Setting the Standard for Automation™

Implementing Wireless around the Plant

Phillip Ng - Honeywell

Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

Phillip Ng

- Phil is a Senior, Global Product Manager in Honeywell's OneWireless Marketing organization.
- His primary focus is to serve as a liaison to the various standards organization such as ISA and the ISA100 Wireless Compliance Institute (WCI).
- Phil has been with Honeywell over 25 years and his past product responsibilities included the first real-time, online corrosion transmitter (SmartCET), APP Node, Control Builder, and Point Builder. Phil is also a certified Six Sigma Black Belt.

Honeywell

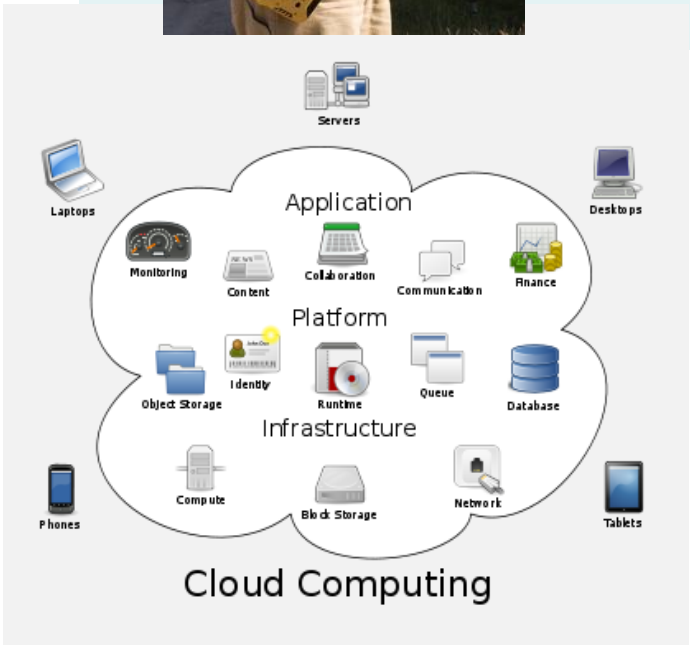
Overview of Topics

- **Wireless Goals**
  - Using Wireless to Solve “Traditional” Issues
  - Expanded Use of Wireless Today
  - Using Wireless in the Near-Future
  - Closing Summary

Select the wireless system that can accommodate the future

Wireless Goals

- Support existing plant control and applications needs
- Provide a wireless solution with the ability to gain benefits from new applications
  - Like mobile workforce, remote monitoring, etc
- Provide a platform to enable future technologies and support new applications.
  - Applications that haven't yet been conceived.



Wireless solutions transforms plant operations

Overview of Topics

- Wireless Goals
- **Using Wireless to Solve "Traditional" Issues**
- Expanded Use of Wireless Today
- Using Wireless in the Near-Future
- Closing Summary

Select the wireless system that can accommodate the future

Case Study 1
Using Wireless to Solve "Traditional" Issues

The focus is to use wireless to solve a monitoring or control problem – a traditional problem.

Customer Need

- A US based refinery selected wireless to monitor pressures in the refinery's flare header piping
  - They needed to determine which unit caused increase gas rate on the FGRU (flare gas recovery unit).
  - Instrumentation was lacking and adding more wired instruments was cost prohibitive
  - Continue to waste plant resources to chase down the problem.

OneWireless is based upon ISA100.11a

Case Study 1
Using Wireless to Solve "Traditional" Issues

Solution

- Decision criteria for selecting OneWireless
  - Network speed
    - High speed Ethernet backbone (100 ms) has almost no latency
    - Transmitter features one (1) second measurement rates
  - Network expandability
  - Cost of transmitters and batteries
  - Integration of Wi-Fi in the Multinodes allow for the same infrastructure to be used for two different wireless networks
    - ISA100.11a radio
    - Wi-Fi radio

