Name: REIMARC G. CORPUZ Date: 2/18/2023

Course & Section: BSCPE 3 IE Score: _____

Network Hardware Familiarization

Objectives

Upon completion of this laboratory exercise, the student will be able to

- familiarize with the different networking equipment, cable terminations, common network modules, and tools. Also the student should be able to identify and describe each them.
- identify the purpose of each LED indicator on a Cisco Switch or any Cisco Device
- identify parts, slot and port number of interfaces of a Cisco Router

Equipment

Computer
Internet Connection

Introduction

A network is a group of two or more computers and peripherals connected (wired or wireless) together in order to communicate. For us to fully understand what network is we need to determine and familiarized with the common networking equipment, networking equipment, cable terminations, common network modules, and tools.

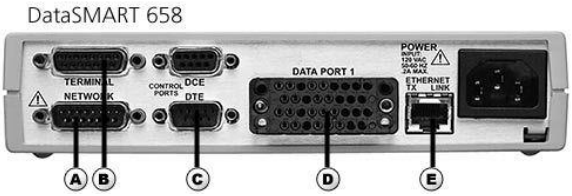
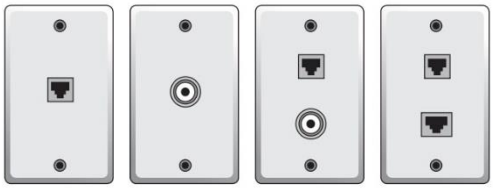
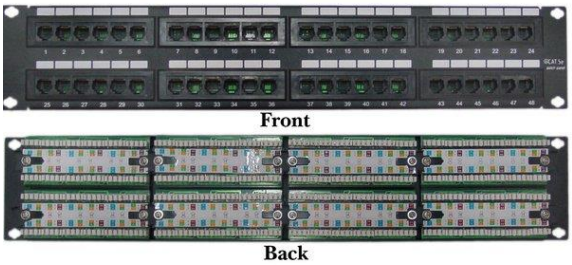
Identifying Networking Equipment

In the following table, insert an image of the networking equipment and give its purpose.

Networking Equipment	Image	Purpose
PC		Computers perform calculations, data storage, retrieval, and information processing. Data or computer language that has been programmed into a computer instructs it on how to do its task. The computer will only carry out the instructions that it is given. "People make mistakes, not machines."

Switch (Cisco Catalyst 9200)		Switches from the Catalyst 9200 Series have security measures that protect the integrity of the switch's hardware, software, and any data that passes through it. It offers resilience that keeps your company operating smoothly.
L3 Switch (Cisco 9300)		Static and dynamic routing, including VLAN and IP communications, are supported by layer 3 switching. The Cisco Catalyst 9300 switch enables flexible and effective use of power resources in stacked switches for power redundancy due to Cisco StackPower and intelligent power management.
Router ISR	 	ISRs offer a diverse range of functions that support cloud computing, mobile connectivity, multimedia capabilities, and secure networking. Second-hand Cisco ISRs can be found online, sold by both vendors and individuals, providing an appealing option for those who would rather not buy new and pricier equipment.
Router ASR		The utilization of aggregation services in routers and edge platforms is crucial for facilitating network edge routing. By consolidating traffic links at higher rates, these devices can meet the

