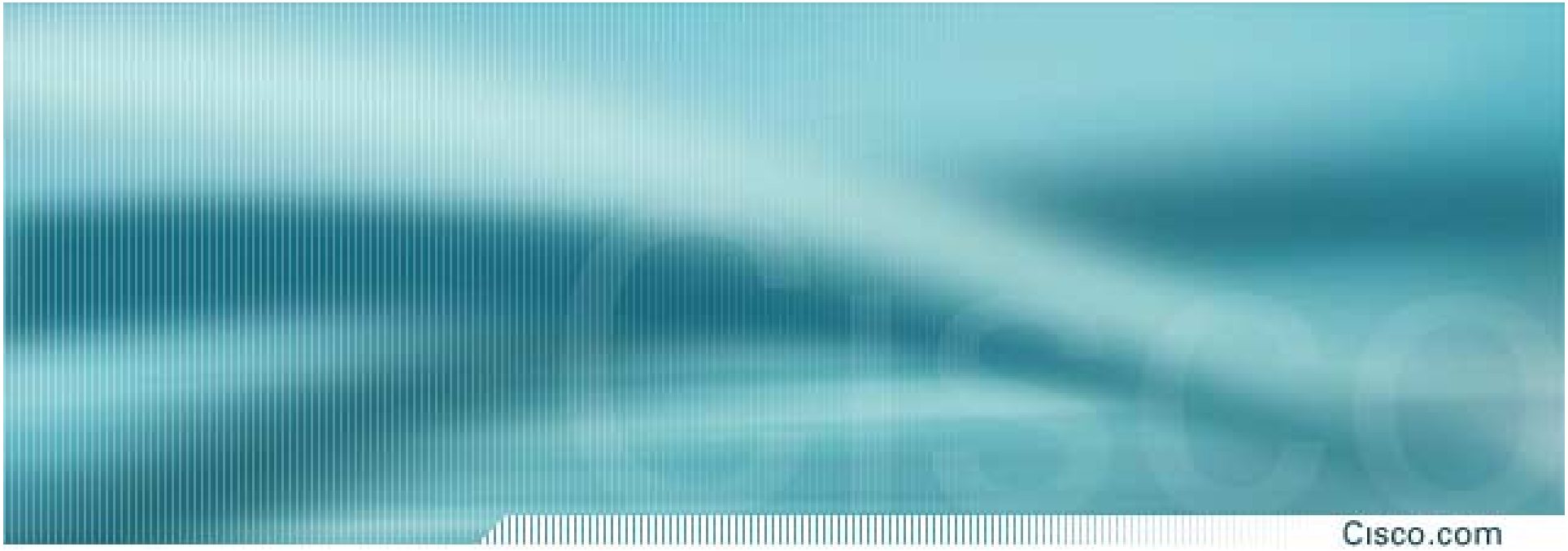

Introducing the Cisco Catalyst® 2955

Industrial Ethernet in Manufacturing

Agenda

- **Industry Overview**
- **Emerging Applications**
- **Catalyst 2955 Overview**
- **Summary**

Market Summary: Network Convergence

- The convergence to Ethernet that occurred in the enterprise market 10 years ago and recently observed in the metro, wireless, and SP markets is extending to other networks
- As Ethernet becomes ubiquitous and the orders of magnitude more competitive than any other L2 technology, new markets outside the traditional enterprise wiring closet begin to converge on Ethernet and IP—taking advantage of all the tools and services that come along with them
- New markets require hardware implementations that address the new and different environmental conditions that differ from the “traditional” applications

