Get More From Your Network

Rely on Liebert for Adapting Your Infrastructure to the Demands of IP Telephony

GET MORE!™ IP TELEPHONY APPLICATION GUIDE

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Network Power

The promise of IP telephony

If your business hasn't already switched from traditional voice communications to IP telephony, it may in the next five years. The research firm In-Stat projected that new business IP line sales would grow from 5.5 million in 2003 to 15.9 million in 2008. IDC projects a steady continuation of double-digit growth in IP telephony sales at least through 2012.

Warning signs that your infrastructure may not be ready for IP telephony.

Adding the demands of IP telephony to your network means raising the criticality of your network infrastructure. Is it ready? Here are warning signals that your infrastructure may not meet the increased power and cooling requirements of IP telephony.

- You have less than 10 minutes of UPS backup power and no generator available in the event of an outage.
- Critical network devices are supported by UPS systems using line interactive technology (rather than the much more reliable online UPS systems).
- Network spaces lack the cooling to support new equipment.
- There is no redundancy designed into the IT infrastructure.
- You have no structured plan for maintaining and replacing UPS and cooling systems.
- Network equipment in remote locations is not physically secure.

Plan for network integrity.

The criticality of IP telephony reduces your tolerance for network downtime. It also places new demands on the power and cooling infrastructure supporting your network.

With the adoption of IP telephony, power and cooling must be considered at the beginning of network expansion projects. These two technologies play a central role in the ultimate success of an IP telephony project. Ignoring them can be disastrous to the performance of your network.

Liebert solutions from Emerson Network Power allow you to:

- Remove power and heat related obstacles to achieving the lower costs, enhanced productivity and service quality promised by IP telephony.
- Increase power availability and reduce downtime risks.

This guide is designed to help you get more from your network. With it, you can:

- Identify gaps in your IT infrastructure that can reduce the success of your network.
- Learn how to apply new infrastructure technologies to increase the reliability, capacity and flexibility of your network.
- Reduce dropped calls and network degradation through Liebert power and cooling products and services.

The Challenges

Let's look at some of the key infrastructure challenges that must be addressed in your IP telephony planning. These include:

Physical Security

Network equipment can become vulnerable to failures caused by unauthorized access or by adverse environmental conditions, especially in remote, unsecured locations.

Power Management

IP telephony systems create new requirements for UPS sizing, runtime, scalability and redundancy. UPSs must be sized properly to accommodate Power over Ethernet (PoE) and future growth. Runtime requirements usually increase for equipment in remote spaces, particularly those not protected with generator systems. In addition, higher availability IP telephony equipment often requires additional power redundancy.

Heat

The network equipment required to support IP telephony may consume more power and generate more heat, especially when higher density switches are deployed. In addition, this equipment is sometimes installed in small, poorly ventilated spaces where heat can build up quickly, degrading equipment performance and threatening the integrity of your network. According to Gartner, "Typically, the cables to office desks and IP phones are aggregated within a wiring closet, and a key issue that must be considered is the concentrated heat dissipation from the switch and UPS placed within the wiring closet."

Visibility and Control

Enhanced monitoring has become essential to managing a high availability network. Many network access spaces are not monitored for assured equipment utilization and for adverse environmental conditions. Monitoring these spaces is critical to ensuring the continuity of business critical applications like IP telephony.

Maintenance and Service

Lack of scheduled maintenance and service can cause unplanned downtime and increases cost of ownership of power and cooling systems. Extending the useful service life of the power and cooling equipment through proper maintenance, predictive monitoring, and keeping the system up to current revisions reduces the likelihood of network downtime.

How to ensure that your infrastructure is ready for IP telephony

Here are measures you can take to ensure your infrastructure is ready for IP telephony. To be sure you're making all the right steps for your particular IP telephony application, talk with your local Liebert Network Solutions Partner.

1. Make sure racks are designed to the requirements of new network equipment

If you need new network racks, select those that are switch friendly, such as the Knurr line from Emerson Network Power. These racks feature 19-inch rails that can be easily adjusted deeper into the racks to accommodate front cabling. Their light weight and tool less accessories make them easier to install and configure as new equipment is added. In addition, their 83 percent perforated doors provide greater airflow into the rack, facilitating cooling in spaces not originally designed for network equipment.

