Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

Computer ports.

Parallel port

8 / 16 / 32 bit data parallelly pass হলে data transfer wire 8 / 16 / 32 টি হয়।
data transfer wire ছাড়াও cable এর মধ্যে আরো wire থাকে যা data communication control করে।
So, normally parallel port এ যে cable use হয় তার মধ্যে 25 or 36 pin connector / wire থাকে।

- parallel ports bidirectional
- parallel ports speed

  from (50-150) KBPS $\xrightarrow{\text{up to}}$ 2 MBPS

- synchronization এর জন্য extra wire লাগে।
- data control এর জন্য কিছু extra wire লাগে।

Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

Serial port (Bidirectional.)

- serial port is a electronic communication gateway used for transferring data one bit at a time.
- serial port এ 2 টি data communication wire থাকে। (1 for send data, 1 for receive data)
- serial port replaced with USB port (universal serial bus)
  Vga port
  Ethernet port
- DB9 serial port has 9 pin connector
- Data transfer এর জন্য 2 টি pin থাকে। বাকি pin দিয়ে data control হয় তথাই sender যখন data পাঠাতে চাইবে তখন সে দেখবে receiver data গ্রহণ করতে ready নাকি, receiver acknowledgement দিলেই data send শুরু হয়। এই সকল কাজ এর জন্য extra কিছু pin লাগে যা parallel port তুলনায় অনেক কম। যা parallel port তুলনায় extra wire লাগে না।
- synchronization এর জন্য extra wire লাগে না।
- Bidirectional port (2 টি data communication wire)

for send →

← for receive

Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

PS2 port

Purple PS2 ⟶ keyboard
Green PS2 ⟶ mouse

- keybord and mouse connect করার জন্য PS2 port use হয়।
- PS2 port এখন USB port দিয়ে replace হয়েছে। Why?

PS2 port এ যে mouse / keyboard connect করা হত তা যদি কখনো disconnected (wire খুলে গেলে) হত then আবার connect করলেও mouse/keybord কাজ করত না। pc restart দিলে then কাজ করত। So, PS2 is not "Plug and play" port.

- USB port হতে PS2 port faster.

Why?

PS2 single directional port. PS2 port শুধু যাতে mouse / keyboard এর জন্য design করা and mouse-keyboard input device থেকান data only 1 দিকে যায় তাই PS2 port এ 1 directional pin ছিল। data speed বেশি ছিল।

USB port bidirectional port. যদিও mouse/keyboad data only send করে তারপর ও USB port এ data send and receive এর জন্য আলাদা line. So, একটু speed কম ছিল। USB port not only for designed mouse & keyboard, that is why it has 2 data communication wire.

Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

USB (universal serial Bus)

- Most used connection point for data transfer
- It is a serial port
- It is designed for devices like printers, mouse, some external
- USB port speed 2.0 Mbps - 480 Mbps
- USB is a bi-directional port. (2 wire. for send & receive) ⟶ ⟵
- 4 pins
- No clock
- Usb-C (latest) feature : যে কোন orientation ও লাগাই না কেন device connected হবে।

pin	signal	color	description
1	Vcc	Red	+V
2	D-	White	Data -
3	D+	green	Data +
4	GND	Black	Ground

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Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

Firewire Port

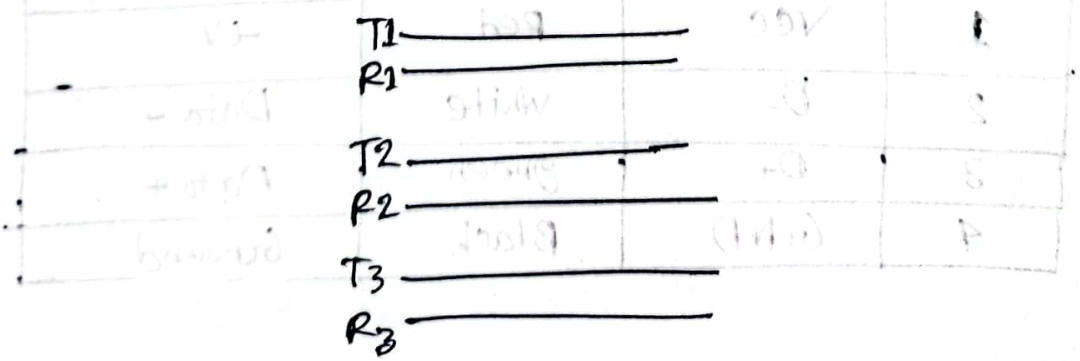
- IEEE 1394 port
- connect multiple type of devices that require faster data transmission speeds.
- version FireWire 800, FireWire 1600, FireWire 3200
- Support Plug and play

Ethernet Port

- Serial and parallel port এর combination.

