

ประวัติวิทยากร



ชื่อ: ร.อ.สมโภช กุลธารารม

Name: Capt. Sompoch Kulthararom

ตำแหน่ง: อาจารย์แผนกการศึกษา กองวิทยากร ศูนย์ไซเบอร์ทหาร กองบัญชาการกองทัพไทย (บก.ทท. แจ้งวัฒนะ)

ประวัติการศึกษา :

- **ปริญญาโท:** วิทยาศาสตรมหาบัณฑิต สาขาวิชาเทคโนโลยีสารสนเทศ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้า พระนครเหนือ
- **ปริญญาตรี:** บริหารธุรกิจบัณฑิต สาขาระบบสารสนเทศมหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร

ประสบการณ์การทำงาน :

๒๕๕๒ - ๒๕๖๑ หัวหน้างานพัฒนาระบบเทคโนโลยีสารสนเทศ สำนักวิทยบริการและเทคโนโลยีสารสนเทศ มทร.พระนคร

๒๕๕๑ - ๒๕๕๒ Senior Programmer บริษัท SYSTOP PLUS (บริษัทรับพัฒนาเว็บแอปพลิเคชัน)

๒๕๔๙ - ๒๕๕๑ Developer บริษัท AISOFT (บริษัทรับพัฒนาแอปพลิเคชันด้านการป้องกัน)

Certificate :





SUCCESS

Lesson 1

Identifying Computer Hardware



ร.ต. สมโภชน์ กุลธารารมณ อจ.แผนกการศึกษา กวก.ศชบ.ทหาร

- ประวัติการศึกษา
 - ปริญญาโท วท.ม. สาขาเทคโนโลยีสารสนเทศ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
 - ปริญญาตรี วท.บ. สาขาระบบสารสนเทศ มหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร
- ประวัติการทำงาน
 - พ.ศ. 2549- 2551 ตำแหน่ง Developer บริษัท AISOFT (บริษัทรับพัฒนาแอปพลิเคชันด้านการท่องเที่ยว จองโรงแรม จองตั๋วเครื่องบิน)
 - พ.ศ. 2551- 2552 หัวหน้างานพัฒนาซอฟต์แวร์ (ชำนาญการ) สำนักวิทยบริการและเทคโนโลยีสารสนเทศมหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร

Certificate

CompTIA: Classroom Trainer (CTT+), Project+, A+, Network+ , Security+

ORACLE: Oracle Database 11g Administrator Certified Associate

ADOBE: Visual Communication using Adobe Photoshop® CS6

NSTDA (สวทช): Information Technology Professionals Examination Council: ITPEC

Microsoft: Microsoft Certified Trainer, Microsoft Certified Solution Expert



ร.ต. ณรงค์ฤทธิ์ วังคีรี ประจำแผนกตรวจสอบวิเคราะห์ กรร.ศชบ.ทหาร

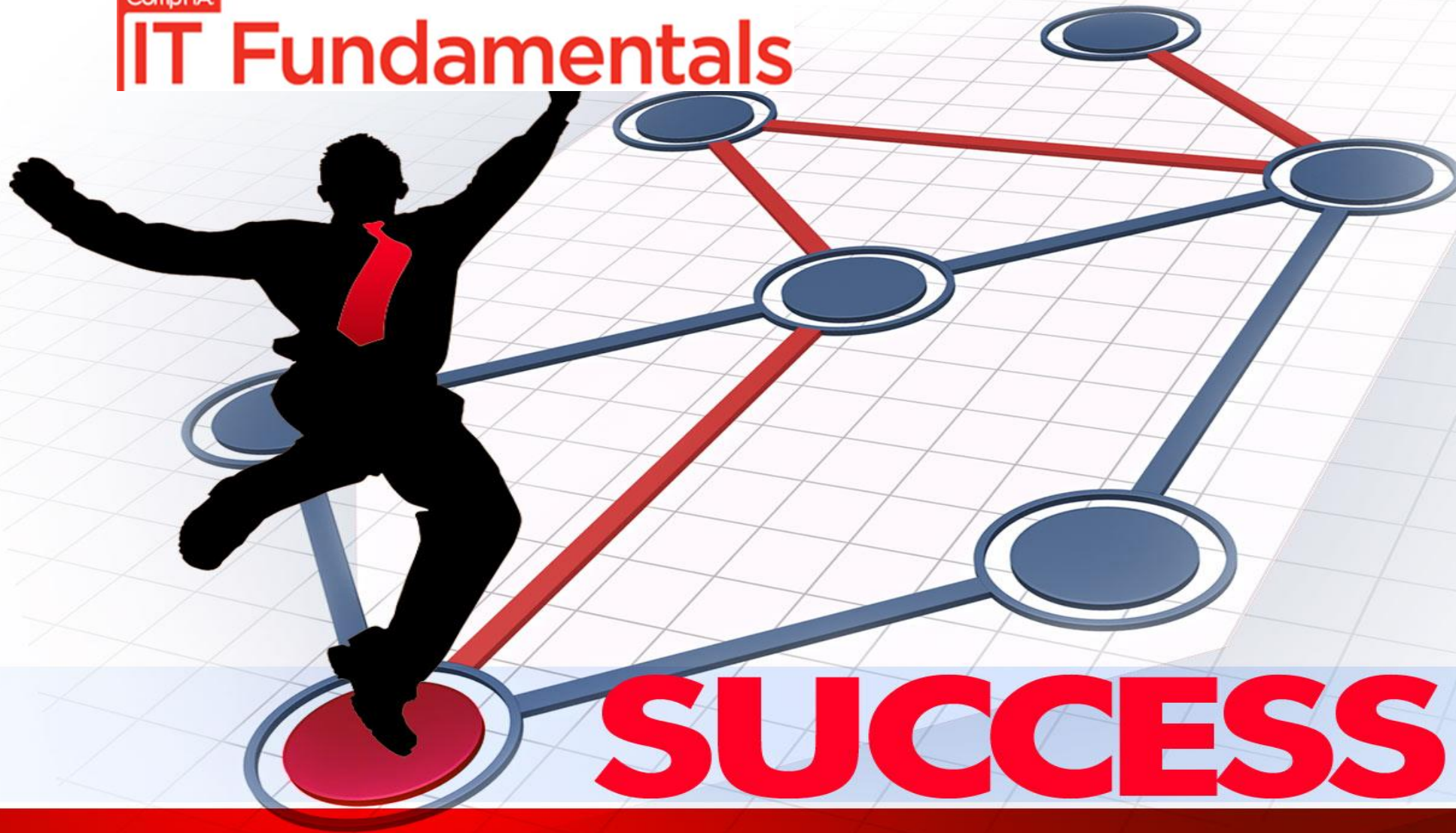
- ประวัติการศึกษา

- ปริญญาเอก ปร.ด. สาขาเทคโนโลยีสารสนเทศ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
- ปริญญาโท วท.ม. สาขาเทคโนโลยีสารสนเทศ(สื่อสารข้อมูลและเครือข่าย)มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
- ปริญญาตรี วท.บ. สาขาเทคโนโลยีสารสนเทศและการสื่อสาร (วิทยาการคอมพิวเตอร์) มหาวิทยาลัยสุโขทัยธรรมธิรา ช
- ปริญญาตรี บธ.บ. คอมพิวเตอร์ธุรกิจ มหาวิทยาลัยปทุมธานี

- ประวัติการทำงาน

- พ.ศ. 2549- 2558 อาจารย์ประจำสาขาเทคโนโลยีสารสนเทศ คณะวิศวกรรมศาสตร์เทคโนโลยี มหาวิทยาลัยปทุมธานี
- พ.ศ. 2558- 2561 อาจารย์ประจำสาขาระบบสารสนเทศคณะเทคโนโลยีสังคม มหาวิทยาลัยเทคโนโลยีราชมงคลตะวันออก

IT Fundamentals



Topic A :

Identify Types of Computing

Computer Device

A computing device :

✓ is an electronic machine that uses binary data to automatically perform calculations.

- Personal Computers
- Desktop Computers
- Laptop Computers
- Tablets
- Smartphones
- Servers
- Other Computing Devices

