

Rockwell Automation
on the move



LISTEN.
THINK.
SOLVE.®

Improve Flexibility & Efficiency

Chatchai Wajakiet / Chee Hoe Lee



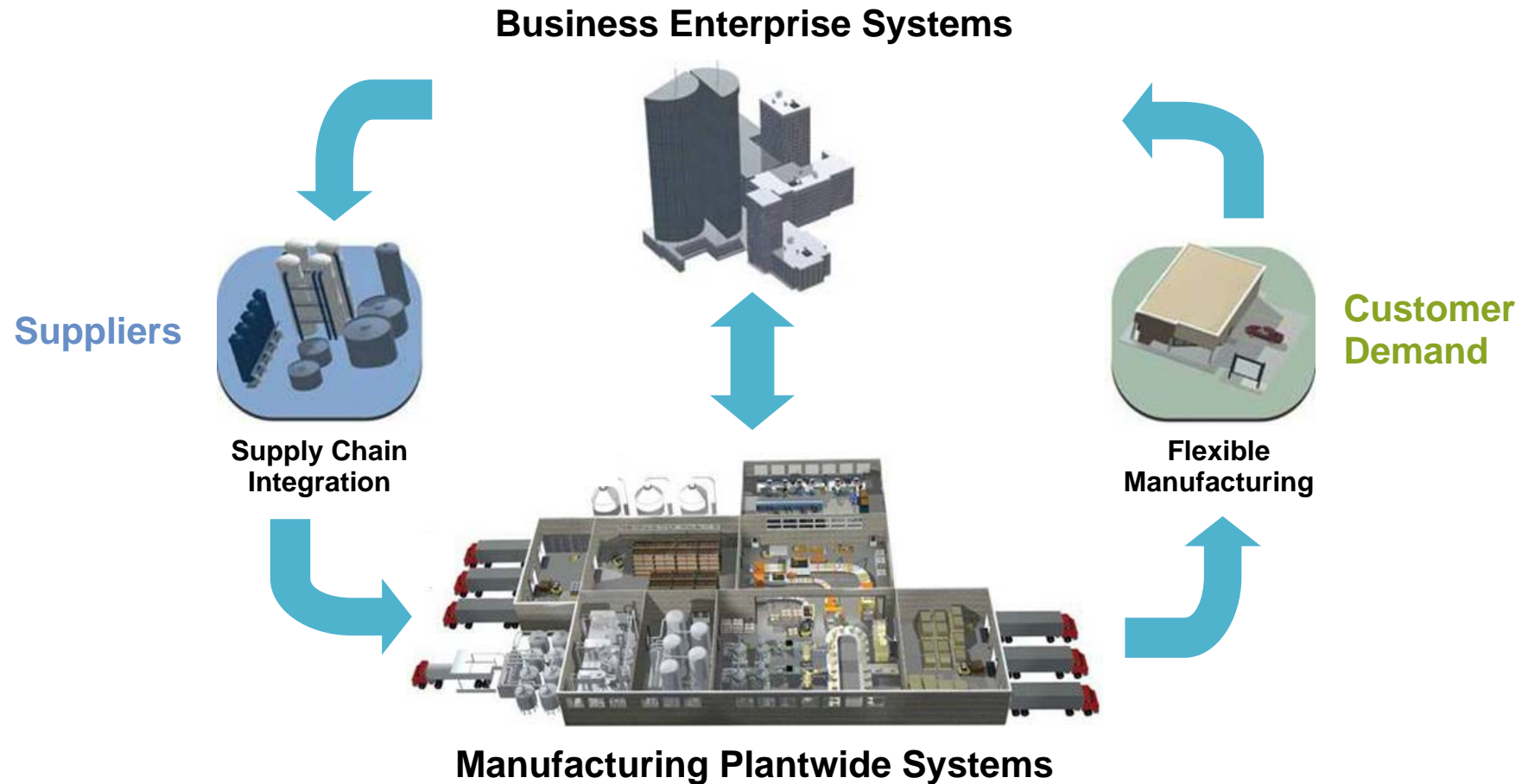
1. Manufacturing and Enterprise Network Convergence