New Markets Migration to Ethernet

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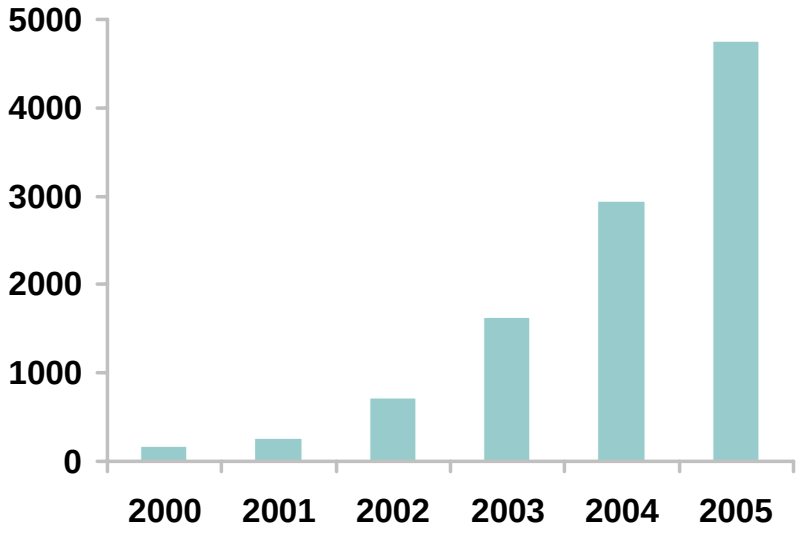
- **Factors driving the migration to Ethernet:**
  - **Widely adopted standards**
    - **Physical Layer: Multiple options that are well understood and competitive**
    - **L2 Connectivity: Ethernet is ubiquitous**
    - **IP Connectivity: Web services and tools**
  - **Bandwidth: Orders of magnitude above the existing technologies**
  - **Economies of scale: Product offering, volume, and "know-how"**
  - **Multiples services on a single infrastructure (convergence):**
    - **Traditional: control, data collection, configuration**
    - **New: voice, video**
