CLOSED CIRCUIT TELEVISION (CCTV)

ECE 516E – ANTENNA & RADIOWAVE PROPAGATION

Monday, November 17, 2025

TYPES OF CAMERAS

CCTV Uses two types of cameras:

1. **Analogue camera:** Generate video signals and transmit to a processing/display device.

2. **IP Camera:** digital video camera that receives control data and sends image data via an IP network.

   Invented in 1996, IP cameras do not require local storage, they use LAN connection via ethernet or WiFi to transfer video signal to storage devices or/and video displays.

CCTV RECODERS

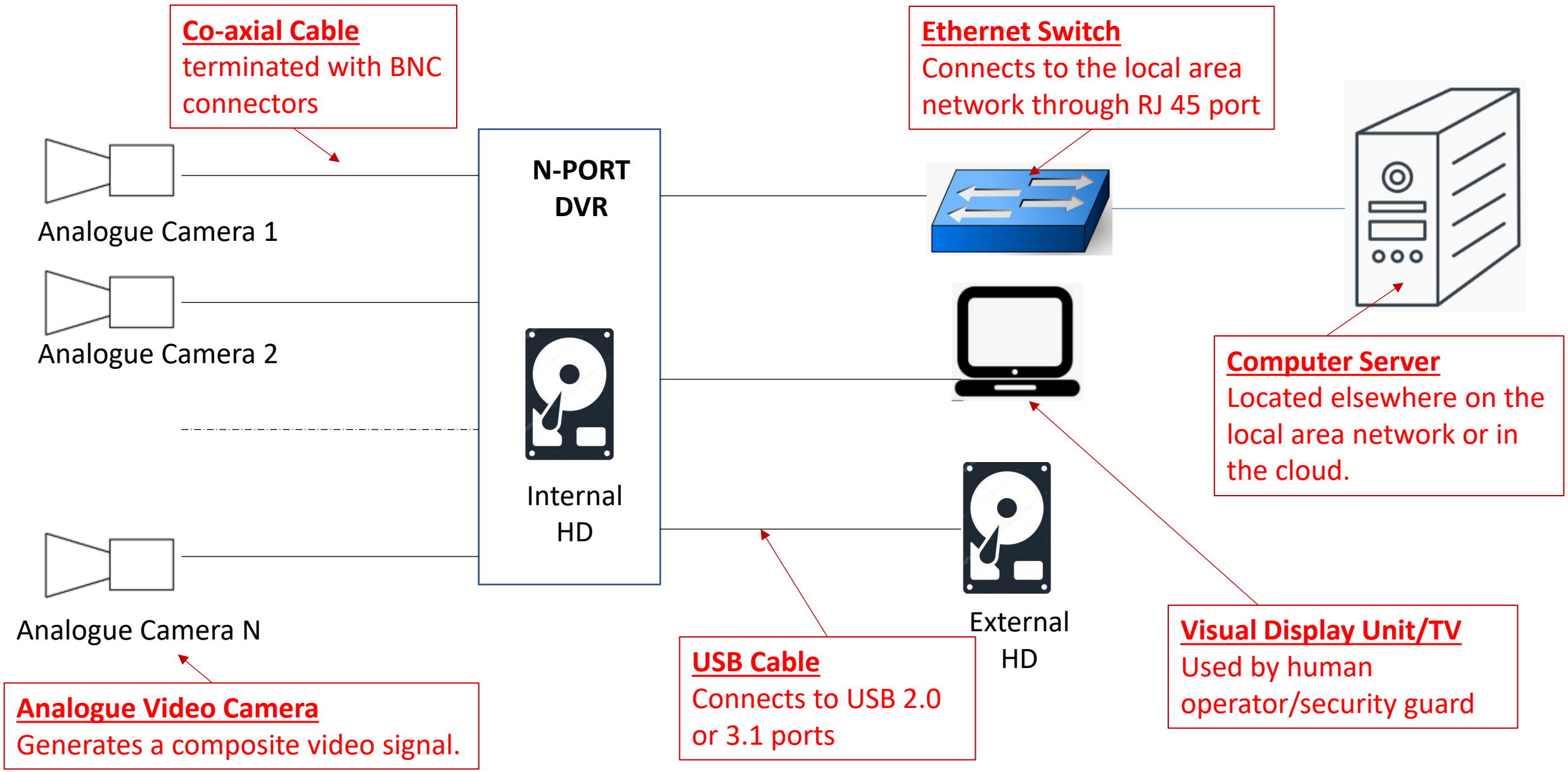
CCTV uses two types of recorders.

1. **Digital Video Recorders(DVR):** Receives video signal from analogue cameras and processes the signal for storage and/or direct viewing with Ethernet connection.

2. **Network Video Recorders (NVR):** Receives digital video signal from IP cameras and routes the data to the network.

   NVRs can also connect to IP cameras through a wireless LAN.