2. Rockwell Automation and Cisco Collaboration

3. Solution for Manufacturing Flexibility and Efficiency

Convergence: The Perpetual Trend

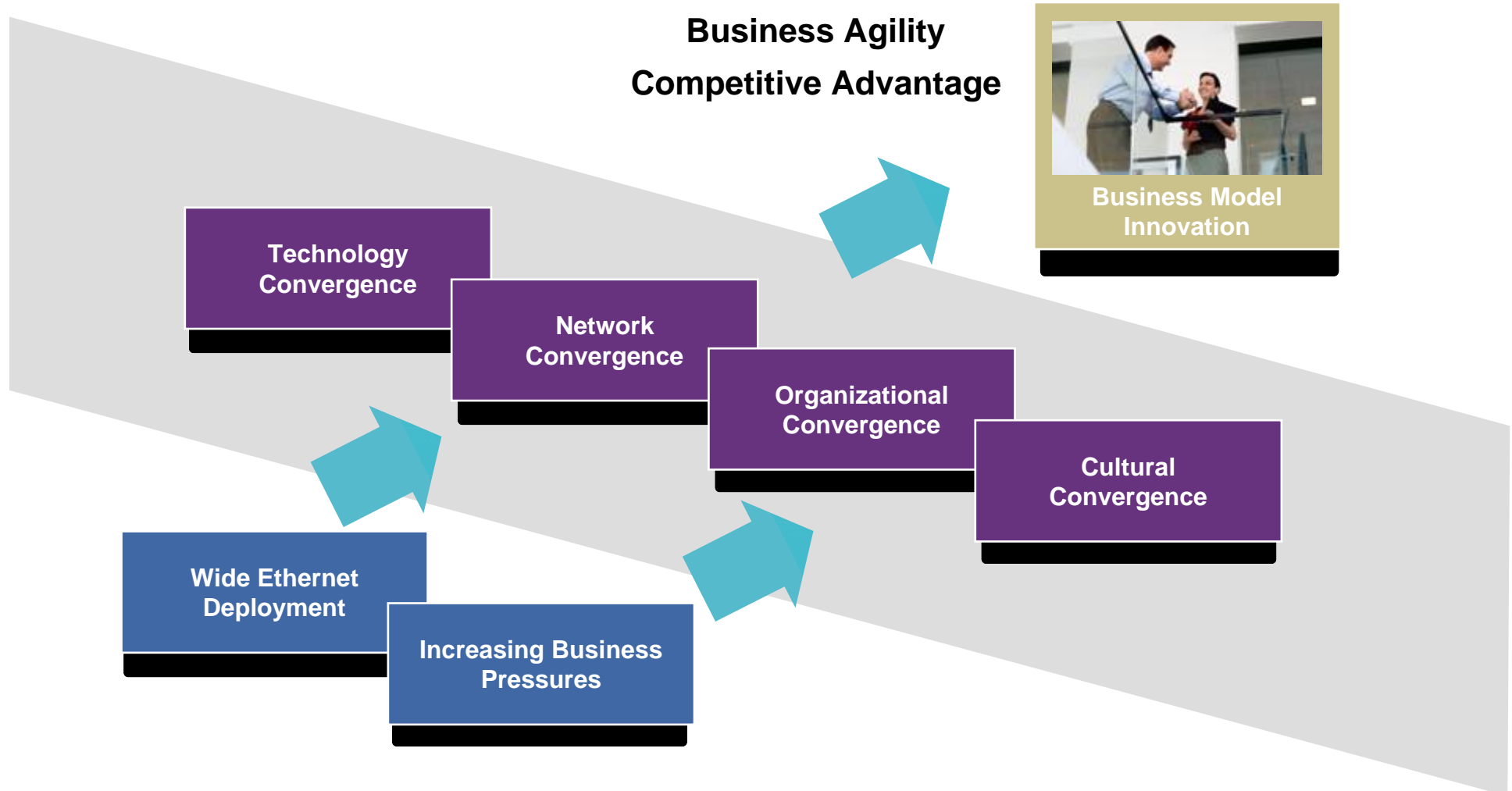
Rockwell Automation
on the move



**Lower Total Cost of Ownership | Faster Time to Market |
Better Asset Optimization | Broader Risk Management**

Manufacturing and Enterprise Network Convergence

Rockwell Automation
on the move



What is Manufacturing and Enterprise Network Convergence?

Rockwell Automation
on the move



PEOPLE



TECHNOLOGY



PROCESSES & INNOVATION

Industries—Manufacturing

Rockwell Automation
on the move



Automotive



Food and Beverage



Household and
Personal Care



Life Sciences



Water/Wastewater



Mining/Metals/Cement



Oil and Gas

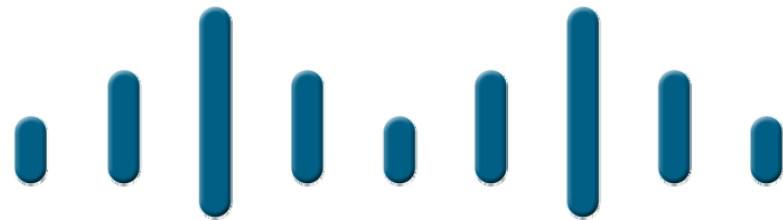


Semiconductor/
Electronics

**Common Enterprise and IT Functions,
Unique Manufacturing and Automation Functions**

The Solution

Rockwell Automation
on the move



CISCOTM

Rockwell
Automation

Combining Our Expertise
to Address the Network Convergence of IT and Manufacturing

Rockwell Automation At A Glance

Rockwell Automation
on the move



Leading global provider of industrial automation control and information solutions

- Annual Sales (FY09): \$4.3 billion
- World Headquarters: Milwaukee, Wisconsin, USA
- Trading Symbol: ROK
- Employees: 19,000+
- Serving customers in 80+ countries