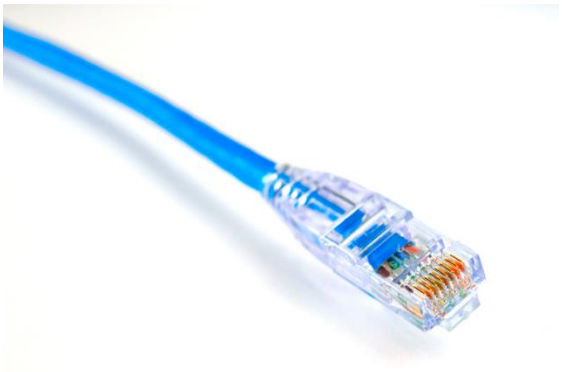
		escalating demand for remote connectivity to both internal and external networks such as the internet and cloud.
Wireless Access Point		Wireless access points are utilized to furnish wireless access to devices. They operate by transmitting a signal that devices can link up with, enabling them to connect to the internet or another network wirelessly, thereby removing the necessity for cables. Homes, businesses, and public areas can all utilize wireless access points.
IP Phone		IP telephony denotes a phone system that utilizes an internet connection for transmitting and receiving voice data. In contrast to conventional telephones that rely on landlines to transfer analog signals, IP phones get linked to the internet through a router and modem.
Server Computer		A server refers to a computer that is utilized within a network to deliver a service to a client. Typically, servers possess greater processing capabilities, memory, and storage capacities compared to client machines. A client machine is a computer that is not performing the role of the server and is seeking a service or information from the server.

Firewall		Essentially, a firewall serves as a barrier between a private internal network and the public Internet. Its fundamental role is to permit harmless traffic to enter while blocking any potentially harmful traffic.
CSU/DSU		The equipment known as the csu/dsu serves as the necessary link between your system and the circuit owned by the telephone company. Additionally, the csu/dsu offers capabilities such as timing regeneration, loopback testing, and framing functions. It can also serve to increase the distance of your connection or function as a short-haul modem.
Wall Plate		A rectangular cover is employed to conceal a wall section with a hole meant for electrical or networking outlets. The cover permits cables to pass through the wall and simultaneously masks the bigger aperture.
Patch Panel		A patch panel allows for the organization of a vast number of cables, facilitating versatile connections to network hardware situated in a data center, access point, or wiring closet. The LAN variant is the most prevalent type of patch panel utilized in a company.

Fiber Patch Panel		Fiber distribution panels, which are also referred to as fiber optic patch panels, facilitate the termination of fiber optic cables and enable access to the individual fibers of the cable for cross-connection purposes.
Network Racks		A metal frame chassis, known as a network rack, is designed to hold, stack, organize, secure, and safeguard an array of computer network and server hardware devices. The rack is typically used to store network equipment such as routers, switches, access points, and modems.

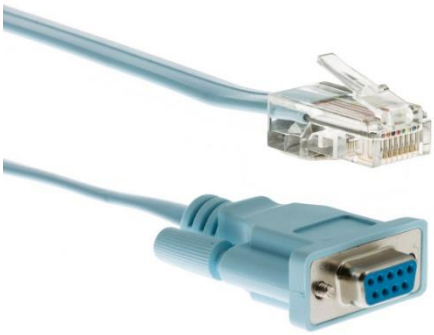
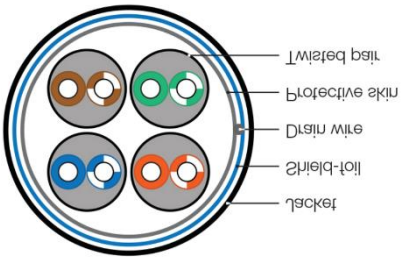
Identifying Cable Termination and Cables

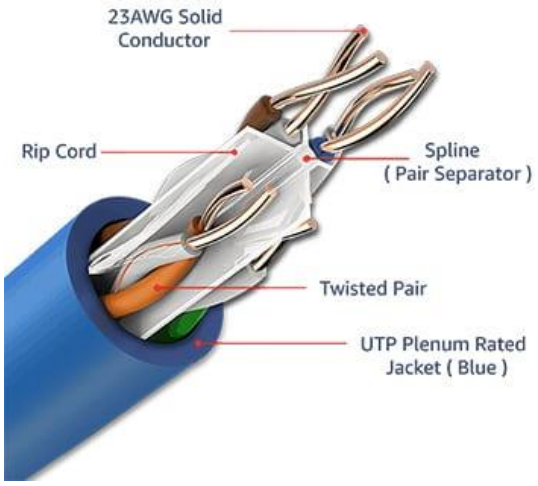
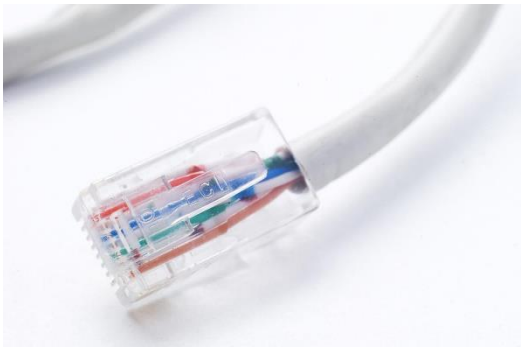
In the following table, insert an image of the cable termination and give its purpose.