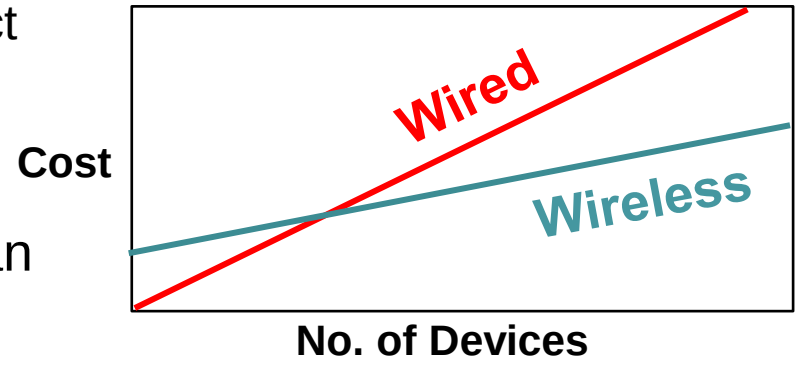
Accurate, reliable plantwide monitoring was the goal

Case Study 1
Using Wireless to Solve "Traditional" Issues

Results

- Customer wanted to set up an infrastructure to go beyond this initial project
  - Project Team took additional step to communicate with other plant engineers to understand additional wireless opportunities
  - Wireless transmitters and Wi-Fi devices connect to the control system
  - Project Team calculated break even point between a wired solution and wireless.
    - 50% reduction in cost for this project

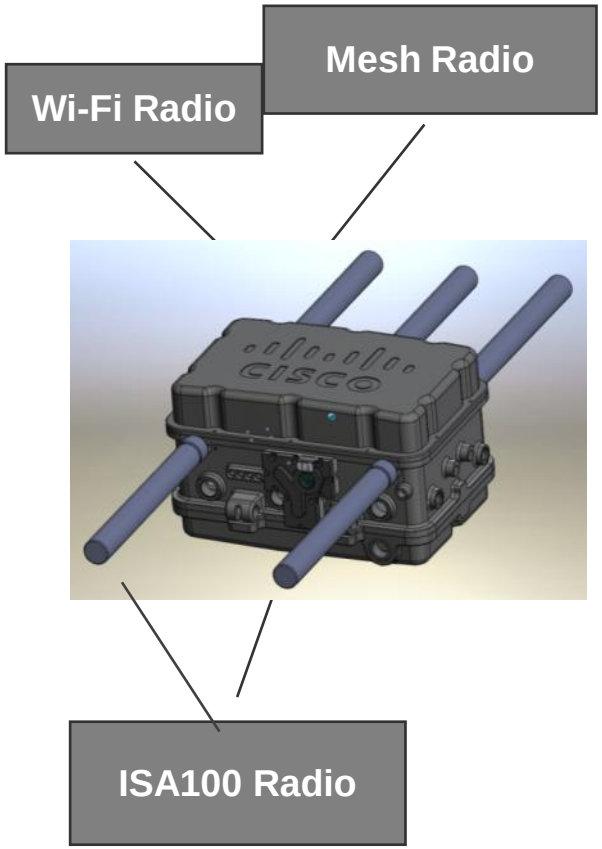
- New data helped to reduce troubleshooting time by 50%
- Additional transmitters take less than day to get online



Immediate cost benefits

Solution Update

- **Alternative solution is to use Cisco's 1552S Access Point to provide a Wi-Fi and ISA100 connection**



- Access points for Wi-Fi, field instrumentation and Ethernet devices
- CleanAir technology for mission critical applications
- Enables secured access to the process control applications
- Enables secured connection of ISA100.11a devices with the process control network

Features

- IEEE 802.11a/b/g/n radios for Wi-Fi and Mesh
- Wireless coverage up to 1300 ft for ISA100.11a field devices thanks to integrated IPV6 based ISA100.11a Backbone Router with diversity antenna
- Process data preconfigured with highest priority

Using Wireless to Solve “Traditional” Issues

Another traditional problem

Customer Need and Solution

- Access to stranded HART diagnostic data from wired HART transmitters.
- Use a wireless adapter to attach to your HART transmitter
  - Unlock stranded diagnostics from HART devices
  - Convert wired HART devices to ISA100 network
  - Option use as routing device
  - Powered from 4-20mA loop and D-cell battery
  - Send HART data over the ISA100.11a network

Real life use of ISA100’s ability to support other protocols

Overview of Topics

- Wireless Goals
- Using Wireless to Solve “Traditional” Issues
- **Expanded Use of Wireless Today**
- Using Wireless in the Near-Future
- Closing Summary

Select the wireless system that can accommodate the future

Case Study 2
Expanded Use of Wireless Today

Customer Need

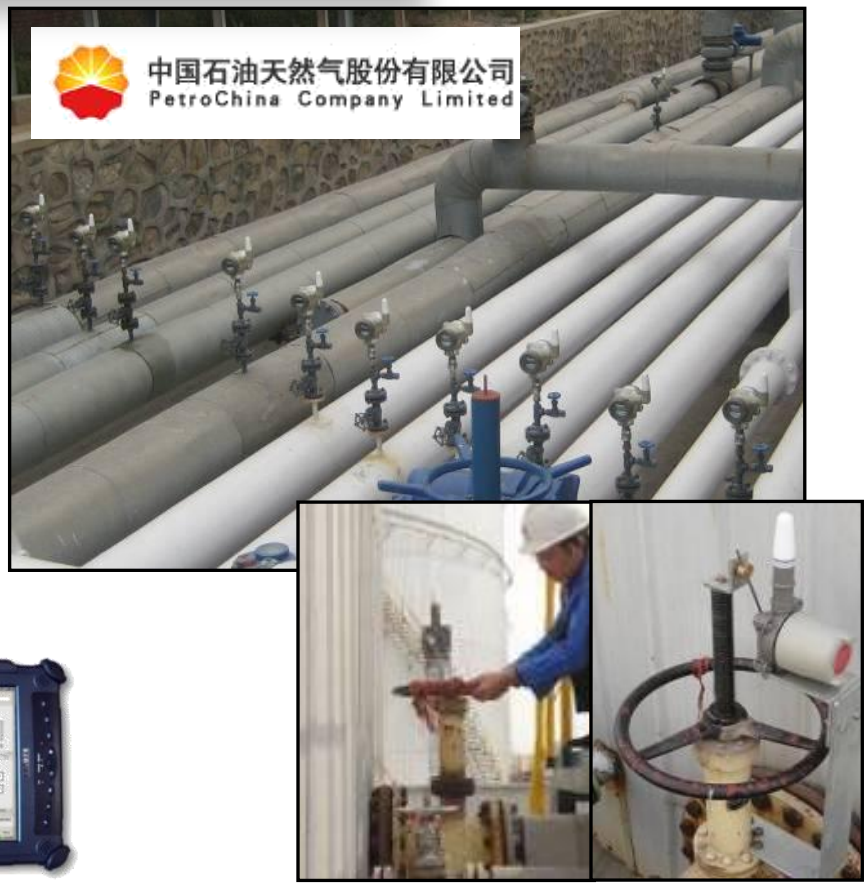
- PetroChina at their Xigu Oil Tank Farm wanted to implement a more modern, intelligent control system
  - Add 20 pressure measurements along the oil transportation pipeline almost 3km away from the control room
  - Monitor tank root valve and integrate data into the Oil Movement System
  - Existing cable trays and conduit were full

Non-efficient and low accuracy walkie talkies were being used

Case Study 2
Multi-Functional Wireless Network in China

Solution

- Complete wireless solution plus integration to mobile access
  - Valve position sensors monitor the on/off status of the root tank manual valves
  - Pressure measurement on pipelines in a remote area of the tank farm
  - **Plus** Data entry at the rail dock via wireless tablet computer for real-time updating of the control system



Eliminate need for paperwork; recurrent cost savings

Case Study 2
Expanded Use of Wireless Today

Results

- Value to PetroChina
  - No new cables, wiring, and cable tray. No affect from the existing railway.
  - Saved on the total installation cost and commission time.
  - Wireless transmitters provide remote online diagnostic, maintenance, and alarm data.
  - Access to real-time data integrated with the control system and train loading system (no more walkie talkies)
  - Online software upgrading, can help save maintenance costs

PetroChina needed a complete solutions and services provider

Case Study 2
Expanded Use of Wireless Today

Results

- Value to PetroChina
  - Mobile station provides access to key process parameters, historical data, graphics, maintenance information and other important control system data on the railway loading and unloading dock
  - Browse SCADA data through a real-time mode using standard Modbus TCP.
  - Wireless network is capable of future extension to additional wireless applications like wireless field advisor, gas detector, radar level etc.