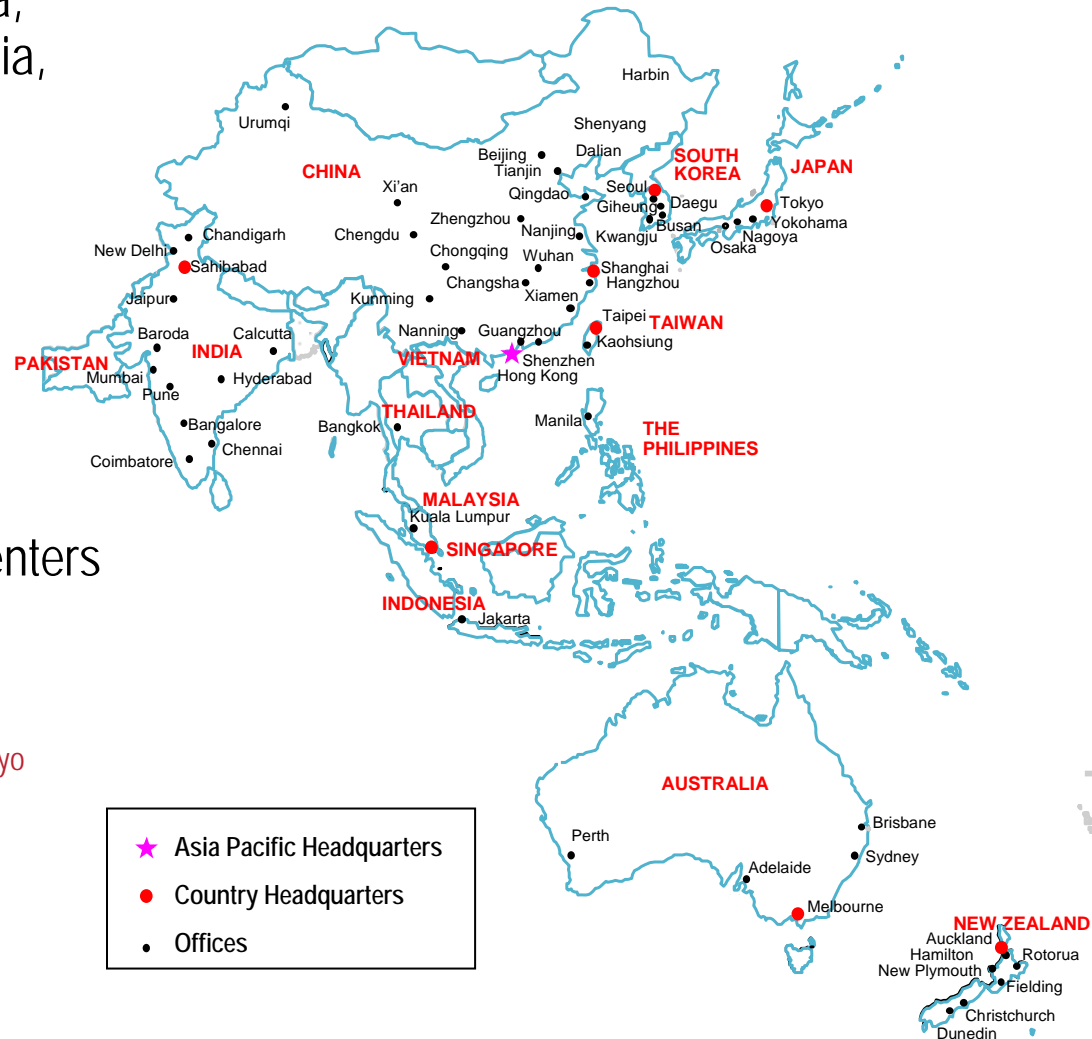


Asia Pacific Fact Sheet

Rockwell Automation
on the move



- Asia Pacific includes Greater China, India, South Pacific, South East Asia, Korea & Japan
- 3,500+ employees
- Over 80 sales/support locations
- 3 manufacturing and R&D centers
Singapore, Shanghai China, Giheung (Korea)
- 1 software development center
Dalian (China)
- 4 OEM application development centers
Shenzhen (China), Shanghai (China), Bangalore (India), Singapore
- 6 solutions engineering centers
Shanghai (China), New Dehli (India), Seoul (Korea), Tokoyo (Japan), Singapore, Sydney (Australia)
- 3 competency centers
Singapore, Shanghai (China), Bangalore (India)



Industries and Customers We Serve

Rockwell Automation
on the move



Consumer Packaged Goods (Food & Beverage, HPC)

- Fonterra
- Kraft
- McCains
- MasterFoods
- Nestle
- Coca-Cola
- Cadburys
- Pepsico
- Anheuser Busch
- General Mills Inc.
- Grupo Bimbo
- InBev
- Unilever
- Mengniu Dairy
- Bright Dairy
- CRB
- Wahaha
- Guangxi Sugar
- Sanlu Dairy
- Strong Food
- Heineken
- United Breweries Limited
- ITC Food
- Universal Robina Corporation (URC)
- National Dairy Development Board (NDDB)
- P & G/Gillette
- Kimberley Clark
- 3M
- Dupont
- Colgate Palmolive
- PZ Cussons
- Avery Dennison
- Clorox
- Recitt Beckinsler
- L'oreal
- Dow Chemicals
- Henkel
- Akzo Nobel
- Amore Pacific
- Kang Na Hsiung Enterprise Co. Ltd



Automotive

- General Motors
- Toyota
- Nissan
- Hyundai
- Daimler Chrysler
- Ford/Mazda
- Magna
- PSA Peugeot Citron
- Arvinmeritor
- Autoliv
- BMW
- Delphi
- Denso
- Fauricia
- FIAT
- Honda
- Johnson Controls
- LEAR
- Martinrea
- Thyssen Krupp Budd
- TRW
- Visteon/HCC
- Volkswagen
- Tata Motors
- Mahindra & Mahindra
- SAIC/Nanjing
- FAW
- Chery
- DongFeng Motors
- Geely
- JAC
- Foton
- Great Wall Motors
- Brilliance



Tire

- Bridgestone
- Goodyear
- Michelin
- Kumho Tire
- Hankook Tire
- Nexen Tire
- MRF
- Apollo Tire
- Pirelli
- GITI
- ARP
- Triangle Group
- Cooper Tire
- Continental Tire
- Shengdong Tires
- Cheng Shin / Maxxis
- Yokohama Rubber



Life Sciences

- Abbott Laboratories
- Bristol-Myers Squibb (BMS)
- GlaxoSmithKline (GSK)
- Pfizer
- Sanofi Aventis
- Wyeth
- Roche
- TEVA
- Lonza Biologics
- Merck Sharpe & Dohme
- Schering Plough
- Johnson & Johnson
- Becton Dickenson
- Genentech
- Sandoz
- Wockhardt
- Ranbaxy
- Jubilant Organosys
- Orchid Chemicals
- Dr. Reddy's
- Biocion
- Matrix Laboratories
- Millipore
- Tapasaya
- Cipla
- Baxter Medical
- Bayer
- Boehringer Ingelheim
- Esteve Huayi
- CDIBP
- Hisun
- Genencor
- Tiens
- Tianxiang
- Cocoplast



Power & Infrastructure (Oil & Gas, W/WW, Power, Mass Transit, Airports, Metals, Mining and Cement)

- Chevron-Unocal
- BP
- Shell
- Exxonmobil
- ConocoPhillips
- CNPC
- CNOOC
- Sinopec
- Meridian Energy
- Genesis Energy
- MHI
- NTPC
- Reliance Power
- Bhushan steel
- Hindalco
- Hindustan Zinc
- NALCO
- Jindal
- TISCO
- SAIL
- KEPCO
- Dongbu steel
- POSCO
- Guangzhou Water supply co
- Datang Power
- Huaneng Power
- Shanghai Electric
- Dongfang
- Harbin Power
- Anshan Steel
- Capital Steel
- Pan Steel
- Shanghai Bao Steel
- Wuhan I&S (WISCO)



Rockwell Automation

Deep Industrial Manufacturing, Application & Control Expertise
Dedicated to Open Solutions ... Developer of Control and Information Protocol (CIP)

Recent Actions

Established premier industrial partnering program: Encompass™ – 1990's
Founding Member – ODVA
Customer Innovation Council with Cisco – 09/06, 9/07

Cisco

Broad Enterprise-wide Communications Expertise
Dedicated to Open Solutions ... Champion of the Internet Protocol (IP)

Recent Actions

Joined Rockwell Automation Encompass™ Program - 2003
Joined ODVA Board – 2005
Customer Innovation Council with Rockwell Automation – 09/06, 9/07

- Shared Vision – *Network Convergence*
- Complementary Technology Roadmaps
- Product Collaboration
- Unified Reference Architecture
- Coordinating Education and Service Offerings

Bringing Together Critical Knowledge and Leadership & Shared Vision

Rockwell Automation
on the move



Enterprise Networks

- IT Domain
- Gigabit Backbones
- Self-Defending Networks



– Ethernet to the Factory –

- Switching
- Security
- Unified Communications
- Wireless
- Video
- Network Mgt

Cultural & Technology Convergence

Rockwell Automation

– Integrated Architecture™ –

- Scalable control and information solutions
- Common architecture across all disciplines
- Actionable information from CIP Networks

Automation Networks

- EtherNet/IP
- Real-Time Performance
- Environmental / Form Factory
- Safety
- Legacy Migration
- “IT Compatible”

