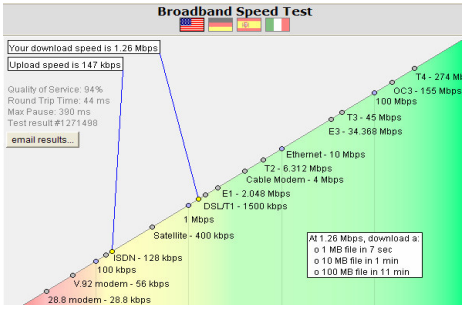
SECURITY NETWORKING INSTITUTE

Network Video Options



Presented by:

David J. Engebretson

SLAYTON SOLUTIONS LIMITED

Fiber Optics Institute

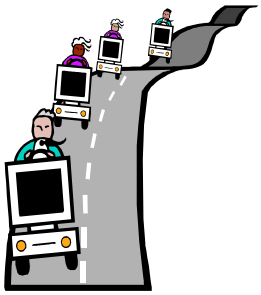
- Opportunities in video networking
- What is network video
- Network camera options
- Video encoders
- Basics of networking video
- Planning network video installation

Network Devices- What's the Fuss?

- Revolution in Electronic Security Communications
- New products, services, options for security installers

Photo: Boeing

Jump on the highways



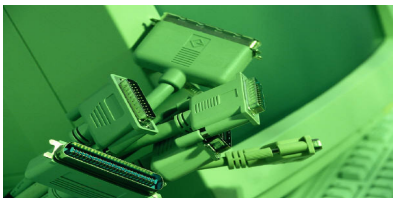
- Ethernet
- Wi-Fi
- Internet

Around the building, campus, or the world

Security applications can “ride” the incredible network of communications that connects all points of the globe

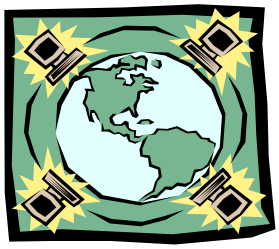
What can you do with network devices?

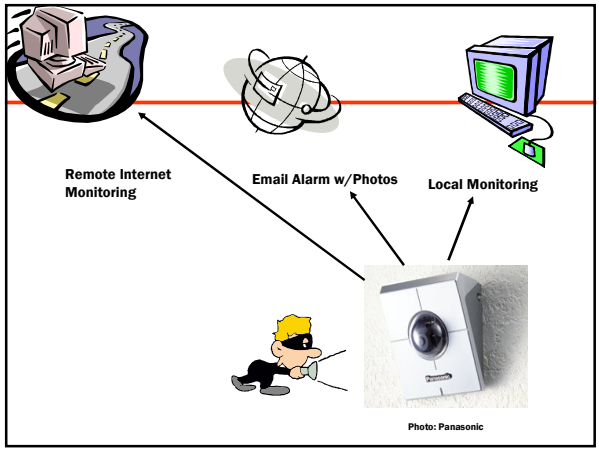
- Use Existing Cabling-Save $$$ and time in installation



What can you do with network devices?

- New options for transmission of video imaging
- Local Network
- Internet



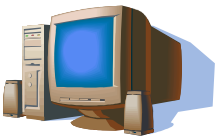


Internet Demonstration

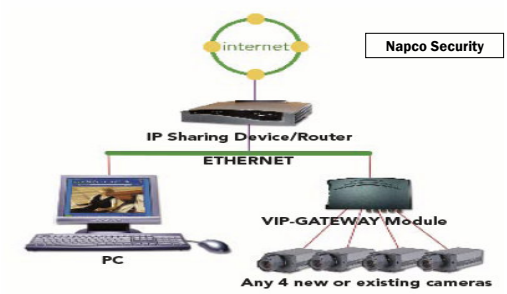
Napco Web Demo
http://www.videoalert.net
User: Tom p/w: 123
2 Web Cams
Home web cam

What can you do with network devices?

- Upgrading existing CCTV systems
- Provide network connections



Upgrading existing CCTV systems



What can you do with network devices?

- Remote viewing & control of systems and facilities

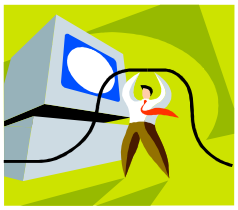
Camera Photo: Axis

Why should dealers care?