SUCCESS



Personal Computer

SUCCESS



Personal Computer

Personal Computer SUCCESS



Fat Clients



Thin Clients



SUCCESS



GAMING PC

Desktop Computer



SUCCESS

All-in-One Desktop Computer

SUCCESS



All-in-One Desktop Computer



Laptop Computer



Laptop Computer

SUCCESS

Smartphones

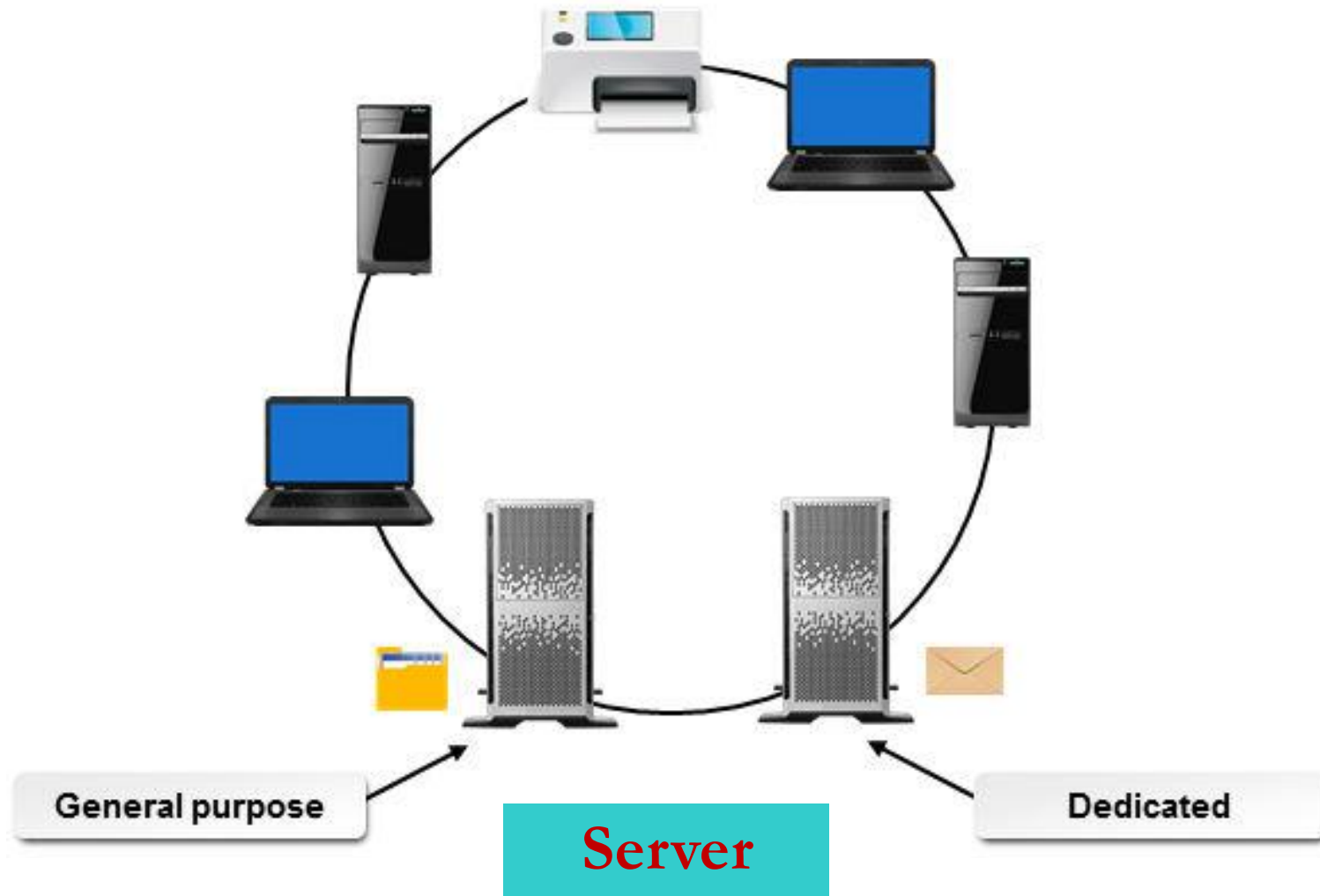


Smartphones

SUCCESS

Server

SUCCESS



Other Computer Devices



Supercomputer



Mainframe



PDA



eBook
reader



Multimedia
Player

Other Computer Devices

SUCCESS



SUCCESS

- ประวัติศาสตร์คอมพิวเตอร์

<https://www.youtube.com/watch?v=85hCYN>

- คอมพิวเตอร์ขนาดเล็ก

<https://www.youtube.com/watch?v=aLITHNJj01s>

Identify Internal Computer Components

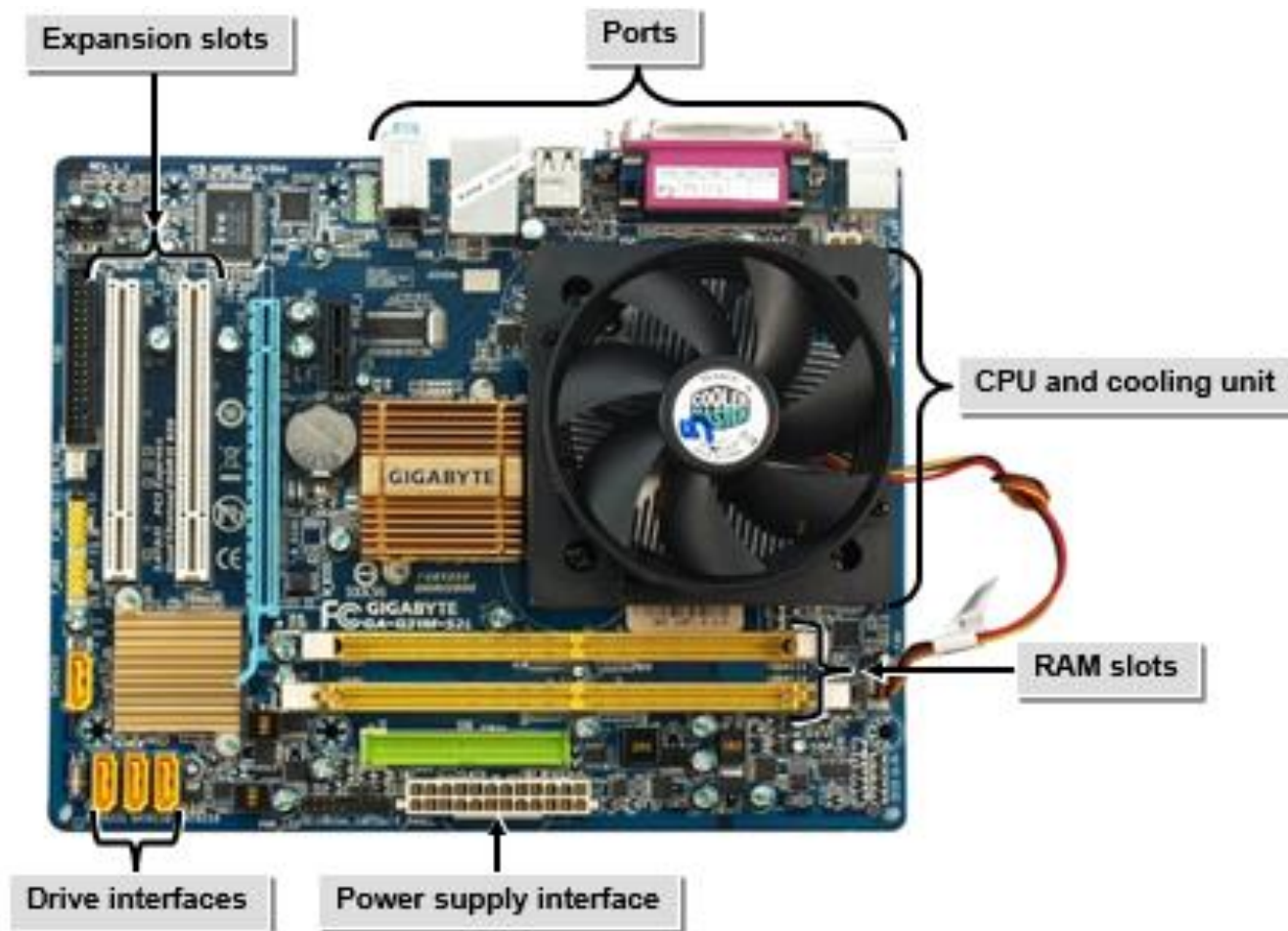
- ✓ Motherboards
- ✓ CPUs
- ✓ Power Supplies
- ✓ RAM
- ✓ Storage
- ✓ Expansion Cards
- ✓ Cooling Systems

SUCCESS

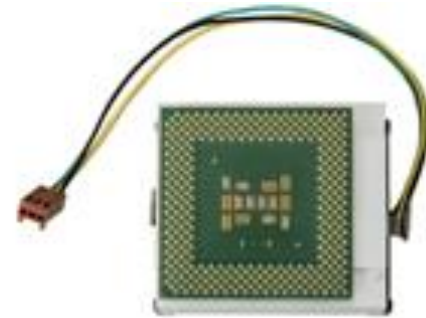
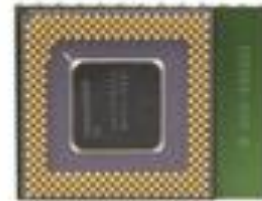


Motherboards

: Sometimes called System Board or Mainboard



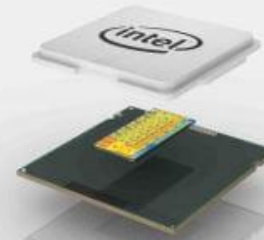
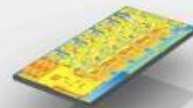
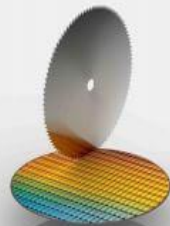
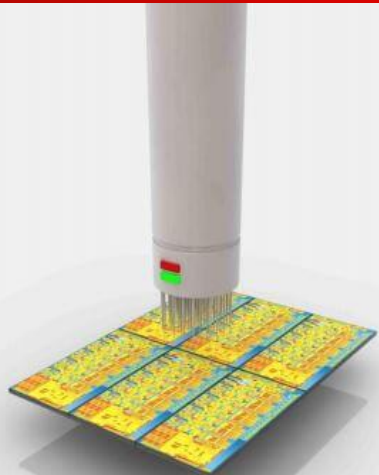
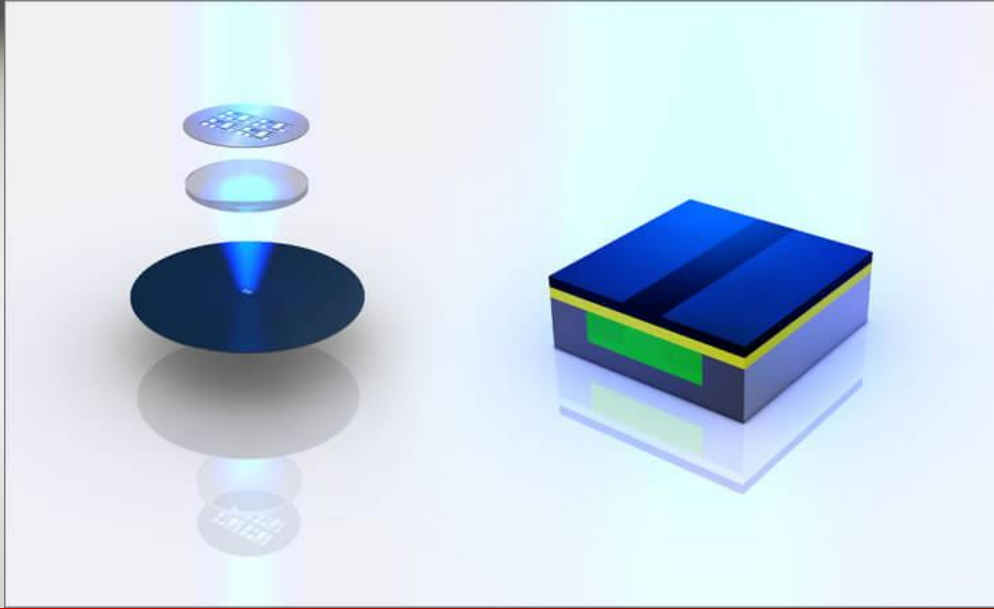
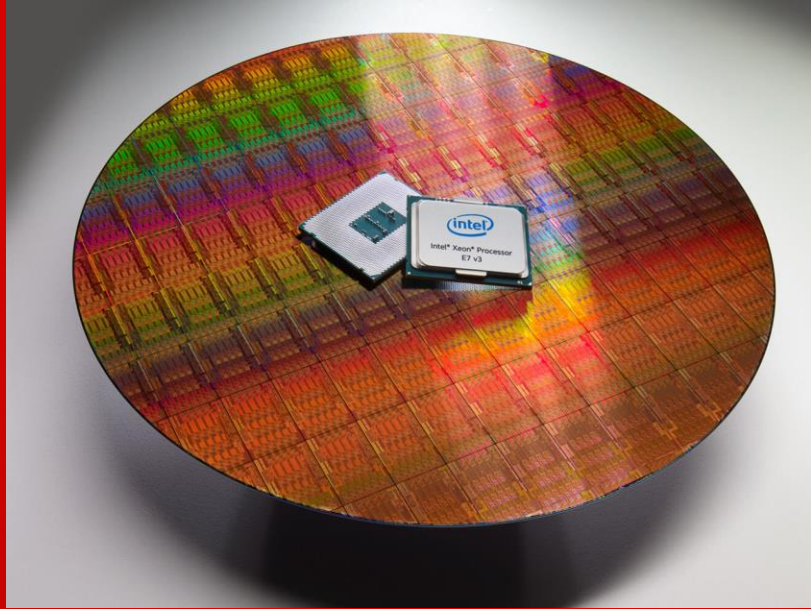
Central processing unit (CPU)



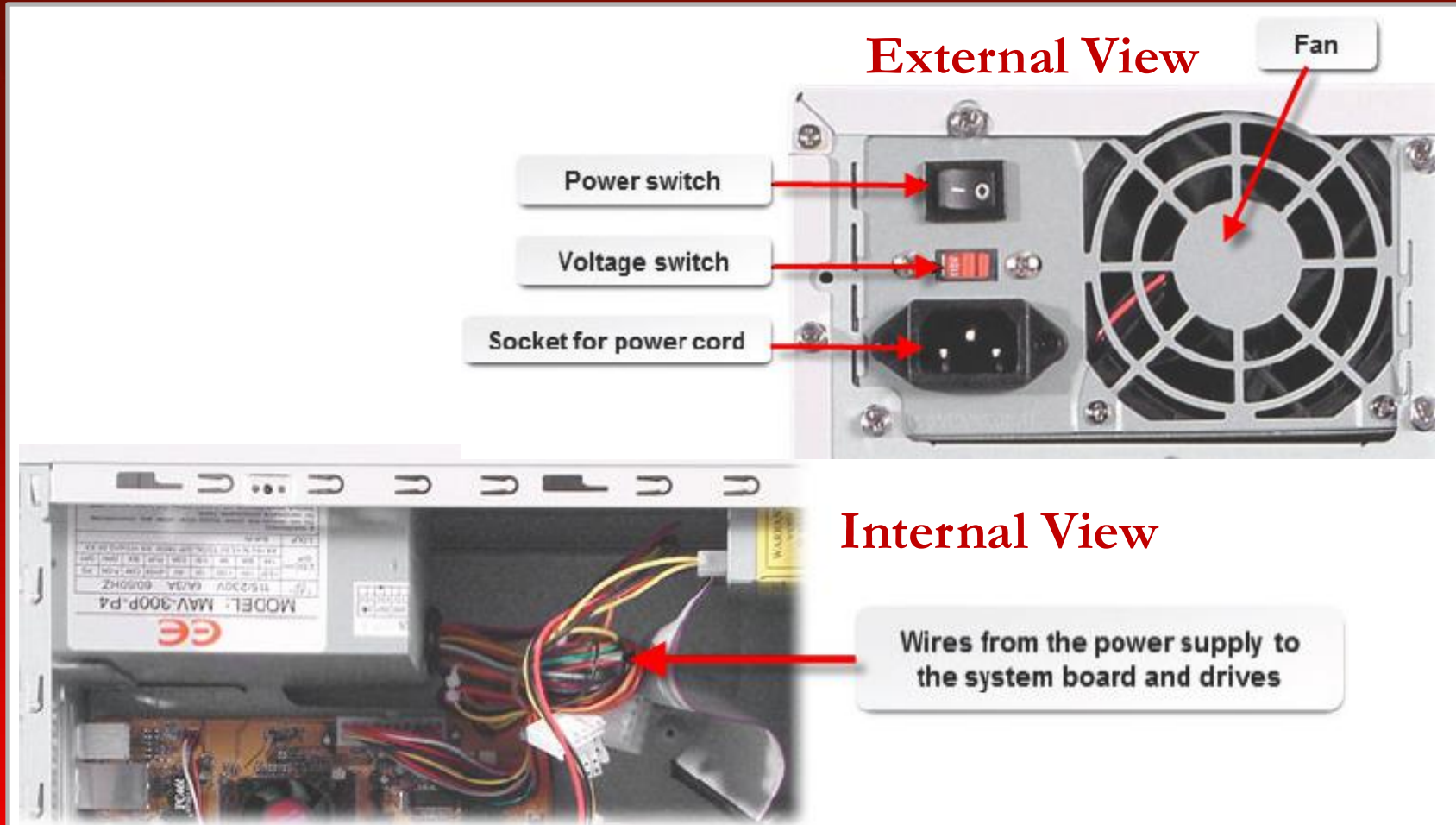
SUCCESS



SUCCESS



Power Supplies



The power supply unit of a desktop computer

Random access memory (RAM)

