

BASIC ELECTRICAL KNOWLEDGE FOR AN IT DATA CENTER TECHNICIAN



THE POWER



ELECTRICAL TERMS

**BASIC UNDERSTANDING
ALWAYS HELP IN
DISCUSSION, PROBLEM
RESOLVING, & DECISION
MAKING.**

DEFINITION

Current (I): is the flow of electrons. It's the base unit that measures the volume of the current.

Volt (V) : is the pressure applied to push electrons from source to endpoint.

Watt (W): Actual amount of power that the electrical device uses. It's the rate at which the power flows. When 1 Amp flows through the electrical difference of 1 Volt the power is 1 watt.

IMPORTANT UNITS THAT ARE USED FOR CALCULATIONS.

Kilo Watt Hour (kWH): is a measure of the number of kilowatts your electrical device uses over a certain time period.

kVA (kilo Volt amperes) : stands for apparent power to be used by electrical device. Consider it as the calculation of amount of power agreed by design and standard to be provided to the electrical or IT device.

kW (kilo Watt): is the real or actual power that is finally consumed by electrical or IT device.



DIFFERENCE BETWEEN VOLT & WATT

VOLT

As mentioned, it's the pressure applied.

Thus, in a circuit, electrons flow can have difference from the point of origin to other points in the circuit due to pressure that also expresses speed at the which electrons flow.

WATT

Watt is not pressure but the rate.



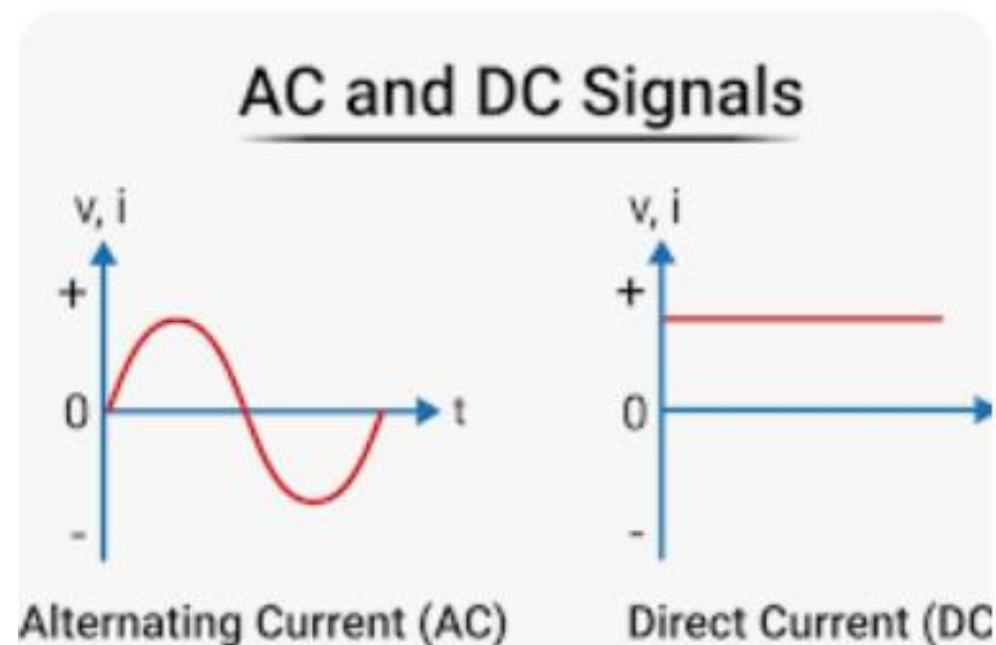
SIMPLE FORMULAE

Watts= Volts (V) x Amperes (I)

Ampere = Watts (W) / volts (V)

Volts = ampere (I) x ohms (R)

THESE TERMS COME MORE
OFTEN IN DEVICE
SPECIFICATION, POWER USAGE
ETC. SO PLEASE KNOW THEM.



BASIC DEFINITION OF ALTERNATING CURRENT AND DIRECT CURRENT

Alternating current: is a standard electricity format that comes from power plant. Main characteristic of this current that it changes its directions periodically or best put alternately. The frequency is different in different countries.

It's the AC current that flows through the station and is stepped down using transformer at the data centre. Further its distributed through power distribution unit (PDU). Ultimately, AC power is distributed through power buses to the racks and finally to the servers & other racked IT devices.