There are multiple Transmitter data wire- receiver data wire pair.

একই সাথে multipl wire দিয়ে data যেতে আবার চাইলে 1 bit করেও data পাঠাতে পারি

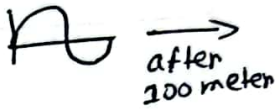


Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

- Ethernet port used for network hardware interface and devices that can support the ip protocol

Q • Why serial port का अविष्कार ethernet port use नहीं हुआ ?

Because Ethernet cable length between switches computers and routers is 100 meters or 328ft. After this 100 meters, the signal starts losing in amplitude. 

That is why we don't use ethernet port everywhere.

Q. How we resolve this signal losing amplitude problem?

Ans: Ethernt cable length between switchs computers and routers is 100 meters / 328ft. After 100 meters the signal starts losing in amplitude. If I want to use ethernet cables on longer distances, we have to use signal Boosters for every 100 meter.

The another more efficient way is to use fiber optic cable who go up to 20 km without any signal booster.

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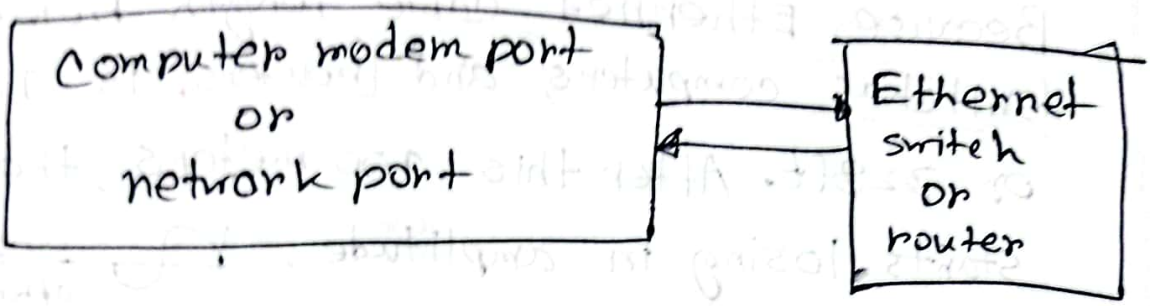
Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

- Coaxial and twisted pair cable was used as ethernet ports
- Twisted pair used for short distance.

Example:



- for long distances fiber optic links are used as Ethernet cable.

- Speed 10Mbps up to 10 Gbps.
- Client receives only 10 to 100 Mbps

Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

VGA & HDMI port (এর slide)

VGA port	HDMI port
① Video Graphics Array (VGA) connect devices between laptop, computer, DVD player to a display (TV, monitor, projector) device.	① High Multimedia Interface (HDMI) connect devices between laptop, computer DVD player to a display device (এটাও same)
② VGA carries only a video signal	② HDMI carry both video and adio signal
③ VGA carry analog video signal	③ HDMI port carry digital video signal
④ No data protection is serviced	④ HDMI port carry data in encryption with HDCP.
⑤ VGA ports doesn't support high resolution. Maximum possible resolution (2048 X 1536)	⑤ Suppor high resolution.
⑥ Refresh rate (60-70) Hz	⑥ Refresh rate more than 200 Hz.
⑦ For transfer audio signal we need extra cables.	⑦ We don't need extra cables for audio signal.
⑧ Data can be loss	⑧ Data cann't be loss

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Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

9. VGA cannot Transfer Audio, HDMI can. Why.

VGA port can only pass analog ~~ve~~ video signal and nothing else. HDMI port is developed to carry signals between an HD TV set and a set top player. It can carry video signal also carry audio signal up to 8 channels. It has CEC channel for communication between devices. For audio signal VGA port is unable. So, For audio signal we need external cable. But in HDMI we don't need 3-8 cables. we can do audio and video signal in one cable. Newer version HDMI port carry data over the internet too. VGA is usually used in computers while HDMI is used in HD tv sets and media players

Sub.: _____ SAT SUN MON TUE WED THU FRI

DATE: / /

Q. Why VGA port risk in Data loss?

VGA port carry analog video signal. That is why it is high chance to loss data. When we transfer data between computer to display device, sender have to send data in analog signal. So sender convert digital data to analog data and in conversion some data can be lost. when analog data came through the VGA cable, for display the data, the receiving data have to convert into digital data again. This conversion can loss some data. So, This is how for conversion analog to digital & digital to analog data can be lost.

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