    - **Multilayer integration: ERP → MES → control**
- **Traditional network solutions lack all of the above, but:**
  - **They are highly reliable, deterministic, and secure**
  - **They meet the form factor, power, and environmental specifications required by the industries and users in the "new markets"**

Industrial Ethernet Growth

- **Ethernet will gain significant momentum in control network architectures**
- **ARC projected growth**

  CAGR = 110% (2000-2005)
- **Intelligent devices are now delivering more data and real time monitoring**

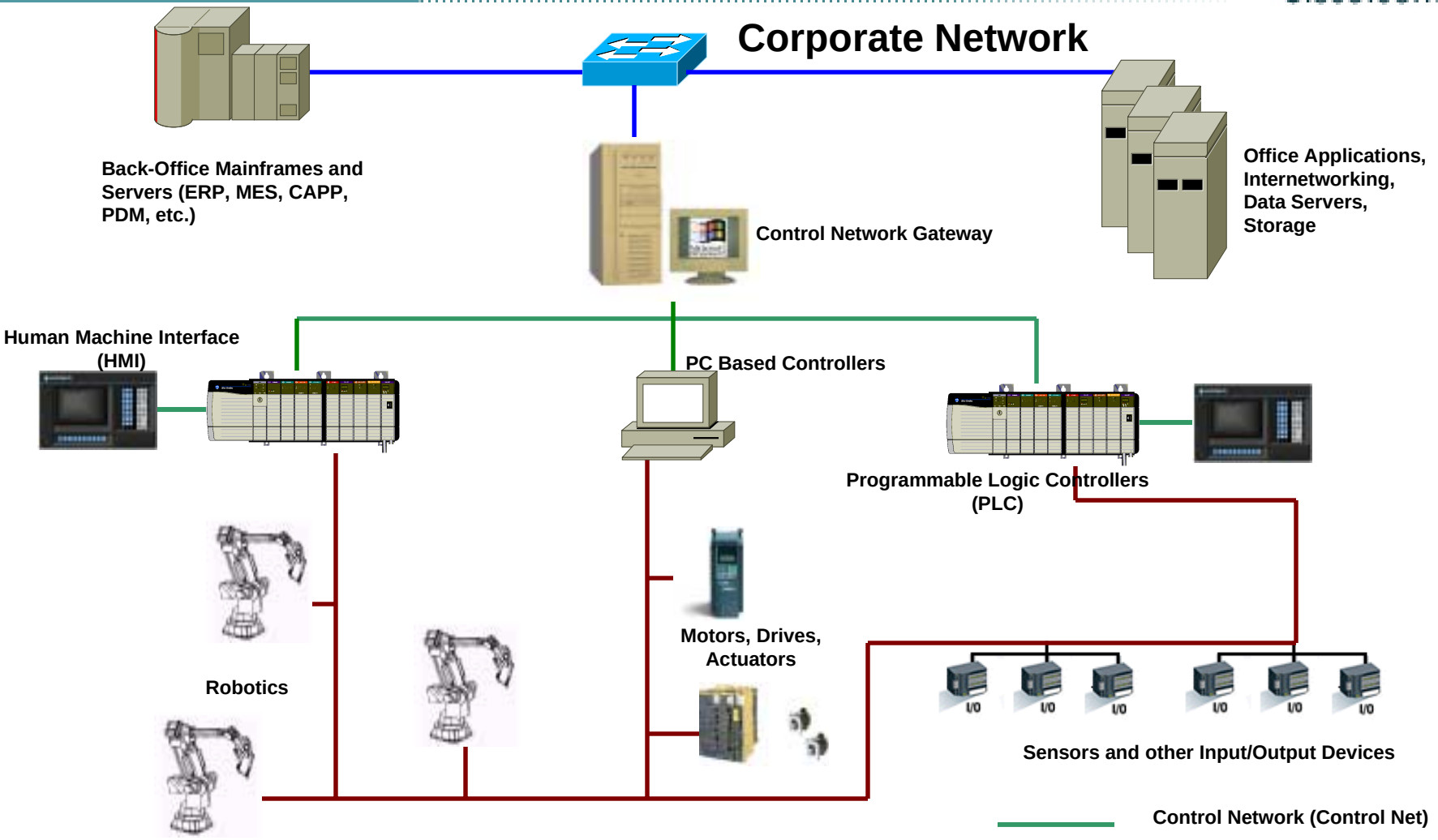
Worldwide Shipments of Device Level Ethernet Nodes (Thousands of Nodes)