Random access memory (RAM) :

- ✓ is volatile memory.
- ✓ measure larger amounts of memory

<i>Memory Unit</i>	<i>Description</i>
Byte	One character (a letter, number, space, or punctuation mark). A byte consists of 8 bits.
Kilobyte (KB)	1,024 bytes or 8,192 bits constitute 1 KB.
Megabyte (MB, Meg, or M)	1,048,576 bytes or 1,024 KB constitute 1 MB.
Gigabyte (GB)	1,073,741,824 bytes or 1,024 MB constitute 1 GB.
Terabyte (TB)	1,099,511,627,776 bytes or 1,024 GB constitute 1 TB.

SUCCESS

DIMM vs. SODIMM

Dual in-line memory modules (DIMMS) :

- ✓ are found in many systems, and they have a 64-bit data path.
- ✓ DIMMs generally have 16 or 32 chips per module.

512MB DIMM



DIMM vs. SODIMM

Small outline dual in-line memory modules (SODIMMs) :

- ✓ Small outline dual in-line memory modules (SODIMMs) are half the size of DIMMs .
- ✓ have either 32- or 64-bit data paths.

Crucial 4GB SODIMM



SUCCESS

PC DDR2

PC DDR4(3200)

PC DDR5(5600)

PC DDR3

PC DDR4(3600-4800)

PC DDR5(6000)

PC DDR4(2133-2400)

PC DDR5(4800)

PC DDR5(6200-8400)

PC DDR4(2666-3000)

PC DDR5(5200)

เรียงตาม:

PC DDR5(6200-8400)

ดูทั้งหมด

CORSAIR



RAM DDR5(6400) 32GB
(16GBX2) CORSAIR
VENGEANCE RGB BLACK

TFORCE



RAM DDR5(6400) 32GB
(16GBX2) TEAM DELTA RGB
BLACK

TFORCE



RAM DDR5(6400) 32GB
(16GBX2) TEAM DELTA RGB
WHITE

KINGSTON



RAM DDR5(6400) 32GB
(16GBX2) KINGSTON FURY
BEAST RGB (KF564C32BBAK2)



Storage



Hard Drive



Solid state drive



Optical drive

SUCCESS



SUCCESS

SSD SATA 2.5" 128 GB

SSD SATA 2.5" 2 TB UP

SSD M.2 PCIe/NVMe 128 GB

SSD M.2 PCIe/NVMe 2 TB UP

SSD SATA 2.5" 256 GB

SSD M.2 SATA 128 GB

SSD M.2 PCIe/NVMe 256 GB

SSD SATA 2.5" 512 GB

SSD M.2 SATA 256 GB

SSD M.2 PCIe/NVMe 512 GB

SSD SATA 2.5" 1 TB

SSD M.2 SATA 512 GB UP

SSD M.2 PCIe/NVMe 1 TB

☰ 🖨️ ⬇️ เรียงตาม:

SSD M.2 PCIe/NVMe 1 TB

ดูทั้งหมด

👍 Recommend



👍 Recommend



240 GB SSD SATA BLACKBERRY
(BBR240GST1)

240 GB SSD SATA GIGABYTE
(GSTFS31240GNTD)

240 GB SSD SATA HIKSEMI NEO
C100 (HS-SSD-C100 240G)

256 GB SSD SATA BLACKBERRY
(BBR256GST1)

Types of Optical Discs

- ✓ CD-ROM
- ✓ CD-R
- ✓ CD-RW
- ✓ DVD-ROM
- ✓ DVD-R
- ✓ DVD+R
- ✓ DVD+R DL
- ✓ DVD-RW
- ✓ DVD+RW
- ✓ DVD-RAM
- ✓ BD-ROM

SUCCESS



USB Drive

SUCCESS



Multi-card Readers and Writers



SUCCESS

Mobile Media Devices



SUCCESS

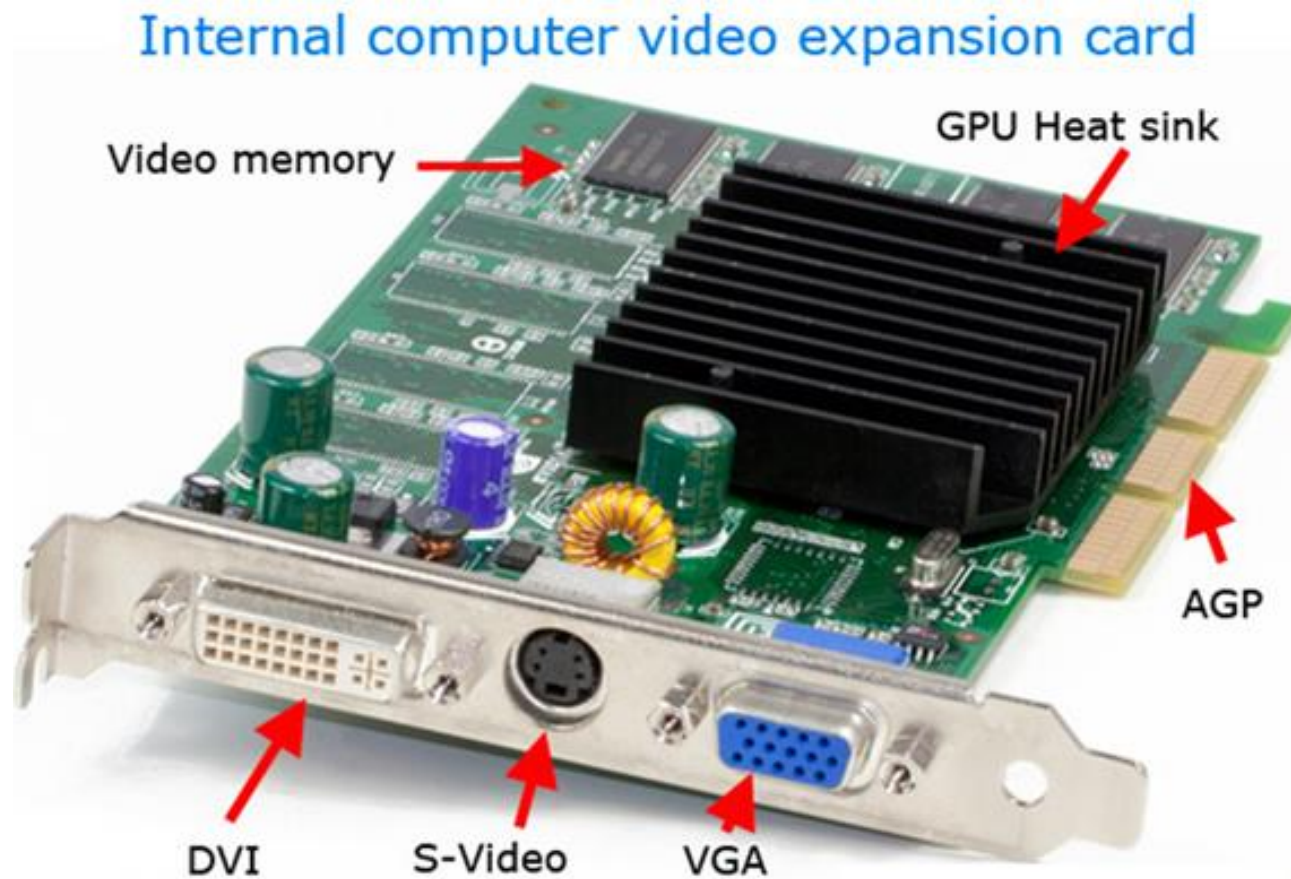
Expansion Cards

An expansion card :

- ✓ is a printed circuit board that you install into a slot on the computer's system board to expand the functionality of the computer.
- ✓ Expansion card type :
 - Video card
 - Audio card
 - Network card
 - Modem