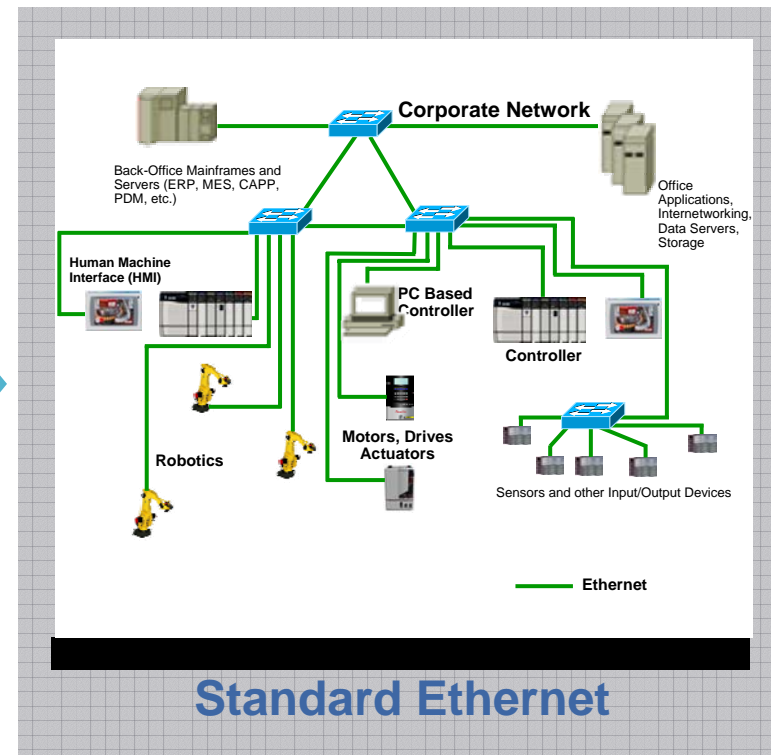
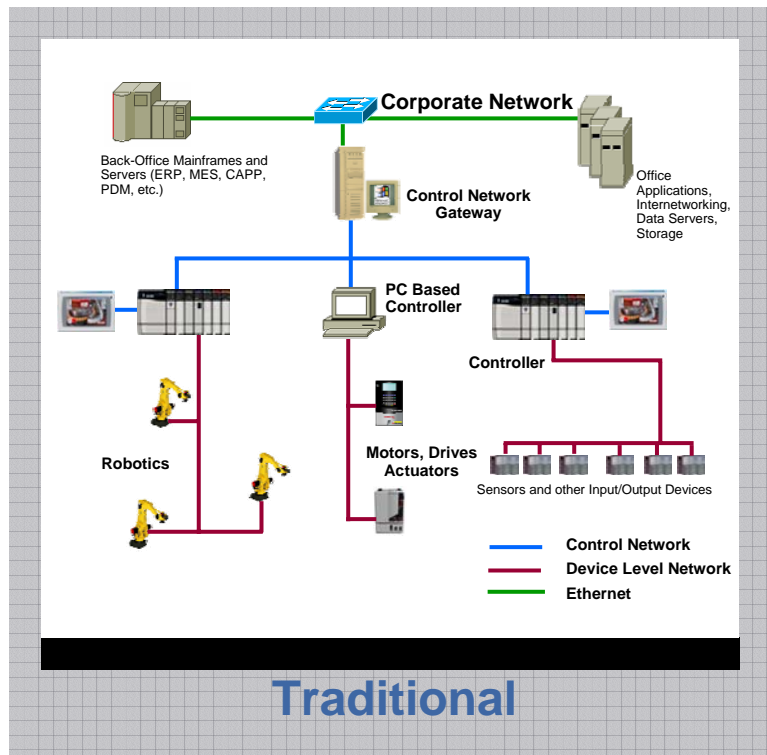
Integrated Architecture - Enabling Convergence

Rockwell Automation
on the move



Manufacturing Network Convergence

Rockwell Automation
on the move



Cultural and Organizational Convergence

Rockwell Automation
on the move



Security Policies	IT Network	Controls Network
Priorities	Confidentiality Integrity Availability	Availability Integrity Confidentiality
Types of Data Traffic	Converged Network of Data, Voice and Video	Application Specific Data
Access Control	Strict Network Authentication and Access Policies	Strict Physical Access Simple Network Device Access
Implications of a Device Failure	Continues to Operate	Could Stop Operation
Threat Protection	Shut Down Access to Detected Threat	Potentially Keep Operating with a Detected Threat
Upgrades	ASAP During Uptime	Scheduled During Downtime

Cisco and Rockwell Automation Initiatives

Rockwell Automation
on the move



Common Technology View

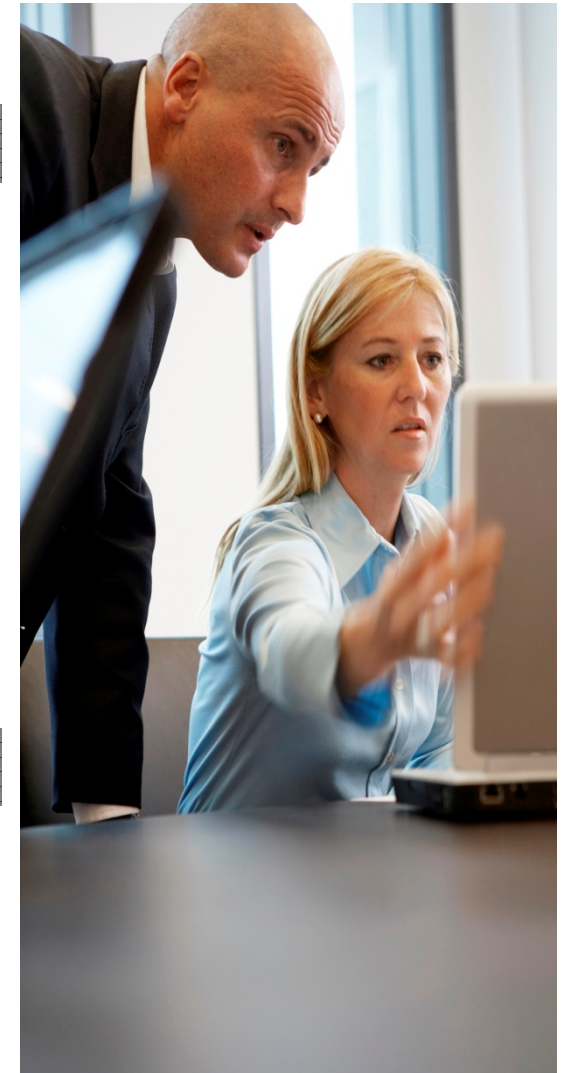
Support use of open, unmodified standards, with intelligent networking features in automation networks

Collaborating on Reference Architectures

Detailed design and implementation guidance and best practices for a converged network architecture