- New Services, New Clients
- New Services, Existing Customers
- New Monitoring options- new recurring revenues
- Expansion of business vs. status quo

Clients want to control/monitor their security imaging & other devices just as they control other systems w/PC's and the Internet

Clients want remote viewing and control

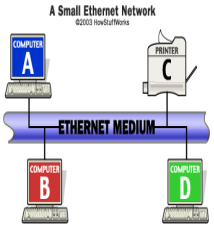


Basics of networking video

- LANs and WANs
- Ethernet
- Wi-Fi
- Internet Communications

LANs and WANs

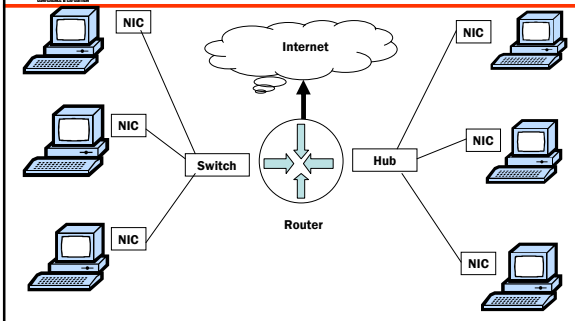
- LAN- Local Area Network
- Generally, connected computers, printers, etc. within a building or campus of buildings



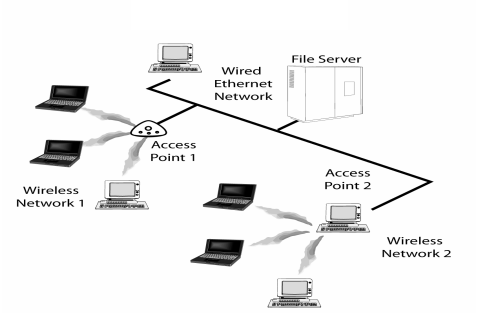
LAN's and WAN's

- WAN- Wide Area Network
- The Internet- Network of networks

Ethernet LAN



Wi-Fi LAN



Internet Communications

What is network CCTV?

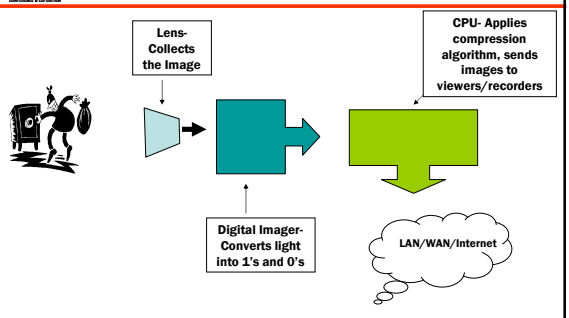
- Transmission-Conversion of CCTV video signals into data packets suitable for network transmission
- Receiving-Viewing and recording video over local and/or remote:

network computers

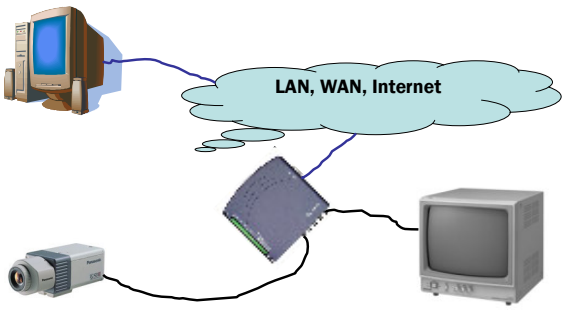
video monitors

storage drives

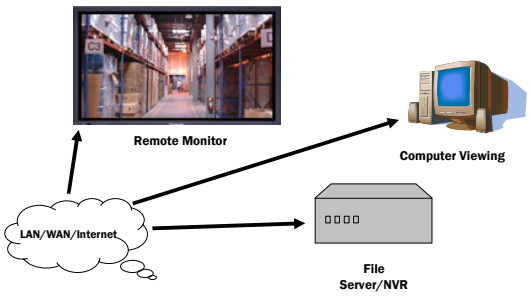
Network video transmission-IP Camera



Network Video Transmission-Encoder



Receiving Network Video



Network Camera Options

- IP-enabled Ethernet
- Wi-Fi
- Hybrid Analog-Network
- IP Mega pixel

IP Ethernet Camera

- Self-contained with RJ-45 Ethernet connection
- Various prices and features
- Demo - ?

IP Ethernet Camera

- Advantages- ideal for single camera/small systems
- Web browser viewing (typically)
- Easy connection to network with UTP
- Low bandwidth if only one or few cameras

IP Ethernet Camera

- Disadvantages – may not fit all applications – outdoor, p/t/z
- Additional software needed if viewing & recording multiple cameras
- May have to use cameras from same vendor for entire system
- $$$ - ?