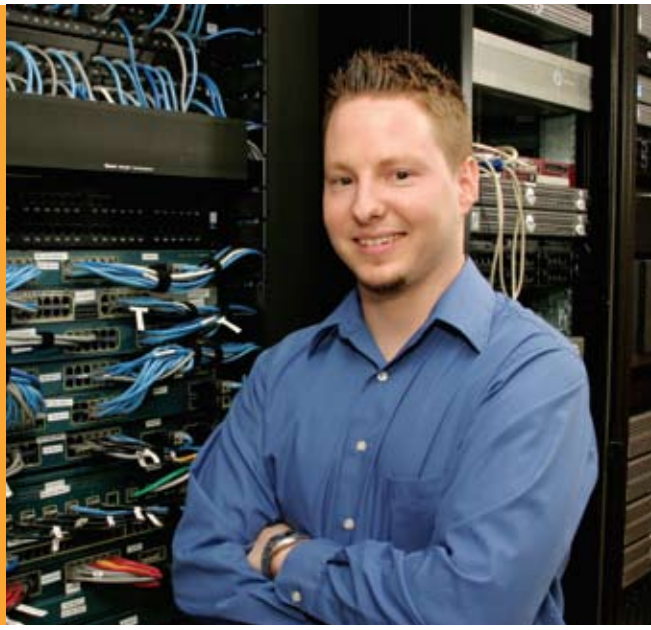
2. Ensure physical security

It's important to use racks, like the Knurr line from Emerson Network Power, that come with key or card swipe locks and contact closures that protect against unauthorized access, especially in remote network rooms.

Coleman Technologies Inc., an IT engineering services firm headquartered in Orlando relies on its network for traditional network functions, the IP phone system and a remote network monitoring business. It was experiencing periodic disruptions in its network operations following the move to IP telephony.

The disruptions were traced to internal problems within the primary UPS supporting the network, which was not only failing in its role to prevent downtime, but was actually creating downtime. Coleman replaced the system with a 6 kVA Liebert GXT UPS just before a series of hurricanes tore through Florida.

"We were hit with four hurricanes in less than six weeks," said Chris Ireland, network administrator at CTI. "Our building lost power eight to 10 times during the storms, but we did not experience a single interruption. In fact, since we installed the Liebert GXT UPS system, we have not had any network reboots."



3. Ensure UPS capacity and reliability

Chances are, if your UPSs are more than three years old, they may not have the capacity or reliability required for IP telephony. Given the changing nature of network technology and the growth in power requirements, sizing UPSs to accommodate a 50-100 percent growth factor is not excessive. Line interactive UPSs currently in place may have to be upgraded to systems with higher reliability, such as the online Liebert GXT UPS. Online UPSs have up to twice the reliability as line interactive UPSs that traditionally have been used for rack applications.

4. Make sure power redundancy is sufficient

Often the high potential cost of network downtime warrants power redundancy. You can achieve this by adding a UPS to the system where no UPS exists, or by configuring dual corded switches with dual UPSs and dual PDUs running to two different circuits. Adding a maintenance bypass switch, like the Liebert MicroPOD, will let you provide power to the network equipment during UPS maintenance.

5. Ensure you have adequate UPS backup in the event of a power disruption

About 19 percent of all UPS failures can be attributed to insufficient run times. Where many data networks can tolerate a controlled shutdown 10 or 15 minutes after an outage occurs, most organizations will want to maintain phone availability for at least an hour. Have sufficient UPS battery backup to meet your existing and anticipated growth needs.

6. Increase visibility into your infrastructure

Monitoring of physical security and system performance becomes essential with a high availability application like IP telephony, especially in unmanned, remote network spaces. Ensure UPS systems are equipped with interface cards like the Liebert Intellislot Web Card, and with monitoring and control software like Liebert Nform, which enables remote monitoring of UPS status and battery capacity, and supports graceful shutdown of equipment if desired.

Ability Beyond Disability, a non profit organization dedicated to helping people with disabilities realize their dreams, made sure they included ample runtime when they upgraded their UPS as part of an IP telephony deployment. “Some or our clients have life threatening conditions so any interruption of telephone service was unacceptable,” said Laurie Dale, manager of Information Technology Services.

