



ServersCheck PoE & SNMP sensors
for monitoring conditions in your racks & rooms
alerts via email & SNMP Traps. Attractive price

Live Demo

UPS: A User's Perspective

James Coughlan March 9, 2012 No Comments »



There are many UPS manufacturers promoting their own specific approach to uninterruptible power supplies—online or offline, centralized or distributed. But for the most part, particularly sub-15kW, it's really all about box-shifting, and the user is pretty much on his or her own in making the right selection.

With 20 years in the UPS business, James Coughlan of Cannon Technologies has spent the last 12 months researching all of these issues from a user perspective—particularly operational and maintenance issues—and offers his advice on the pitfalls awaiting unsuspecting users/specifiers and how best to avoid them.

Uninterruptible power supplies (UPSs) are not a hot technology like Cloud computing, storage or blade systems. They are part of the fabric of the data center and, as such, can easily be forgotten or overlooked. Such an omission is an extreme risk to any business.

The decision on buying a UPS is often taken by those outside the data center, such as the facilities management team. That same team is responsible for making decisions about upgrades and maintenance. Being divorced from the day to day power needs of the data center, however, means that there must be input from the IT department to prevent the underprovisioning of UPS and the need for maintenance at critical times.

Sizing Your UPS

Correctly sizing a UPS for a data center is critical and relatively simple. Once you've decided exactly what equipment you want to protect, you record the power requirements (in volts and amps) from the equipment back plate, multiply the two figures and thereby get your volt-ampere (VA) load. If you know what equipment you will be adding into the data center over the next six months to a year, look up the ratings from the vendor website and add that as well.

In general, a good working practice is to add around 25% to allow for unexpected additions to the data center. This is a process that should be done on a regular basis to ensure that any equipment introduced is not using more power than expected and that you have not outgrown your UPS.

An example of why regular validation is needed is blade servers. Few organizations purchase a blade server chassis fully populated and running. Instead, they buy the chassis and add blade servers over time. As they need more-powerful computer resources, they change out older blade servers for newer ones. In this process, it is easy to forget to check whether the UPS is still capable of supporting the load that is now being put upon it.

Storage is a real pressure point for data centers as users do more business intelligence processing and the data gathered by the organization increases. Although SSD has lowered the power requirements in some areas, the majority of storage is still spinning disk.

Disks purchased for storage area networks (SAN) are often purchased as a complete tray or a whole new SAN device. These are power hungry devices whose power management systems, tends to make the load drawn quite variable. Always size for the maximum possible load not the median.



Search

Featured Whitepapers

Whitepaper Library

10 Critical Factors to Ensure A Successful ERP Selection and Implementation Process: This paper will first outline the challenges of ERP selection and i...

see more whitepapers...

AS#404: NO AD FOUND IN ROTATION

Register for our eNews

Email Address

First Name

Last Name

Upcoming Events

- March 18, 2012 – March 22, 2012
[AFCOM-Data Center World](#)

- March 19, 2012 – March 19, 2012
[Data Center Technologies Academy](#)

- March 22, 2012 – March 22, 2012
[District of Columbia Data Center Discussion Panel Event](#)

- March 23, 2012 – March 24, 2012
[Cascadia IT Conference](#)

- March 27, 2012 – March 29, 2012
[Green Data Center Conference and Exhibition](#)

Redundancy

Servers, power supplies, switches and storage are all critical systems. As a result, when they are purchased, part of that process is to consider what is needed to prevent a single point of failure. In large data centers, the UPS is provisioned with its own backup, but in the mid-sized data center, the UPS is often a single solution—and that is a significant business risk. You should always have two correctly sized UPSs, each of which is capable of carrying the whole data center load, should the other UPS fail.

Choose a Good Quality Brand

Many UPS vendors are in the market despite the consolidation of the last three to four years. Some of these are well-known and established brands with proven engineering and testing divisions. They also provide their own engineers for warranty and support maintenance.

At the same time the number of new brands is slowly growing, and some of these brands appear to be rebadging similar equipment. Here it is hard to prove the engineering quality because this is a sealed box unit with no user maintainable components. This means that critical electronics that deal with waveform distortions and harmonics as well as varistors that deal with power spikes cannot be proven to be enterprise quality. At the same time, finding local engineers to support the UPS is not a guarantee, and you could find that your nearest engineer is more than a day away.

In a time of fiscal belt tightening, choosing a new, cheaper brand for a system that is rarely seen might seem like a sensible business decision. But a UPS is part of your critical infrastructure that needs regular maintenance and the attendance of an engineer as soon as something goes wrong. Skipping on this is a false economy.

New or Second Hand?

With so many companies downsizing, there are a number of good quality, well-maintained UPSs available either through auction sites like eBay or from other third-party sites. But although the low price of second-hand equipment is attractive, should you be buying it? It's a reasonable question, and one that isn't necessarily simple to answer. Here are some issues to consider:

1. You will almost certainly need to change the batteries, as you cannot be sure how well they have been maintained.
2. Maintenance records are rarely, if ever, available, and without them you cannot be sure that the UPS will be fit for purpose when installed.
3. You cannot be sure of what the power was like at the location where the UPS was last used. As such, you do not know how hard a life the electronics have had and if they need to be replaced.
4. Even if a vendor will send out a certified engineer to look the unit over, there will be no warranty. The best they will do is provide you with a maintenance agreement that is almost certainly going to be more expensive than buying a new UPS.