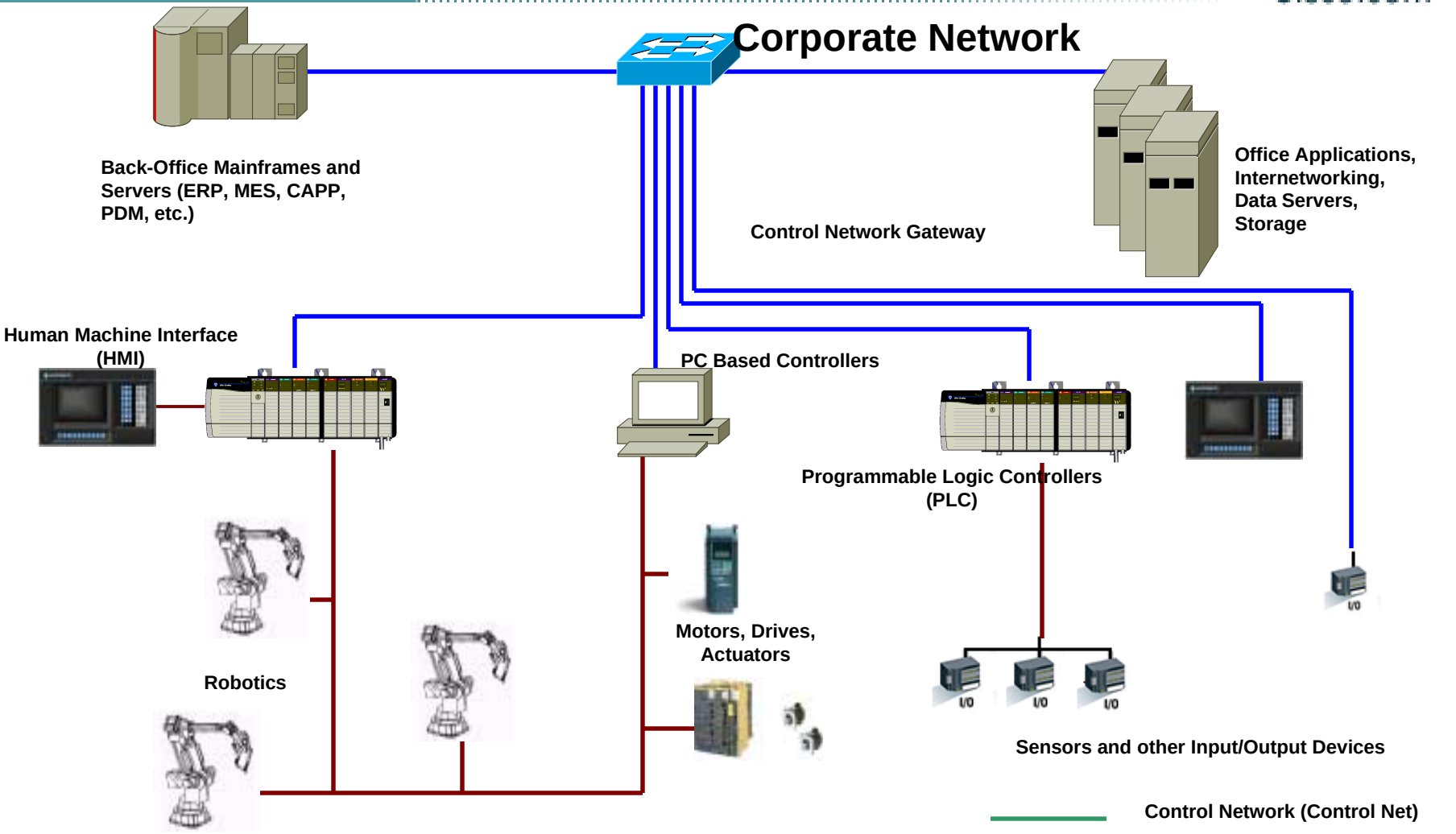
Ethernet at the Device Level Worldwide Outlook by ARC Advisory Group, June 2001.