Her system was tested almost immediately. The agency suffered a power outage a half hour before employees were preparing to clock out. “It could have been a big problem if our UPS had only 15 minutes of runtime, but because we planned ahead everyone was able to clock out as though we were not in the middle of an outage,” said Dale. “I no longer worry about power outages. I can relax and focus on new ways to use technology to enrich our clients’ lives.”

"Smart" PDUs, like the Liebert MP Advanced Power Strips, can be a valuable addition to your network infrastructure. These units provide receptacle level control of power so you can prevent the addition of new devices that could create an overload condition.

Additional visibility into network rooms can be achieved via network enabled environmental monitoring units, like the Liebert vEM-14. The compact size of these devices makes it easy to deploy them in 1U of rack space to monitor temperature, humidity, water detection and contact closures within individual racks or small spaces.

7. Keep your cool

IP telephony could significantly change the environmental conditions in network access rooms and data centers.

Many network access rooms are converted closets that have inadequate cooling and poor ventilation.

If you have relied upon building air conditioning in the past, you may find that now is the time to thoroughly investigate whether dedicated cooling is needed for your network spaces. Critical equipment requires more precise temperature and humidity control — as well as the air filtration — provided by precision cooling.

Typically, racks with 1kW to 3kW need dedicated cooling. At 5kW and above, high-density cooling is required to protect equipment adequately. A number of solutions are available for cooling network spaces and smaller data centers, including:

- **Integrated enclosures.** These provide a power protected, climate controlled, physically secure environment for critical equipment and are ideal for small spaces where equipment needs physical security and cooling. Examples of these systems include the Liebert Foundation MCR (Mini-Computer Room) for loads up to 1.6kW and the Liebert XDF for loads up to 14.4 kW. Both come with options for power management and monitoring.

- **Ceiling mount precision air conditioners, like the Liebert MiniMate2.** Compact, powerful precision cooling units can be ceiling mounted to provide a zero footprint cooling solution for small spaces.

- **Floor mount and wall mount precision air conditioners.** Floor mount systems, such as the Liebert Challenger 3000 and wall mount systems, such as the Liebert DataMate, are designed for smaller spaces.

A Liebert Network Solutions Partner, working with a local Liebert Representative, can help you evaluate cooling options and select just the right cooling solution.

8. Don’t forget service and maintenance

Battery issues are the single highest cause of UPS failure. Be sure to monitor your UPSs and have a battery replacement schedule in place. Some IT departments manually assess UPSs to see if the battery alarm is sounding or the fault indicator light is on. You can also monitor UPSs remotely via network communications software and monitoring software. One major benefit to having network monitoring of your UPS is that it minimizes labor costs and if properly reviewed can effectively reduce battery problems.

The Liebert Power Assurance Package, for example, provides onsite service and battery replacement for rack mount UPS systems. Remote monitoring is also available. Both offerings are supported by the largest service organization in the industry and are available through Liebert Network Solutions Partners.

Cooling equipment must also be maintained, and maintenance should be conducted by factory certified technicians. Extending the useful service life of the power and cooling equipment through proper maintenance, predictive monitoring, and keeping the equipment up-to-date increases equipment life spans and maximizes performance.

Liebert Checklist for IP Telephony

Below is a checklist to help you evaluate your IT infrastructure for IP Telephony. Be sure to work with your local Liebert Network Solutions Partner to review your needs and determine exact equipment requirements.

Availability Considerations	YES	NO
Do you know what level of power availability you require for your network?		
If not, have you calculated your cost of downtime for network equipment to help determine your desired availability level?		

Room Size	YES	NO
Can you fit all your desired network equipment — including power and cooling systems — into the rack?		
Can you fit the rack into the room?		
Is your room secure from unauthorized access?		

Existing Power	YES	NO
Is there sufficient incoming power for your full equipment loads?		
Are there sufficient circuits for redundancy if desired?		
Have you checked which types of receptacles are present — will they accommodate equipment plug types?		

Existing Cooling and Ventilation	YES	NO
Is the room ventilated?		
If not, can it be ventilated to the outside?		
Does room cooling — dedicated or building cooling — exist?		

Power Quality	YES	NO
Will your equipment need power protection during outages only or continual protection and power conditioning?		

Power Backup Runtime	YES	NO
Are you using full loads and not nominal loads to size the UPS?		
Have you sized the UPS based on factors such as Power over Ethernet, network equipment growth, and the criticality of the equipment?		