DIGITAL VIDEO RECORDER (DVR)



HARD DISK DRIVES (HDD)

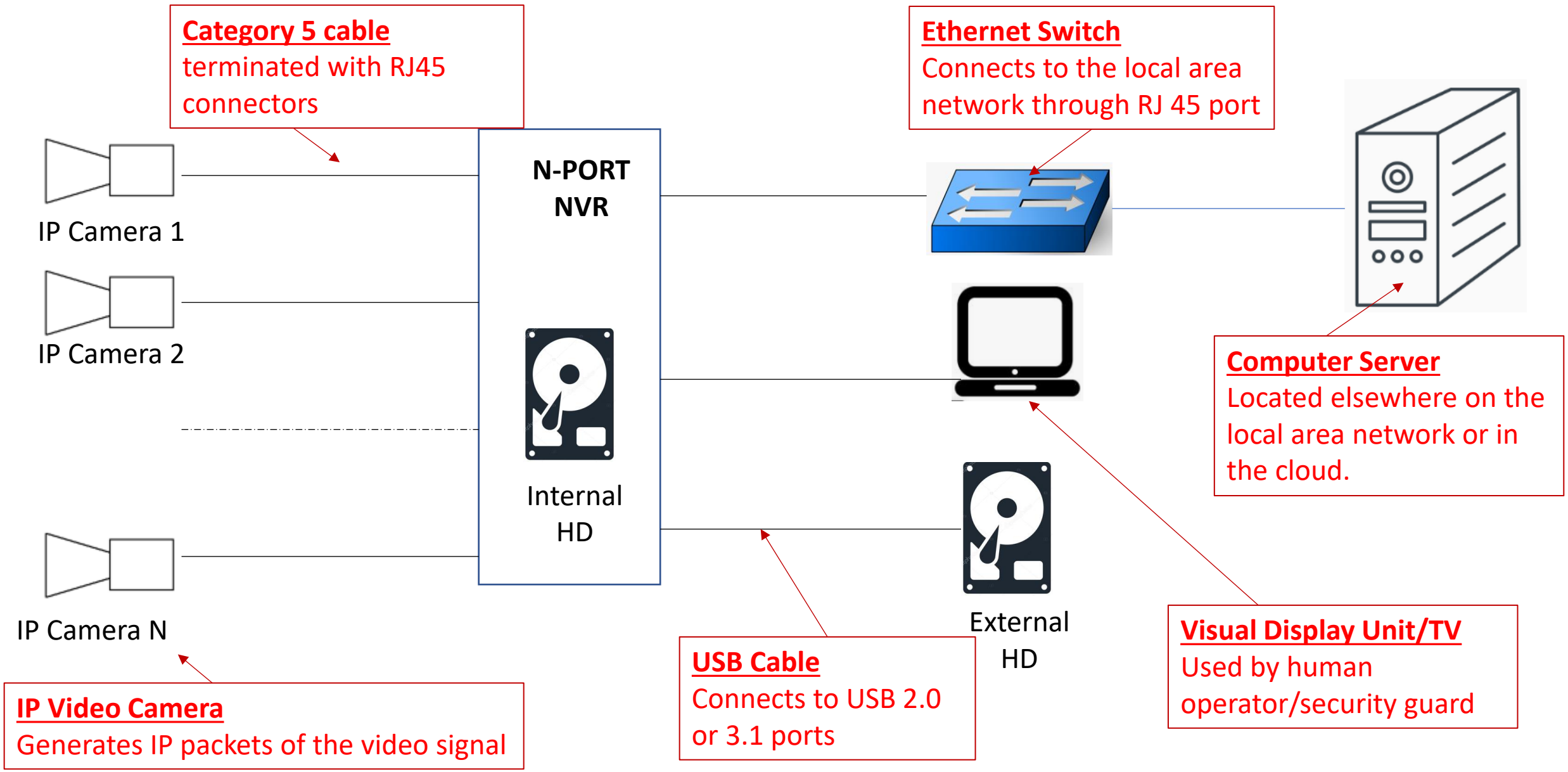
1. **Hard Disk Drive are used for storing data** on, such as the footage from your cameras, and you will almost always find an HDD inside your DVR/NVR.
2. Video Storage hard drives are **generally measured in terabytes (TB)** of data storage.
3. **1TB will usually be enough to store footage from four cameras for a week before running out of space.**
4. However, that **depends on the quality** you're recording at, how many cameras and some other factors.
5. An online calculator for HDD storage can be found at the link below.

https://www.westerndigital.com/tools/surveillance-capacity-calculator

PROS & CONS OF DVR

1. **Powering the camera: Coaxial cables - unlike PoE cables** - do not supply power to the camera. This means two types of cables are needed - one for power and one for video transmission. In practice we use RG-59 cable which is expensive.
2. **Difficult to Install:** Coaxial cables are wider and stiffer than Ethernet cables, which can make installation a challenge.
3. **Carrying Audio:** Audio is a limitation since most analogue cameras and DVRs do not support composite video containing audio.

NETWORK VIDEO RECORDER (NVR)



PROS & CONS OF NVR

1. **Power over Ethernet (PoE):** eliminates the need for separate cable and power supply.
2. **Easy to install:** cable are thinner shape, cost less, and be more readily available compared to coaxial cables.
3. **The NVR recorder is only used for storing and viewing the footage.** It doesn't process video data - a step that's done at the camera before it's sent to the recorder.
4. **Easy to carry audio:** camera with a microphone on an NVR system can record audio to the NVR.

ISSUES TO CONSIDER WHEN CHOOSING BETWEEN DVR & NVR

1. What hardware do you have in place currently (i.e: wiring)? Are you prepared to replace it?
2. Are you comfortable programming network devices?
3. How much maintenance is required?
4. Who needs access? Is remote access required?