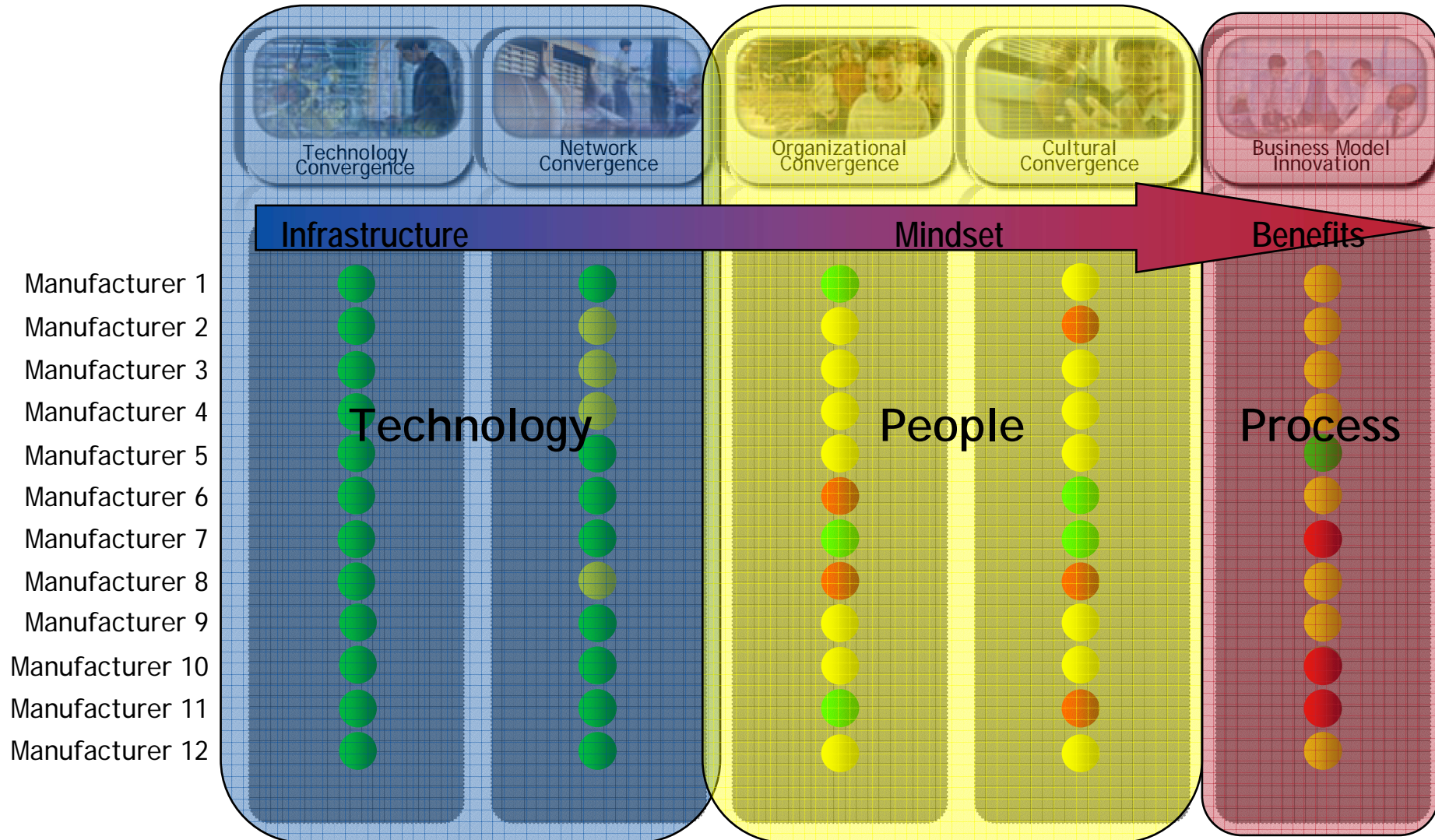
People and Process Optimization

Develop process and design guidelines, facilitate training and dialogue with IT and Manufacturing



A Sample of the Current State of Convergence

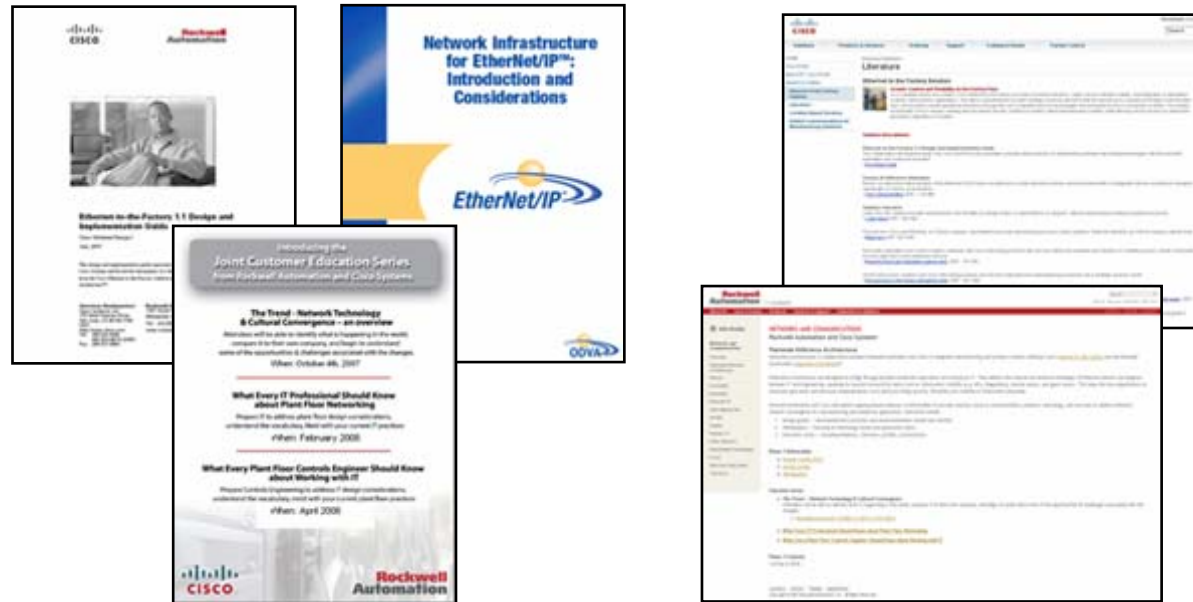
Rockwell Automation
on *the move*



Source: *Customer Innovation Council* © 2007 Cisco and Rockwell Automation

Manufacturing and Enterprise Network Convergence

Rockwell Automation
on the move



- Rockwell Automation Stratix 8000™ managed switch line with Cisco Technology
- Reference Architectures
- Education Series

