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Fundamentals of Video Surveillance

Concepts and Technologies to Create an Effective Video Security Solution

Objective: At the end of this program, attendees will be able to identify the essential components of a video surveillance system. Guides, tools, and resources will be provided that allow an attendee to perform a basic site survey. With the knowledge gained, an attendee will be able to clearly communicate the basic system design required for a variety of common applications. With this knowledge the attendee will be able to work with other professionals to finalize a project parts list that reflect the immediate and long-term expectations of the site owner.

Delivery Methods: This program can be attended in two different manners: classroom or online. Classroom attendance may provide continuing education credits from one or more agencies. Online attendance is in the form of pre-recorded videos. No continuing education credits are available for online attendance.

Presenter Considerations: public internet connection and speed. Pre-downloaded video clips or active links. Projector. Whiteboard. Audio capability. Download & install calculators.

Supporting Documentation: Presentation USB for attendees

Class Structure: The class is divided into several major components as outlined below

Introduction to Course and Presenter **8:00 – 8:30am**

Why am I here?

Compelling video showing intense, active use of surveillance

Introduce presenter

Current position/responsibility

Past relative experience & years

Personal – public service, volunteering, etc.

Site logistics: bathrooms, breaks, Wi-Fi access, refreshments, emergency exits

Case examples of success vs. challenge

Market Layout **8:30 – 9:00am**

Manufacturer > Reseller > Specifier/End User – Function and Relationship

Manufacturer – rep vs direct, tech support (pre/post), customer service

Reseller – integrator or distributor

End User – specifier, IT, finance, owner, operator

Common System Description **9:00 – 9:30am**

System diagram and images

Camera, transmission infrastructure, recording, viewing, connection to other systems (integration)

Site Survey **9:30 – 10:00am**

Importance of doing one – setting/meeting expectations

AHJ driven vs “eye of the beholder” driven

Determination of technology types vs physical location

Who should be there?

Guide

Budget setting – does budget cover expectations?

Performance

Demonstration

Proof of concept

Try before you buy

Break **10:00 – 10:15am**

Camera and Lens Technologies and Uses **10:15am – 12:15pm**

Indoor vs outdoor

Dome, bullet, box

Fixed vs PTZ – preselected scene vs manual operation

Fixed: panoramic or traditional FOV

PTZ

Presets

- Tour
- Manual Operation
- Analytics Controlled

Lenses

- Fixed vs Motorized/Zoom
- Standard vs Megapixel
- Glass Quality
- True Day/Night vs Electronic
- f-Stop / Shutter Speed
- mm Range/Adjustability
- Focus manually vs Auto-focus
    - Field install methods – Handheld Monitor vs Laptop

Specialty Housing

- Extreme Rugged PTZ
- High/low Temperature
- Intrinsically Safe (explosion proof)

Image Resolution

- DCRI
- Standard definition
- High Definition
- Mega Pixel
- More pixels = higher resolution …usually
- Impact on Storage
- Digital pan/zoom
- Project/jurisdictional requirements

- Demo pixels/foot calculator
- Specialty
- License Plate Capture vs Vehicle Characteristics Capture
- Thermal
- No-Grip Corner

Frame Rates

- 1-15 vs 30 vs 60
- Camera capability
- Project/jurisdictional requirements
- Impact on storage

Lunch **12:15 – 12:45pm**

Camera and Lens Technologies and Uses (Continued) **12:45 – 1:45pm**

Lighting

- Ambient light
  - Level and Type
  - Reflectivity of scene materials
  - Always on vs Motion
  - Indoor night lighting policies
- Higher resolution needs more light
- Higher speed target needs more light
- Visible vs Infrared vs Thermal IR
  - Low light Imaging
  - Infrared Illumination
    - Short Range Integrated
    - Long Range Integrated

Integrated PTZ

2nd Device

Thermal

Fixed vs PTZ

Camera Smarts **1:45 – 2:15pm**

PoE: 15w vs 30w vs more…

Masking scenes

Data reduction (bit rate)

Analytics

Edge vs Server

Live alarming vs Forensic investigation

Applications: people counting, behavior detection, security, human resources, fire/smoke

Rules: line cross, loitering, left behind, counting, tracking, etc

Security Certificates / Data Security / Encryption

Edge recording

Firmware

Break **2:15 – 2:30pm**

Transmission Methods **2:30 – 3:30pm**

Analog vs IP

Copper

Coax for Analog and Ethernet over Coax

Unshielded Twisted Pair (UTP)

Category (Cat 6)

Common cabling method

- Fiber
    - Multimode vs Singlemode
    - Ease of installation
    - Benefits
        - Surge/EMI/RFI
        - Bandwidth
        - Distance
        - Analog channel capability
    - Limitations
        - Installation familiarity
        - PoE
- Wireless
    - Point to Point Ethernet
    - Point to Multi-Point Ethernet
    - Existing Mesh
    - Benefits
        - No pathway
        - Cost to establish pathway
    - Limitations
        - Installer knowledge
        - Line of site
        - Environmental
- Network considerations
    - Get IT involved early
    - Shared network or separate network

- Hardware separation
- VLAN
- User access
  - Local
  - Remote
  - Policies

Recording & Video Management Solutions **3:30 – 4:00pm**

- Digital Video Recorder
- Network Video Recording
  - 1-32 cameras
  - 33-128 cameras
  - 33- Thousands of cameras
  - Specialty needs, policies, requirements
- Hybrid Solutions
  - Encoding legacy cameras
- Storage Calculations
- System Topography
  - Network Limitations or Policies
  - Project Demands or Policies
- Video Management Software

Integration **4:00 – 4:30pm**

- Manufacturing Partners
  - SDK vs ONVIF
- Access Control
- Barriers/Entrance Control

Fenceline/Perimeter Detection

Intrusion Detection

Intercom / Pull Station

Fire

PSIM

Other 3rd Party Systems

Break **4:30 – 4:45pm**

Power Management **4:45 – 5:15pm**

Cameras – relies on network for power

PoE only or supplemental power

Network – supplies power to cameras

Uninterruptable Power remote

Uninterruptable Power data center

Workstations

Uninterruptable Power at Desk

Command Center

Uninterruptable power for large monitors and multiple workstations

Command and Control **5:15 – 5:45pm**

Active vs Reactive Monitoring

Workstation Computer Capabilities

Monitor Walls vs Workstations

Command Center Layout

Remote Notification/Control

Applications **5:45 – 6:45pm**

Example: Mall with 100 analog cameras - Journey from Analog to IP

Forklift vs Staged Approach

End user expectations

IT leader

Mall manager

Guards

Example: New hospital/campus needs 250 cameras

IP from day 1

End user expectations

IT Department

Legal / HIPPA / Student Privacy

Finance

Facilities Department

Example: Bridge with 25 cameras

Environmental Concerns

IT involvement

Electrical team

Example: Tunnel with 12 cameras with 3rd party VMS in place already

Integration: ONVIF or SDK

Environmental

Attendee Project Examples **6:45 – 7:15pm**