All Major Automation Equipment Vendors Are Implementing Ethernet-Based Protocols as an Alternative or Replacement of Traditional Field-bus Networks

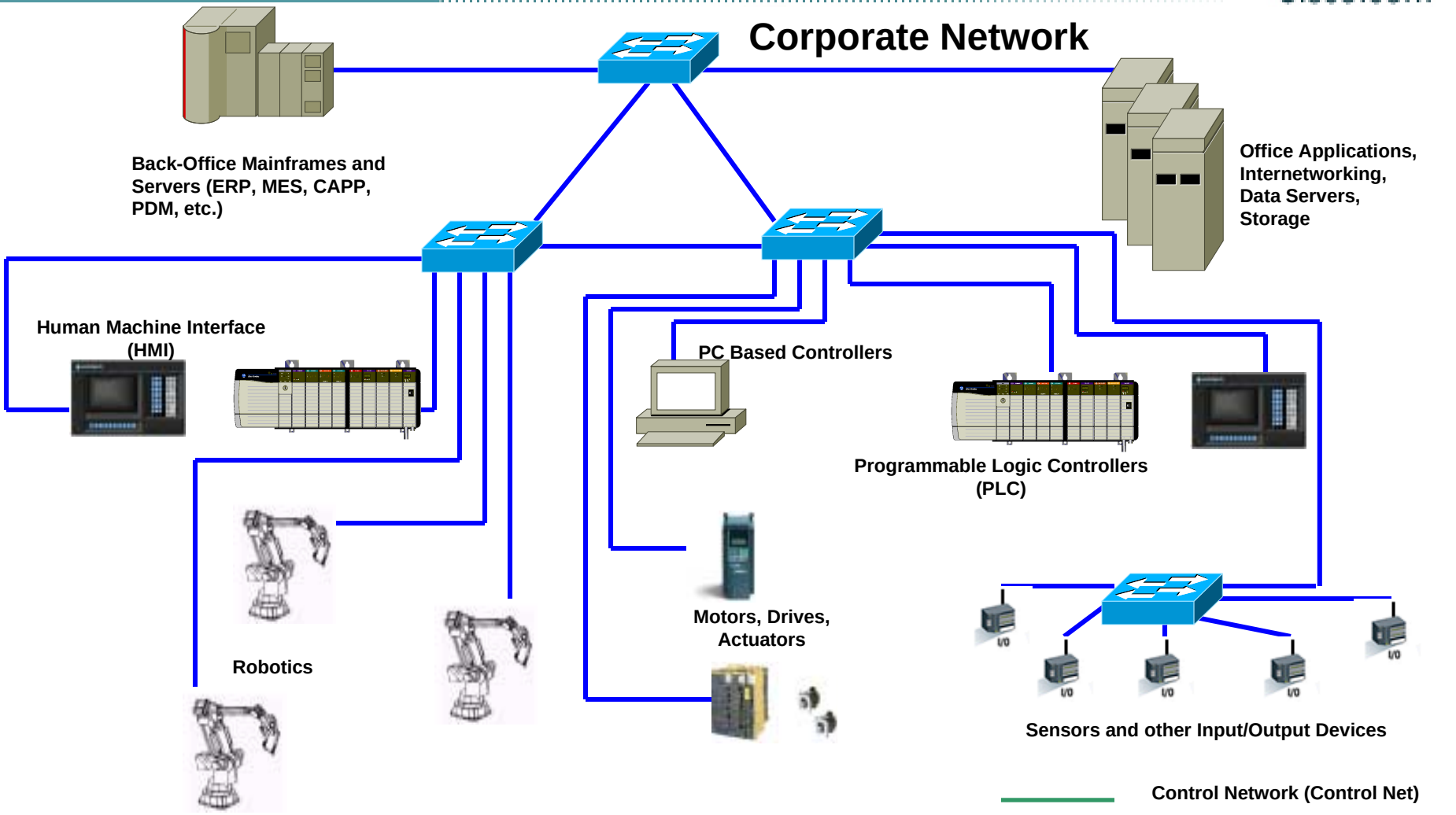
Proprietary Field-Bus Architecture



Ethernet for Control Network



Industrial Ethernet Architecture



Network Convergence and Increased Productivity

Current

- Separate networks to respond to diverse information flows and control requirements

The Change

- Need for converged networks
  - Connecting the plant floor to the back-end IT network

