INTEGRATING WITH ETHERNET/IP™

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“Great minds discuss ideas, average minds discuss events, small minds discuss people.”

-- Eleanor Roosevelt
ACE Overview

- Independent Systems Integrator
- Established in 1991
- Genesis based in:
  - Chemical
  - Specialty Chemical
  - Air Separations
- 100+ Fulltime employees
- Privately Owned
- Internally Financed
Engineering Offices

- Delaware Valley
- Chesapeake Region
- Greater Boston
- Gulf Coast
- Lehigh Valley
- New England
- Ohio Valley
Automation Services

- Projects from $500-$2M
- Greenfield, Brownfield, Legacy migration
- New systems
- 24/7 Service Support
Integration Opportunities

- $65B worth of existing process control systems nearing end of useful life
- Migration opportunities

“If you must have motivation, think of your paycheck on Friday.”

--Noel Coward
The World Before EtherNet/IP

- Closed networks
- Everything "owned" by hardware vendors
- Severe limits on integrating pieces
- Playground for integrators
- EtherNet/IP eliminates these issues

"The future ain't what it used to be."

-- Yogi Berra
“That new process equipment is arriving next month. Send out the drawings to five integrators and let’s get quotes…”

Process control project execution. Networks are no longer predetermined.

- Control Platform
- Instrumentation
- Valves
- Electrical Distribution Equipment
- VFD Vendors
- Regulatory Equipment and Interfaces

EtherNet/IP enables and simplifies these communications.
System Life Cycle

Networking has impacts throughout the system life cycle

- Requirements Definition
- Architecture
- Vendor Selections
- Detailed Design
- Implementation and Testing
- Infrastructure
- Installation and Commissioning
- Operation and Maintenance
Network Requirements

- Interoperability and support
- Data availability
- Reliability
- Compliance to standards
  - Conformance testing
- Secure
- Ease of use
Project Examples
Chemical Process Industry Application

- Migration from legacy DCS
  - Existing system:
    - Proprietary I/O bus and controller bus networks
    - No other devices were networked
  - Migrated System:
    - All VFD's and soft starters connected via EtherNet/IP and ring architecture
    - All I/O on EtherNet/IP
    - All data available to Historian and enterprise
Chemical Process Industry Application

- Terminal Servers
- Engineering Workstation
- HMI Server
- Historian
- Thin OWS
- Twin OWS
- MCC
- Switch
- Remote IO
- Hopper Weigh Scale
- DLR Network
Chemical Process Industry Application
Consumer Products / Process Application

- Upgrade from legacy hardware
- Mixed vendor and vintage hardware
- Two HMI platforms
- Multiple remote I/O networks
- Gateway linking device to serial MODBUS devices
- Some obsolete hardware
- Limited documentation

Migrated System:
- Customer received multiple proposals; some with multiple networks
- Final design moved to EtherNet/IP with resilient and redundant networks
Consumer Products / Process Application
Life Science Application

- Converged Network
  - Core switches used to connect entire campus
  - Distribution switches used to connect to the Core
  - Access switches
  - Local access switches
- Server rooms host resources for the DMZ and Level 3 networks
- PCN allows for Process Control elements to communicated across campus
- Having all devices on network allows for OT functions
Life Science Application
Process Utility Application

- Mission critical application (one customer is data center)
- System has lived >25 years
- Redundant controllers
- ControlNet™ I/O network providing segregation from controlled Ethernet network
- Dual EtherNet/IP networks for HMI and data collection
- OEM package equipment on ControlNet
- MCC included DeviceNet™.
Process Utility Application

- Dual Screen Computer
- Redundant PLC
- Air Dryers
- Remote I/O
- ControlNet
- Legacy Network
- Motor Control Center
- VFD
- Power Monitor
- Device Net
Future from Integrators Perspective

- Physical
- Wireless
- Security (IEC 62351, IEC62443)
- Scalable Redundancy Options
- Network Set-Up
- Reduce the IT component
- Quantity of field devices
- Diagnostics
THANK YOU