How to enhance hyperconvergence with infrastructure management

Powering Business Worldwide

Consolidating the server, storage and management layers of traditional IT into one solution, hyperconverged solutions delivers scalability, decreased complexity and increased efficiency—if backed by advanced UPSs, PDUs and integrated power management software.

The combination of a consolidated IT infrastructure and highly resilient power solution ensures business continuity.

Risks with hyperconvergence

Research into Eaton UPS owners found an average cost of downtime of **$471,000 *per hour***. 23% reported their sites as being extremely critical with costs of more than $1 million per hour of downtime.

Power disruptions are even more detrimental in virtualized environments. Every server needs more power and flexibility for instantly shifting the power demands within existing infrastructure.

Risks include:

- **Costs increase** because of overprovisioning of power infrastructure
- **Sub-optimal operating conditions** because of the right amount of power doesn't go to the right place at the right time

Organize, protect, manage hyperconverged and reap power management benefits

- ✓ Lower operating costs:
  - ✓ Doubling runtime with integrated load shedding and power capping
  - ✓ Avoiding data retrieval costs of $2,450 per hardware device incident
  - ✓ Reducing generator fuel consumption by approximately 54% to ride through outages
- ✓ Simplify power management: Centralized, remote control
- ✓ Simplify operations: VMware vCenter virtualization integration
- ✓ Simplify configuration: Reference designs, use and scale

Use cases

Managing small, remote data centers

Without local IT staff to perform manual operations or UPSs and generators, power management software enables IT managers to remotely monitor, manage and control the power infrastructure on their network.

Software should enable uptime through workload management (load shedding) and power capping while also ensuring data integrity with automated failover for business continuity.

A dedicated in-rack UPS conditions power to ensure continuous uptime, and during power interruptions, keeps hyperconverged solutions running through battery runtime.

Ensuring uptime for data centers

Large data centers that typically use generators can automate processes and reduce the workload and generator fuel usage during major disasters where power may be out for several days or longer.

When Hurricane Sandy hit the U.S. in 2012, data centers ran generators to continue operations. In the meantime, the fuel tanks were draining, causing employees to carry gallons of fuel to generators on the roofs, and IT techs were manually determining which applications and virtual machines could be shut down to reduce the generator load.

Power management software starts the load-shedding process soon after the disaster strikes, and also has power capping capabilities to reduce the generator's workload and the corresponding fuel usage.

Implementing disaster recovery

Hyperconverged solutions can help you achieve disaster recovery goals, but make sure the disaster recovery site is protected against power problems and is able to ride through prolonged power outages.

Safeguarding data center scaling

Hyperconverged solutions help operationalize data center scaling with a modular approach to all-in-one solutions. When the next data center refresh is upon you, including power infrastructure and management will optimize uptime.

Steps to success

Best practices for powering hyperconverged solutions

- Developing an effective power strategy is achieved by understanding the current rack environment
- and workload demands, followed by choosing an optimized rack PDU and then backing up
- the system with a UPS enabled with virtualized management software. The addition of power
- management software enables IT managers to monitor hyperconverged solutions to the outlet level, further optimizing operational efficiency.

Populating the rack

- Racks should be populated with the heaviest and most power-dense equipment (UPS, battery modules) at the bottom.
- Install the hyperconverged nodes above.
- Place the fabric interconnect and fabric extenders toward the top of the rack or enclosure.
- U-space not consumed should be populated with blanking panels for improved airflow.

Managing cables

- Proper cable management is critical to reducing airflow blockage.
- Lack of sufficient airflow may result in increased equipment fan power consumption to compensate for increased airflow impedance.
- Properly dress the cables with cable rings and Velcro tie-downs to provide the best airflow.

Power planning

- Gather basic information about the site where the hyperconverged solution will reside.
- Answers to these questions will confirm UPS and PDU selection:
  - What voltage is used? Is power available as a single- or three-phase source? What types of power input plugs are used?
- For dual power supplies in small deployments: Connect the nodes and switches to one PDU and then to the UPS for power protection.
- For larger deployments: Use two rack PDUs for redundancy. Plug each rack PDU into a different load segment (group of receptacles that can be independently controlled) of the UPS.

In summary, not factoring in power as part of virtualized environments in general, and hyperconverged environments in particular, is a risky move.

For a deeper dive, read this Cisco and Eaton white paper.