Cisco Expo 2008

Cisco Physical Security Solutions

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Agenda

- Cisco's Physical Security Strategy
- Cisco Video Surveillance Manager
- Cisco Video Surveillance on ISRs
- Cisco Video Surveillance Cameras
- Summary

Cisco's Physical Security Strategy

Security New Realities

Common Goals

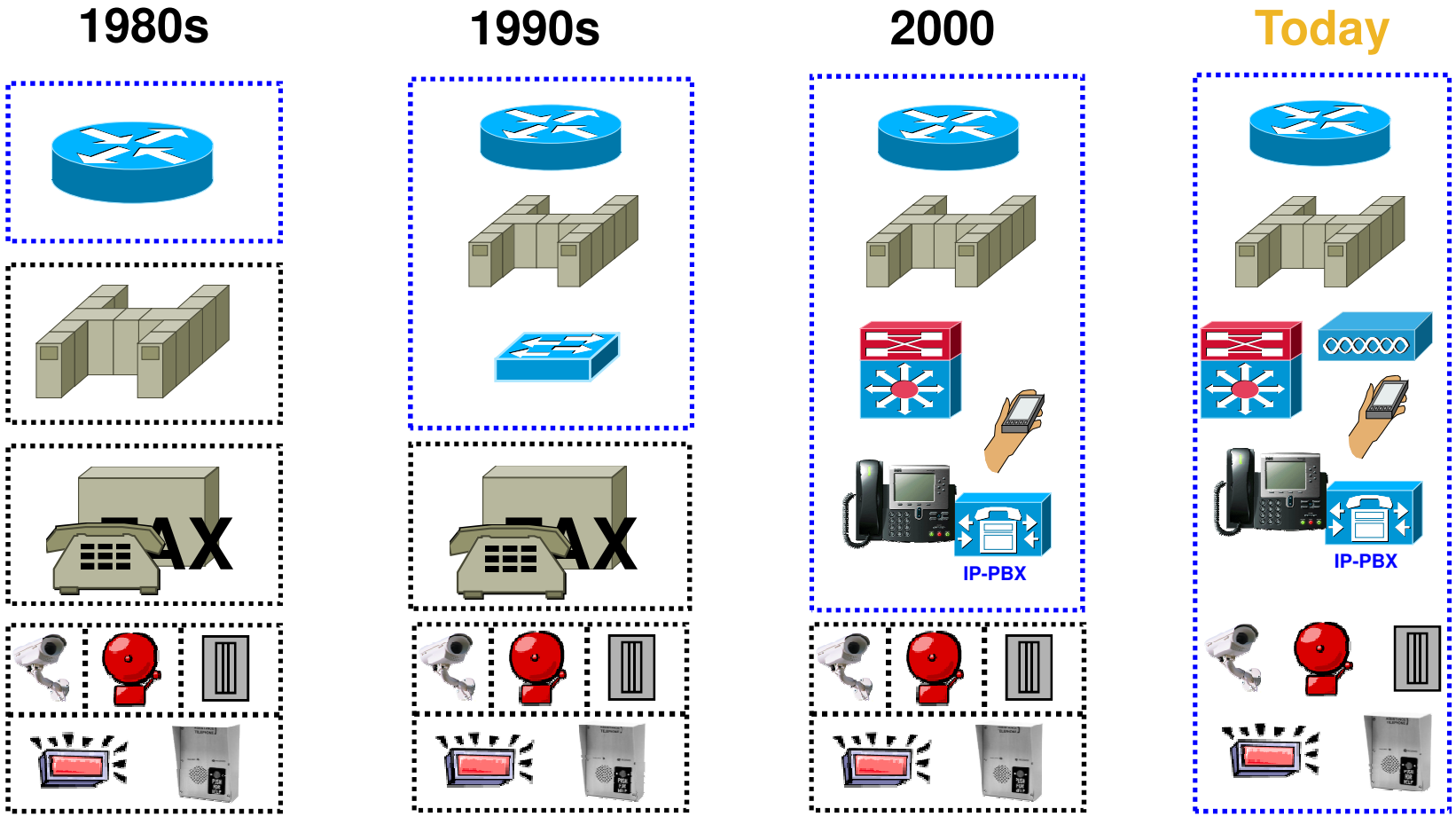
- Faster identification, response, resolution and investigation of incidents
- Enable greater Collaboration
  - Secure Remote and Mobile Access to Physical Security Platforms
- Increase ubiquity of communications and monitored locations - scalability
- Maximize investments in existing and new technologies
  - Legacy systems (analog)
  - Leverage ubiquity of IP networks

Common Challenges

- Limited manpower
- Lack of interoperability
- Tight budgets
- Existing infrastructure and processes incapable of meeting today's security requirements – proprietary, analog, serial vs. open, digital (IP) and parallel

Cisco is experienced with Convergence

Waves of Convergence



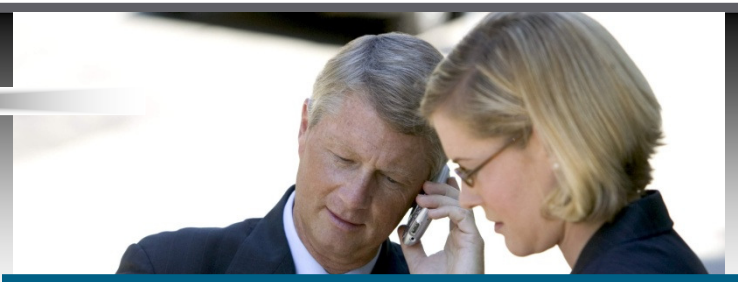
Network Consolidation

Cisco's Vision for Safety & Security

Transforming from Silo'd Infrastructure

To Collaborative Applications

Business Expense



Business Asset

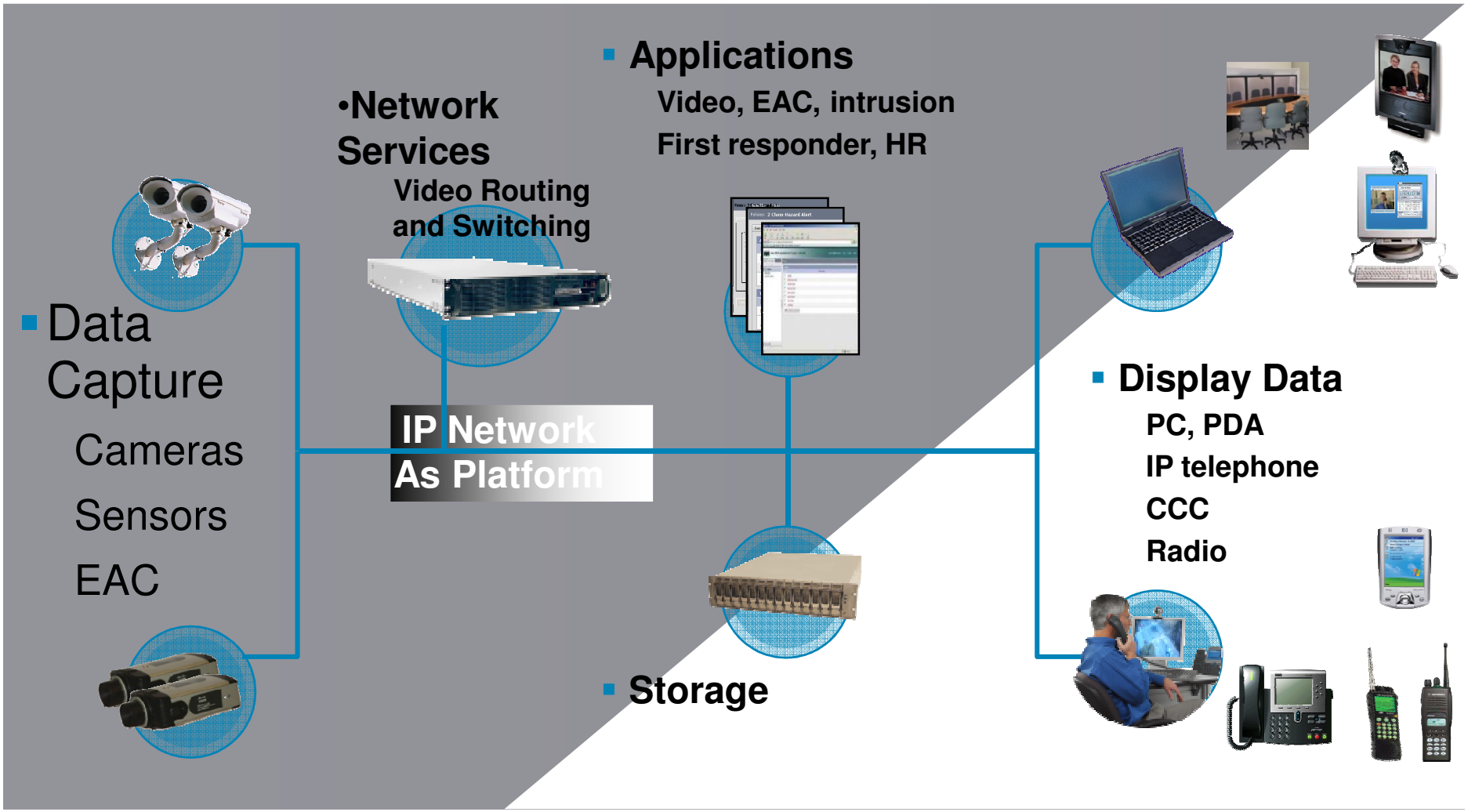
Cisco's Physical Security Strategy

- Using the **Network as a platform** Cisco's product strategy is to
  - ✓ Create a **tightly integrated** set of IP-based products and complementary services
    - Extend the range of supported **IP endpoints** within the security system, allowing them to exchange multiple forms of content, including video, data and voice
    - Leverage Cisco's networking expertise to provide unparalleled levels of interoperability, functionality in Physical Security
    - Are **modular**, **scalable** as both a **platform** and **end-to-end** solution
  - ✓ Create an integrated and **policy-driven** security solution that includes detection, classification, & automated response
  - ✓ Offer industry changing **Open APIs** which allow interoperability with Cisco's solution, and which will further extend Cisco's partner **ecosystem**