Mobile station

Users are exploring how wireless can make new positive changes

Overview of Topics

- Wireless Goals
- Using Wireless to Solve “Traditional” Issues
- Expanded Use of Wireless Today
- **Using Wireless in the Near-Future *– It’s Here***
- Closing Summary

Select the wireless system that can accommodate the future

Case Study 3
Unmanned Control Room in France

Customer Need and Solution

- Mesh network to support mobile applications
- Operators in process plant equipped with PDAs with real-time control room alarms

Solution

- OneWireless™ Network
- PDAs
- Buzzer / flashlight alarming
- Site survey and startup assistance

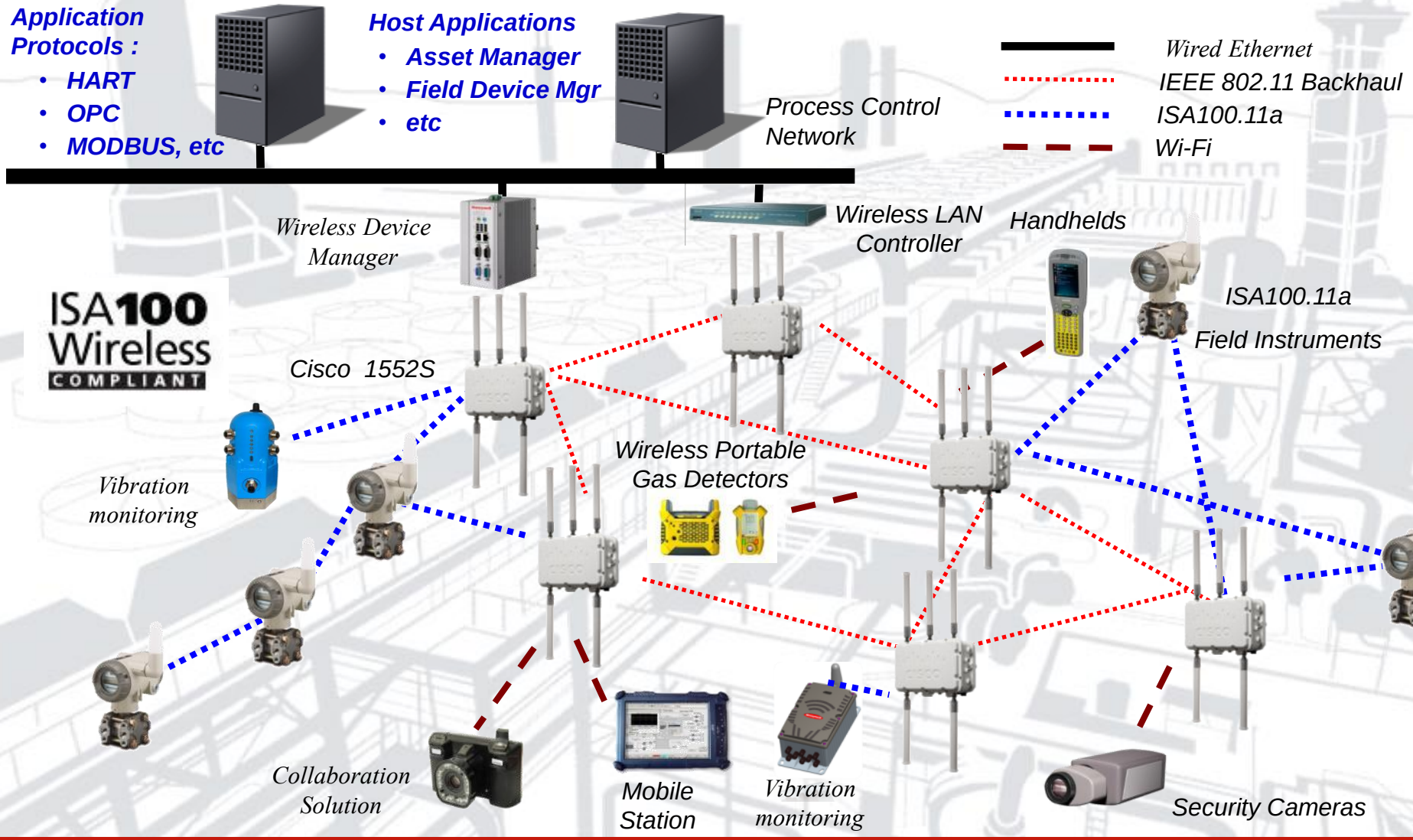
Benefits

- Operators are informed about active alarms in the control room
- Can perform other tasks while monitoring plant operations

First unmanned onshore control room; true business transformation

Customer Need and Solution

- **A single wireless network to support a variety of wireless devices**



Leading technology – the wireless platform for now and the decades to come

Planning Your Future Wireless Network

Customer Needs

- Wireless device network for process control field devices and the backhaul network will be linked
  - The Cisco 1552S AP is an example
  - How will you manage the networks?
  - What are the underlying features, functions, building blocks (e.g. IP device addressing) that make it easier for you to manage?

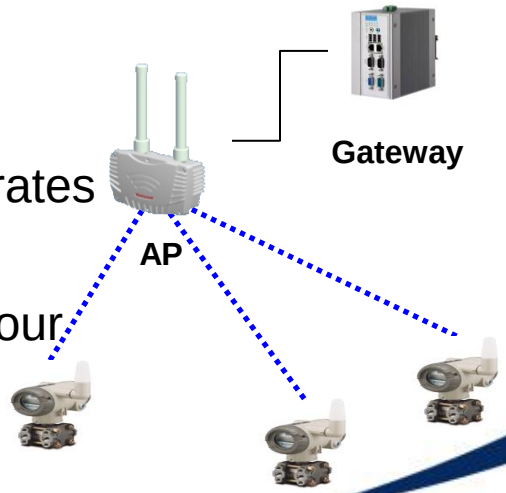
Planning Your Future Wireless Network

Customer Needs

- What existing applications are you running?
  - They haven't disappeared today and they most likely won't in the future.
    - HART, FF, OPC, Modbus?