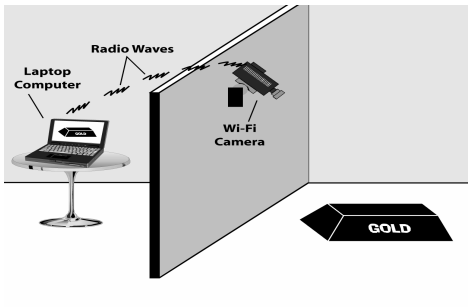
Wi-Fi Cameras

- Basically the same as Ethernet, but use Wi-Fi transmission
- Same form factors and issues as IP Ethernet cameras

Wi-Fi Cameras

- Advantages –
- Wi-Fi cameras are portable and movable
- Wi-Fi connectivity makes for quick installations
- Wi-Fi and IP Ethernet cameras can be blended together for one system

Portable Cameras



Wi-Fi Cameras

- Disadvantages –
- Wi-Fi coverage problems
- Security of transmission and reception
- Not all camera form factors currently built with Wi-Fi capability

Hybrid IP/Analog Cameras

- Standard form factor camera housings- Dome, traditional
- Camera has both IP (sometimes Wi-Fi) and analog outputs
- Demo – Panasonic NP472

Hybrid IP/Analog Cameras

- Advantages –
- Fits in standard housings mountings
- Uses standard lenses
- Provides analog output for existing local monitors/recording
- Provides migration path to take existing systems from analog to network
- Camera settings can be remotely controlled over Internet or network

Hybrid IP/Analog Cameras

- Disadvantages –
- $$$ - More expensive than standard camera

IP MegaPixel Cameras

- Various form factors, some with traditional shape
- Provides large pictures, excellent resolution, digital pan/tilt/zoom

Higher resolution improves coverage

320 x 240 NTSC/PAL HDTV **2 Mpix**

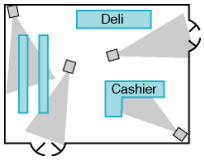
Odd Aspect Ratio Support

IQeye cameras can be tailored to each scene

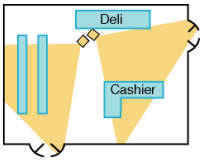
Replace Multiple Fixed Cameras

Reduce camera counts to save money

4 CCTV Cameras



2 IQeye Cameras



IQeye – Resolution

40X the resolution of CIF cameras/DVRs

- Capture license plates and facial details
- Digital Zoom without distortion

DVR Digital Zoom

IQeye Digital Zoom

Digital Pan/Tilt/Zoom

- Highly reliable - no moving parts
- Capture everything, all the time
- Multiple simultaneous control

IP MegaPixel Cameras

- Advantages – excellent pictures for viewing, storage, and analysis
- One camera, properly placed, can do the job of several standard cameras
- More varied video setting options that standard IP cameras

IP MegaPixel Cameras

- Disadvantages –
- Cost – but coming down as these cameras are accepted in the market
- Network bandwidth usage may be an issue, particularly with multiple cameras on one network

Video Encoders

- Economy
- Multifunction

Economy Video Encoders

- Economy
- Typically one or four video inputs
- Some provide analog output for local monitor
- Some provide p/t/z control outputs
- Some web browser viewing, others require specific software

Economy Video Encoders

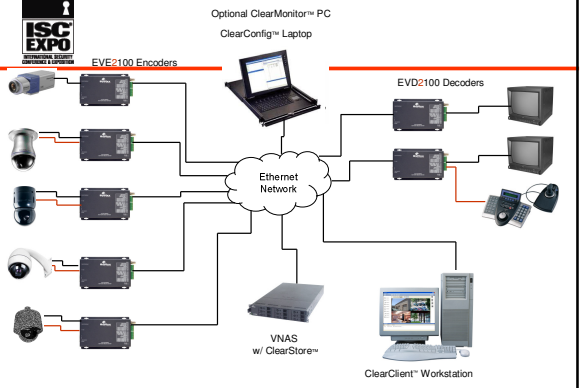
- Advantages –
- Uses existing cameras, lens, and mountings – huge parts/labor savings
- Enormous market of pre-installed CCTV systems that can now be networked effectively and inexpensively

Economy Video Encoders

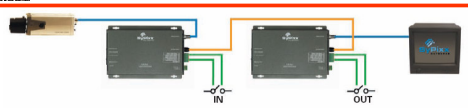
- Disadvantages –
- Possible limits to how many encoders can be viewed simultaneously on one computer/software set – usually 1 to 16

Multifunction Encoders

- Provide one to eight analog camera inputs
- P/T/Z, inputs and outputs, audio, access, other alarm functions can be controlled through the encoder
- Usually use vendor-specific control and viewing software
- System application – encoders, decoders, NVR, software all from one vendor



Multifunction Encoders



Single encoders can transport and control:

Video

P/T/Z

Contacts in/out

Audio-intercom

Access Control data

Planning network video installation

- Get the picture?
- Network Transport
- Video Compression Selection
- Viewing-local and remote
- Recording

Get the Picture?