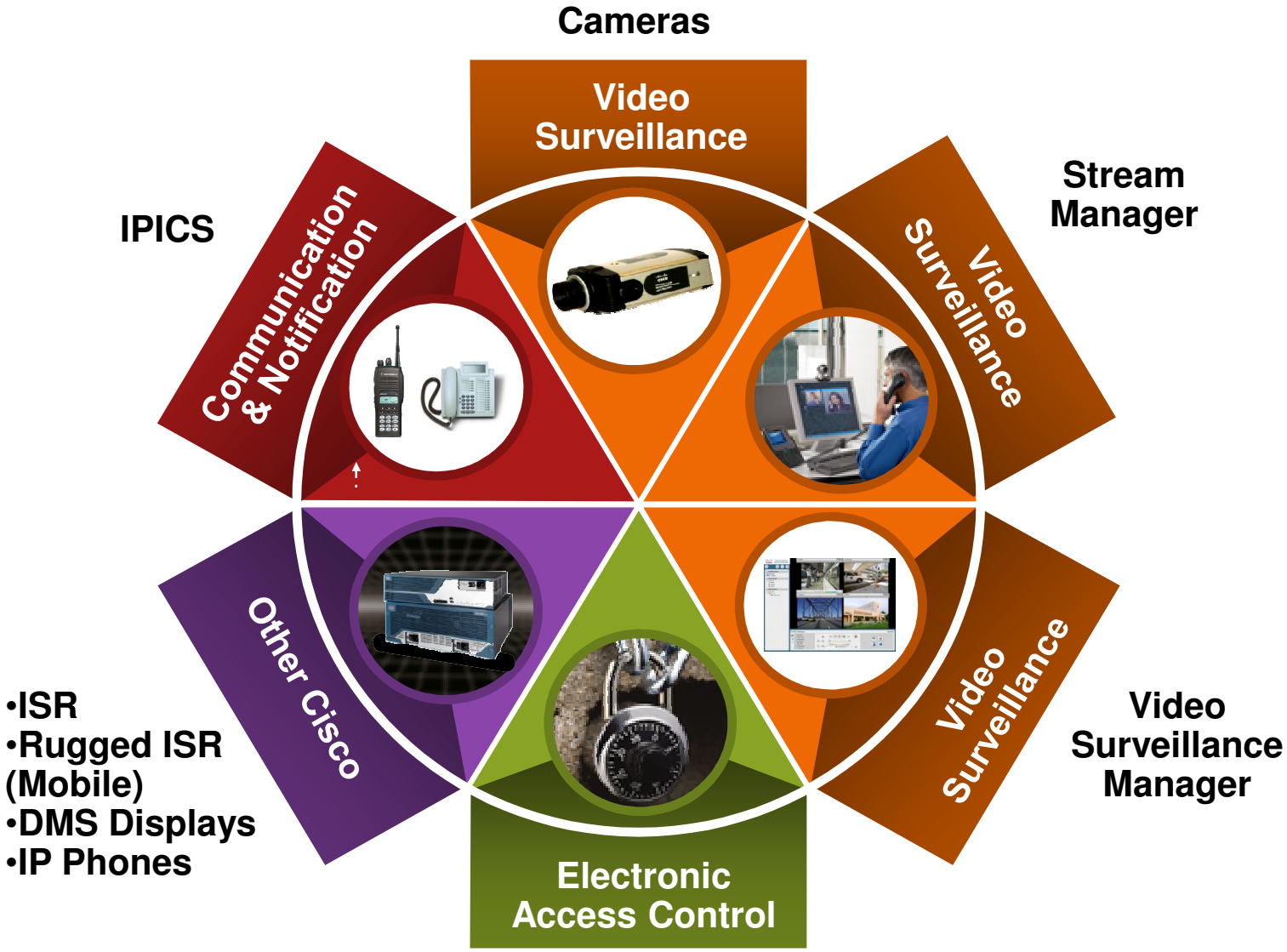
Our Differentiation

- Cisco's competitive differentiation is based on three key capabilities.
  - ✓First, is the ability to provide **extensive interoperability** with third party systems, enabling customers to build best of breed systems.
  - ✓Second, is providing **connectivity with legacy security systems** and devices, to ensure maximum investment protection.
  - ✓Third is supporting **tight integration** between security applications and the network, so enabling effective event monitoring, collaboration and response.

Where We Are Headed



The Physical Security Portfolio



Physical Security

Capture | Store | View | Respond

IP Cameras

Analog

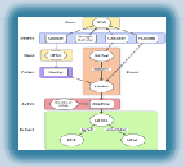
Video Surveillance Manager

Multiservices Platform

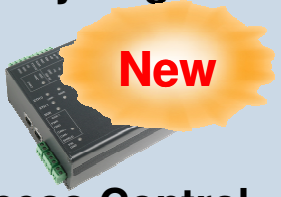
Legacy Integration

Web Client

Integrated Comms

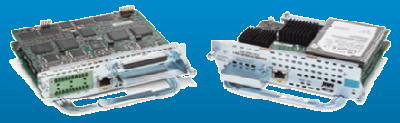


Policy Engine

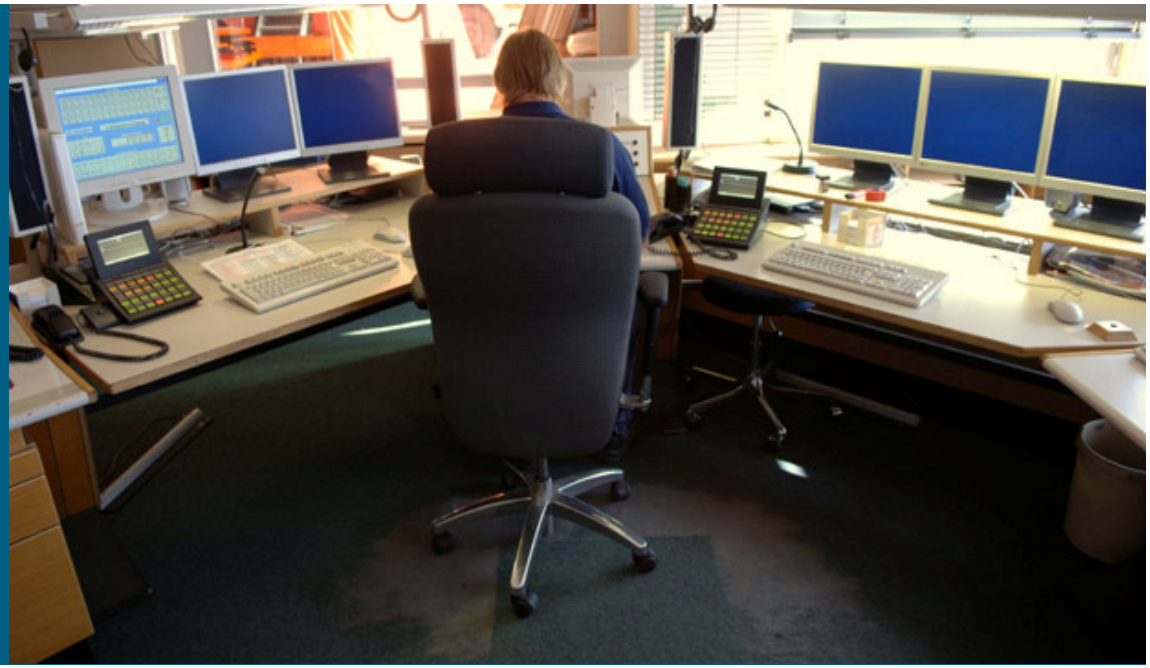


Access Control

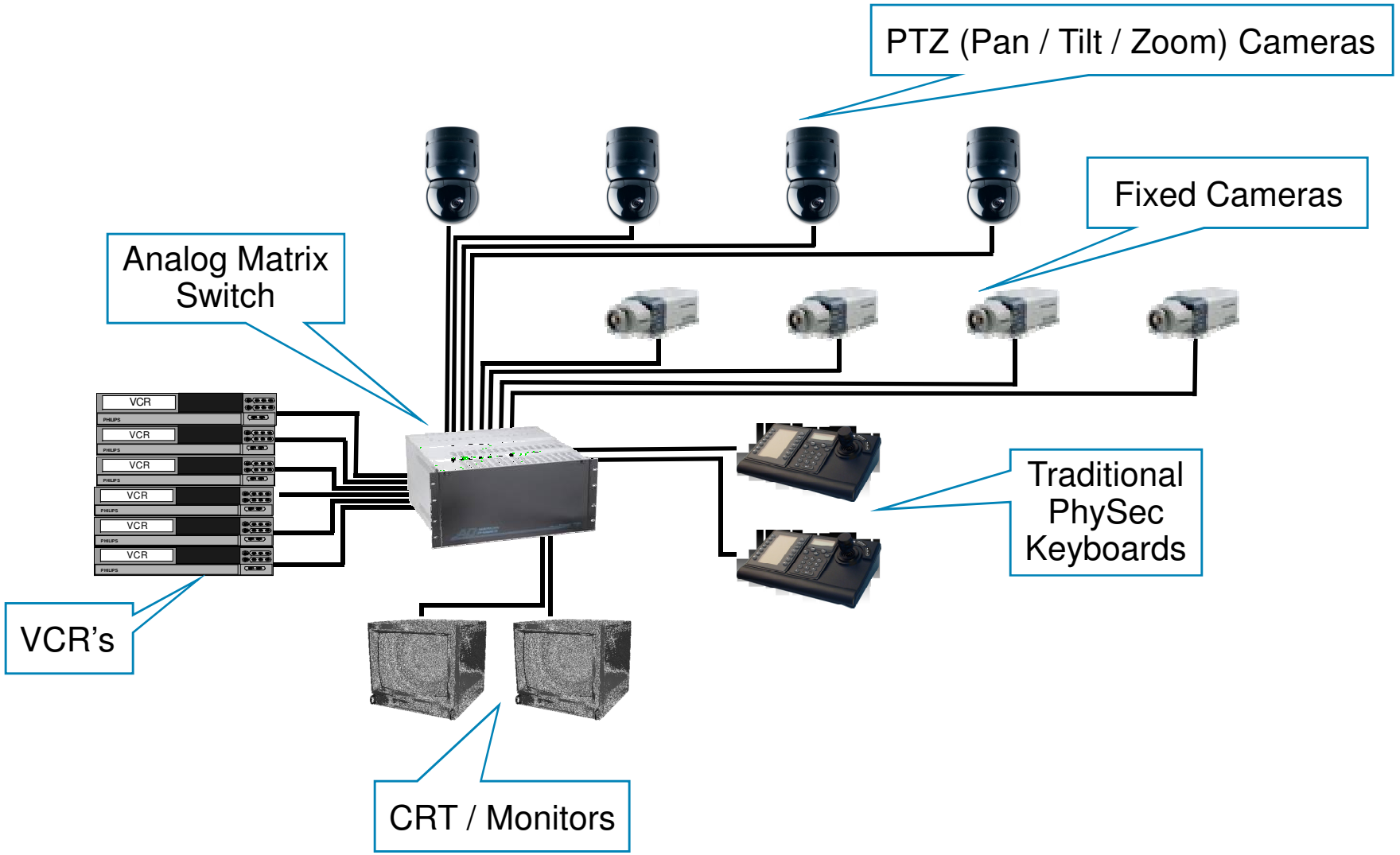
Network as the Platform



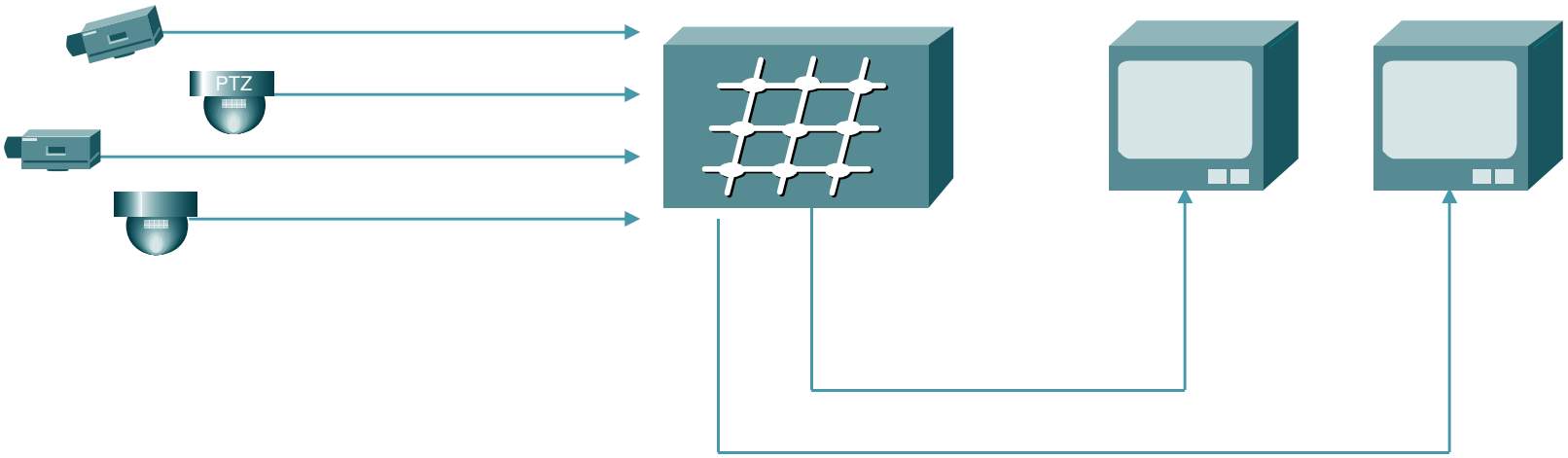
Physical Security Basics



Sample Traditional Matrix Based Solution



Video Surveillance System Components Matrix Switchers



- Routes multiple audio/video input signals to multiple output signals
- Switches more than one camera or VCR to more than one monitor or VCR
- In a native IP based solution, the network and the software controlling it enables a “virtual matrix switch”
  - Control room equipment can be replaced / extended by a PC from any point on the network
  - Each camera is connected to the network via an encoder / decoder that compresses analog video into digital video for transmission
  - Digital video can be viewed, analyzed and recorded with PCs running video and alarm management software, and NVRs installed around the network.
  - For new installations IP cameras combine a CCTV camera with an IP Video transmitter/receiver for connection directly to the network

Video Surveillance System Components Storage

- Video Camera Recorder (VCR)

  Outdated Technology, Poor reliability, requires manual operations.

- Digital Video Recorder (DVR)

  Digitally compresses analog feeds onto a hard drive. “Digital" refers to the compression & storage, not transmission. Must be located near the analog feed

- Network Video Recorder (NVR)

  Streams have already been digitally encoded and compressed at the camera/encoder. Can be PC software-based or appliance

  Can be located anywhere on a network - the monitoring center, adjacent to cameras, or in a hardened environment. Location is transparent to an operator

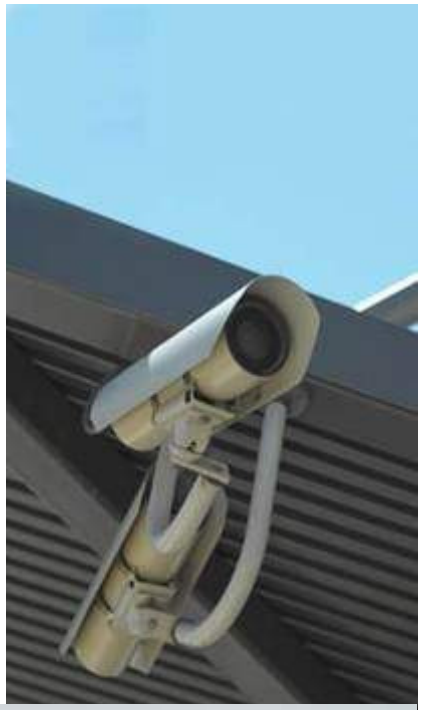
  Record and replay simultaneously, and recordings can be simultaneously viewed by multiple operators spread across the network

  Placing NVRs near camera clusters minimizes the impact on bandwidth

  “Mirroring” duplicates the recording on NVRs, protecting against failure.

Video Surveillance System Components Cameras

- Fixed Cameras
  - Type 1 - body, lenses of different focal lengths and/or fixed or variable irises
  - Flexible configuration means use in most commercial CCTV systems
  - Type 2 - fixed lens mounted on a camera circuit board (board camera), packaged in a small case , dome or tube
  - Low cost solution, particularly in a home or retail environment
- Pan, Tilt, Zoom Cameras
  - rotate horizontally 360°, vertically through 90° with powered zoom
  - can be set to auto-scan or move through range of pre-sets and zooms
  - in weatherproof domes when used outside
- Analog Cameras
  - Use a continuous signal vs. digital, which breaks everything into numbers
  - Scan their viewing area a line at a time and convert the infinitely varying intensities of red, green and blue (RGB) light into analogous electrical signals
- IP Cameras
  - Equipped with an electronic photosensitive sensor.
  - Typically supports multiple users, and web browser accessible.
  - Located anywhere with a network connection (Wired / Wireless)
  - No Costly Coax Installation.
  - Few are actually natively digital.
  - Presently Lower Video Quality than Analog cameras.



Video Surveillance System Components Monitors

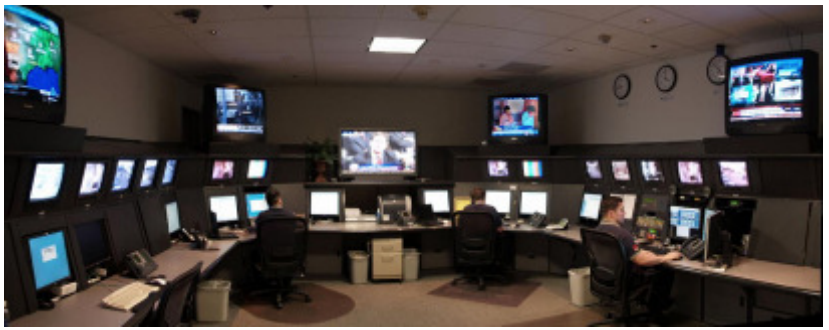
Color or B&W - resolution higher than TVs

Designed to be always on

Analog CRT are most popular

Digital (LCD/Plasma) - inferior image & Lifespan

Size determined by application



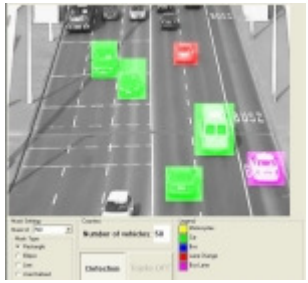
Video Surveillance System Components
Transmission Media

Installation Techniques vary with each media

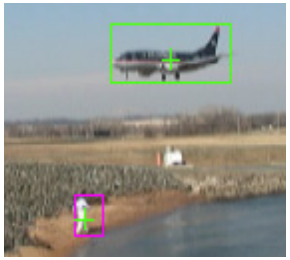
- Coaxial cabling (75Ω)
  - Most popular cable used
  - 90%-99% EMI protection
- Fiber Optic
  - Capable of long distances
  - No interference
  - Immune to EMI – Better for outdoor
  - Resists lightning strikes
- Twisted Pair
  - CAT5 / 5e / 6
  - Easiest to install
  - Requires transmitter and receiver
  - Baluns – From Coax to UTP / UTP to Coax

Cabling is more important with Video than most realize!

System Components - Analytics

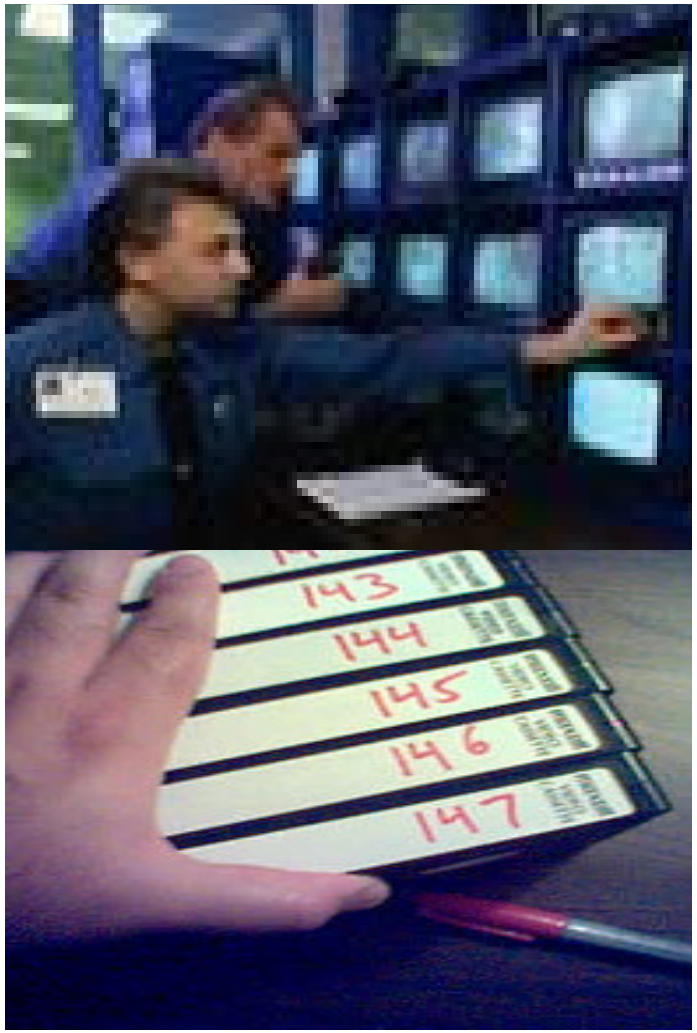


- Processing video to detect events
- An add-on to analog systems, making it difficult to realize full benefits
- Integrated IP-based analytics:
  - Real time at the Camera or Encoder (IP Gateway)
  - Post-processing from an operator's PC on recorded video
  - Identify events as they occur and provide tools to analyze previous situations
- Operators are poor at watching video for long periods, but good at confirming whether something an incident once it has been flagged
  - Productivity improvements result from using analytics to search NVR data
- Sample Algorithms:
  - *Congestion detection - too many people in too small a space*
  - *Motion detection - person or vehicle moving across a scene*
  - *Abandoned object detection - suitcase abandoned in airport*
  - *Counter flow - person moving against an immigration route*
  - *Tripwire - detection and alarm upon breach of a defined line*
  - *Shape-based detection - vehicle detection.*
  - *Object tracking and theft detection - object removed from a busy scene*



Pain of Traditional CCTV

- Central station access only
  - No remote access
  - No on-scene collaborative access
- Investigation delays
  - Locate tape in archive
  - Ship from remote location
  - Review hours of video
- Low probability of threat detection and high false alarms

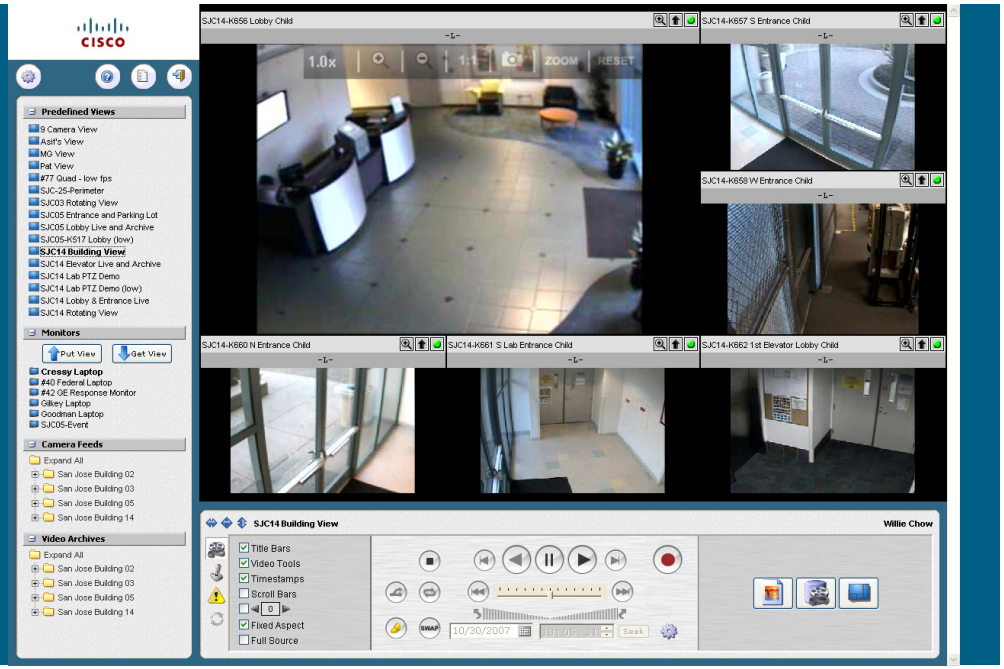


More Pain of Traditional CCTV

- Video value limited to security
- Installation costs of traditional coax or fiber
- Number of monitoring stations is limited as costly cabling must be duplicated
- Matrix switcher cannot be easily expanded without new hardware

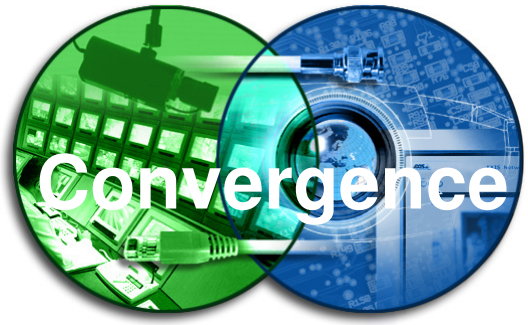
Overall scalability, including the cost of expansion, is poor

Cisco Video Surveillance Manager

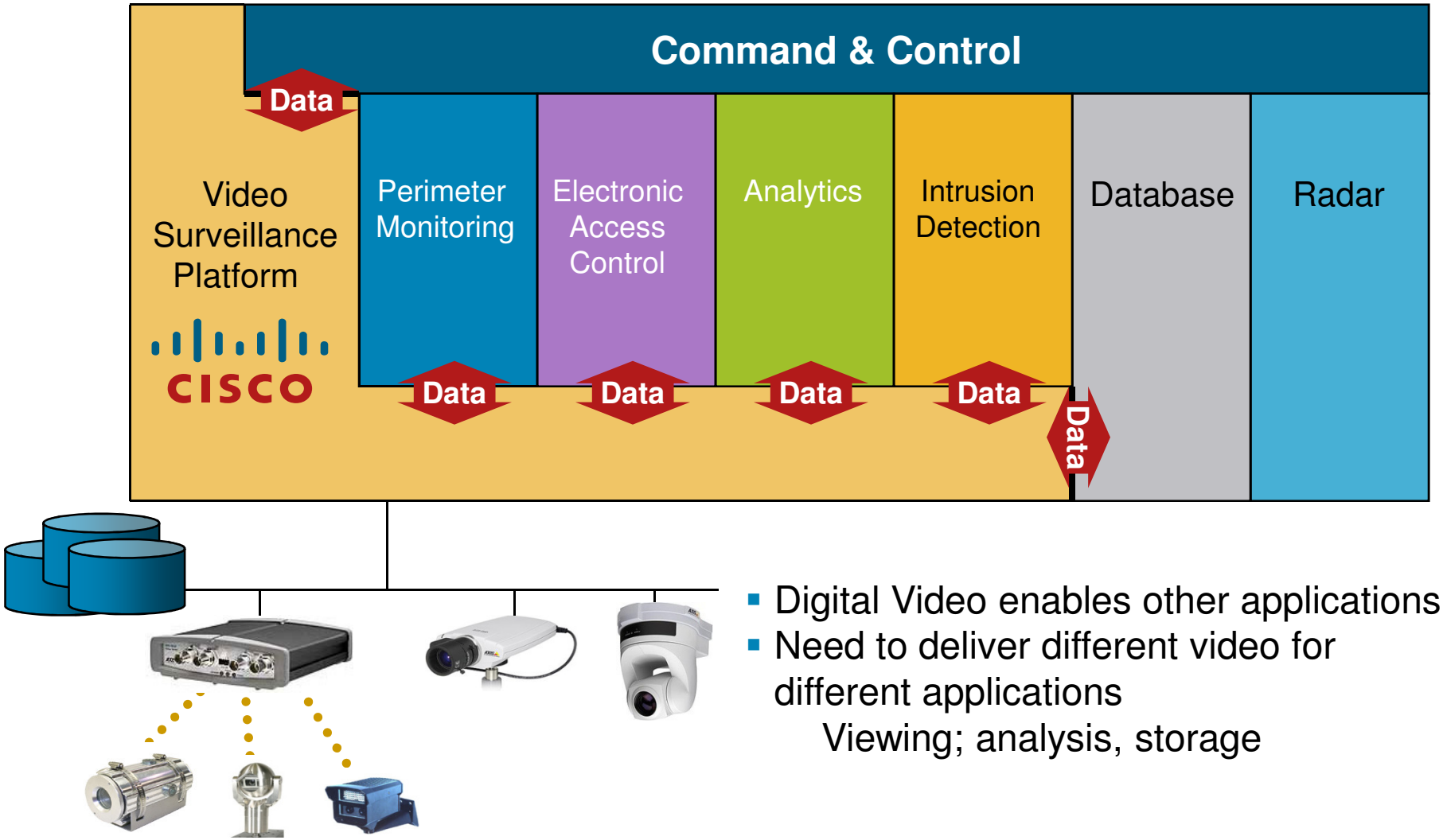


Introducing Cisco Physical Security
Transform Security to IT

- Network video & security systems
- Use standard IT products
  - 100% Linux & Browser Based
  - COTS Servers, Storage
- Provide easy integration
  - Open API…built from the ground up for interoperability
  - Broad device and technology support
- Robust architecture
  - Extreme scalability
  - Patented streaming and proxy technology
- Total Solution
  - Encoding, Management & Application Servers

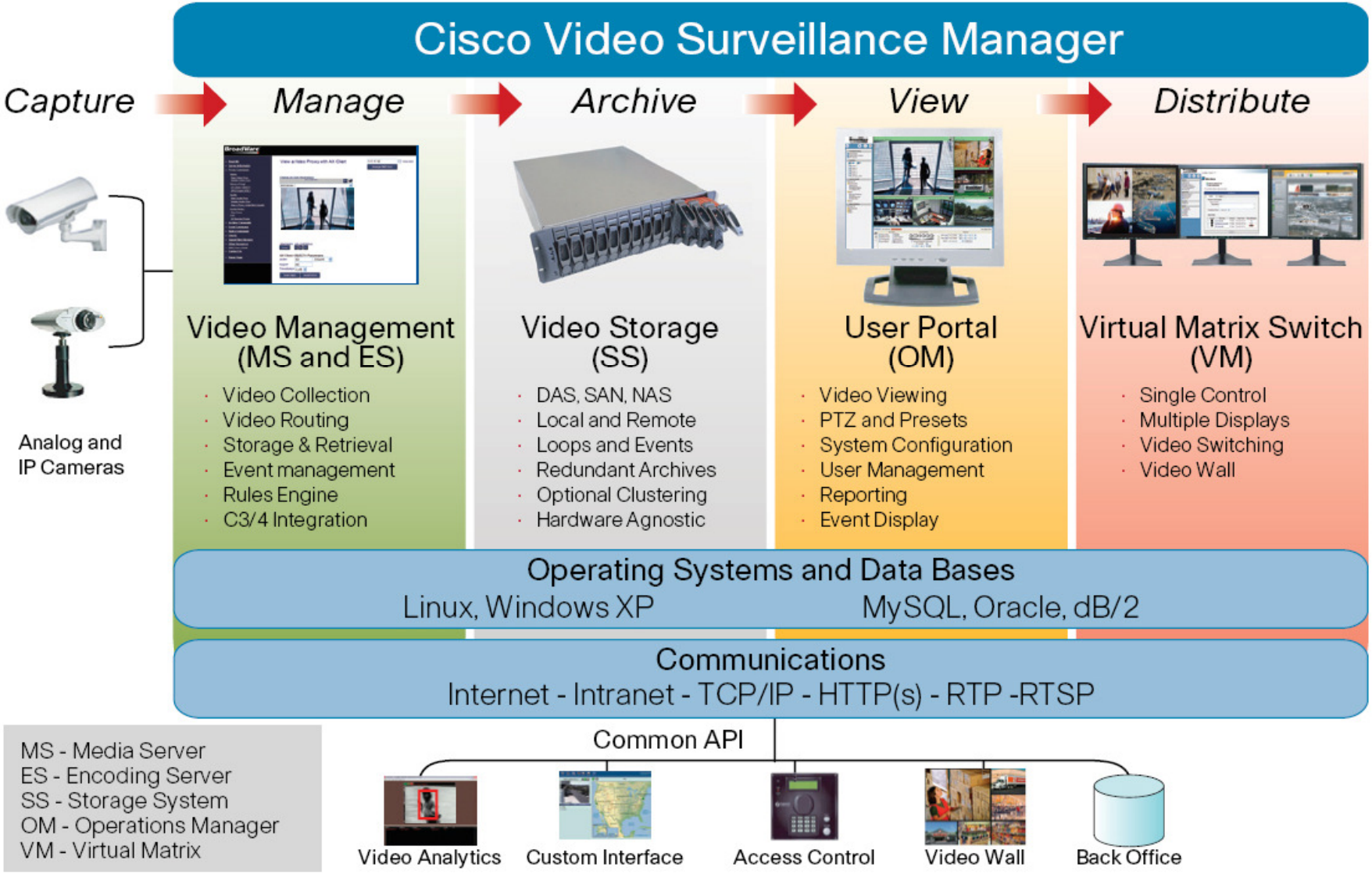


Open Architecture "Enables" Other Applications



- Digital Video enables other applications
- Need to deliver different video for different applications
  - Viewing; analysis, storage

Video Surveillance Manager Overview



New line of Multiservice Platforms

- Leading Multiservice and IP Network capabilities
- Industry standard hardware
- Cost Effective, flexible for distributed systems

New

New

New

Cisco Multiservices Platform

1RU

Up to 4TB

~ 50 streams

Cisco 3200

Mobile Solution

Analog Video Encoding Module

Video Management and Storage System

Cisco 2821

Cisco 2851

Multiple Services

Extended Modular Connectivity

Cisco 3825

Cisco 3845

High-Density Services

Modularity with Performance Optimized for "All-in-one" Solution

Cisco Multiservices Platform

2RU

Modular storage

Up to 12TB

~ 300 streams

Cisco Multiservices Platform

4RU

Modular storage

Up to 24TB

Resilient

~ 300 streams

Enterprise Branch Office

Enterprise Campus

Scalability, Resiliency, Serviceability

Video Surveillance Media Server (VSMS)