SUCCESS

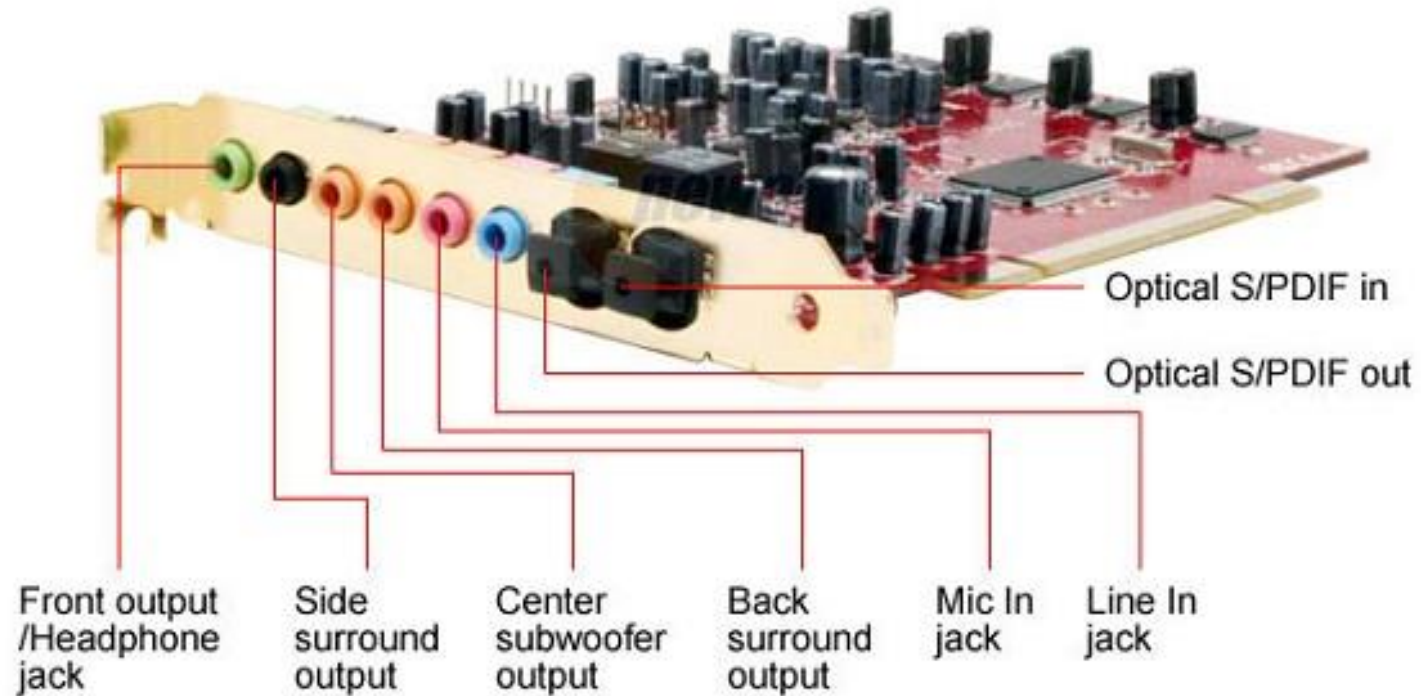
Expansion Cards



Video Card

SUCCESS

Expansion Cards

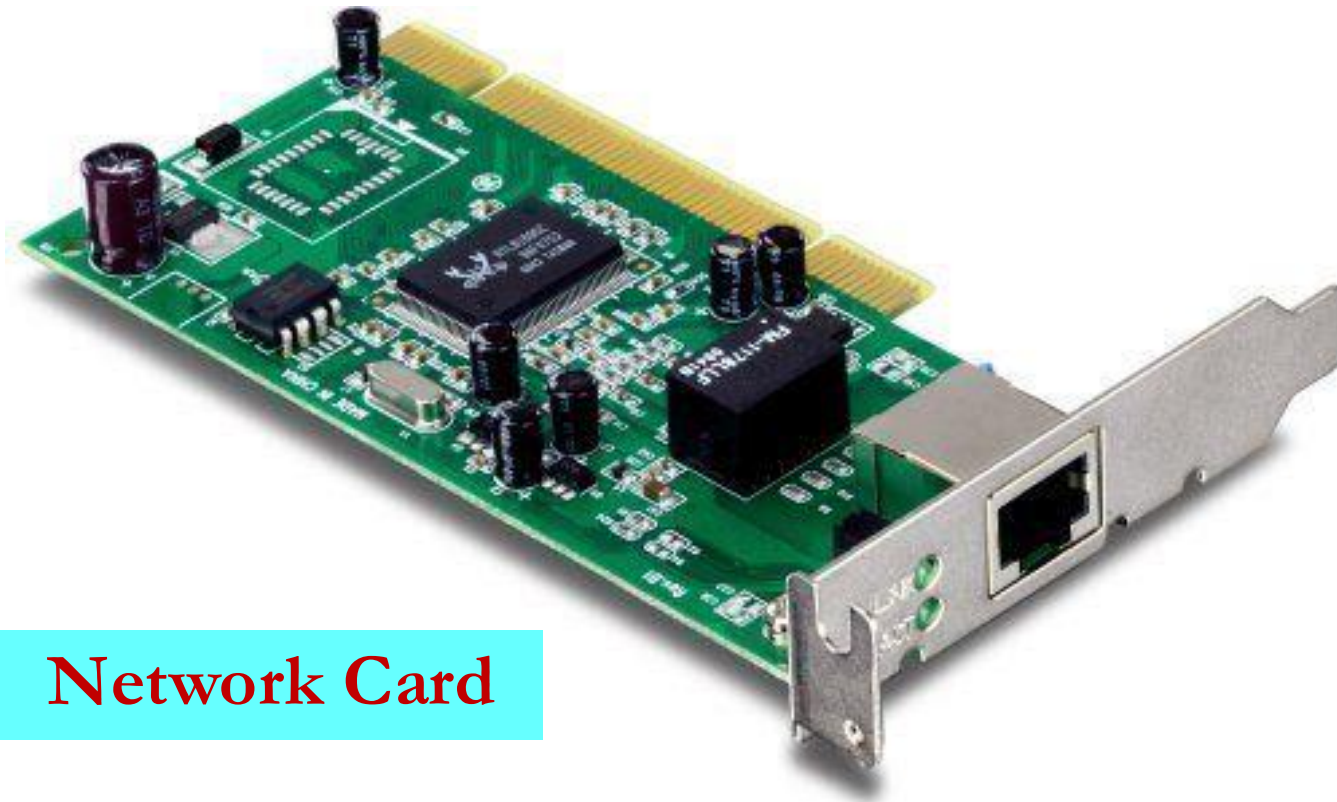


Audio Card

SUCCESS

Expansion Cards

SUCCESS



Network Card

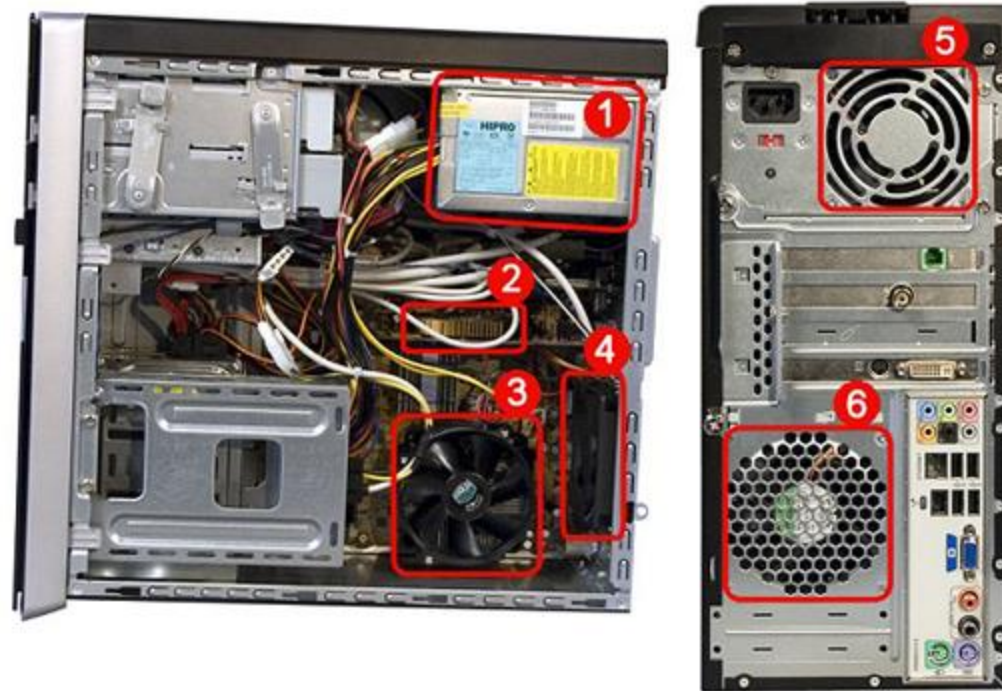
Expansion Cards



Modem



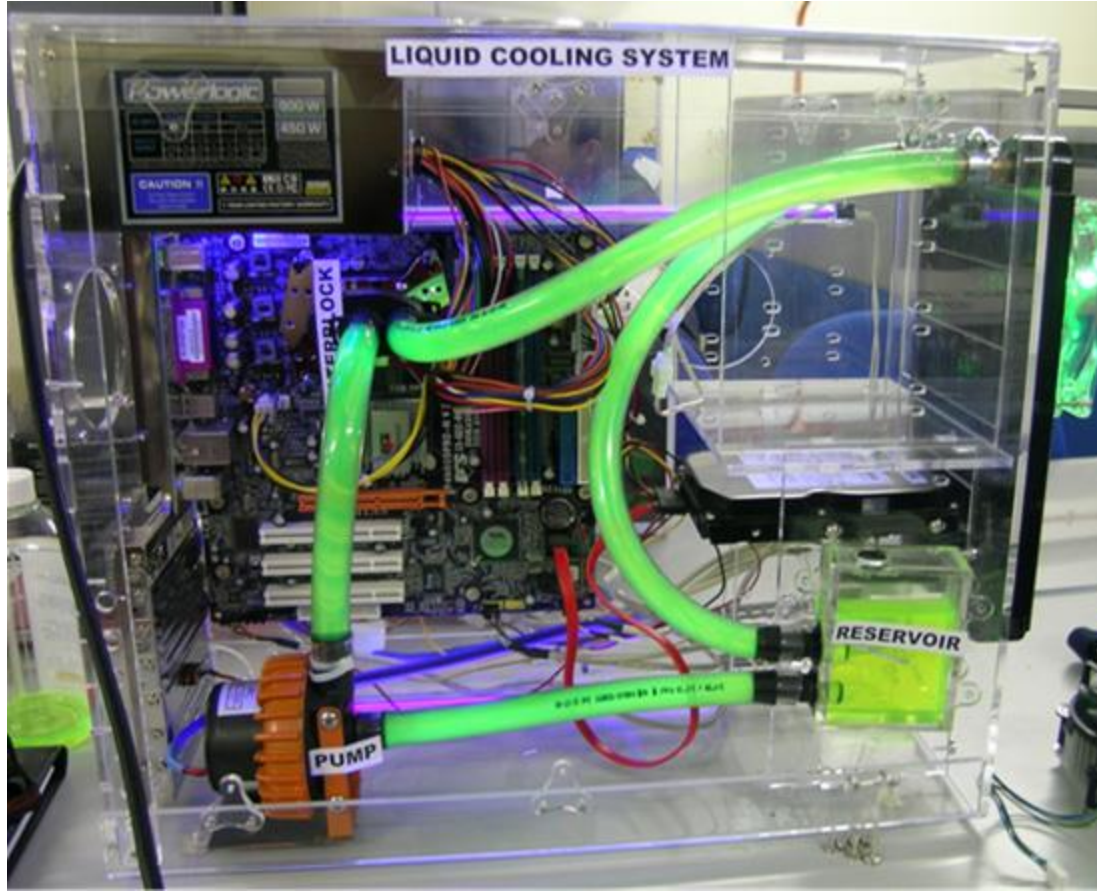
Cooling System



Fans

SUCCESS

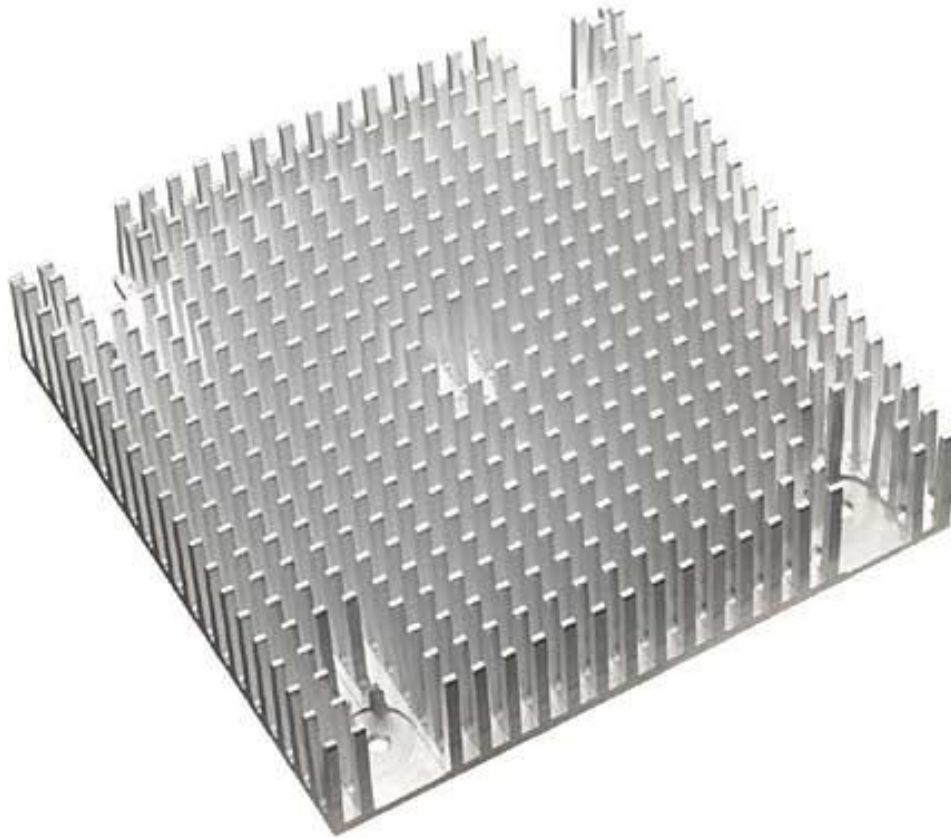
Cooling System



Liquid Cooling

SUCCESS

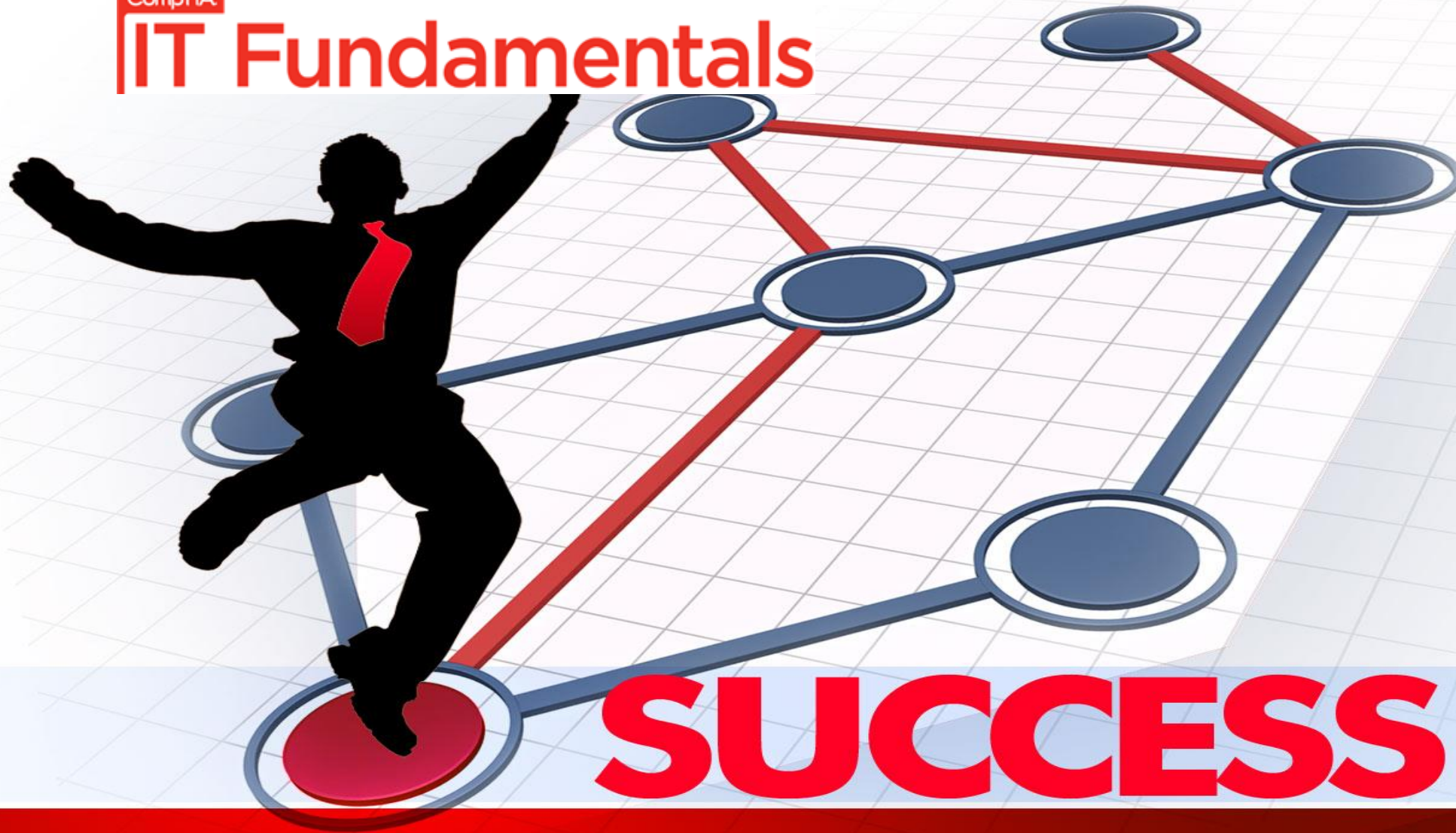
Cooling System



Heat sink

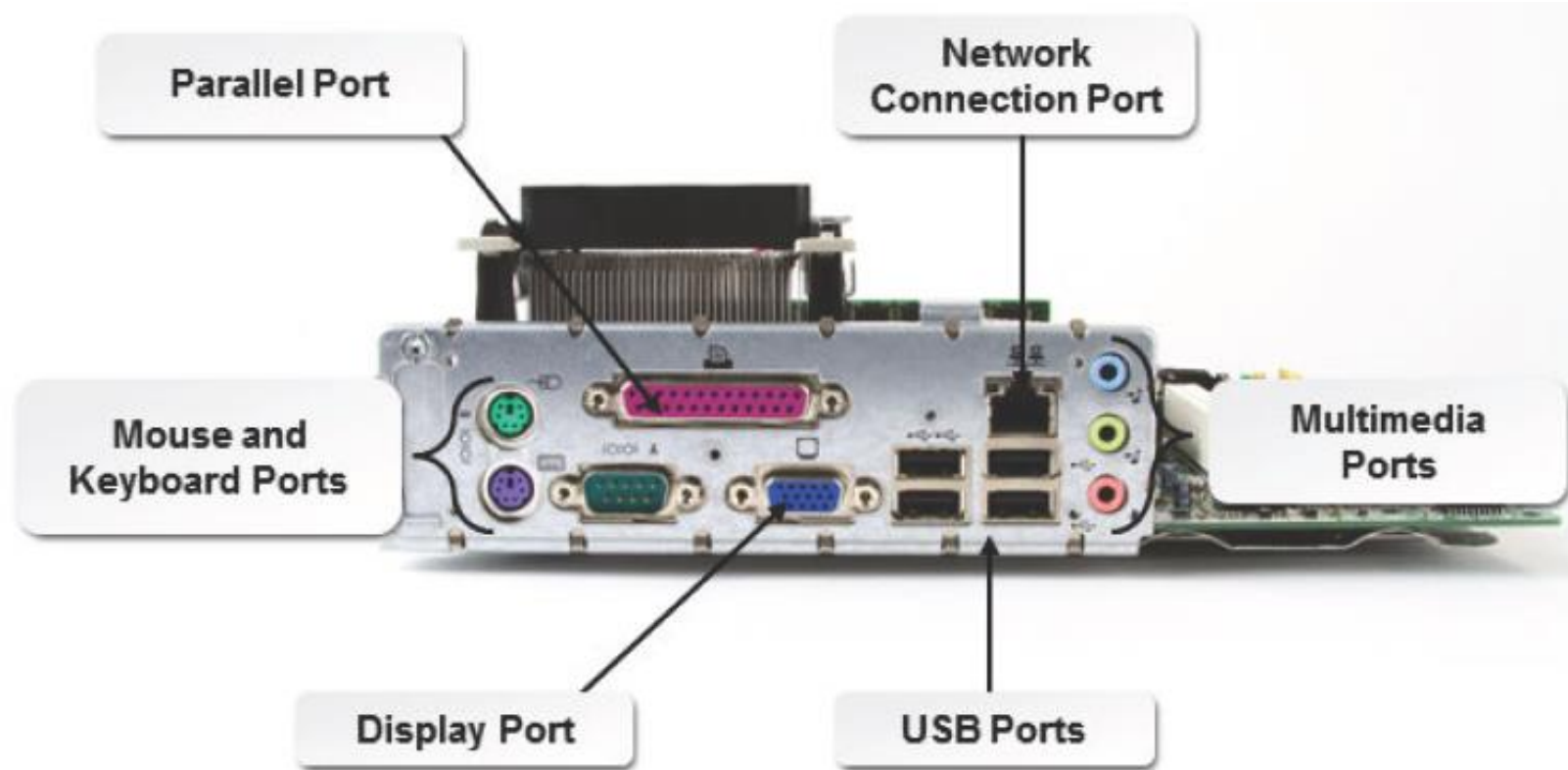
SUCCESS

IT Fundamentals



Topic C: Common Computer Connector Types

Ports



Ports on the personal
computer

Genders / Port Shapes

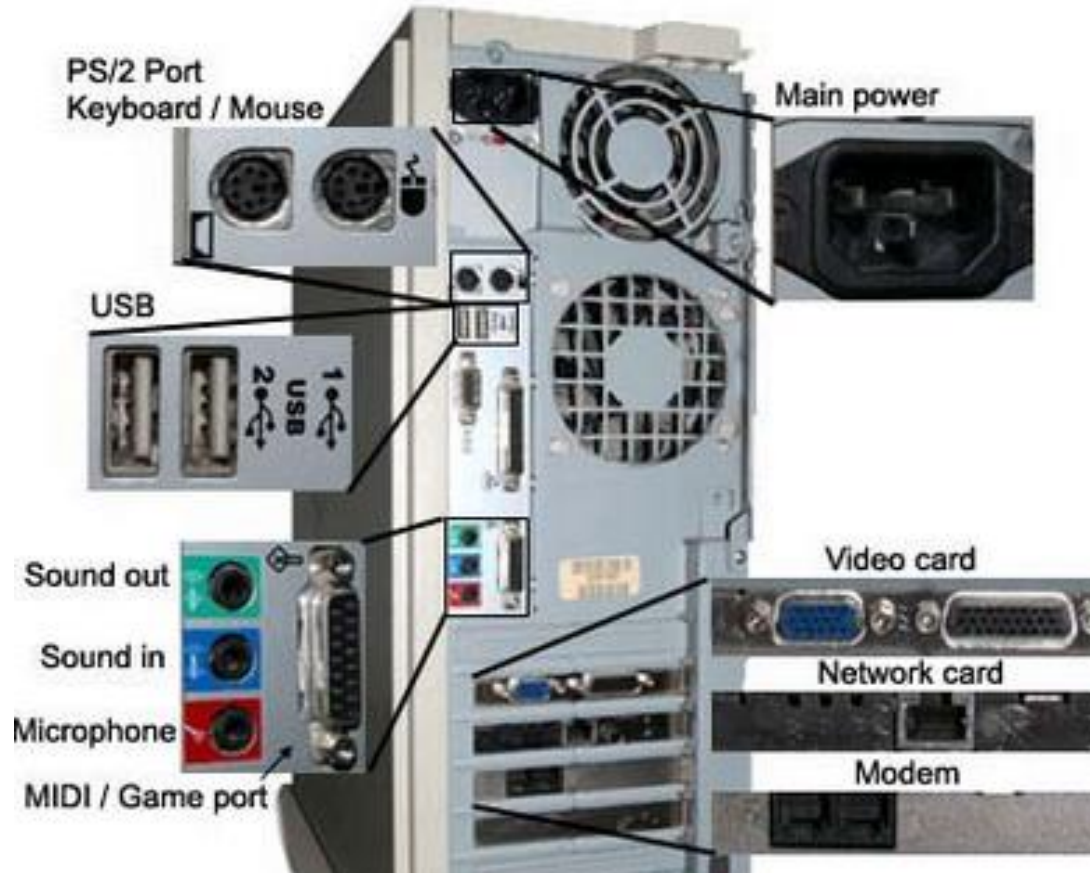
CONNECTOR	DB-9, 9-pin male	DB-9, 9-pin female	DB-15HD, 15-pin high-density female	24-pin DVI