<http://www.ab.com/networks/architectures.html>

http://www.cisco.com/web/strategy/manufacturing/ettf_overview.html

Cultural Convergence - Common Tools

Rockwell Automation
on the move



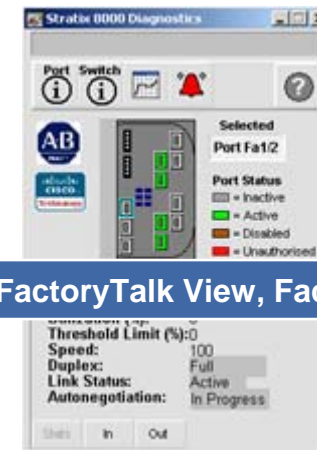
Device Manager



Command Line Interface

```
Current configuration : 10758 bytes
!
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname CZ-C3750-1
!
aaa new-model
aaa authentication login default local
aaa authorization exec default local
aaa authorization network default local
```

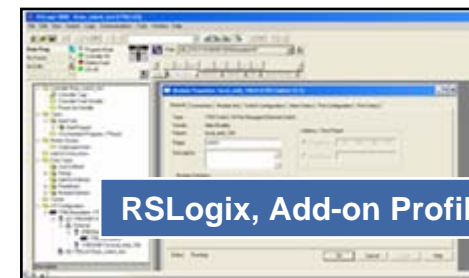
FactoryTalk View, Faceplates



Cisco Network Assistant



RSLogix, Add-on Profile



Industrial Infrastructure Portfolio

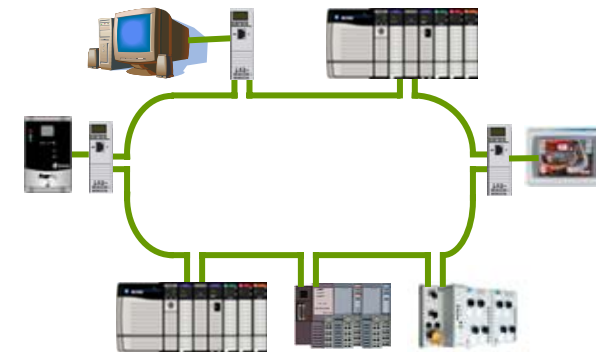
Rockwell Automation
on the move



- **Stratix 8000™ - Modular Managed with Cisco Technology**
 - Integrates the enterprise and manufacturing environments
 - IT Friendly - Cisco operating system, feature set and user interface
 - Engineer Friendly – RSLogix 5000 configuration, Logix tags and FactoryTalk View faceplates
- **Stratix 6000™ - Fixed Managed**
 - Optimized for the Plant Floor
 - Engineer Friendly – RSLogix 5000 configuration, Logix tags and FactoryTalk View faceplates
- **Embedded switch technology**
 - Switch technology embedded in Rockwell Automation and 3rd party products
 - Enables high speed ring and linear topologies
- **Stratix 2000™ - Unmanaged**
 - IP20 and IP67 versions
 - No configuration required
- **Physical Media**
 - cables
 - connectors
 - cordsets



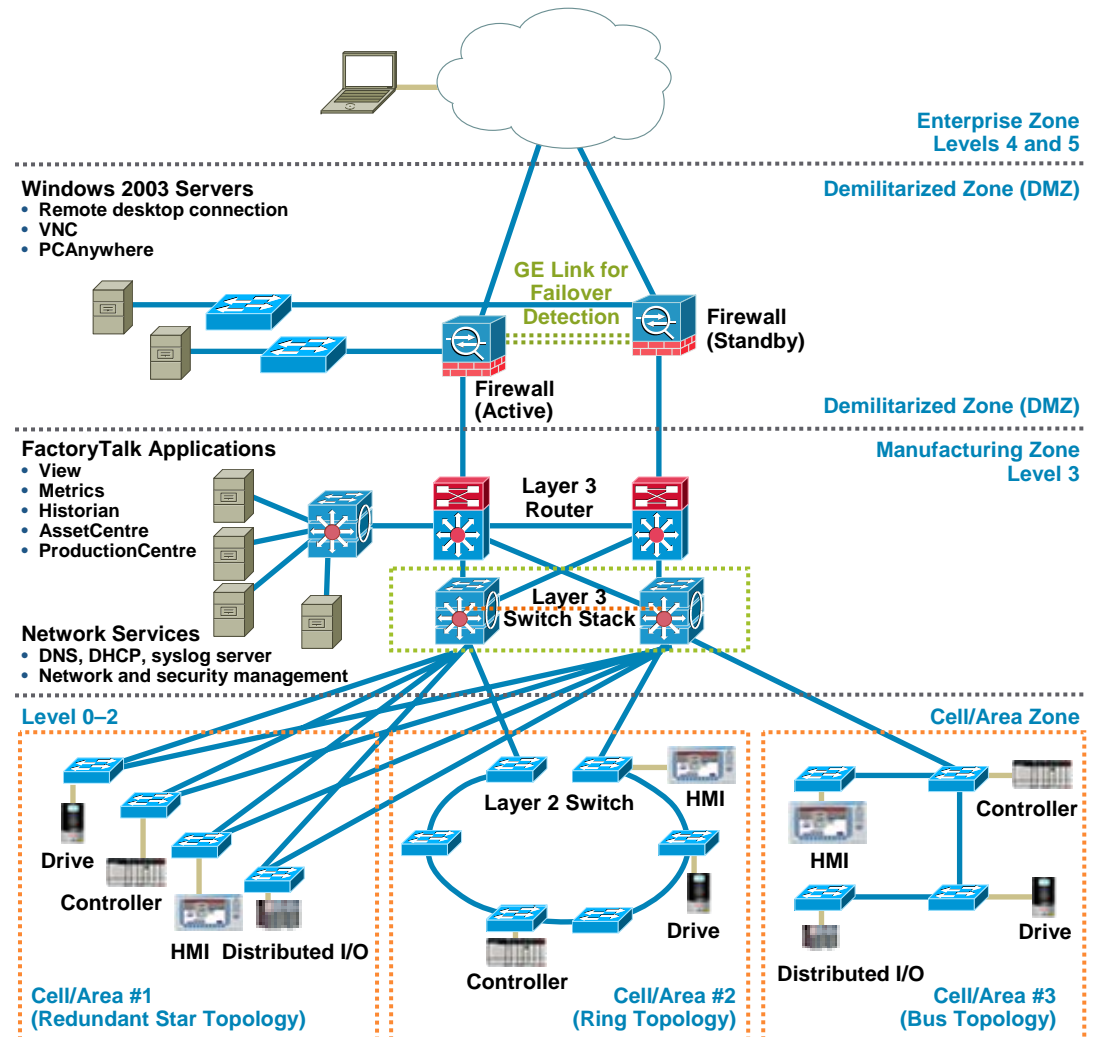
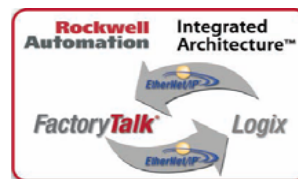
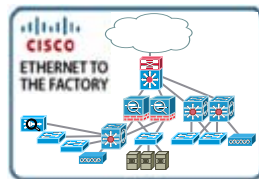
Linear or Ring