Cable Termination	Image	Purpose
RJ45		The primary purpose of an RJ45 cable is to link various devices via an Ethernet connection, including computers, printers, cable or DSL modems, and network storage devices. It is crucial to recognize an RJ45 cable when trying to establish network connectivity. There are two wiring configurations for RJ45 cables, namely T-568B and T-568A.
RJ-11		In the US, a popular telephone connector called the registered jack-11 (RJ-11) has 6 positions and 2

		conductors. However, 4 of those positions are usually not utilized. The RJ-11 is frequently employed to link the telephone handset to the base unit and to connect the whole telephone to the wall outlet.
RJ-48		RJ48 is a jack that has been registered for specific purposes such as terminating T1 and ISDN connections, as well as for local data channels or digital sub rate services. This jack makes use of an 8P8C modular connector. When it comes to T1 circuits, the RJ48C variant is frequently utilized and relies on pins 1, 2, 4, and 5.
Fiber Optic LC termination/cable		In fiber optic communications, an attenuator is employed to decrease the power of the optical fiber by a specific amount. Typically, it features a male plug connector at one end and a female fiber optic adapter at the other. Moreover, its average attenuation levels range from 1 to 30 dB.
Fiber Optic SC termination/cable		The SC connector is a device designed for push-pull operation in a fiber-optic connection, utilizing a ceramic ferrule to ensure precise alignment. Its square shape is often referred to as "stick and click," and it includes a locking tab for easy attachment and detachment.

Fiber Optic ST termination/cable		A straight-tip connector (ST connector) is a connector used in **fiber-optic cables** that utilize a bayonet-style plug and socket. It has become the de facto standard for commercial wiring
Fiber Optic FC termination/cable		A Fibre Channel switch is a networking device that is compatible with the FC protocol and designed for use in a dedicated storage area network (SAN). **An FC switch inspects a data packet header, determines the computing devices of origin and destination and forwards the packet to the intended system**.
DAC Cable		DAC cables are used for **directly connecting ports between active equipment; switches, routers, servers, and storage**. Their main restriction is transmission distance. Their main benefit is cost, although there are other benefits.
T1 DB-15 cable		This T1 cable is constructed using two pairs of shielded T1-rated cables and consists of DB15 male connectors on both ends. It is designed to be **used specifically for T1 telecommunication applications where straight-through wiring is required**.

DB-60 cable		This is used **to connect two routers together where one has a DB60 style serial port (WIC-1T) and the other router has a smart serial port (HWIC-1T) on it in your Cisco Certification lab**.
Smart Serial Cable		A serial cable is a cable used **to transfer information between two devices using a serial communication protocol**. The form of connectors depends on the particular serial port used. A cable wired for connecting two DTEs directly is known as a null modem cable.
Console Cable		Console cables — also known as Cisco cables, rollover cables and management cables — are designed for a specific purpose. They **connect Cisco networking devices to terminals or PCs for configuration**. Typically, the Cisco end will connect via RJ45, and the terminal end will conclude in a serial connection.
Cat5e Copper Cable		A Cat5e cable is among the best cables for **connecting local area networks (LANs) in a residential or commercial setting** because they're affordable and work with most hardware setups. While there are other Ethernet cables available, a Cat5e will certainly get the job done.

Plenum Cable		A plenum cable is essentially an electrical cable for Ethernet networking that is designed to be installed in the plenum spaces of buildings. Plenum spaces are the areas found between the raised floors and dropped ceilings of buildings, which are crucial for air circulation, cooling, and heating purposes in various types of structures. Simply put, a plenum cable is the kind of cable that runs through these specific areas of buildings that serve as pathways for air.
Cat6 Copper Cable		A Cat 6 cable is used mainly for **computer networks reaching a Gb, 1000 Mbps or one Gbps of data transfer speed (DTR) or higher**. Characteristics are as follows: Consists of four pairs of copper wires, which are all utilized for data transfer.
Single Mode Fiber Cable		A single strand of glass fiber, called single-mode fiber, is used **to transmit single-mode or light beams**. Single-mode fiber allows only one transmission mode. It can transmit higher bandwidth than multimode fiber but requires a light source with a limited spectral range.
Multimode Fiber Cable		Multi-mode fiber is mainly used **to transmit across comparatively shorter distances**, as the modes are more likely to disperse over longer extents. This

	 MMF	phenomenon is known as modal dispersion. Another common type of optical fiber is single-mode fiber, which is used mainly for longer distances.

Identifying Network Equipment Modules and Cards

In the following table, insert an image of the network equipment modules and cards then give its purpose.

Network Equipment Modules	Image	Purpose
EtherSwitch Service Module Ports		Cisco EtherSwitch service modules **help ensure trust and identity with support of IEEE 802.1x plus enhancements that are specific to Cisco**. When combined with the advanced security features of Cisco Integrated Services Routers, Cisco EtherSwitch service modules help to ensure networkwide security.
HWIC-2t module		Cisco HWIC-2T is a 2-port serial WAN interface card, made for Cisco1800, 1900, 2800, 2900, 3800, and 3900 Series Integrated Services Routers. HWICs **help customers enable applications such as WAN access, legacy protocol transport, console server, and dial access server**.
1000BASE-T SFP		It **allows auto negotiation between 100Mbps and**

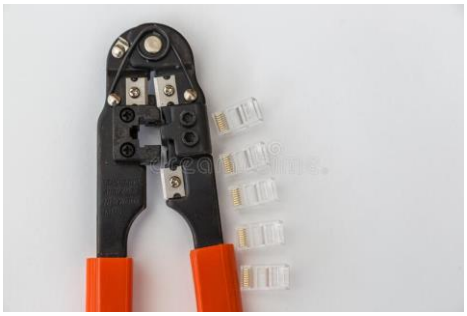
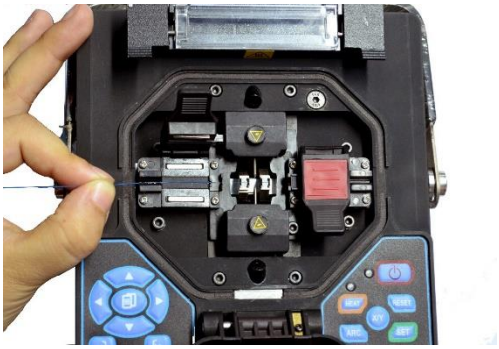
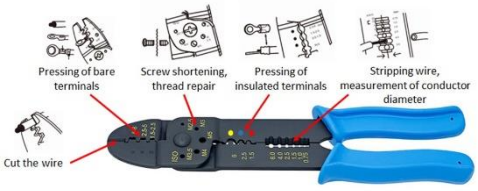
		**1000Mbps**. The most prominent feature of 1000BASE-T is that it enables users to maintain the existing copper cabling, instead of having to rewire with optical fiber.
1/10/25/50 Base SX SPF		SFP modules **facilitate high-speed communication between switches and network components such as routers and other devices**. It is mainly used with copper or fiber optic cables. Its small form factor makes it ideal for areas that may not be very accessible.
4/40/50/100/200G Base-QSFP		The Quad Small Form-factor Pluggable (QSFP) is a compact, hot-pluggable transceiver used for **data communications applications**. The form factor and electrical interface are specified by a multi-source agreement (MSA) under the auspices of the Small Form Factor Committee.

400G QSPF-DD		The Cisco 400GBASE Quad Small Form-Factor Pluggable Double Density (QSFP-DD) portfolio offers customers a wide variety of super high-density transceiver modules and the flexibility of 400 Gigabit Ethernet connectivity options for data center, high-performance computing networks, enterprise core and distribution layers, and service provider applications.
VWIC-2MFT-T1		They are dual-port trunk interfaces for voice, data, and integrated voice and/or data applications. These cards **provide basic structured service for T1 or E1 networks and unstructured service for fractional E1 networks**. The cards include an integrated DSU/CSU.

Identifying Network Cabling Tools

In the following table, insert an image of the network cabling tools and give its purpose.

Tools	Image	Purpose
UTP Wire Stripper		Featuring an adjustable blade for all sizes of UTP, STP, and Flat Silver Satin cabling, this tool **allows users to consistently remove the cable jacket without damaging the internal conductors**. The cable stripper also features a built-in cable cutter to trim and cut cables.

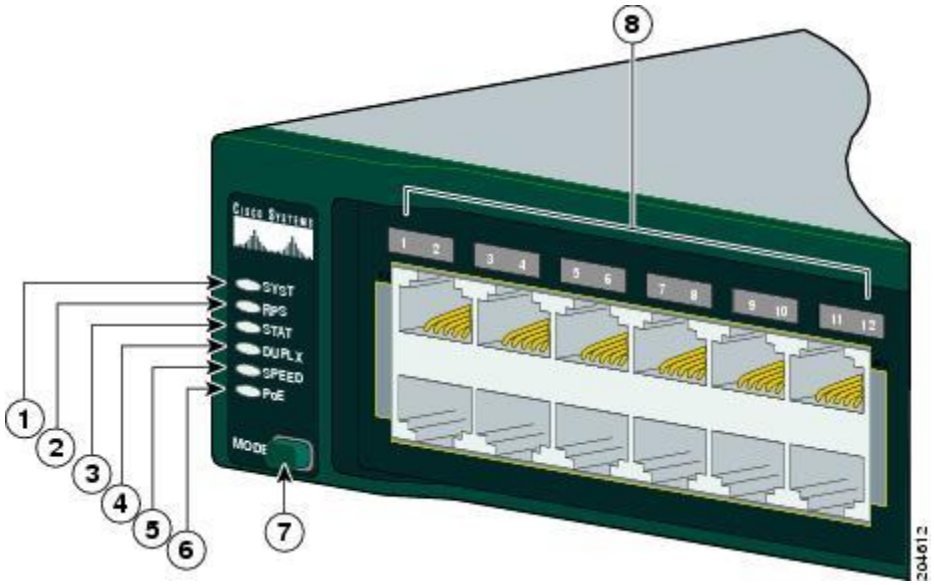
UTP Wire Cutter		Designed **to reduce the time required to prepare UTP twisted-pair cable for termination**. Specifically designed to accurately strip the jacket from a 4-pair cable without damaging the conductors.
Fiber Splicer		Fiber optic splicing is used **to join two fiber optic cables together**. This is most commonly done when a cable is accidentally severed, or when fiber cables need to be lengthened during a cable run. Fiber optics are essential to keeping businesses and homes connected around the world.
Crimping Tool		A crimping tool is the tool used **to deform the material and create the connection**. Crimping is commonly used in electrical work, to attach wires together or wire to other connectors.
Punch Down Tool / Impact Tool		Impact punch down tools are used **to terminate wires into punch down patch panels and punch down keystone jacks**. The idea is the tool head blade is used to push a wire conductor into a IDC terminal slot (Insulation Displacement Conductor).

Velcro Cable Ties		Also known as zip ties, they're fasteners that bundle your cables and wires together to **keep them organized and prevent damage**. They come in different sizes, lengths, materials and even colors.
Cable Tester		Cable testers **verify the electrical connections in a signal cable** — confirming things are wired correctly between the ends of the cable. A cable tester is a device used **to test the strength and connectivity of a particular type of cable or other wired assemblies**.
Cable Comb		The Cable Comb™ consists of a blue inner hub and a yellow outer collar. The inner hub is designed to interlock with the outer collar to provide an assembly **allowing installers to conveniently straighten, organize, and lash single cables into professional appearing cable bundles**.

Cable Probe and Tone / Cable Identifier		A tone and probe tester and tracer kit are used **to check the polarity in telecom lines, identify wire pairs and continuity in connections**. There are tone generator wire tracers that can determine the wiring issues in a non-contact manner, which is through an audible sound.

Identify the parts of a Catalyst 2960 Switch LEDs

On the table below write the parts of the Switch LED



1.	The system LED	2.	The RPS LED (if RPS is supported on the switch)
3.	The port status LED (This is the default mode)	4.	The port duplex mode LED
5.	The port speed LED	6.	The PoE status LED (if PoE is supported on the switch)
7.	The Mode button	8.	The port LEDs

Identify Switch LEDs meaning

System LED

Color	Status
Off	The system is not powered on.
Green	The system is operating normally.

Amber	The system is receiving power but is not functioning properly.

Redundant Power System LED

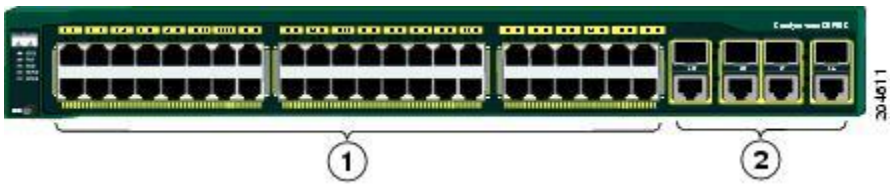
Color	Status
Off	RPS is off or not properly connected.
Green	RPS is connected and ready to provide back-up power, if required.
Blinking Green	RPS is connected but is unavailable because it is providing power to another device (redundancy has been allocated to a neighboring device).
Amber	The RPS is in standby mode or in a fault condition. Press the Standby/Active button on the RPS, and the LED should turn green. If it does not, the RPS fan could have failed. Contact Cisco Systems.
Blinking Amber	The internal power supply in a switch has failed, and the RPS is providing power to the switch (redundancy has been allocated to this device).

PoE mode LED

Color	Status
Off	PoE mode is not selected. None of the 10/100 PoE ports have been denied power or are in a faulty condition.
Green	PoE mode is selected, and the PoE status is shown on the port LEDs.
Amber	PoE mode is not selected. At least one of the 10/100 PoE ports has been denied power, or at least one of the ports has a PoE fault.

Identify the parts of a Catalyst 2960G-48TC-L Switch Front Panel

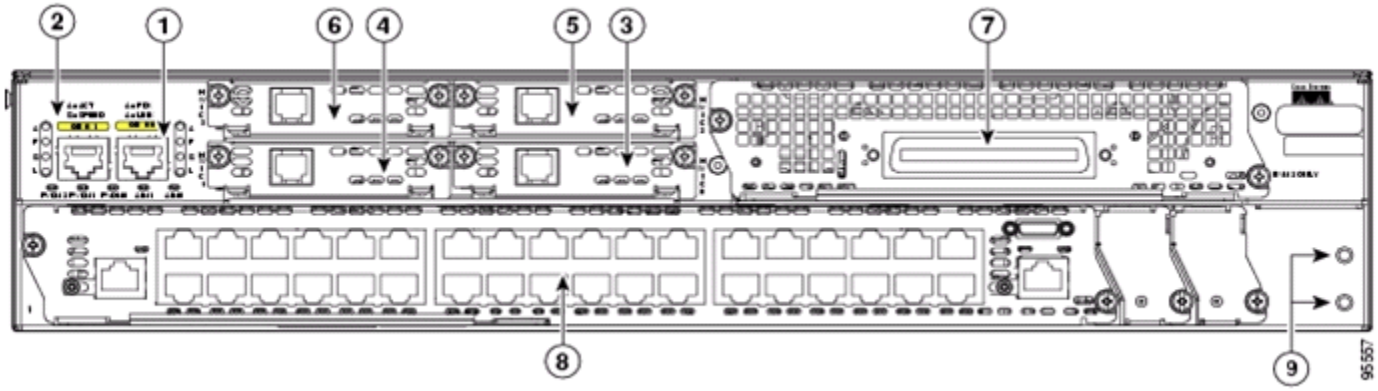
On the table below write the parts of the switch



1	10/100/1000 ports	2	Dual-purpose ports

Identify the parts of the Rear Panel of a Cisco 2851 Router

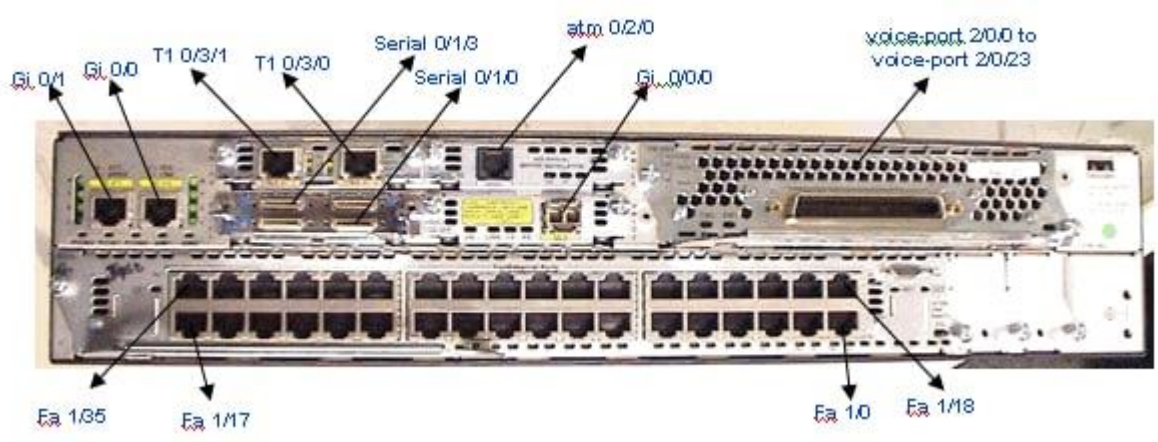
On the table below write the parts of the router



1	Gigabit Ethernet port 0/0	2	Gigabit Ethernet port 0/1
3	High-speed WAN interface card slot 0	4	High-speed WAN interface card slot 1
5	High-speed WAN interface card slot 2	6	High-speed WAN interface card slot 3
7	EVM slot ONLY	8	NME slot[1]
9	Screw holes for ground lug		

Identifying slot and port number of interfaces on a Cisco 2851 Router

On the image below write the slot or port number of each interfaces



Conclusion: Draw conclusion based on the objectives.

In my view, this laboratory exercise aims to equip me with a comprehensive understanding of various networking equipment, cable terminations, common network modules, and tools. Through this exercise, I am expected to gain the ability to identify and describe each component, as well as understand the purpose of LED indicators on a Cisco switch or any Cisco device. Additionally, I will be able to identify the parts, slot, and port numbers of interfaces on a Cisco router, which is essential for configuring and troubleshooting network devices. Overall, this exercise provides me with a solid foundation to enhance my knowledge and skills in the networking field, and prepares me for more complex challenges in this area.