Power Supplies

Normally, we need to select the exact power cables or supplies that our computer needs. Otherwise, if we supply the power more than a laptop or a computer needs, then it will gonna damage several internal parts of the CPU or computer itself. And in the contrary, if we supplied less power to the computer than needed, then the expected performance that we want from the computer will not be delivered. Hence, we should use the correct power supplies.

Selecting a power supply

When we select a power supply, we need to consider several things:

a. Local Input Voltage:
   As we know, the electricity that we receive in our home is AC current. Its voltage is different in every country. Like in Nepal we receive the voltage between 220-240V. It means that the current we get when we plug something in the wall socket. In Canada, the voltage inputs is 110-120 VAC. (Volts of Alternating Current).
   So, based on this, the laptop is sold in these countries. I mean, the laptop which needs the power 220V is sold in Nepal whereas the laptops which needs the power 110 is sold in Canada.

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   It is important to use the correct voltage power supply or power converter for the computer's voltage specifications. Imagine that you have a customer who imported a PC from a country that uses a different standard for input voltage. You will need to adapt the input power to protect the computer. Some options for doing this might include:

   - Replace the power supply with a unit that uses the appropriate voltage for the target country.
   - Install a power supply model that includes a dual-voltage switch that can be toggled from 110-120VAC to 220-240VAC.
   - Plug the computer into an external power converter that then plugs into a normal wall socket. Power converters can be purchased from any store that sells international travel merchandise.

   Without a power converter, the following problems may be experienced:

If a computer needs	But the wall socket delivers	The result will be
220-240VAC	110-120VAC	not enough power for the computer to run properly
110-120VAC	220-240VAC	too much power, which will damage the computer's internal parts

b. The motherboard and the form factor specifications document will provide the list of compatible power supply types to help us select the correct part. The form factor size and components embedded in the motherboards will create a starting point for the minimum power supply wattages required.

Voltages and pin connectors

The internal hardware components of a computer require varied input voltages to operate. Voltage regulators embedded in the motherboard of the computer control the amount of power that is delivered to the computer's various internal components.

Voltage	Examples of components that use each voltage level
3.3V	DIMMs, chipsets, and some PCI/AGP cards
5V	SIMMS, disk drive logic, ISA, and some voltage regulators
12V	Motors and voltage regulators with high outputs

The computer's power supply plugs into an adapter on the computer's motherboard. The wiring for this connection uses color coded wires. Each wire color carries a different voltage of electricity to the motherboard or serves as a grounding wire. A standard ATX motherboard power adaptor has either 20-pins or 24-pins to connect these wires. The 20-pin design is an older technology. The 24-pin connector was developed to provide more power to support additional expansion cards, powerful CPUs, and more. The 24-pin connector has become the standard for today's personal computer power supplies and motherboards.

The power supply will have multiple connectors that plug into the motherboard, hard drives, and graphic cards. Each cable has a specific purpose and delivers the appropriate amount of electricity to the following parts: