

Integrated Systems Overview

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Q: What is An Integrated System?

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A: Anything You Want it to Be.

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One Definition.

“An integrated system is the control and operation by a single operator of multiple systems whose perception is that only a single system is performing all functions”

Referenced by Philip B. Purpura “Security and Loss Prevention, an Introduction” p153

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Wide Range of Definitions

- **Interconnection Vs. Integration**
- **In some ways, interconnections can be considered to be primitive integration**
 - Intrusion system trips elements of access control and access trips elements of intrusion
- **Simple: Relay Output Connections**
- **Complex : Seamless Full Facility Systems Integration at Data Link Level**

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Examples

- **Low: “Relay Magic”**
 - Garage door opens – area or alarm off
 - Control zone alarm out trips input on video switcher
- **Medium: Data Level Between Control Devices**
 - RS-232 from intrusion control to DVR, zone alarm selects camera and increases frame rate
- **High: Host or Server Based Management & Linking of Multiple Sub-Systems**
 - VMD on Channel of DVR alarms, event sent to monitoring via IP, event selection produces custom response plan and window with streaming video.

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System Basics

- **Equipment Levels & Transports:**
 - Device - Field Bus
 - Controller - Network
 - Host or Server - Network

The diagram illustrates a hierarchical network structure. At the top, a host/server (represented by a computer monitor and tower) is connected to a controller (represented by a rack-mounted server). The controller is connected to a network of devices (represented by a cloud). Below the network, a series of devices are connected to the network, showing a field bus configuration.

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System Basics

- **Device State Monitoring**
 - Analog or Digital States of Devices
 - At Controller or Host level
 - Most New Analog Mechanical Building Systems Monitor State at Host Level
 - Simple or Complex Rules and Associations

The diagram illustrates a hierarchical network structure. At the top, a host/server (represented by a computer monitor and tower) is connected to a controller (represented by a rack-mounted server). The controller is connected to a network of devices (represented by a cloud). Below the network, a series of devices are connected to the network, showing a field bus configuration.

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Device Based World

- All Systems are Collections of Devices
- Device States and Interactions are Evaluated According to Sets of Rules and Associations
- Outputs/Messages are Produced by Controllers or Hosts
 - Analog or Digital State/Change of State
 - Time
 - Location
 - Combination of above

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Integrated Systems Elements

- **Scope** – Range of Capabilities
- **Scale** – Size of the Integration / Number of Facilities
- **Systems** – Applications to be Integrated
- **Process** – Sequence of Automated Interactions
- **Management** – Handling and Resolution of Events

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Functional Domains

The diagram shows a central circle labeled "Security & Life Safety" surrounded by several other circles representing functional domains: Video, Access Control, Intrusion, Incident Management, LBS, EAS, POS, Fire, and Video.

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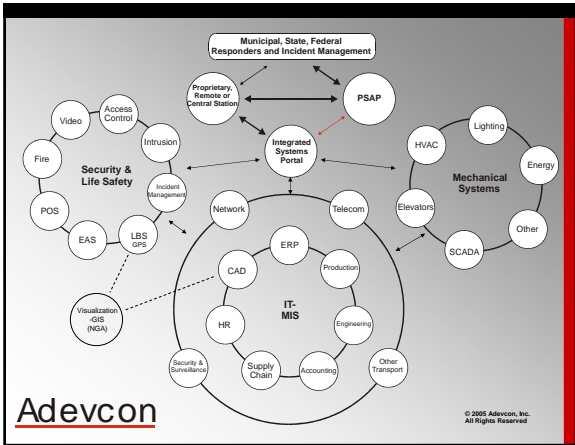
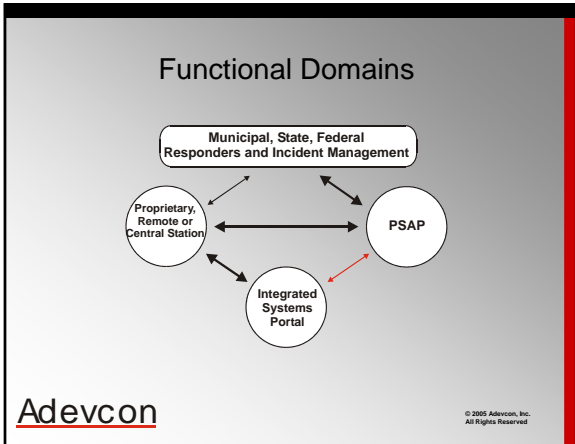
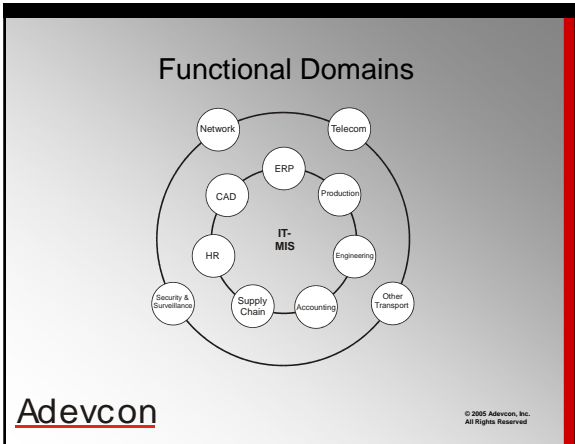
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Functional Domains