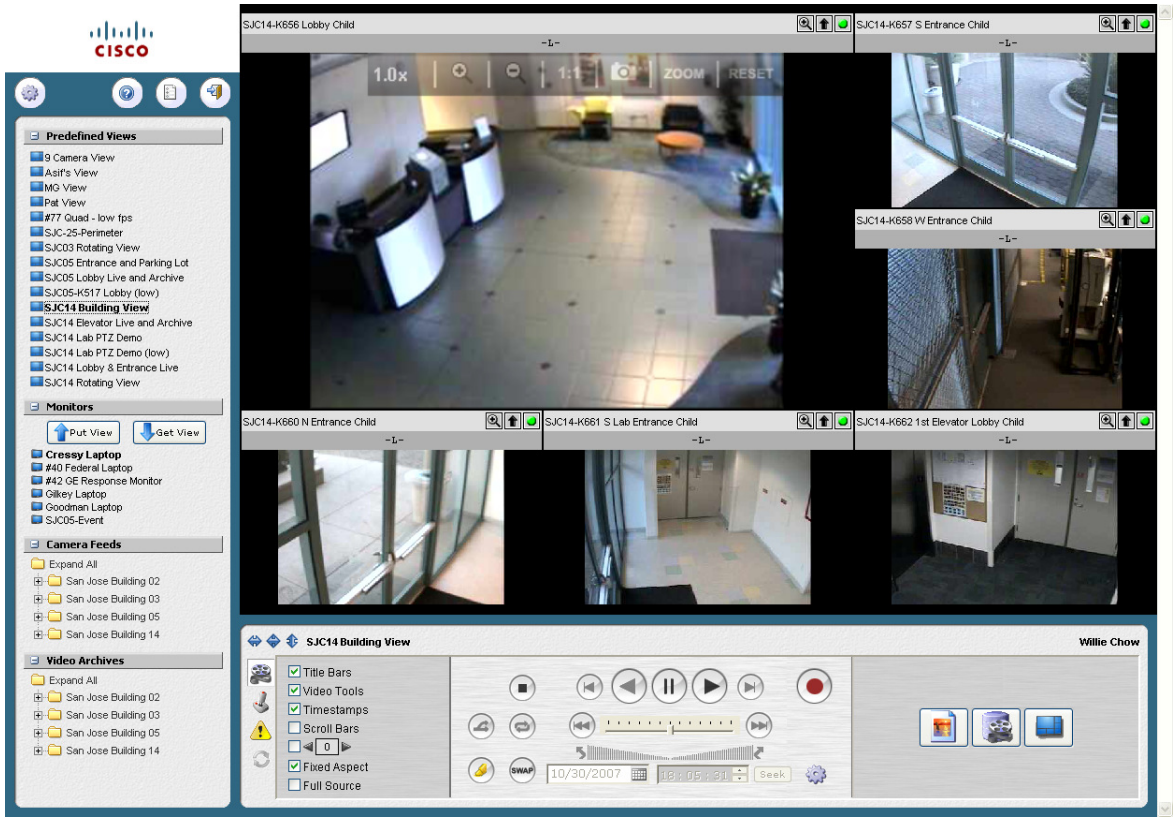
- Video Surveillance Media Server is the core component in the PSBU Media Platform, enabling distribution, archiving and management of video feeds.
  - Make video an information resource
    - Proxy and stream live feeds
    - Store and stream recorded media
  - Infinitely customizable
    - Add custom UIs
    - Use best-of-breed codec: Motion JPEG, MPEG-2, MPEG-4, H.264
    - Highly Scalable – Cameras, Clients, Storage
    - Share IT Infrastructure intelligently – Storage Systems and Bandwidth
  - Open and distributed
    - Integrate with other systems
    - Expand system as needed
    - Harden System as needed (fail-over and redundancy)

Video Surveillance Operations Manager (VSOM)

- Enterprise solution
- Highly configurable to effectively manage complex video applications
- 100% browser-based UI
- Multiple web-based consoles to configure, manage, display, and control video throughout a customer's IP network.
- Unlimited cameras, storage, viewers

Video Surveillance Operations Manager (VSOM)

- Provides real-time remote monitoring w/virtual matrix switching (VSVM)
- Display live and archived video streams with high quality images.
- PTZ control and presets
- Review and clip archives



Video Surveillance Operations Manager (VSOM)

For Administrators:

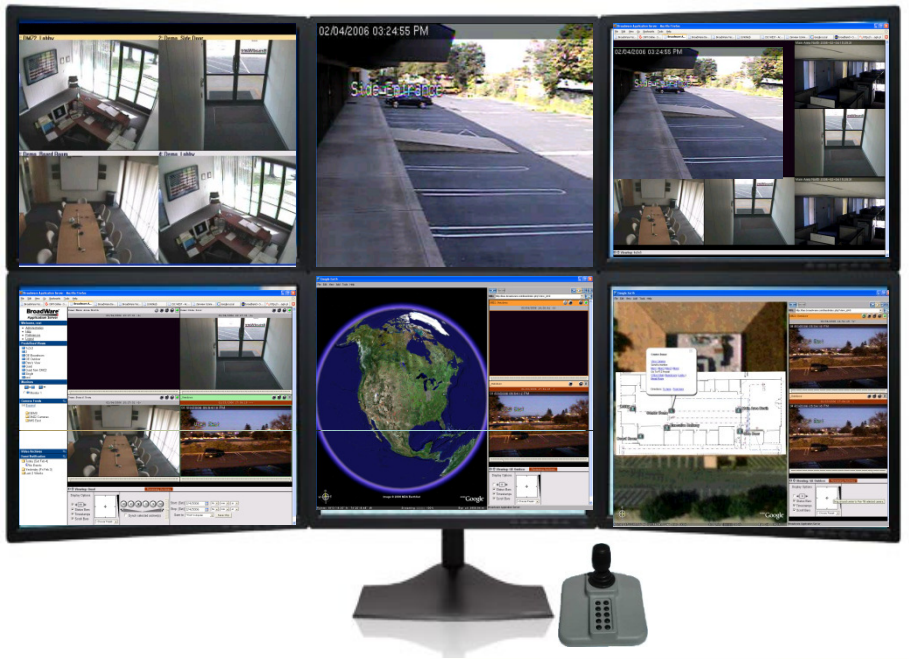
- Customizable branding and look and feel
- Device Management
- Scheduled and event-based video recording
- User and role management
- Activity and system reports
- Ability to push pre-defined views to any number of monitors with VSVM

For Operators:

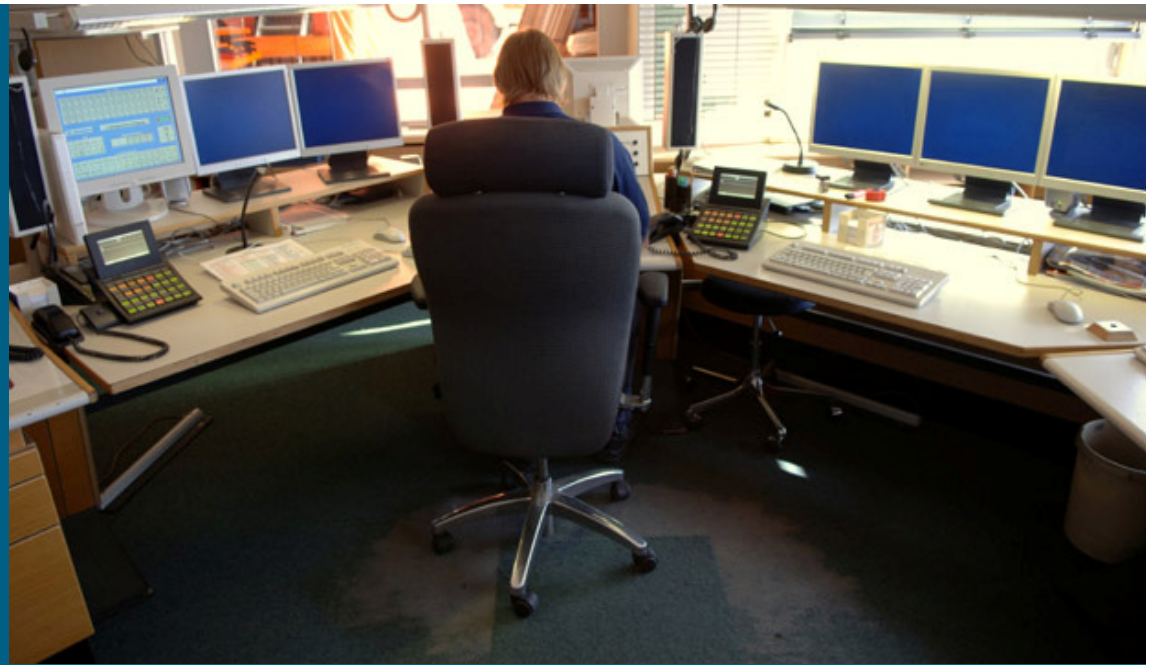
- Secure login
- Flexible video displays
- PTZ controls and presets
- Archive review and clippings
- Event notifications

Video Surveillance Virtual Matrix (VSVM)

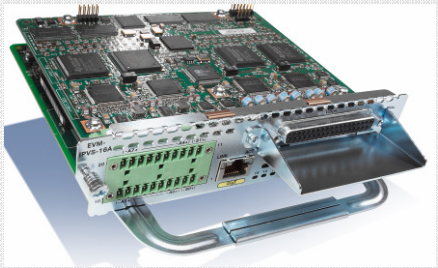
- **VSVM - Client Stations**
  Windows PCs for video decoding, display and control.
  Running Web browsers or specialized Windows applications.



Cisco Video Surveillance on ISRs



Cisco Integrated Services Router (ISR) Portfolio for Video Surveillance



EVM-IPVS-16A: Analog Video Encoding Module

NME-VMSS: Video Management and Storage System

Cisco IP Video Surveillance Solution

Cisco 2821

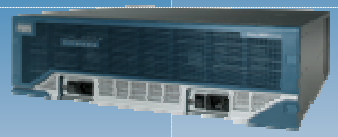
Cisco 2851

Multiple Services

Extended Modular Connectivity (EVM, NM, AIM, WIC/VIC)

Cisco 3825

Cisco 3845



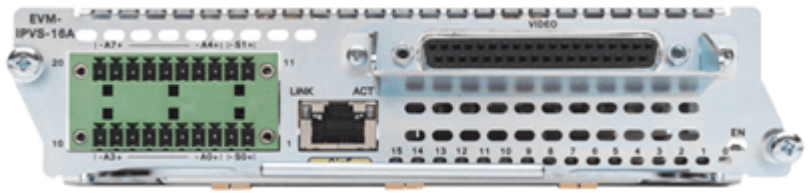
High-Density Services

Modularity with Performance Optimized for "All-in-one" Solution (HSDM, NM, EVM, AIM, WIC/VIC)

Enterprise Branch Office

Cisco Integrated Video Surveillance

The Cisco Integrated Video Surveillance Solution provides a cost effective way to deploy globally accessible surveillance to your remote sites



Integrated Analog Video Gateway

Integrated Video Management and Storage System

Analog Video Gateway

Offers analog video interface for IP Video Surveillance Solutions

16 Analog Video Ports: MJPEG, MPEG-4, H.264

8 Contact Closure Ports

2 RS-485 ports for device Pan/Tilt/Zoom control

- ## Integrated Video Management and Storage System

  Targeted at <32 stream (camera) deployments

  Utilizes pre-packaged **VS Operation Manager** and **VS Media Server**

  Manage, view and archive surveillance data for up to 32 devices simultaneously

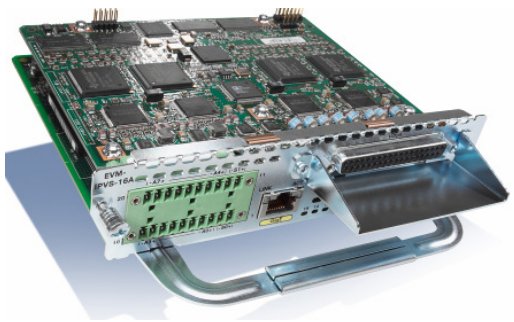
  Unified interface into IP Cameras and Analog devices (through the AVG)

Key Benefits

Single Box Solution for UC and Surveillance

Remote access to surveillance data for alarm/event validation

Integrated Analog Video Gateway



Move your Analog Video onto the IP Network

- Up to 16 Analog Video Ports
  - 14 dedicated inputs, 2 configurable input/output
- Chose your preferred Codec
  - MJPEG, MPEG-4, H.264
- Transport with Standard Protocols
  - RTSP with standard RTP for MPEG4 based Codecs
  - HTTP with multipart Mime for MJPEG

Control your Cameras

- 2xRS-485 ports for device Pan/Tilt/Zoom control
- Support for pass-through of serial commands to/from host system

Alert your management station

- 8 Contact Closure Ports for sensor triggers
  - 4 dedicated Inputs, 4 input/output