The New Model

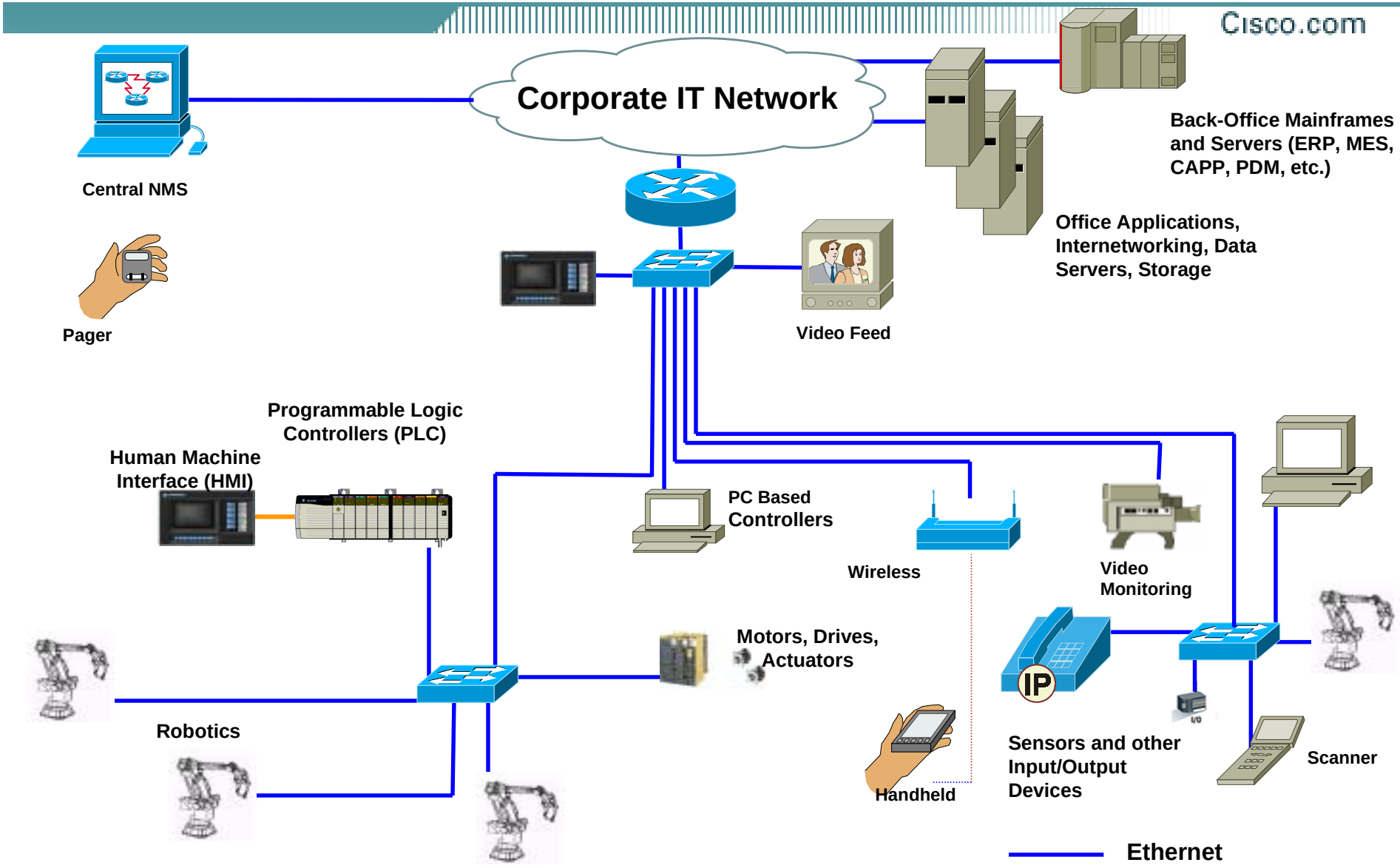
- Need for converged applications

- Lower efficiency and productivity
- Higher costs
- Higher complexity, training duplication

Business Case for Change

- Enhanced productivity and efficiency
- Reduced costs
- Streamlined network structure

Future Scenario on the Factory Floor



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Emerging Applications Produce Bottom-Line Benefits

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Real Time Monitoring

- Preventative maintenance; reduced maintenance costs
- Fewer line shut downs

Resource Management Optimization

- Lower scrap rates
- Lower setup time

IP Video on Demand

- Instant access to equipment support services
- Remote monitoring capabilities
- Improve safety and security
- Less than two-year payback

IP Telephony

- Single IP/Ethernet-based infrastructure for data/voice/video
- Fewer network upgrades—lower TCO

Intelligent Ethernet is Critical in Manufacturing Environments

Security

- Robust access control
- SSH, intrusion detection, L2-L4 ACLs, etc.

Availability

- Different data traffic models require intelligence to guaranty scalability and resilience of the network

QoS

- Deterministic networks
- Low latency and jitter
- Prioritization of critical control services

The Industrial Ethernet Challenge

- **Industrial networks are deployed in uncontrolled environments**
  - **High temperature, vibration, humidity**
- **The factory floor has specific requirements for hardware deployment**
  - **Form factor, passive cooling, power, compliance, safety**
- **Industrial control data flows need to be understood**
  - **Multicast models are commonly used**
- **Manufacturing applications are very sensitive to latency and jitter**
  - **Network determinism is required**

Cisco Delivers Optimized Networks

- Cisco delivers products optimized factory deployments and applications running on the manufacturing control networks
- The Catalyst 2955 family delivers all the benefits of an Intelligent Ethernet architecture while meeting the network reliability and environmental specifications of the manufacturing operations
- Cisco delivers end-to-end solutions
  - Cisco IOS® software robustness
  - Integral system security, reliability, and quality of service through the network
  - Consistency of Cisco Catalyst Intelligent Services and management
  - Integrated management
  - Long-term reliability and support
  - Cisco Cluster Management Suite (CMS)

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Product Overview

- **Environmentally optimized switch for automation control deployments in manufacturing networks**
- **Based on the Catalyst architecture, integrating industrial-grade components and meeting compliance requirements of industrial manufacturing operations**

- **Three initial models:**

  12 10/100 TX ports + 2 100 Mbps Multimode (FX) uplinks

  12 10/100 TX ports + 2 10/100/1000 TX uplinks

  12 10/100 TX ports + 2 100 Mbps Singlemode (LX) uplinks