More about different electrical equipment in the future

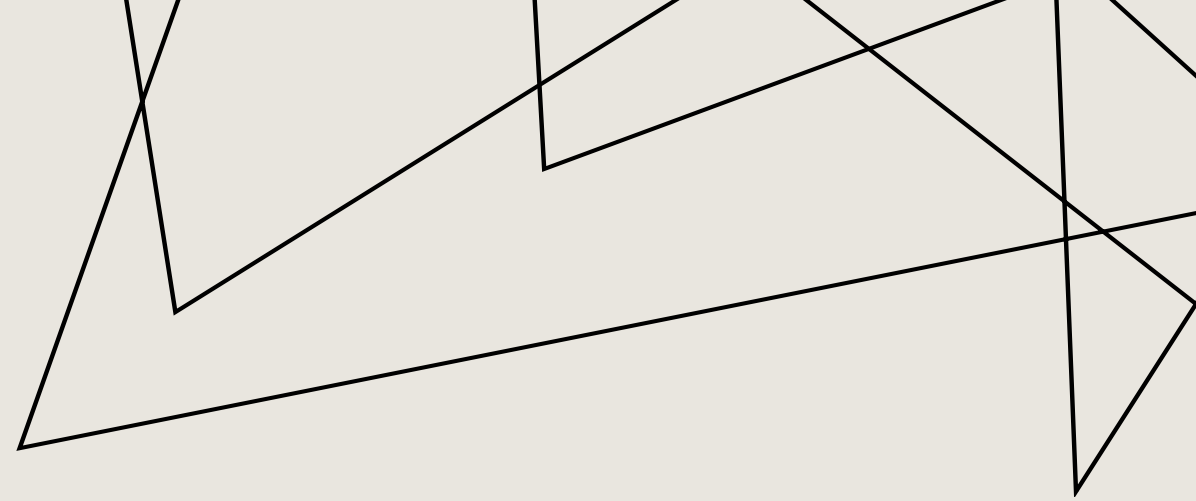
BASIC DEFINITION OF ALTERNATING CURRENT AND DIRECT CURRENT CONTD.

Direct current: is a standard electricity format that comes from battery or solar cells and travels linearly.

DC power is not connected to the transformer like AC power.

This type of power is mainly used to store energy, for example in UPS or some of the hyperscale data centers deploy batteries in the racks.

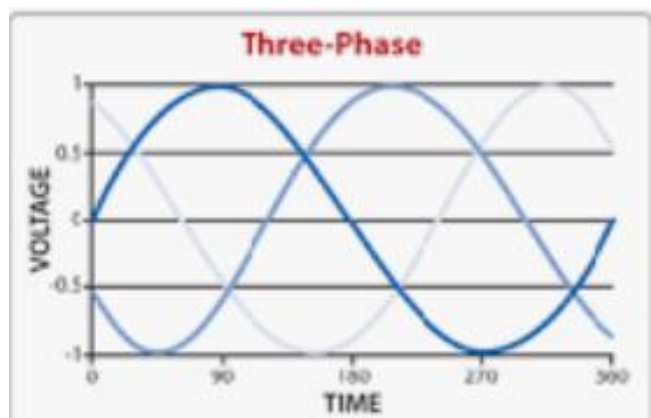
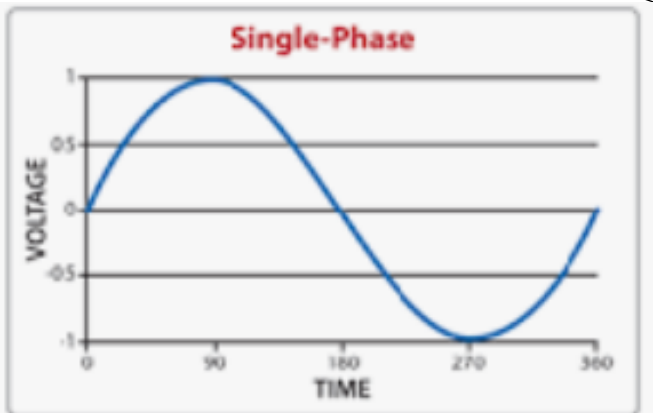
FINAL TIPS & TAKEAWAYS