Optimize your video with Analytics

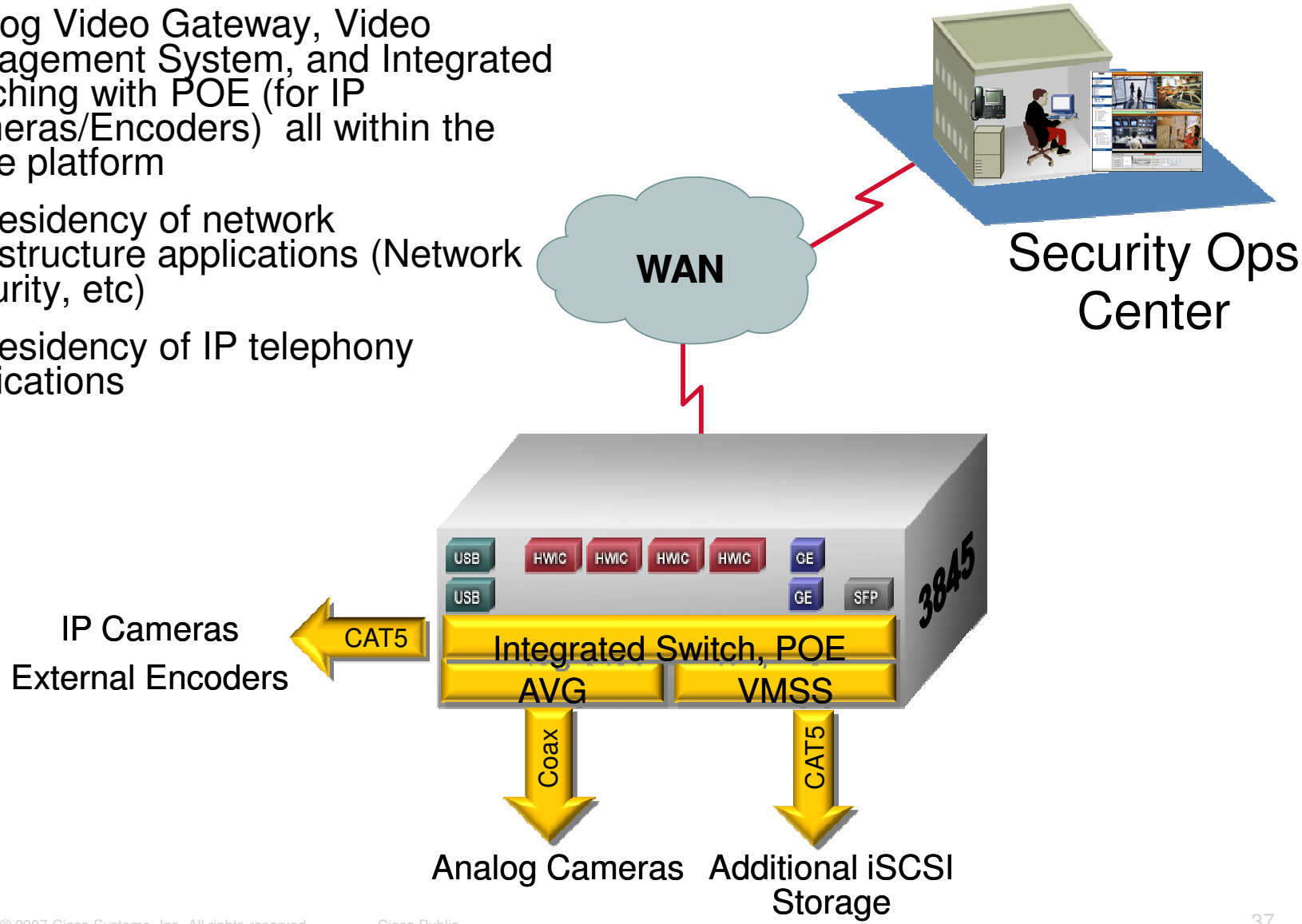
- Built in Motion Detection algorithms

Integrated Video Management and Storage System

- Manage all video sources through a single converged interface
  - Provides a simple interface to configure and control IP Video Surveillance Devices
    - Cisco Video Surveillance Management Software Suite
    - Supports Cisco Integrated Analog Video Gateway
    - Supports major 3rd party IP Cameras and encoders/decoders
  - View live and archived video through same Thin Client interface
- Archive and Manage Video
  - Up to 160GB of local storage
  - Expand to external storage for long term archival
- Protect video assets
  - High configurable user privileges
    - Control access with a fine granularity
    - Create Schedules for individual users

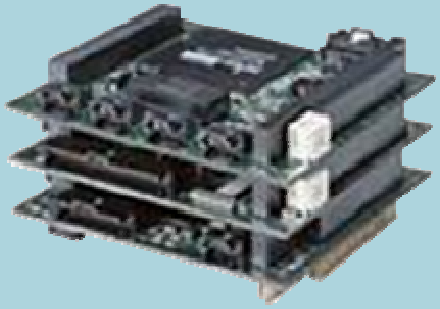
Video Surveillance on the ISR: System Composition

- Analog Video Gateway, Video Management System, and Integrated switching with POE (for IP Cameras/Encoders) all within the same platform
- Co-residency of network infrastructure applications (Network Security, etc)
- Co-residency of IP telephony applications



Rugged Enclosure for Cisco 3200 Series Wireless and Mobile Router

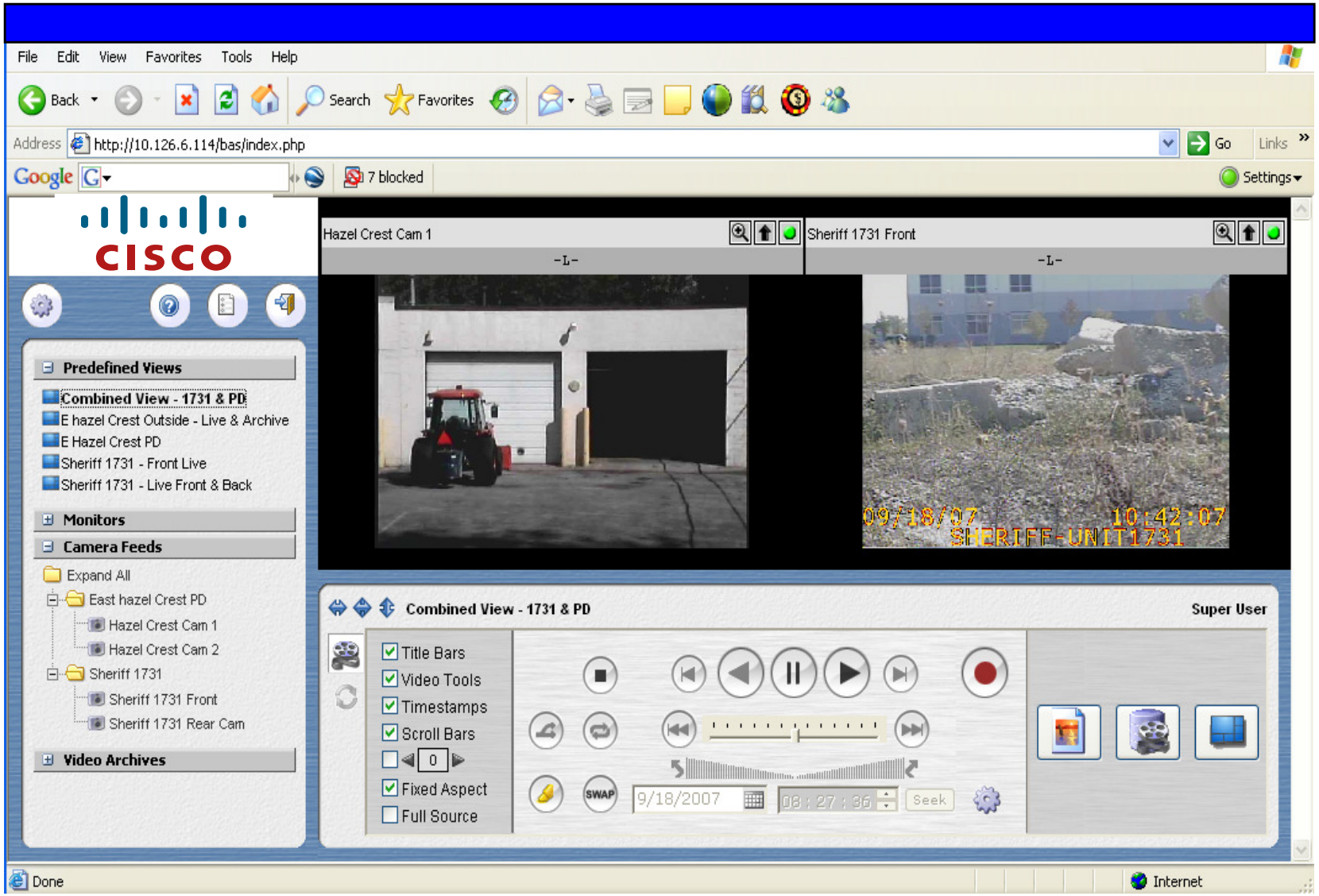
- Rugged Enclosure Manufactured by Cisco
- Designed for in-vehicle use
- Utilizes conductive cooling in place of cooling fans
- Sealed Enclosure to keep elements from internal components
- Configurations allow for up to 3 Cisco WMICs
- Approved Hardware Partners can incorporate 3rd party cards (cellular modems for example)