USE	serial port, external modem	EGA and CGA video	VGA and EGA video	digital video interface monitor
CONNECTOR	DB-25, 25-pin male	DB-25, 25-pin female	36-pin female, mini ribbon	
USE	serial port, external modem, SCSI	parallel port, printer, tape backup	printer	
CONNECTOR	36-pin Centronics female	50-pin Centronics female	DB-15, 15-pin female	
USE	printer	SCSI	game port	
CONNECTOR	USB	FireWire	RJ-11, 6-pin female, modular telephone	5-pin 180° female DIN
USE	connects to 127 different peripheral devices	connects to 63 different peripheral devices	telephone, modem	keyboard, MIDI
CONNECTOR	RJ-45, 8-pin female	BNC, male coaxial	6-pin male, mini DIN	Miniplug
USE	LAN	LAN	mouse, keyboard	speaker & microphone

SUCCESS

Connections

SUCCESS

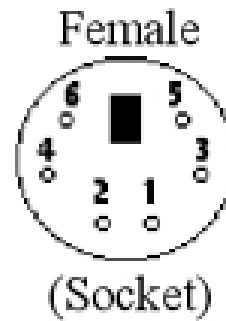
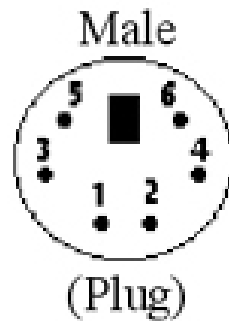
Back of computer case and each connection



A personal computer connection

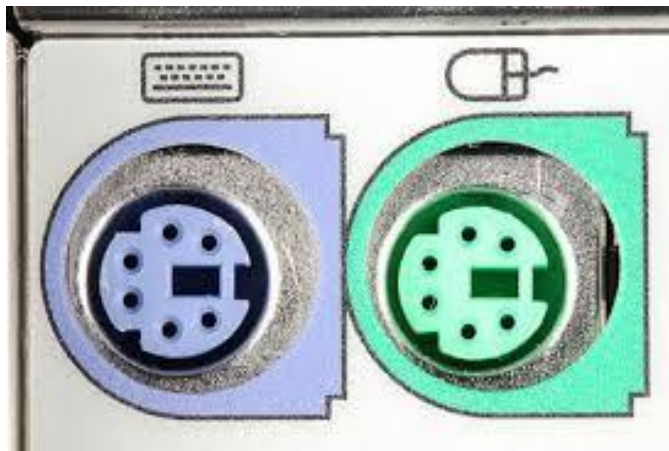
P/S2 Ports and Connectors

SUCCESS



6-pin Mini-DIN (PS/2):

- 1 - Data
- 2 - Not Implemented
- 3 - Ground
- 4 - Vcc (+5V)
- 5 - Clock
- 6 - Not Implemented



Serial Ports and Connectors

SUCCESS

25-pin serial port
on a serial device



25-pin end of serial cable connects
to modem and 9-pin end
connects to computer's serial port

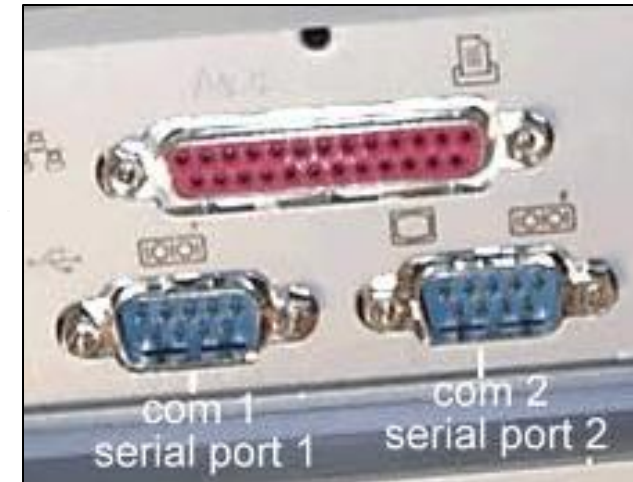


Serial Ports Naming

Serial port setting :

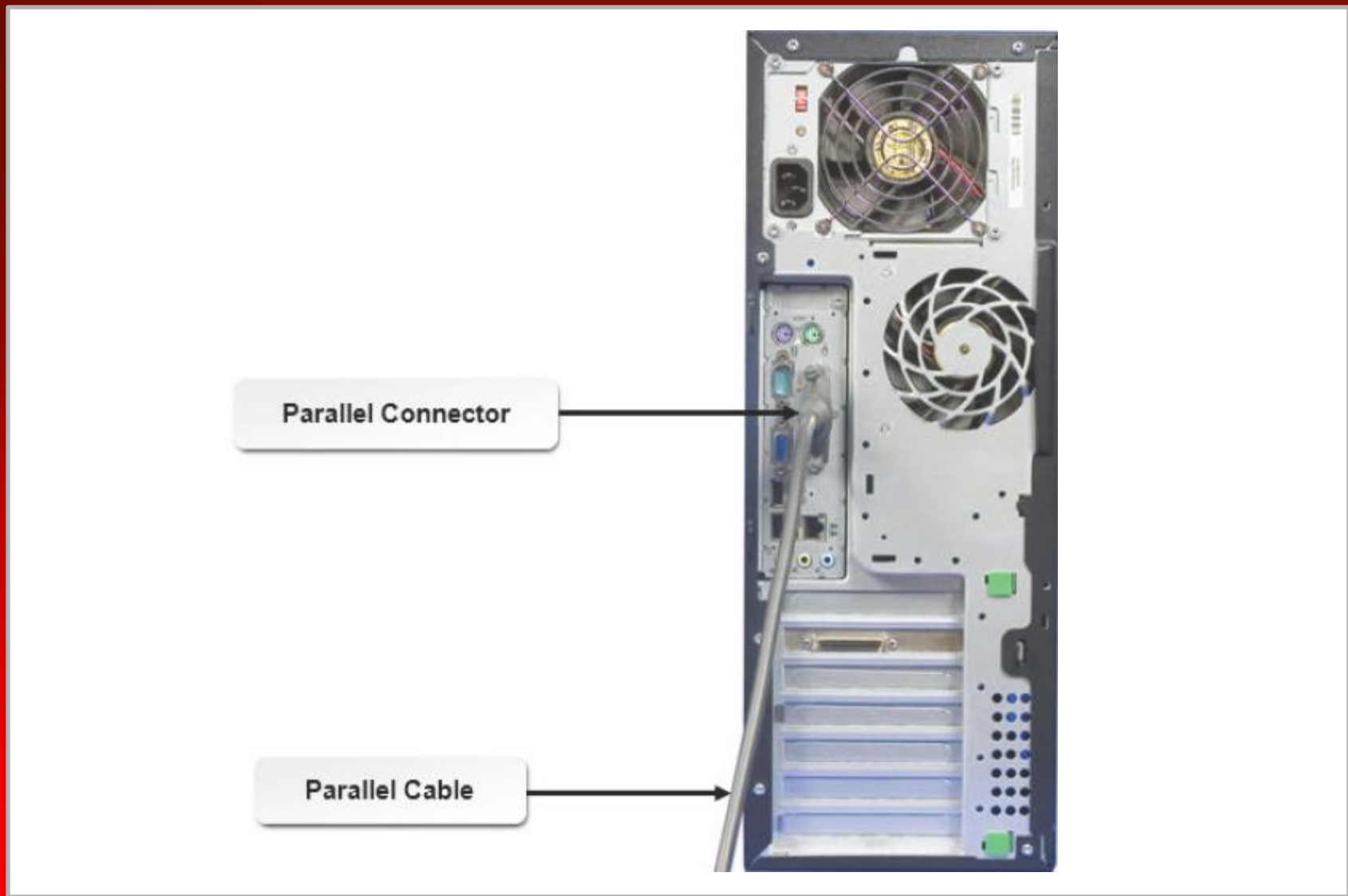
- ✓ 3F8/IRQ4 (COM1) : default the first serial port
- ✓ 2F8/IRQ3 (COM2) : default for the second serial port.
- ✓ 3E8/IRQ4 (COM3)
- ✓ 2E8/IRQ3 (COM4)

COM Port	Base Address	IRQ Setting
COM1	3f8	4
COM2	2f8	3
COM3	3e8	4
COM4	2e8	3



SUCCESS

Parallel Ports and Connectors

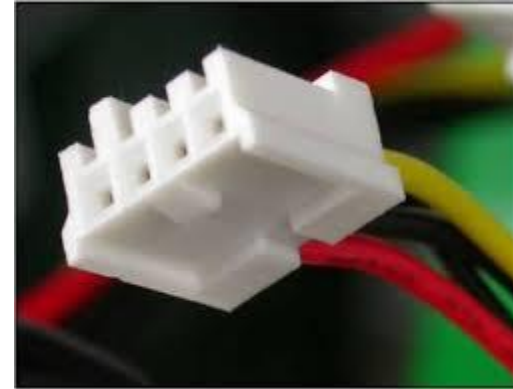


SUCCESS

Power Connections & Connectors



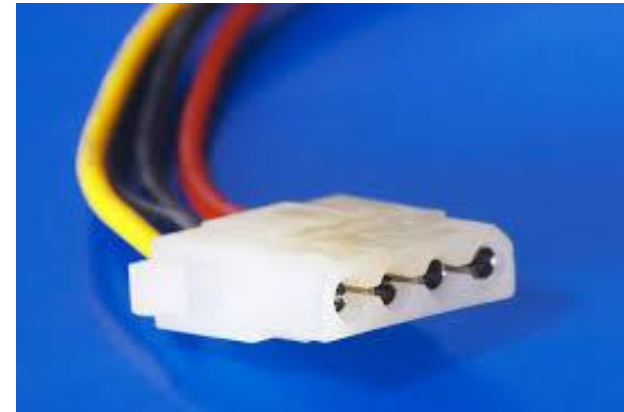
Main power
connector



Berg
connector



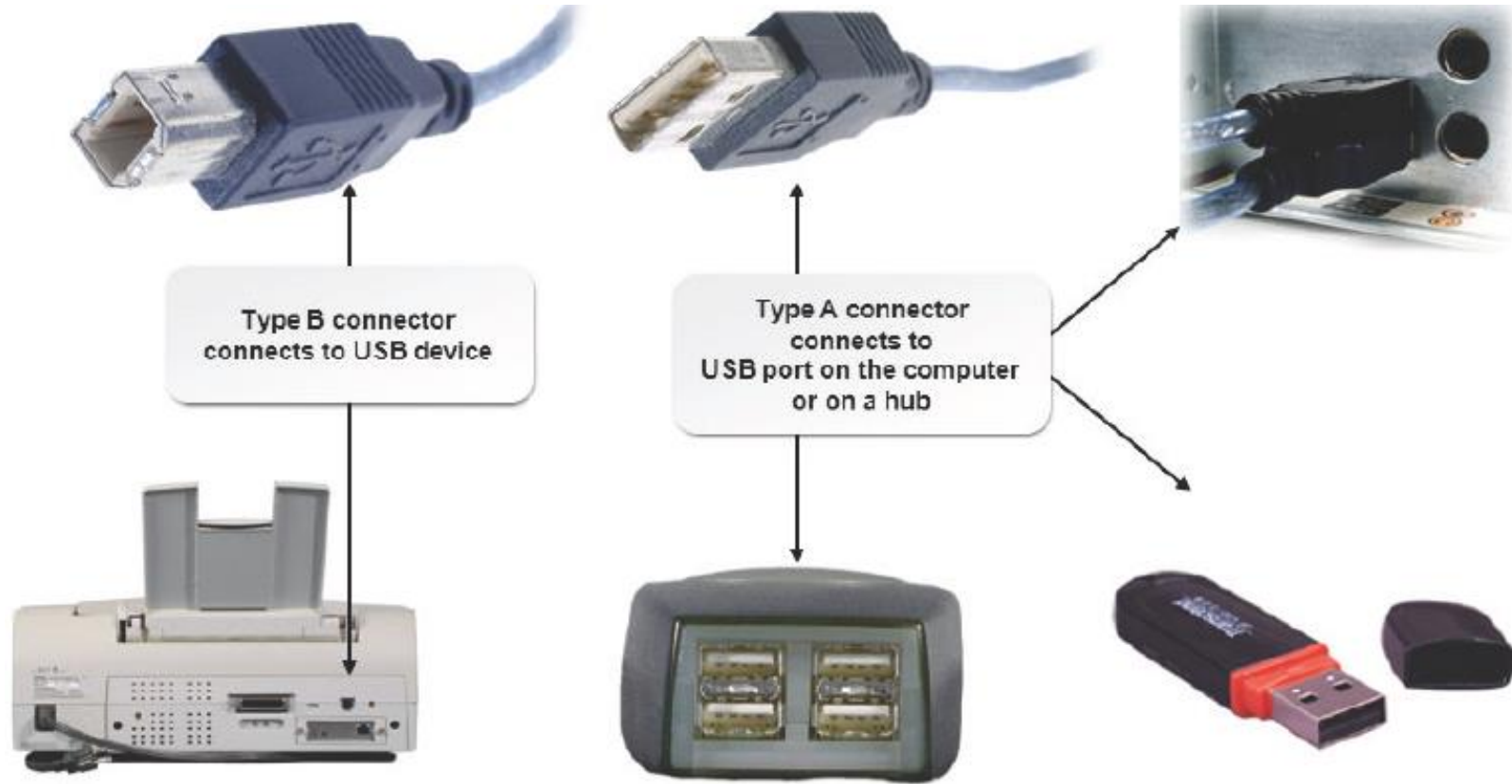
SATA power
connector



Molex connector

SUCCESS

USB Ports and Connectors



USB Connections

SUCCESS

USB Standards

	Logo	Speed	Transmission	Power Supply	Cable Length
USB1.1		Low-speed(1.5Mbps) Full-speed(12Mbps)	Half-duplex two-wire differential signaling	5V / 500mA	5M
USB2.0		Low-speed(1.5Mbps) Full-speed(12Mbps) High-speed(480Mbps)	Unidirectional data flow with negotiated directional bus transitions	5V / 500mA	5M
USB3.0		Low-speed(1.5Mbps) Full-speed(12Mbps) High-speed(480Mbps) Super-speed(5.0Gbps)	Dual-simplex, four wire differential signaling separate from USB2.0 signaling Simultaneous bi-directional data flows	5V / 900mA	5M