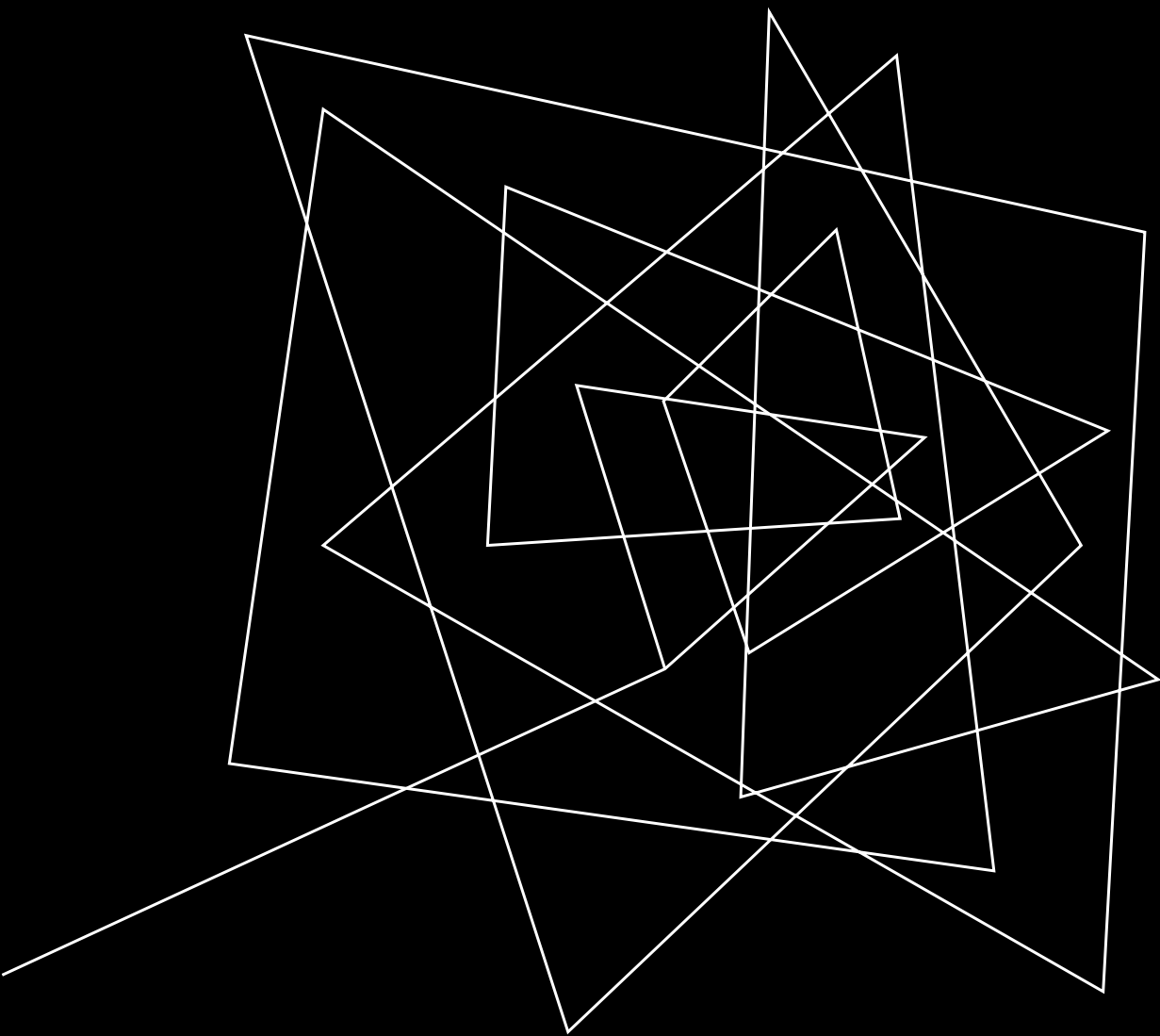


- As DC technician or manager of data centers you will come across fundamental topics on power while working on projects or operational challenges such as upgrade, new deployment etc.
- Hence learning those topics makes ones gain control over the subject. As a manager, you may also have to guide your DC technicians with power calculations before racking devices and your knowledge will eventually help senior leadership with the decision making.
- So, keep refreshing these basic concepts times and again!

$$\text{PUE} = \frac{\text{Total Facility Power}}{\text{IT Equipment Power}}$$

MORE TOPICS IN THE FUTURE
BLOGS!





**WHAT DOES DATA
CENTER USE TO CHECK
AND MONITOR ITS
POWER EFFICIENCY.**

COMING SOON!



THANK YOU

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