Reference Architectures for Manufacturing



- Design guidance
 - Best practices and recommendations
 - Methodology
 - Documented configuration settings
 - Developed against tested and validated architectures
- “Future-ready” network foundation



Reference Architectures for Manufacturing

Rockwell Automation
on the move

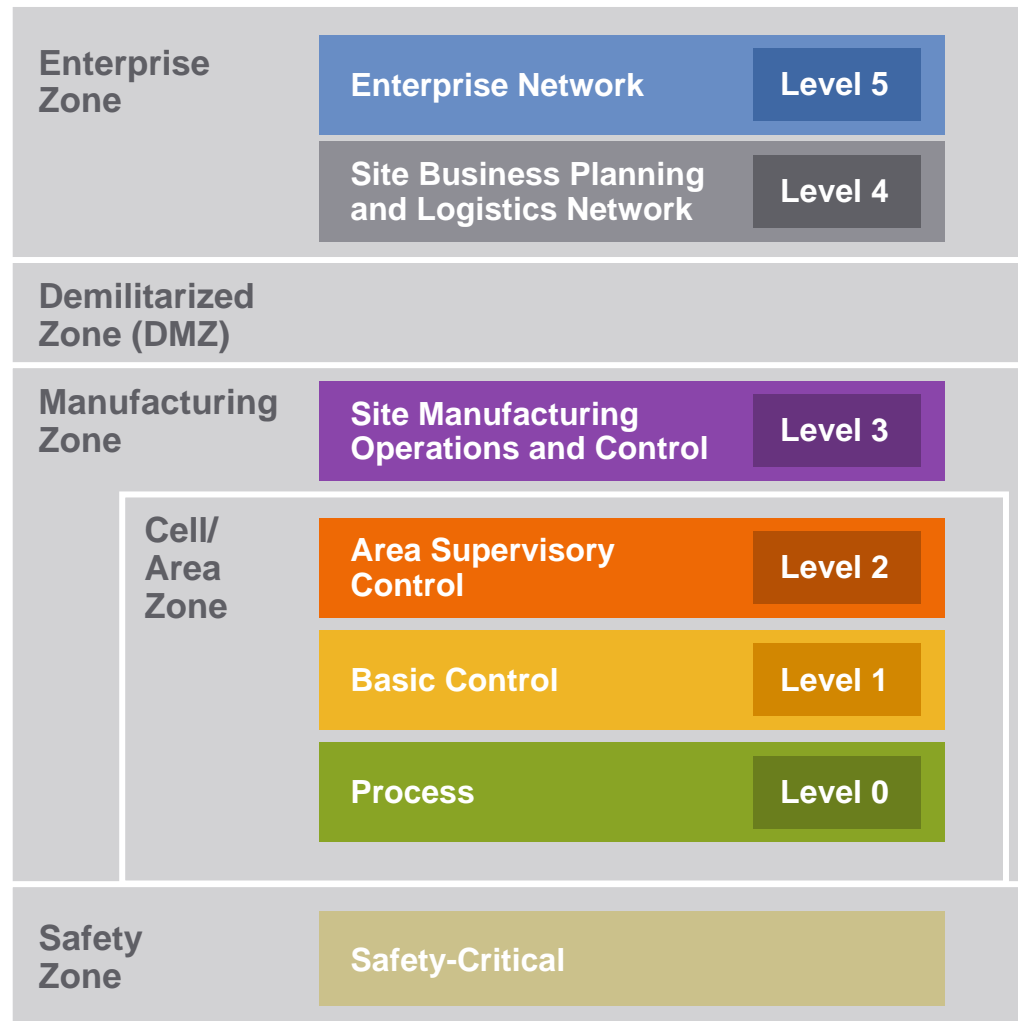


- Technology
 - IEEE – standard/unmodified Ethernet
 - Future - Wireless & PTP (1588)
 - IETF - standard Internet Protocol (IP)
 - ODVA - Common Industrial Protocol (CIP)
 - ISA 100 – Wireless (Future)
 - NIST – National Institute of Standards and Technology
- Manufacturing
 - ISA 99 - Manufacturing and Control Systems Security
 - ISA 95 - Enterprise-Control System Integration
 - Purdue Reference Model

