Unit – 3 Raspberry pi
Lec : 1

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Learning Outcomes

- IoT Device
- Basic Building Blocks
- Raspberry pi
  - Features
  - Hardware Specs.

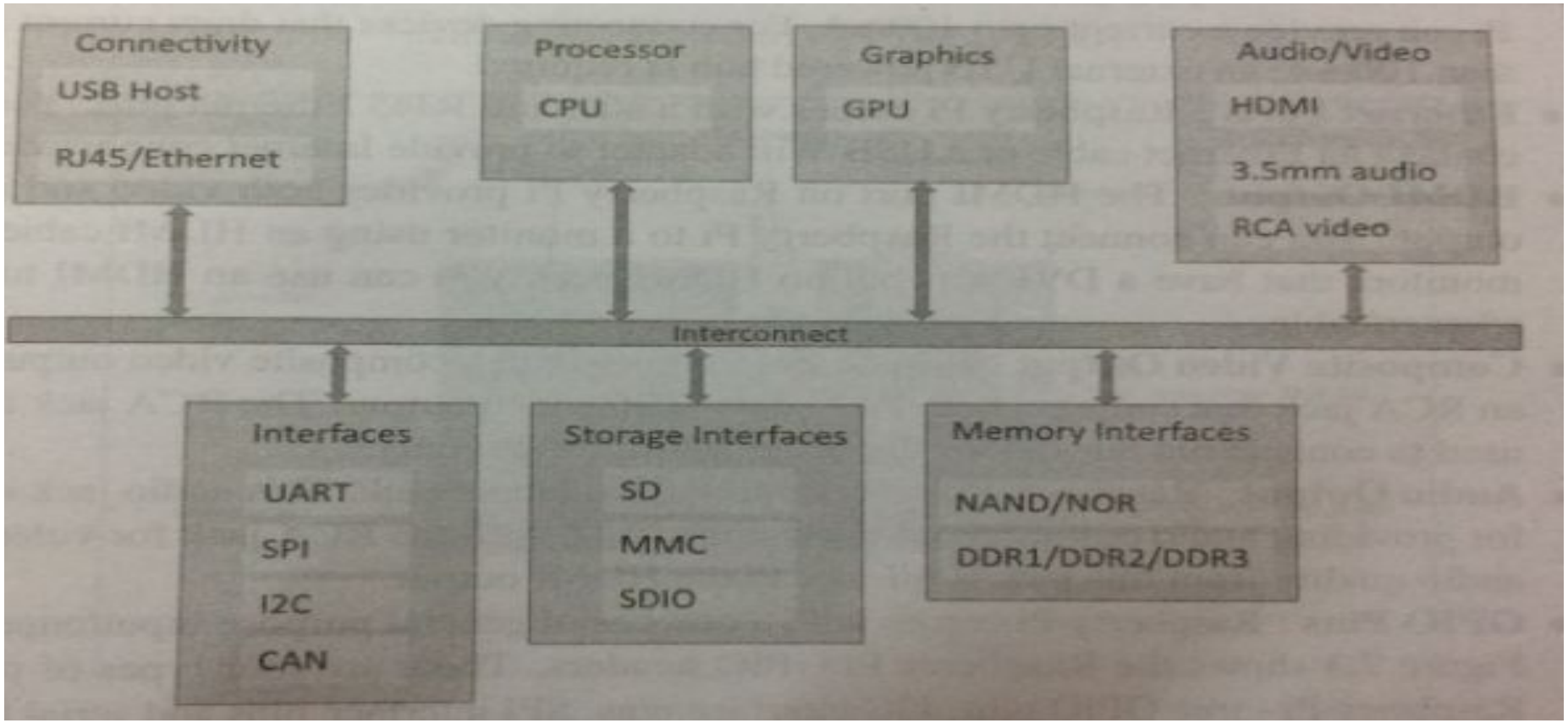
IoT Device?

- “Thing” in IoT can be any object which has unique identifier and which can send/receive data over a network.
- Examples:
  - Home automation device
  - Industrial machine
  - Wearable devices ,etc…

Basic Building Blocks of an IoT device

- Sensing: Sensors can be either on – board of the IoT device or attached to the device.
- Actuation : It allows taking actions upon the physical entities in the vicinity of the device.
- Communication : It is responsible for sending collected data to other devices or cloud based servers / storage and receiving data from other devices and commands from remote applications.
- Analysis & processing

Block diagram of an IoT device



Raspberry Pi

- Raspberry pi is a low-cost, credit card sized computer which plugs into a computer monitor or TV and uses keyboard and mouse.
- Also used to play games and HD videos.
- It runs various flavours of Linux and perform all tasks like normal desktop computer.
- It Supports interfaces to sensors and actuators via General Purpose I/O pins(GPIO).
- Make use of Python

User friendly features

- Low cost
- Low power consumption
- Instant start up
- Fan less and easy to program

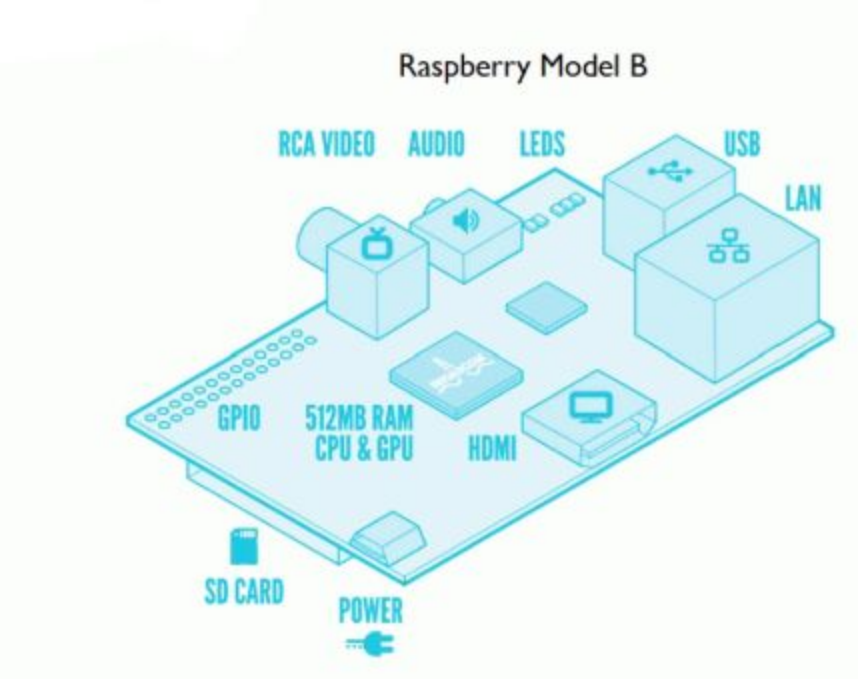
Different Models of Raspberry Pi

Model A	Model B	Model B+
		
$25	$35	$35
1 USB port	2 USB ports	4 USB ports
No Ethernet	10/100 Ethernet	10/100 Ethernet
SD card slot	SD card slot	Micro SD card slot

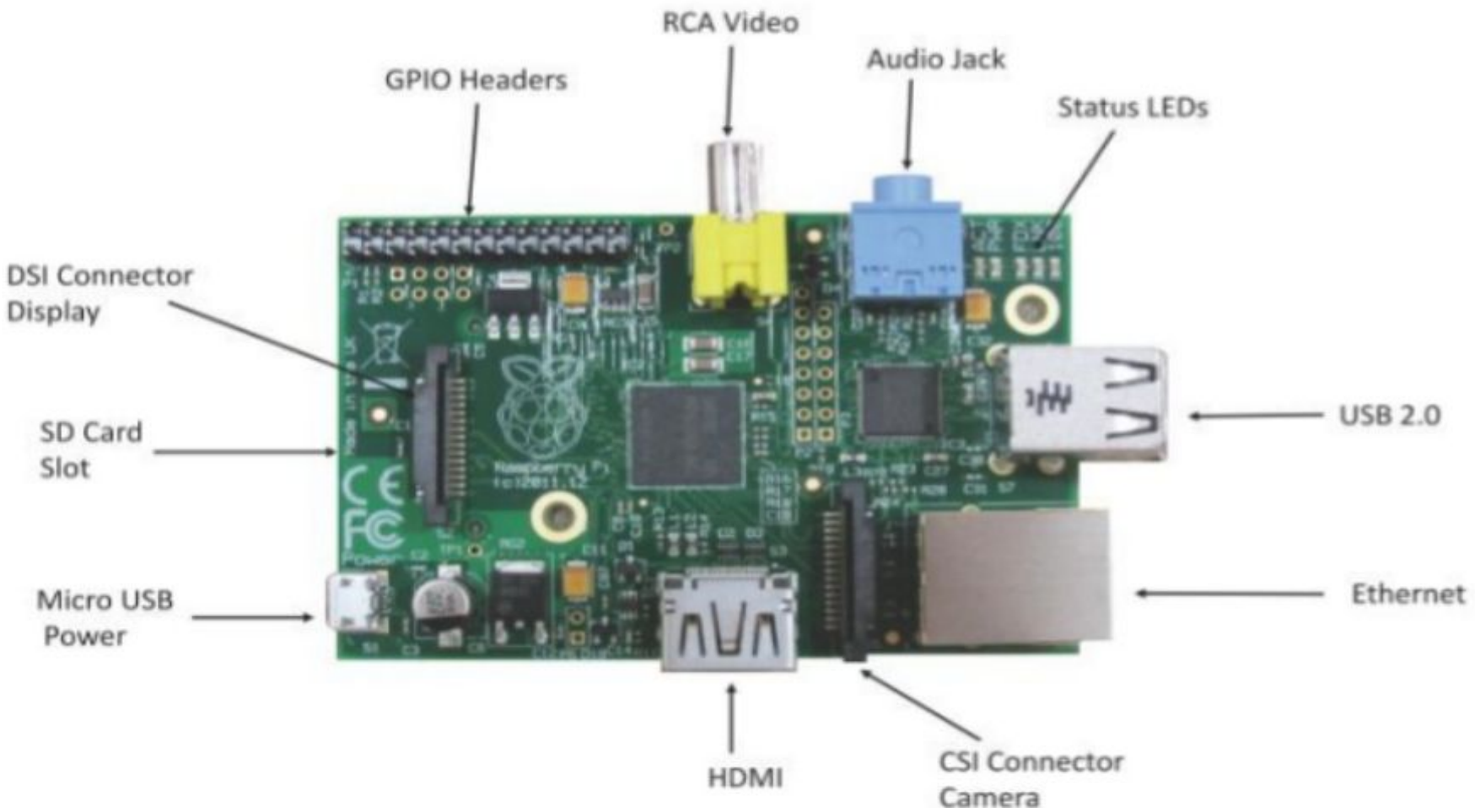
Building the Internet of Things
with Raspberry Pi

Hardware Specifications of Raspberry Pi

- Ethernet Ports : RJ45 ,10/100 Base T Ethernet or Wifi.
- HDMI Socket – Multimedia Interface
- Composite Video Output :RCA video
- SD Card Slot
- Powered from Micro USB Socket
- Processor & RAM : ARM
- USB ports,Audio Output
- GPIO pins
- DSI and CSI



Hardware Specifications of Raspberry Pi



Raspberry pi - board

Software Requirements
(Linux on Raspberry Pi)

- Raspbian
  - Raspbian Linux is a Debian Wheezy port optimized for Raspberry Pi.
- Arch
  - Arch is an Arch Linux port for AMD devices.
- Pidora
  - Pidora Linux is a Fedora Linux optimized for Raspberry Pi.
- RaspBMC
  - RaspBMC is an XBMC media-center distribution for Raspberry Pi.
- OpenELEC
  - OpenELEC is a fast and user-friendly XBMC media-center distribution.
- RISC OS
  - RISC OS is a very fast and compact operating system.

References

- Arshdeep Bahga, Vijay Madisetti, “Internet of Things – A hands-on approach”, Universities Press, 2015.
- SKIFI labs