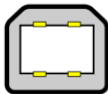
FireWire Terminology : IEEE 1394 Standard

SUCCESS

USB 1.0
12mbps



Type A



Type B



Mini-A



Mini-B



Micro-A

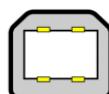


Micro-B

USB 2.0
480mbps



Type A



Type B



Mini-A



Mini-B



Micro-A

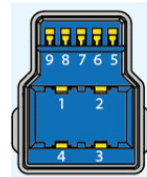


Micro-B

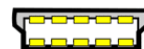
USB 3.1
Gen1
(Previously 3.0)
5gbps



Type A



Type B



Mini-B



Micro-B

USB 3.1
Gen2
10gbps

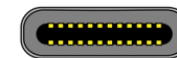


Type A



Type-C

USB 3.2
20gbps

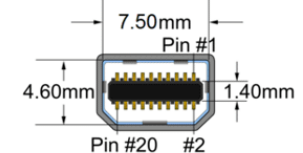


Type-C

Thunderbolt
2
20gbps



Mini DisplayPort
Connector

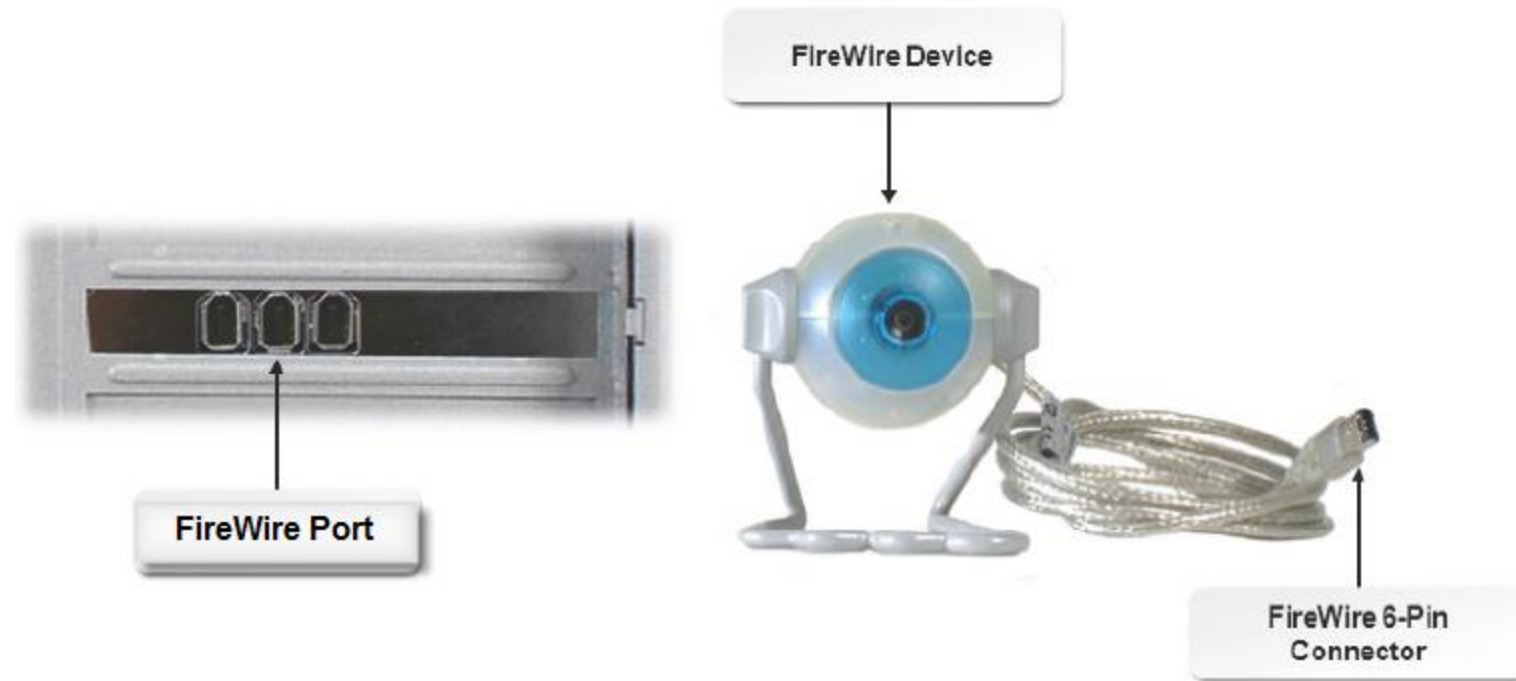


Thunderbolt
3
40gbps



Type-C

FireWire Ports and Connectors



FireWire Terminology : IEEE 1394 Standard

FireWire vs. USB

Type	Transfer Rate	Number of Devices	Length
USB 1.1	12 Mbps	127	5 m
USB 2.0	480 Mbps	127	5 m
FireWire 1394a	400 Mbps	63	4.5 m
FireWire 1394b	800 Mbps	63	100 m

SUCCESS

FireWire vs. USB

	Rate (bit/s)	Rate (byte/s)
USB 1.1	1.536 Mbit/s	0.192 MB/s
USB 2.0	12 Mbit/s	1.5 MB/s
USB 3.0	5000 Mbit/s	625 MB/s
FireWire 400	393.216 Mbit/s	49.152 MB/s
FireWire 800	786.432 Mbit/s	98.304 MB/s
FireWire 1600	1573 Mbit/s	196.6 MB/s
FireWire 3200	3145.7 Mbit/s	393.216 MB/s

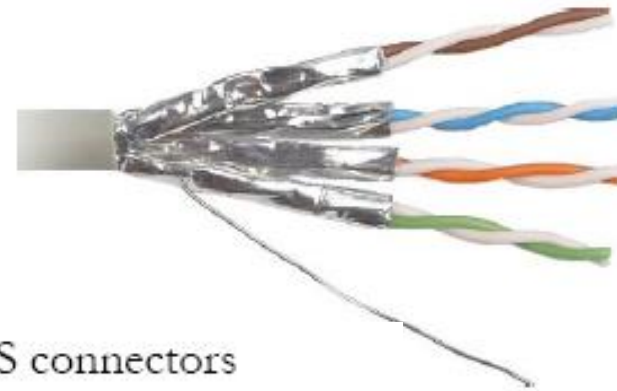
SUCCESS

Audio Ports and Connectors

Single-core/shielded cable



One pair/shielded cable



3-pin XLR connectors



TS and TRS connectors



Audio Ports and Connectors

SUCCESS

Video Ports and Connectors

Video Graphics Array (VGA)



Digital Video Interface (DVI)



Video Ports and Connectors

SUCCESS

Video Ports and Connectors

Mini-High Definition Multimedia Interface (Mini-HDMI)



High Definition Multimedia Interface (HDMI)



Video Ports and Connectors

SUCCESS



SUCCESS

USB-C



DISPLAYPORT



HDMI



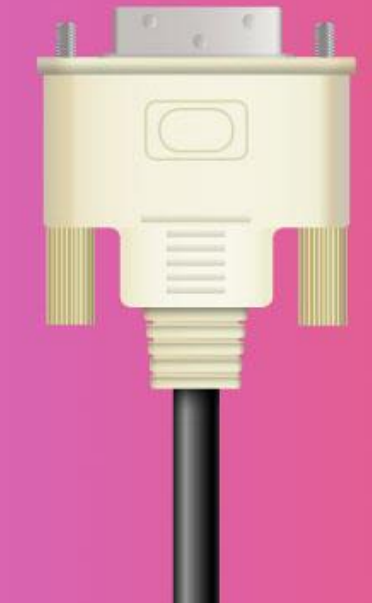
THUNDERBOLT



VGA



DVI



Video Ports and Connectors

Separate Video (S-Video)



Component/RGB



Composite video



Coaxial



Video Ports and Connectors

SUCCESS

Video Ports and Connectors

DisplayPort



Radio Corporation of America (RCA)



Bayonet Neill-Concelman (BNC)



Video Ports and Connectors

SUCCESS

DVI Single Link vs. Dual Link

DVI Single Link :

- ✓ use a technology called Transition Minimized Differential Signaling (TMDS)
- ✓ to transmit serial data over a high-speed connection.

SUCCESS



DVI Single Link vs. Dual Link

Dual Link :

- ✓ Single link cables use a single TMDS transmitter to carry data, while double-link uses two.
- ✓ can transmit larger images at higher speeds than single link.

SUCCESS

Wireless A/V Connections

A wireless audio/visual adapter

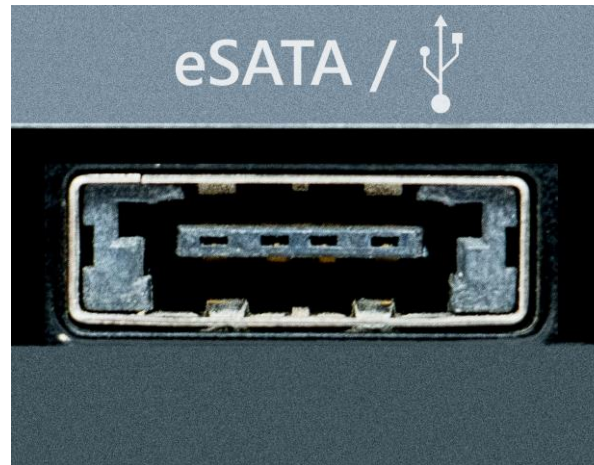
- ✓ needs to be attached to the display monitor in order for the display to receive a signal from the device that is projecting to it.



eSATA Connectors

External SATA (eSATA) :

- ✓ is an external interface for SATA connections.
- ✓ provide fast data transfers without having to translate data between the device and the host computer.



eSATA and USB port

RJ-45 Ports and Connectors

The RJ-45 connector :

- ✓ used on twisted pair cable.
- ✓ eight-position connector that uses all four pairs of wires.
- ✓ The RJ in RJ-11 or RJ-45 is an abbreviation for "registered jack."



RJ-45 connector.