The diagram shows a central circle labeled "Mechanical Systems" surrounded by several other circles representing functional domains: Lighting, Energy, Other, SCADA, Elevators, and HVAC.

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- ### Why Integrate?
- Asset Optimization (synergy)
 - Enhanced Security (loss prevention/reduction)
 - Enhanced & Shared Situational Awareness
 - Enhanced & Faster Critical Event Response
 - Enhanced Economy
 - Guard Staff Reduction /Force Enhancement
 - IBS Reduces Energy Consumption
 - User Convenience, Simplified Operation
 - False Alarm Reduction
 - Violent Crime & Homeland Security Implications
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- ### Desirable Characteristics
- Elements Coexist Without Conflict
 - Share Information - Trigger Events
 - Common User Interface, Shared Database, Inputs From Relevant Sources
 - Outputs, Displays, Reports Straightforward and Relevant
 - Simple Management Process
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- ### “Full Integration” - Critical
- STAT Resources Study:
 - CCTV - 82% 91% Utilization EAC
 - Photo ID - 82%
 - Burglar Alarm - 74%
 - Fire Alarm - 71%
 - Asset Tracking - 40%
 - Personnel Tracking - 39%
 - Guard Tour - 38%
 - Critical Process - 35%
 - Time & Attendance - 31%
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Systems Integrators

- **Two Levels of Integrators**
 - **Off the Shelf, Technician Level**
 - Most Traditional Security Dealer/Integrators
 - **Write Your Own Code IT Level**
 - Andover Dealers
 - Rockwell, JCI, Siemens, Honeywell etc.
 - Diebold
 - **IBM & Other Fortune 500 (!)**

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Systems/Software Providers

- **Central Station Systems**
 - SIMS, SIS, MicroKey, Bold, ABM, Dice, GE-MAS
- **Integrated Systems & Software Providers**
 - Imron, GE, Honeywell, Bosch, Lenel, Andover
Rockwell, Siemens, JCI, PACOM, Ortega, Vigilos
- **Enterprise Total Integrated Systems/Application Software Providers**
 - GE Facility Commander, Honeywell EBI, Andover
Continuum, Rockwell Logix, Siemens Apogee,
Johnson Controls MetaSys

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Integration Impediments

- **Legacy Systems, Legacy Systems, Legacy Systems**
- **Vendor Proprietary Protocols**
 - Closed at the Field Bus & Controller Levels
- **Vendor Proprietary Architecture**
 - Open at the "Developer Kit" Level
 - Open at the Scripting Level
 - Developer "Applications" Programs
 - HTML, ASP, JavaScript, Active X
 - Requires IT Level Expertise

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Protocols & Standards

- **BACnet**
 - Building Systems
- **LONtalk**
 - Building Systems
- **DALI**
 - Lighting Systems
- **Zigbee**
 - Building Systems

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Protocols & Standards

- **Modbus**
 - Machine Automation
- **OPC**
 - Inter-Systems
- **Zigbee**
 - RF Mesh LAN
- **Wi-Fi**
 - 802.11x
- **TCP/IP**

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Other Integration Issues

- Video Codecs**
 - MJPEG
 - MPEG-2
 - MPEG-4
 - Custom Codecs
 - Associated Metadata

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Questions?

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Thank You!

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