    - Vibration waveforms, tank gauging, other unique large data files?
    - ISA100.11a's flexibility supports existing protocols
- Control is not a four letter word
  - Wireless can and will be used for control
    - ISA100.11a supports 1 second measurement rates
    - With good battery life
    - With determinism and latency that works for your tried and true PID control

ISA100 HART Adapter

Vibration monitoring



Future Case Study – Wireless Enables Mobile Operations & Commissioning

Customer Need and Solution

- Mobile Operations
  - Real-time data in the field for faster and more effective decisions
    - Process views, procedures, data
  - Improve response to field data & information
- Checkout and Commissioning
  - Mobile access to project data
    - Drawings, instrument databases, operating procedures, real-time process graphics
  - Reduce equipment & improve schedule

Tablets and smartphones for engineers, operators and plant management

Overview of Topics

- Wireless Goals
- Using Wireless to Solve “Traditional” Issues
- Expanded Use of Wireless Today
- Using Wireless in the Near-Future
- **Closing Summary**

Select the wireless system that can accommodate the future

The Impact of Wireless Technology

1. **Wireless can provide immediate benefit**
   - Saves project costs (one time cost saving)
2. **Wireless also transforms operations**
   - Saves costs year in year out (recurrent cost saving)
3. **Select a system that is easy to use**
   - Easy to use today
   - Easy to use in the future
     - Easy to support your applications and operational changes in the future
     - Easy to manage and integrate other wireless networks

Thank You

Questions