Power Distribution	YES	NO
Do you require rack PDUs with monitoring and control capabilities?		
Do you need to maintain tighter controls over who makes equipment changes?		

Liebert Checklist for IP Telephony (cont.)

Power Redundancy	YES	NO
Have you determined the level of power and UPS redundancy you need given the criticality of your equipment and your cost of downtime?		

Physical Security	YES	NO
Is your network access room secure from physical entry?		
Do you need to secure cabinets from unauthorized entry?		
Do you want to be alerted when the cabinet is opened?		

Cooling and Ventilation	YES	NO
Will the equipment you install require dedicated cooling equipment?		
Is the power load in the rack 5kW or more — high enough to consider high density dedicated cooling?		
Have you calculated the cooling requirements of your network equipment — planned and anticipated?		

Monitoring & Management	YES	NO
Do you want to monitor power and cooling equipment via your network?		
Do you want to be able to send alerts, initiate graceful shutdowns of equipment and control power usage within the rack?		
Do you need to monitor for environmental conditions, such as heat, humidity and water leakage?		

Preventative Maintenance & Rapid Response Service	YES	NO
Do you want to be able to service the UPS without shutting down power to the protected equipment?		
Do you need UPS and battery checks or other types of preventative maintenance?		
Do you need startup services for larger UPSs and cooling systems?		
Do you want to consider a long term warranty and service package to provide preventative maintenance and repair for up to 5 years?		

For assistance with power and cooling solutions, contact your local Liebert Network Solutions Partner.

Key Liebert Products For IP Telephony

Product	Why It's Right for IP Telephony
Racks & Cabinets	
Knurr Racks & Cabinets	– Knurr offers switch friendly configurations. 19" rails can be easily adjusted deeper into the racks in seconds to accommodate switches with front cabling – Locks and contact closures can be monitored remotely via the network to protect against unauthorized access – 83% perforated doors facilitate airflow for improved removal of potentially harmful heat
Liebert MP Advanced Power Strips	– Protect against unauthorized equipment adds and changes – Allow remote control of power usage at the receptacle level to avoid circuit overloads
Monitoring	
Liebert Intellislot Web Card	– Provides network communications for Liebert UPSs
Liebert Nform	– Alerts you to adverse equipment and environmental conditions before they become problems and provides for graceful shutdown if required
Liebert vEM-14	– Monitors temperature, humidity and water leakage and contact closures
Enterprise Remote Monitoring	– Monitors power and cooling systems and environmental conditions for customers that lack the time or personnel
Power Protection	
Liebert GXT Rack and Tower Mount UPS	– Provides complete power conditioning for sensitive equipment – Twice as reliable as commonly used line interactive UPSs – Easily paralleled for redundancy and capacity
Liebert NX	– Room level UPS for protecting multiple network spaces in a single building

Key Liebert Products For IP Telephony (cont.)

Product	Why It's Right for IP Telephony
Cooling Systems	
Liebert Foundation MCR (Mini-Computer Room)	– Physically secure environment for equipment in remote locations – Cooling for up to 1.6 kW of equipment – Optional power management and monitoring accessories
Liebert XDF	– High density cooling up to 14.4 kW – Optional power management and monitoring accessories
Liebert Challenger 3000 – Floor Mount	– Provides complete control of temperature, humidity and air filtration – Small footprint
Liebert DataMate – Wall Mount	– The perfect solution for cramped quarters requiring more effective temperature and humidity control and air filtration than comfort cooling systems
Liebert MiniMate 2 – Ceiling Mount	– Provides precision more effective cooling, humidity control and air filtration than comfort cooling systems – Takes up no floor space
Special-Situation Solutions	
Liebert IP Telephony Availability System	– Combines a wall mount or floor mount lockable enclosure with optional UPS, PDU, monitoring and fan accessories – Certified as Cisco Compatible
NterpriseIP Solution	– DC powered lockable enclosure for larger IP telephony implementations – Higher energy efficiency – Certified as Cisco Compatible

How to get started

IP telephony represents a significant challenge not just for your network, but for your entire business. Look for solutions providers that have been trained in power and cooling issues and can offer a full range of solutions.

Your local Liebert Network Solutions Partner, working with a Liebert Representative, can evaluate your network spaces and prescribe solutions that answer today's needs and accommodate tomorrow's growth.

To find a Liebert Network Solutions Partner near you, **call 1-800-844-8816**.

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