RJ-11 Ports and Connectors

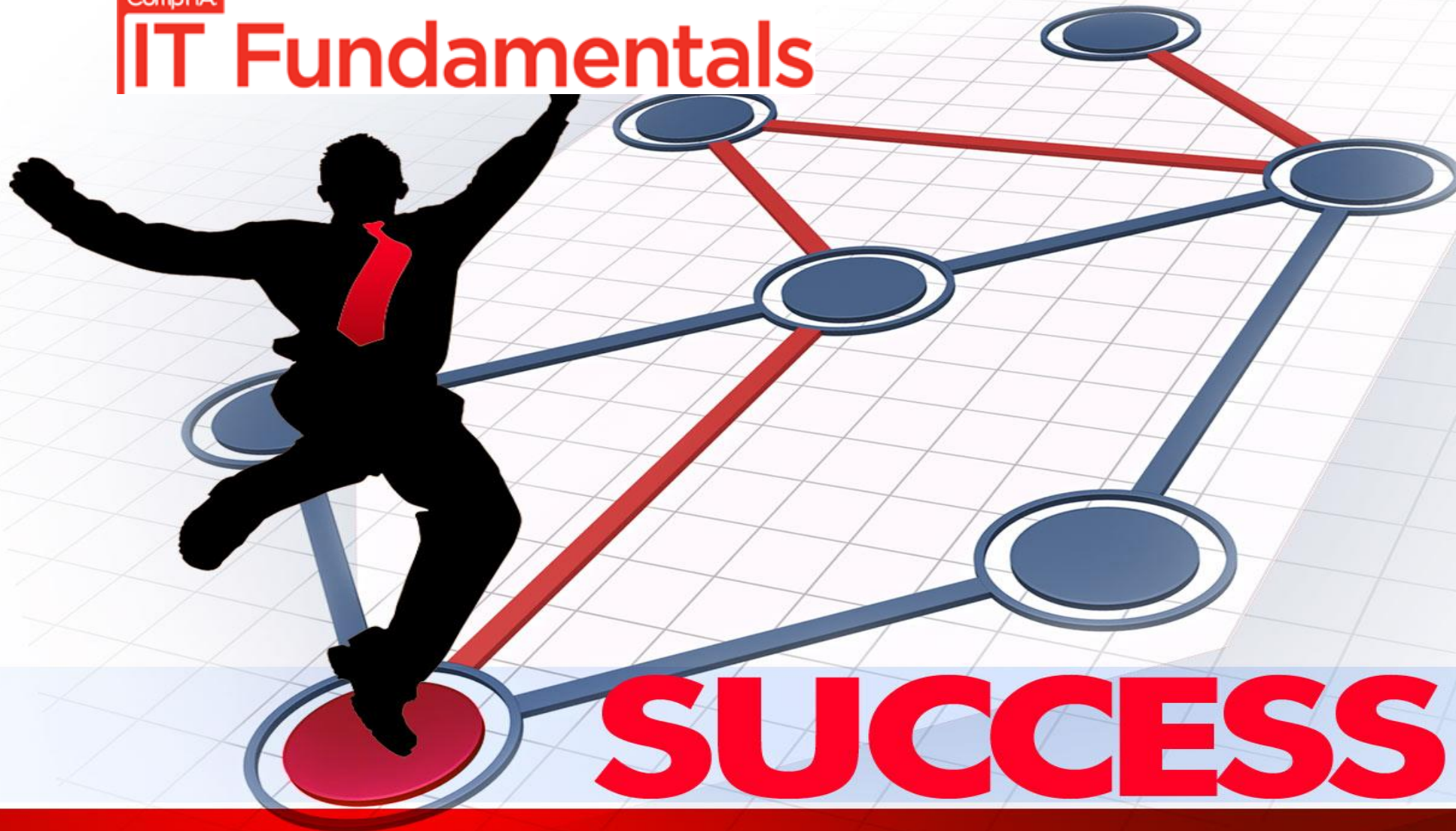
The RJ-11 connector :

- ✓ used with Category 1 cables in telephone system connections
- ✓ is not suitable for network connectivity.
- ✓ smaller than RJ-45 connectors and have either four or six pins.

RJ-11 connector.



IT Fundamentals



Topic D :

Identify Common Peripheral Devices

Peripheral Devices

- ✓ is an external device that connects to a computer to expand the computer's functionality.
- ✓ examples : keyboards, mouse or other pointing devices, microphones, cameras, scanners, printers, and external drives.

SUCCESS



Peripheral Devices

Input



Storage



Output



Communication



SUCCESS

Input Devices

- ✓ is any hardware device that sends data to a computer, allowing you to interact with and control the computer.

SUCCESS



Input Devices

SUCCESS

Examples of Manual Input Devices

Keyboard



Numeric Keypad



Pointing Device



Remote Control



Joystick



Touch Screen



Scanner



Graphics Tablet



Microphone



Digital Camera



Webcams



Light Pens



Types of Input Devices

1. Keyboard

1.1 Standard keyboards

- ✓ rectangular in shape
- ✓ have 84, 101, or 104 keys.



Types of Input Devices

1.2 Ergonomic keyboard

- ✓ or natural keyboards
- ✓ split the keyboard in half so each hand can comfortably use its own set of keys.



Types of Input Devices

1.3 Dvorak keyboard

- ✓ rearrange the keys into a more efficient arrangement
- ✓ makes faster typing possible for users



SUCCESS

Types of Input Devices

2. Pointing Device



Mouse



Trackball mouse



Touch pad



Trackpoint



Stylus pen



Joystick

Types of Input Devices

3. Other Input Device



Scanner



Microphone



Webcam



Graphics tablet

Output Devices

- ✓ enable the user to get information and data out of the computer.
- ✓ Typical examples include printers, speakers, and displays.

SUCCESS



Types of Output Devices

1. Printer

1.1 Laser Printer

- ✓ is a printer that uses a laser beam to form images and toner to print the images on a printing medium



Types of Output Devices

1.2 Inkjet Printer

- ✓ is a printer that forms images by spraying liquid ink from an ink cartridge out of nozzles aimed carefully on the printer.



Types of Output Devices

1.3 Thermal Printer

- ✓ uses a heating element to create the image on the paper with dye, ink from ribbons, or directly with pins while the feed assembly moves the media through the printer.



Types of Output Devices

2. Display Device

2.1 CRT (Cathode ray tube)

- ✓ displays use electron beams within a vacuum tube to create images on a fluorescent screen.



Types of Output Devices

2.2 LCD (Liquid crystal display)

- ✓ displays are a compact, lightweight alternative to traditional CRT displays.



Types of Output Devices

2.3 LED (Light-emitting diode)

- ✓ displays utilize the same screen as an LCD display, but use a different backlighting technique/technology.



Types of Output Devices

2.4 OLED (Organic light emitting diode)

- ✓ used in a larger variety of dimensions than LED screens, and are currently utilized in computer monitors, television screens, tablets, and mobile phones.



Types of Output Devices

2.5 Plasma (Plasma displays)

- ✓ use xenon and neon rays and a flat panel of glass to provide visuals with high contrast, brightness, and vibrant colors that can be viewed from a multitude of angles.



Types of Output Devices

2.6 Projector

- ✓ used to display the video output onto a whiteboard or other surface so that a larger audience can see it.



Devices that Perform Both Input and Output Functions



Flash drive



External hard drive



Mobile media



Smartphone



Memory card



Optical discs and drives



Network attached storage



Touchscreen

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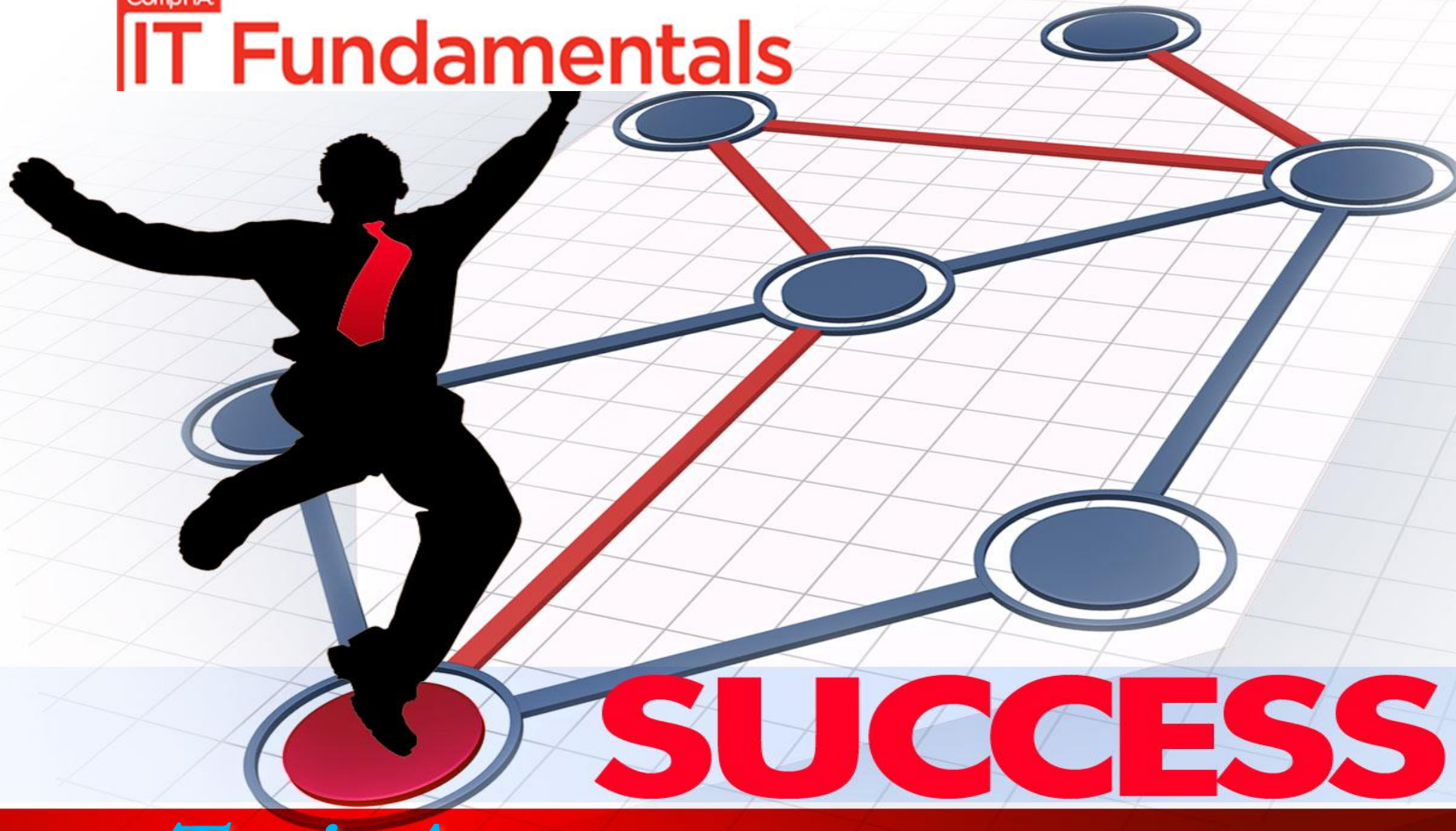


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Lesson 2

Identifying Computer Software

IT Fundamentals

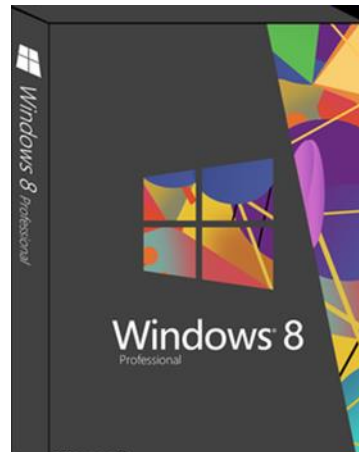


Topic A :

Compare Functions and Features of Common
Operating Systems

Operating Systems

- ✓ is a software package that enables a computer to function.



Operating System Software



Operating System Functions

- ✓ Provides the user-friendly environment to work with system features and applications.
- ✓ Converts a user's input and sends it to the monitor or other display device.
- ✓ Controls peripheral devices such as disk drives and printers.
- ✓ Provides the structure for files and folders.
- ✓ Monitors the operating system's health and functionality.



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Licensing

- ✓ ***Open source*** : software enables users to access its source code and gives them the right to modify it .
- ✓ ***Freeware*** : applications can be downloaded from the Internet directly and used without any restrictions .
- ✓ ***Commercial*** : software application is sold to users .
- ✓ ***Copyleft*** : is used to define a concept that is essentially the opposite of “copyright .”
- ✓ ***Shareware*** : free applications that a user can download from the Internet directly .



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Software Registration

- ✓ By registering the software, a user becomes eligible to receive regular updates, upgrades, and technical support.



The image shows a screenshot of a 'Software Registration Wizard' dialog box. The title bar reads 'Software Registration Wizard'. The main heading is 'Enter Product Information'. Below this, there are five input fields with labels: 'Application Name:', 'Application Version:', 'User Identifier (calculated):', 'Serial Number (if provided):', and 'Email address (if available):'. At the bottom of the dialog, there is a paragraph of text: 'Please enter the information requested above. If you are registering software that will run on another machine, please refer to the information displayed on that system.' Below the text are three buttons: 'Close', '<< Back', and 'Next >>'.

Software Registration Wizard

Enter Product Information

Application Name:

Application Version:

User Identifier (calculated):

Serial Number (if provided):

Email address (if available):

Please enter the information requested above. If you are registering software that will run on another machine, please refer to the information displayed on that system.

Types of Operating Systems for Workstations



SUCCESS

Types of Operating Systems for Mobile Devices



SUCCESS

Operating System Compatibility Issues

- ✓ **Hardware** : The 32-bit and 64-bit OS architectures have different hardware requirements.
- ✓ **Applications** : designed to run on 64-bit operating systems are not compatible with 32-bit OSs.
- ✓ **Drivers** : is specialized software that controls a device attached to a computer.



SUCCESS



SUCCESS