200IDR – Backbone Router**

- ISA100 compliant, cost-effective Backbone Router
- Provides wireless and wired backbone connectivity to ISA100 compliant wireless field instruments
- EZ Mesh Wi-Fi Backbone infrastructure connectivity + perfect triple play infrastructure video surveillance



Thank You!

# Contact

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For additional information please visit

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