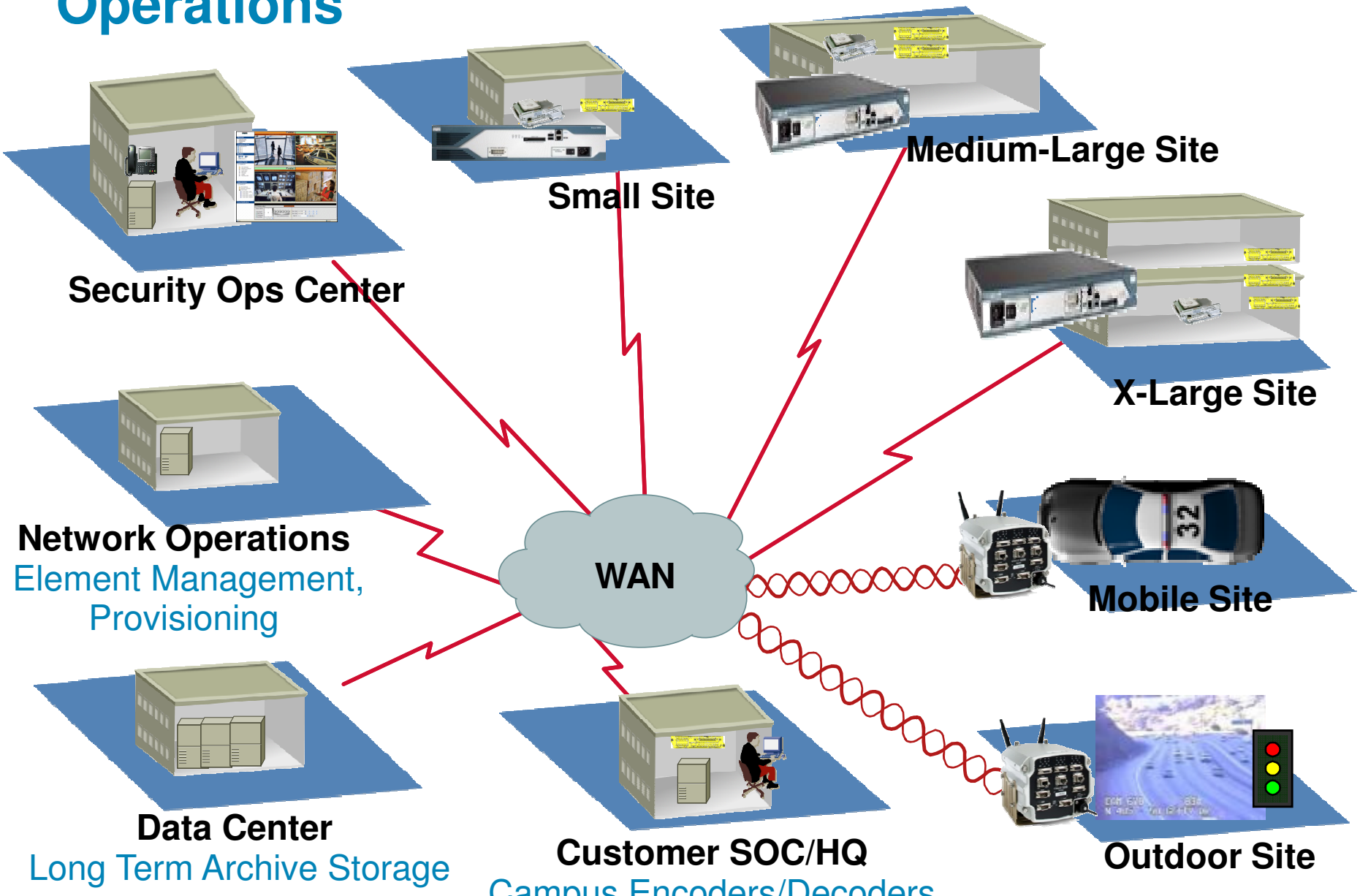
Cisco 3200 Router Cards

Cisco 3200 Router in Rugged Enclosure

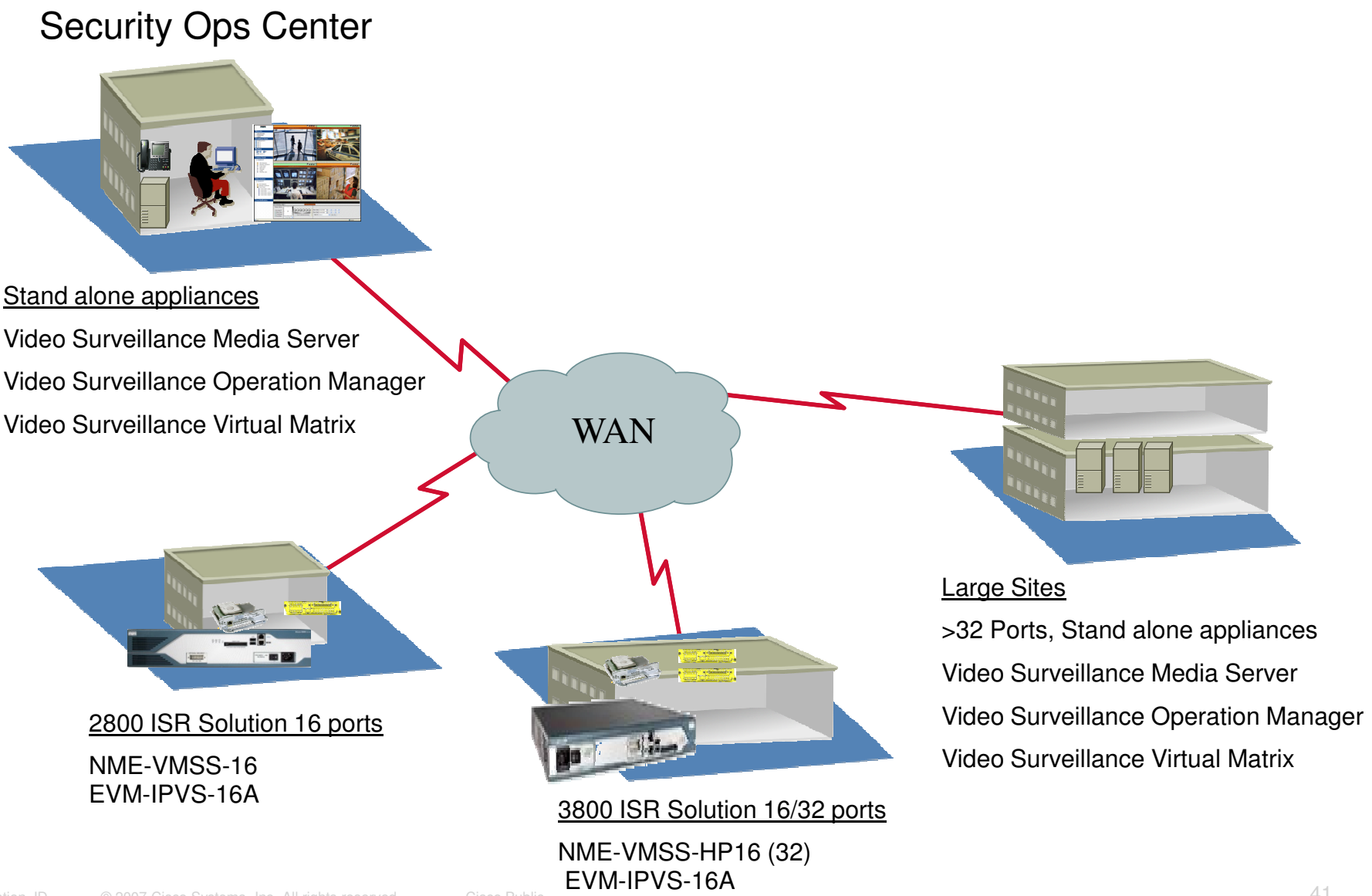
Real Example: Law Enforcement



Next Generation Distributed Security Operations



Typical Solution Components (cont): IP Video Surveillance



Cisco Video Surveillance End Points

Cisco IP Video Surveillance Cameras 2500 Series – Fixed Cameras

- CIVS-IPC-2500
- Fixed Wired Camera

- CIVS-IPC-2500W
- Fixed Wireless Camera

- CIVS-IPC-VF38
  - ✓Fujinon 3 - 8 mm
  - ✓CIVS-IPC-VT38
  - ✓Tamron 3 – 8 mm
- CIVS-IPC-VF31 @
  - ✓Fujinon 3 - 11 mm
- CIVS-IPC-VT31
  - ✓Tamron 3 – 11 mm
- CIVS-IPC-VF55
  - ✓Fujinon 5 – 50 mm
- CIVS-IPC-VT55
  - ✓Tamron 5 – 50 mm

Benefits

Optimal image in multiple lighting conditions

Cisco Imager | **Typical Imager**

Cisco imager can pick up details in extreme lighting conditions a common in warehouse applications

Benefits
No Saturation with strong lighting

Cisco Imager **Typical Imager**

Cisco imager provides color detail even in extreme lighting with a manual iris lens, CCD technology is completely over-saturated

Cisco Video Surveillance IP Camera Fixed Domes

- Same core Cisco IP Camera as the Standard Definition (SD) wired version
- Fixed Dome Form Factor
- Power Over Ethernet (Indoor)
- Multiple Flavors
  - Indoor Flush Mount, Surface Mount
  - Indoor Vandal Resistant
  - Outdoor Vandal Resistant
- API for interfacing with third party vendors
- Integration with VSM and Stream Manager
- Available Q2 CY09

Video Resolution

Dimensions	PAL	NTSC
QCIF	176 x 144	176 x 120
VGA	640 x 480	640 x 480
SVGA	800 x 600	800 x 600
XGA	1024 x 768	1024 x 768
CIF	352 x 288	352 x 240
2 CIF	704 x 288	704 x 240
4 CIF	704 x 576	704 x 480
D1	720 x 576	720 x 480

Resolution Comparison
1080i (1920x1080) with CIF resolution (352x288)

Resolution Comparison
1080i (1920x1080) with D1 resolution (720x576)

Resolution Comparison
1080i (1920x1080) with 720p resolution (1280x720)

Resolution Comparison
1080i (1920x1080)

Introducing Cisco IP Video Surveillance Cameras 4500 High Definition Cameras

- True HD Video Surveillance Camera
- Outstanding Image Quality
- No other HD VS camera on the market
- 1080p (1920 x 1080) 30 FPS
- 720p (1280 x 720) 60 FPS
- H.264, MJPEG Compression
- Dedicated Digital Signal Processor (DSP) for Video Analytics
- USB Memory Card
- Application Programming Interface (API)
- IPv6

Wired (available Q4 CY08) and Wireless (available Q1 CY09) models

Video CODEC's

Compression

Less

More

- Image Based:
  - JPEG / JPEG2000 (Typically measured in Thousands of Bytes)
  - MJPEG (Motion JPEG) (Typically measured in Thousands of Bytes)
  - Wavelet (Typically measured in Thousands of Bytes)

Compression

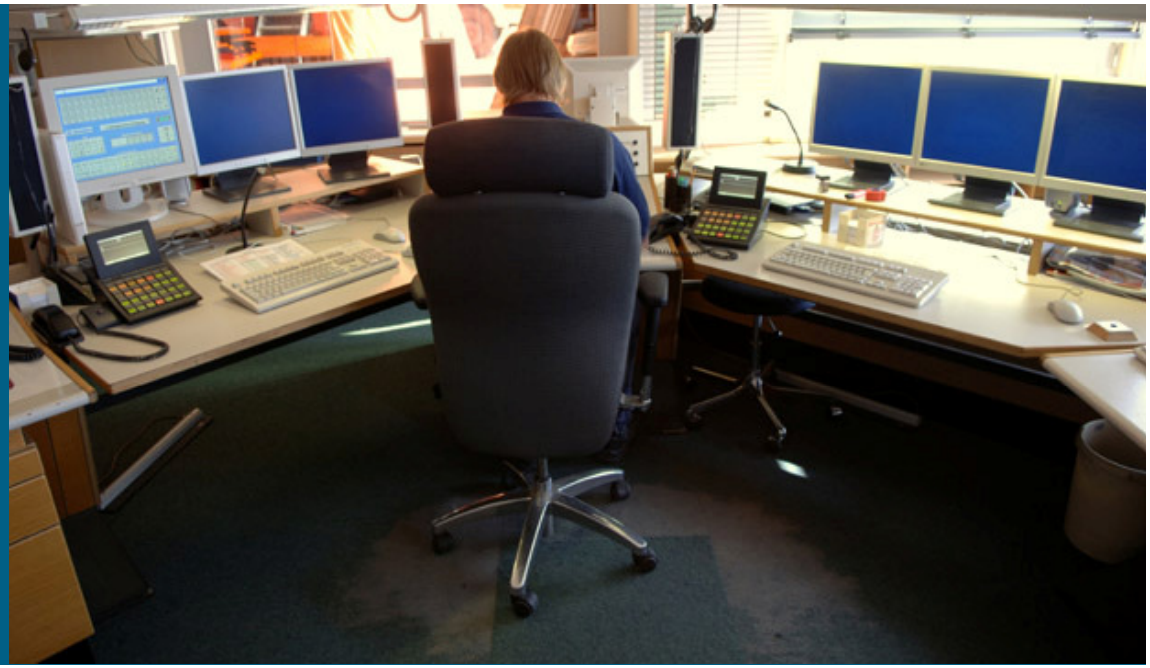
Less

More

- Video Based:
  - MPEG-2 (Typically 2 - 20 Mbps)*
  - MPEG-4 (Part 2) (Typically ~3 Mbps)**
  - H.264 (MPEG-4 Part 10 + Higher Coding efficiency) (Typically 40-50% less than MPEG-4 equivalent)***

* Used for numerous applications and quality levels
** 4CIF @ 25-30 Frames Per Second)
*** 4 CIF @ 25-30 Frames Per Second (CPU and Option Specific)

Summary

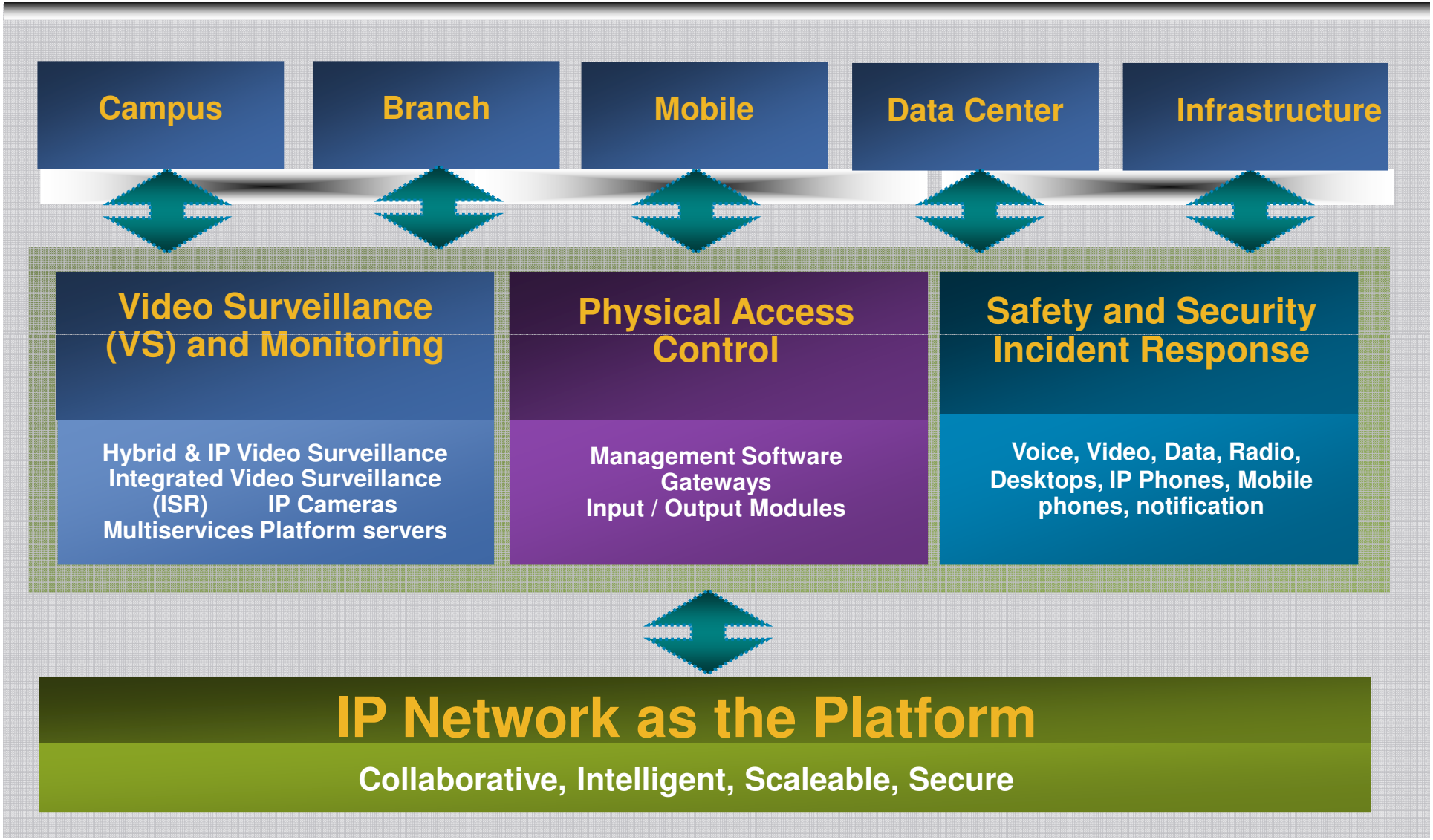


Cisco leadership in Physical Security Convergence

- Proprietary → Open
- Silo to integrated
  - Access control, surveillance, incident response, intrusion
  - Business Video Ready networks
- Standardization
  - Codecs
  - APIs
  - Network protocols
- New Channel Partner requirements
  - Must embrace both physical security and IT practices and capabilities

Cisco Connected Physical Security Architecture

Complete Campus, Branch, Mobile, Data Center, Infrastructure Platform Solutions



Commitment to Open Standards

Support of new IP Media Device API specification introduced by the PSIA to standardize how devices communicate with the network

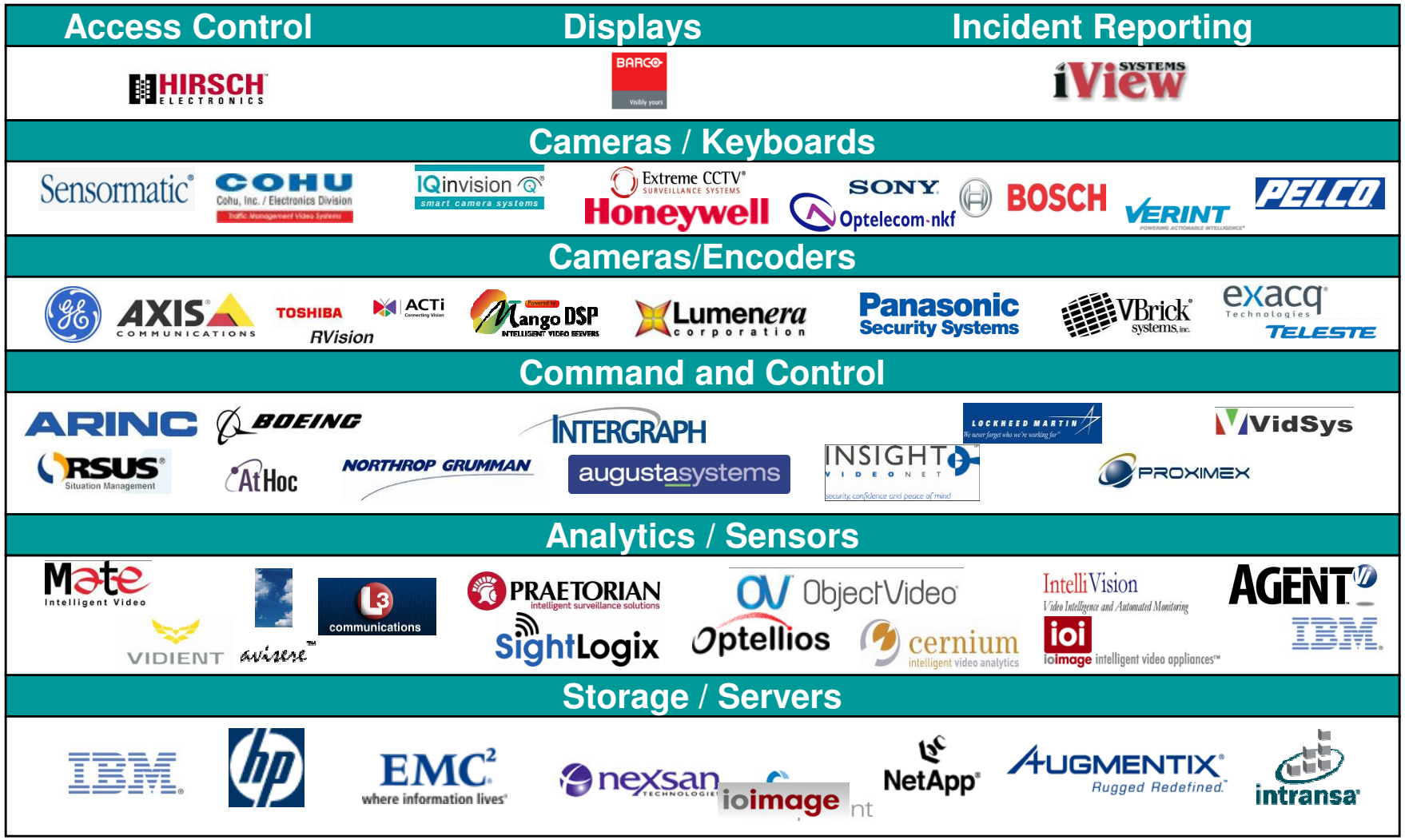
- Defines uniform methods for how devices communicate with the network
  - Discovery and Configuration
  - Command and Control
- Ensures Systems Integrators can focus on value added capabilities rather than writing new device drivers
- Provides physical security and IT with cost effective options to evolve and customize solutions

Cisco Video Surveillance IP Cameras

The initial Physical Security Interoperability Alliance (PSIA) specification is endorsed by the following industry leaders: Adesta LLC, ADT Security Services, Cisco, CSC, DVTel, GE Security, Honeywell, IBM, IQinVision, Johnson Controls, March Networks, ObjectVideo, Orsus, Panasonic, Pelco, Santa Clara Consulting Group, Texas Instruments, Verint and Vidyo.

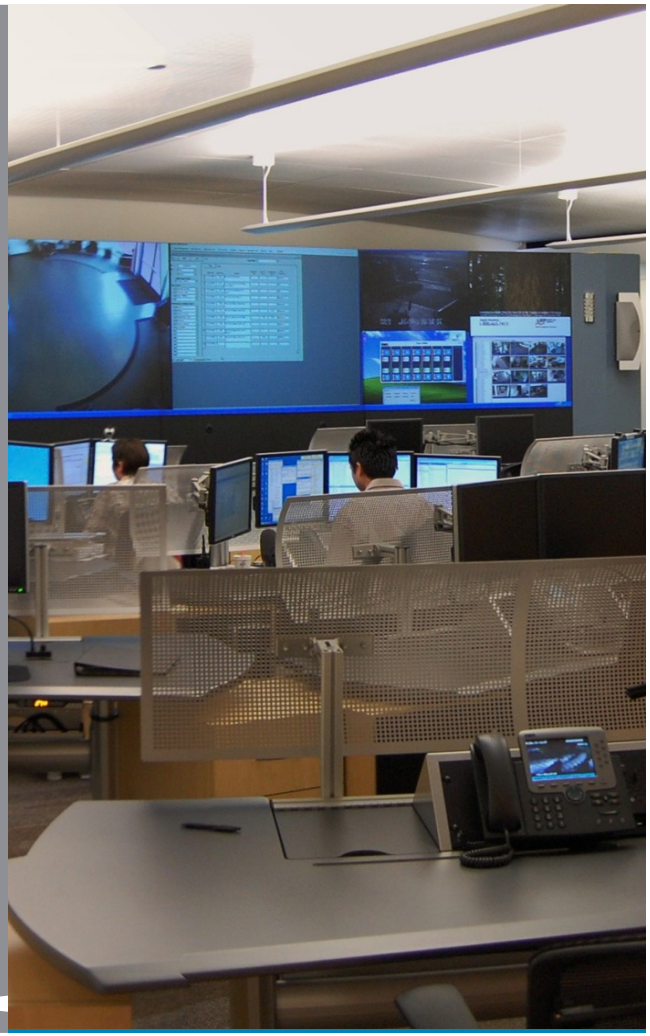
Support for All Edge Devices

Cisco's Physical Security Eco-system



Why Cisco

- Customer Solution Benefits
  - Data sources
  - Display/UI options
- Investment protection
  - Open APIs
  - Standard codecs, hardware
- New Integrated IP Network Capabilities
  - Video Surveillance, IP Cameras
  - Access Control
  - Interoperable Communications
- Innovation
  - New technologies and capabilities
  - Open partnering: Technology, Integrators,…



Networked Technologies Enhance Safety and Operational Efficiency