- IP-enabled camera
- Video Server connected to camera
- P/T/Z issues

Network Transport

- Ethernet or Wi-Fi?
- Availability of connection ports
- Bandwidth usage on LAN
- IT department approval

Network Transport Issues

- Type of Connection – DSL, Cable, T-1
- Quality of connection:
  Latency
  Packet Loss
  Available Bandwidth

Network Transport Issues

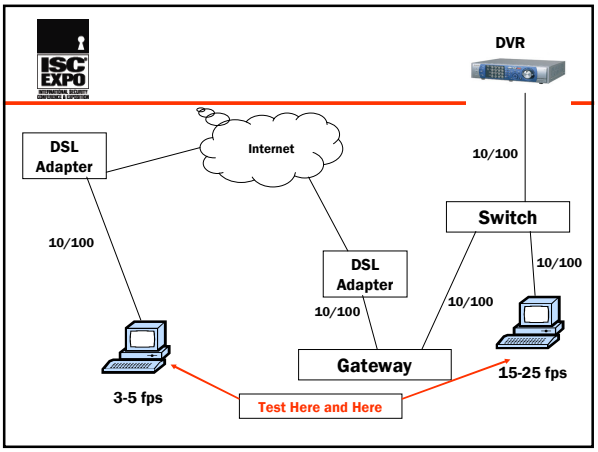
- Latency – how long it takes for data packets to travel from one network device to another
- Local Networks – 5 milliseconds or less
- Internet Connections – sometimes 500 ms or more
- Long latency can cause problems for some IP cameras and encoders

Network Transport Issues

- Packet Loss
- When streaming packets, what percentage are lost in the network
- More than 5% packet loss = problems
- Ping –t test demo www.ratzenet.de

Network Transport Issues

- Available Bandwidth
- 100 Mbps local networks?
- Internet – local test of bandwidth capability
- Myspeed demo
  http://myspeed.visualware.com/



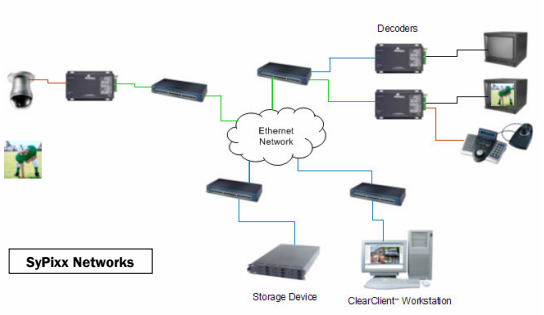
Video Compression Selection

- JPEG – Inexpensive, transmits all complete images, web browser viewing*, higher bandwidth and storage requirements
- MPEG-4 – Higher cost devices, transmits partial and complete images, specific software viewing, lower bandwidth and storage requirements

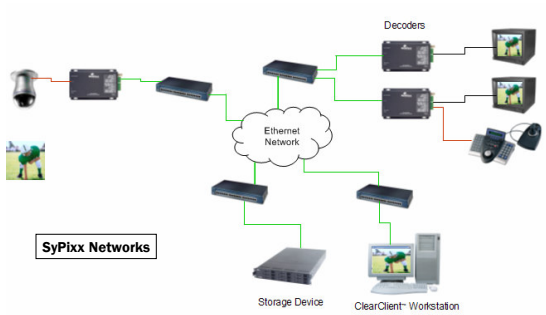
Viewing-Local and Remote

- Local computers- Authorized users
- Remote computers- Internet connections
- Multiple viewers- Unicast and multicast

Unicast Transmission



Multicast Transmission



Video Recording

- In Camera
- Email images
- Viewing computer recording
- FTP upload
- Network Video Recorder
- RECAM Demo

Your Future in Networking Video

- New Products hardware and software
- Reduced costs for devices
- Improved relations with IT personnel
- New service options – IP intercom, alarm transmissions

Prepare Yourself

- Read networking periodicals and trade publications – SDM Magazine
- Attend training classes specific to networking security
- Practice, practice – get a network camera and hook it up at your office/home

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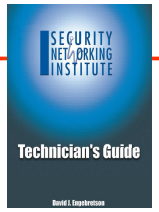
Video Servers, Network Cameras, DVRs, and Wi-Fi networks

Practical Knowledge, Programming Examples, Step-by-Step Instructions



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