Built on Standards

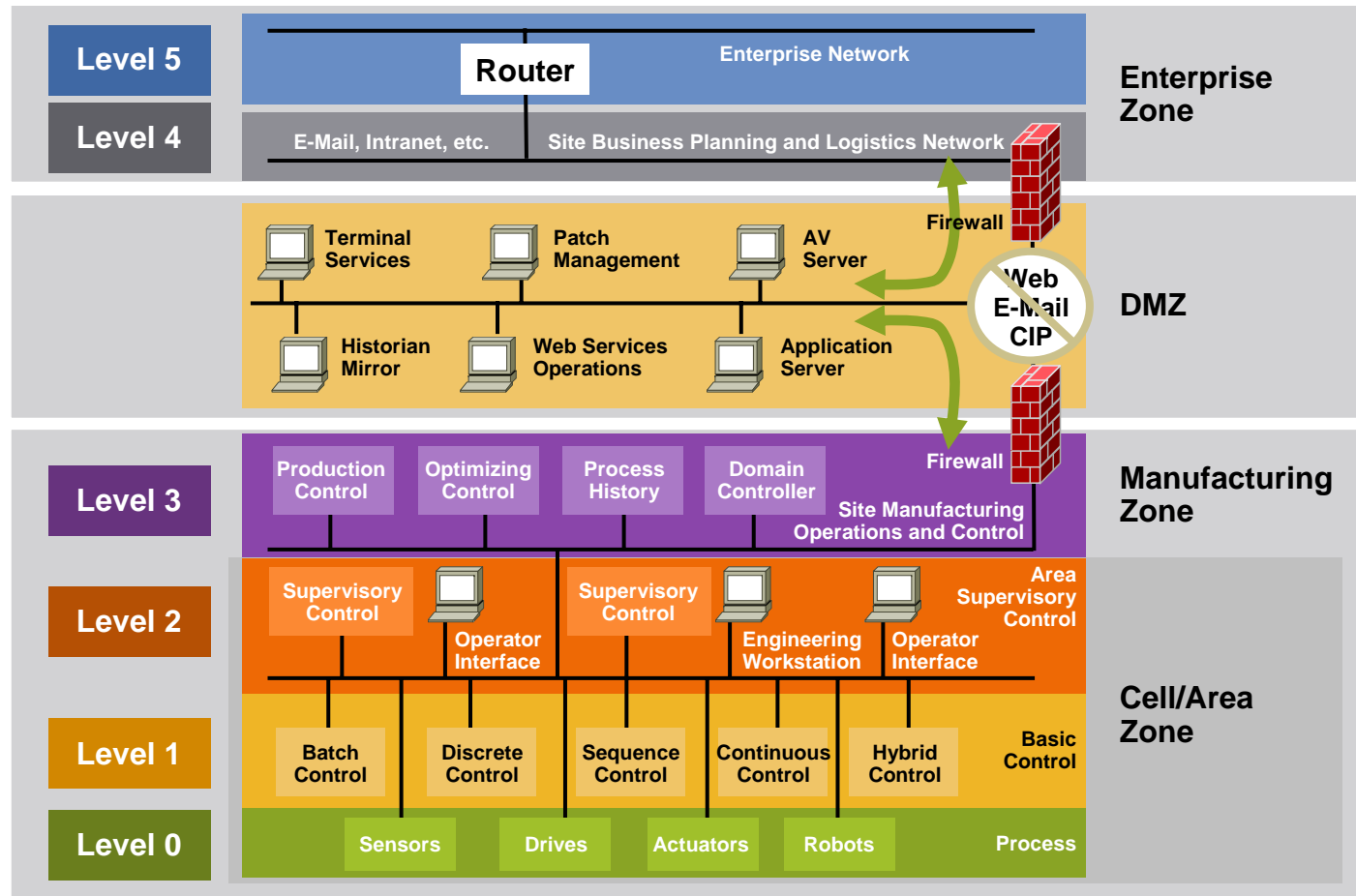
Manufacturing Framework

Rockwell Automation
on the move



- Enterprise zone for IT networks
- DMZ as a buffer zone to securely share data and services
- Manufacturing zone where critical production floor systems exist
- Cell/area zone where devices and controllers reside
- Safety zone for safety devices
- Levels from ISA SP95 and Purdue Reference Model
- Zones from ISA SP99

Manufacturing Framework

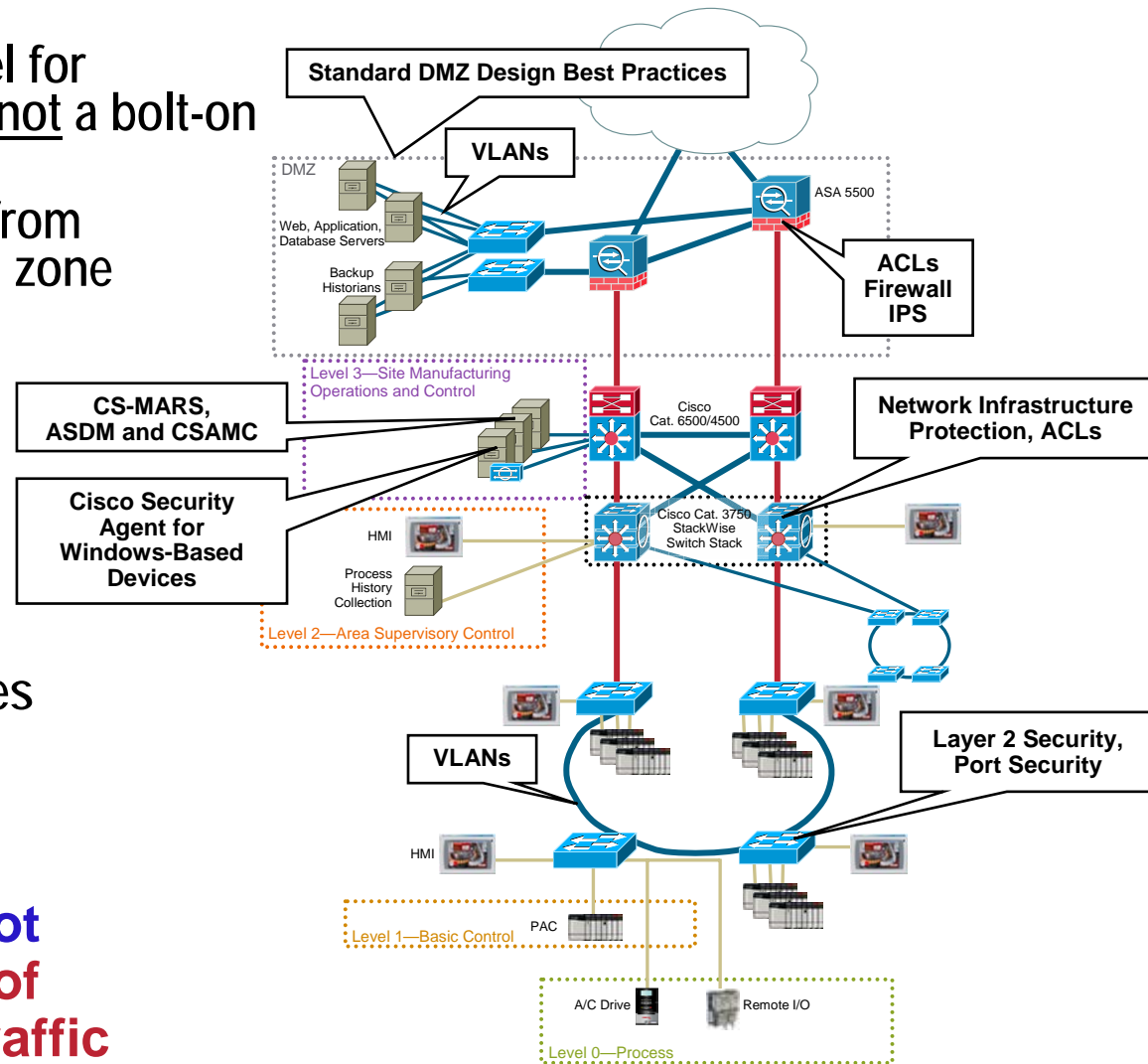


No Direct Traffic Flow from Enterprise to Manufacturing Zone

Manufacturing and Enterprise Security Design



- Comprehensive Security Model for Defense in Depth - Security is not a bolt-on component
- Segment Manufacturing floor from Enterprise with a Demilitarized zone
- Defense in Depth
 - Defending the edge
 - Protecting the interior
 - Guarding the endpoints
 - Physical Security
- Design Secure Remote/ Guest Access
- RA Network & Security Services



Security Services Must Not Compromise Operations of the Control Zone or I/O Traffic

Rockwell Automation
on the move



LISTEN.
THINK.
SOLVE.®