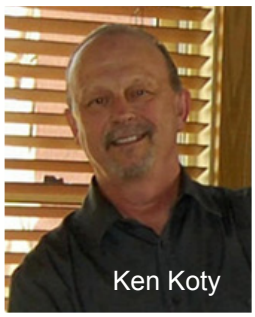

Ken's Korner

SELECTING RACK PDUs "POWER STRIPS"

The term PDU refers to two major classes of hardware power devices. The first and typically most common one in the data center facility world refers to the higher-cost floor mounted power distribution devices that transform large capacity UPS power output feeds into distributed power feeds. These floor-mounted PDU devices are composed of transformers and circuit breakers. In a typical data center for example, there would be relatively few of these floor-mounted PDU devices located on the raised floor. Each of these would feed a large number of racks and rows of racks. In some cases they would feed Remote Power Panels (RPP's) with multiple power panels.

The second class of power distribution unit (Rack PDU) or "Power Strip" covered in this article is a much smaller and lower cost device fitted with multiple power outlets or receptacles designed to distribute electrical power to racks or cabinets filled with data center electrical equipment. It is the added features of data center PDUs that can help a mission critical facility achieve and maintain uptime, that make them special and unique to the industry.

Finding the right PDU isn't a hard job, but does require some advance planning and considerations for the unique needs of the data center.

Rack PDU Plug Receptacle Types & Cord Lengths

Identify which racks or cabinets the PDU will be used with, and determine how and where the unit will be mounted. From that location measure the distance from the PDU to the branch circuit power whip receptacle so you know how long your power cords need to be, allowing enough length to be fed through floor grommets, and around struts and racking (raised floor).

Match the plugs from your electrical equipment with the PDU receptacles. You need to know which types of plugs the devices have so you purchase PDUs with appropriate receptacles.

Rack & Cabinet Compatibility

Be sure that the PDUs selected are compatible with the server cabinets you are using. They should be easy to install and not too large so they take up too much valuable space within your cabinets.

Horizontal PDUs typically occupy space within the rack that might normally be reserved for equipment. For space saving purposes vertical PDUs mount on the backs of the racks. If you can't reserve horizontal space in the rack for the PDU, consider a vertically mounted PDU.

Types of Rack PDUs

The four main types of PDUs range significantly in price and function. The tier level and mission critical nature of your data center will often dictate which PDU is most appropriate.

1. **Basic PDUs** are the least expensive and offer simple power feeds to equipment with no extra features.
2. **Metered PDUs** typically provide an illuminated status display measuring the load level, a handy feature when balancing loads.
3. **Switched PDUs** connect to the network and offer the features of metered PDUs as well as remote on/off control of outlets.
4. **Smart or Intelligent PDUs** combine the features of a metered and switched PDU's into one device, while providing power monitoring and web based management.

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SELECTING RACK PDUs

"POWER STRIPS" (CON'T)

Voltage & Amperage

You need to know how many devices will be in the rack or cabinet so you select PDUs with enough the different C13 or C19 power outlets you might need. Determine how many outlets are necessary to connect all of your devices and how many amps will be needed to support those devices. You also need to know how much power the devices in the rack will draw, being mindful that you have the right voltage and amperage numbers.

A very handy upgrade is to purchase PDUs with amp/volt meters built in. The initial cost of a metered PDU is more but they will help manage the possibility of overloaded circuits which can prevent tripped circuit breakers or overheated conductors which could be a fire hazard.

When using dual corded servers, a metered PDU provides a quick way to monitor the load. By adding each power strip together you can be sure the circuit feeding the surviving power strip will not be overloaded in the event one path is lost. This is easier and safer than going into the PDU/RPP and amp probing each individual circuit.

Power monitoring at a PDU outlet level is a great way to see how much power is being drawn at the server or device level. Power monitoring can be done at the whole PDU level, individual outlet level or outlet group level. Tracking power usage by rack allows you to identify electrical power capacity to add additional electrical equipment to racks and cabinets.

Remember, in mission critical environments with multiple power feeds, capacity of the PDU must be planned at 50% or less but be prepared to carry 100% load for redundancy purposes in case of a failover.

Rack PDU Cord Plug Type

The PDU plugs need to match the receptacles in the branch circuit power whips. I always tried to get a locking type male plug on the PDUs I purchased. With a locking plug you can avoid accidental disconnects when people are working with power or communication cable under the raised floor and within the cabinet. If needed I'd cut off straight blade male plugs and replace them with locking type plugs.

Other Rack PDU Features & Issues

I've always tried to avoid on/off switches on PDUs. If your PDUs have on/off switches I'd recommend placing some type of guard over the switch to avoid accidental shut off from people working inside the cabinet.

Beware of trip devices that come with some PDUs. Your branch circuit breaker will provide the proper protection, especially if you test the breakers prior to installation.

Some form of a locking receptacle or locking device is a nice feature to limit the chance of plugs becoming disconnected due to vibrations or inadvertent contact.

Just because you have an open PDU outlet doesn't mean that you have electrical capacity to plug something in. Prevent people from plugging into empty slots. PDUs with unused outlets or receptacles should have guards or be blanked off to prevent someone from plugging something like a vacuum cleaner or laptop charger in. These non-critical devices need to be plugged into a maintenance outlet.

Inexpensive basic rack mount PDUs distribute power, but they offer little control over critical energy flow. Metered, switched and smart PDUs offer incrementally more advanced tools for monitoring and managing the power feeds but require greater initial cost as well as trained staff to monitor and manage. The first step in selecting power distribution units is deciding what your uptime goals are.