But buying new is no guarantee that you will avoid problems. UPSs need to be bedded down into a data center. Part of that process is ensuring that it adjusts properly to the variances on your input power, and it is not unheard of for engineers to require several visits to ensure everything is running properly. This, however, is not unique to UPSs, and there is nothing wrong with having installation engineering checks on any form of critical infrastructure.

Preventative Maintenance and Servicing

All equipment needs maintenance over time, and regular maintenance is important for a UPS. Once you strip out human error, the main failures for UPSs tend to be batteries, defective parts and end-of-life/worn-out parts. Preventative maintenance (PM) should help reduce the frequency of these causing problems.

How often you should carry out PM differs between vendors and data center professionals. Some advocate monthly, while others tend to talk about quarterly, half yearly or yearly. Yearly PM is more likely to be a scheduled service and replacement of parts, whereas PM, in many cases, is just a visual inspection of batteries and components. PM is also an opportunity to replace any parts identified by a vendor as either being end of life or having a potential manufacturing problem.

Various studies show that 20% of UPS failures are attributable to batteries, and depending on the type of UPS you purchase, checking the batteries can be difficult. Large UPS installations with rows of batteries are relatively easy to check. The increased use of small rack mounted UPSs and sealed unit modular UPSs is a problem, however. Although some modular UPSs do provide access to the batteries, others do not.

Where there is no access to the batteries, the only way to check them is through software that estimates how often they have been used, how often they have been through a partial or complete recharge cycle and whether they need to be changed. It is important with all batteries to ensure you are doing proper management of temperatures, and this is an issue for rack mounted UPS.

Fans can be a variable component in a UPS. The most frequent failure is that the bearings dry out, and if the UPS is running too hot and the fans are constantly on, this will occur more frequently than the vendor expects. This is an area

DCJ Magazine Archive



February 2012 – Risks of ...

February 8, 2012, [No Comments](#)
Table of Contents 1. Risks of Outsourcing your Data Center ...



November 2011 – 2011 Year ...

November 30, 2011, [No Comments](#)
Table of Contents Unique Data Center Locations Combined Heating, Cooling, ...



August 2011 – What are ...

August 31, 2011, [No Comments](#)
Table of Contents The Economy – Has it improved and ...

Click [HERE](#) to view all archive magazines.

Free Print Magazine!

[Register today](#) to get a free print subscription to our DCJ Magazine. Simply complete the registration with your full address and we will mail you our quarterly issues!

where with cheap UPSs, savings are made by using the cheapest fans available—another reason to buy from a reputable manufacturer.

In modern data centers, air filters should not become clogged, as these are generally dust-free environments. External UPS installations that are not in clean rooms, however, can have problems here, and this should be easy to spot. If you are experiencing multiple failures, you should consider air filters for the UPS room to help reduce maintenance issues.

Capacitors and varistors, which help to smooth out fluctuations, degrade over time with excessive use. Although they are not always easy to check by way of a quick visual inspection, they should be looked at carefully during yearly maintenance.

In addition to a redundant UPS providing backup should one UPS fail, you will need to shutdown your UPS for proper maintenance. Rather than run the risk of running with no UPS, a redundant UPS ensures your business risk is minimized.

Rack or Modular?

UPSs generate little heat compared with IT systems and, when rack mounted with blade systems or storage systems, are often operating at the bottom of their recommended temperature range owing to cool-aisle technologies. Another temperature problem occurs where data centers are increasing the input temperature to servers in order to manage cooling costs. Here, we are seeing temperatures in the mid 20°C range (68°F), with a small number of data centers beginning to move to the 30°C (86°F) and even 40°C (104°F) ranges. At these higher temperatures you will need to be sure that you are cooling the rack-mounted UPS.

This is where modular UPSs are more attractive. They can be placed in a temperature-controlled environment where you can be sure that the batteries are not subjected to temperature extremes. At the same time, you can simply add another UPS module should your load requirements change, such as with the purchase of a new shelf of disk drives for a SAN or the addition of extra blade servers into a blade chassis.

Shutdown Scripts

Should your UPS be called into use, it will provide you with a limited period of time to carry out a controlled shutdown of your equipment. This can be automated by using computer scripts that will ensure that all data is saved. Depending on the type of UPS, it is possible for it to restart servers and storage devices once the primary power is restored.

The longer you own a server, the longer it will take to shut down safely. This is down to the software and patches we load to keep it running. You need to monitor increases in shutdown time to make sure the UPS provides enough protection.

In addition to checking for increased shutdown times, you should also check any dependencies between devices, which might mean that some cannot be shut down until others have completed their shutdown process. Get it wrong and you can end up corrupting databases and other data.

Test Regularly

As with any backup mechanism, unless you test it, you do not know if it is working correctly. For a data backup, you should do a restore; for a UPS you need to test a power outage.

The best method is to use a circuit breaker installed in your electrical box. To test the UPS, just throw the circuit breaker—you should immediately receive notifications that the power has gone down, and servers and devices should start to shutdown gracefully.

Conclusion

UPSs to protect your company systems are not optional extras; they are core pieces of hardware that should be invested in. Provided you buy from a reliable source, maintain it properly and regularly check that it is sufficient to protect your IT systems, you should be able to avoid landing in the 40% of businesses that suffer a serious data loss.

About the Author

James Coughlan is Business Development Manager Middle East for [Cannon Technologies](#). Cannon Technologies provides its T4 Data Centre Solutions product set to the data center industry, and it has its own worldwide installation force and regularly builds complete data centers as turn-key projects at any level up to and including Tier 4 (data center standard TIA 942) resilience for 99.999% availability.

Photo courtesy of [The Planet dedicated hosting](#).

Related Posts :
