Remote Monitoring and Management for Healthcare Network Closets and Distributed Sites

As healthcare networks continue to expand to support more remote facilities while adding the capacity required for digitalization and emerging technologies such as telehealth and AI, IT management becomes more critical and more complicated. Vertiv™ solutions enable remote monitoring and management of distributed sites through dedicated monitoring of individual systems, comprehensive monitoring of distributed sites and remote monitoring by Vertiv engineers.

The Challenges

With more IT capacity spread across more locations, management resources can get spread thin. Few healthcare organizations have the resources to manually monitor distributed sites to ensure conditions in those sites remain safe for IT equipment, and equipment isn't exhibiting early signs of failure. In addition, tasks such as responding to alarms or making software updates become complex when spread across multiple sites. Without the ability to remotely monitor and manage distributed sites, healthcare organizations face higher risk of downtime in distributed locations and much longer times to resolve problems when they occur. When implementing remote monitoring and management, consider the impact of the following factors on IT system performance:

Power Continuity: Are distributed UPS systems operating as expected and will UPS batteries deliver expected runtimes when needed? UPS battery systems degrade over time and require regular replacement. Failing to monitor UPS performance and battery capacity can leave remote sites exposed to unexpected and avoidable failures.

Environmental Conditions: Closets and small rooms can heat up quickly when not protected by dedicated cooling systems. Building cooling systems may provide adequate protection during some periods but then leave IT equipment exposed to high temperatures when cooling is reduced during off-hours. If dedicated cooling is used but not monitored, it can take days or weeks to recognize a failure in these systems. Monitoring cooling system status and environmental conditions within the room or rack can ensure IT systems are operating within manufacturer-specified temperature and humidity ranges. Distributed environments also benefit from the addition of leak and smoke detection sensors.

Power Usage: Gaining insight into power consumption by device ensures loads are properly balanced, allows energy use trends to be evaluated, and enables power redundancy to be monitored, all of which can support maximum uptime. Adding the ability to switch on and off power outlets can help prevent accidental overloads and enable IT equipment cycling.

IT Management and Troubleshooting: KVMs and Serial Consoles provide remote centralized access to IT devices across multiple closets and distributed locations to streamline configuration, troubleshooting, and monitoring. Software updates and other routine maintenance tasks are greatly simplified by enabling access to multiple devices through switches or consoles. If human intervention is required to troubleshoot issues, the engineer is able to dial into the system even if no IP is available. They can then examine logs to see what the device was doing before it failed. If the issue is software or firmware related, which 80% are, it can be resolved remotely, significantly reducing the downtime of the device and the technical time to resolve the issue. Even if the issue is hardware related, the time to diagnose has been reduced, avoiding potential failures.

Vertiv™ Solutions

Vertiv is a global leader in critical infrastructure offering a complete family of solutions for remote monitoring and management of distributed sites. From intelligent infrastructure systems that simplify connectivity to remote IT management and monitoring software and services, Vertiv has the technology and expertise to help you get connected, simplify operations and maximize business continuity.

Power Continuity and Efficiency

Vertiv™ infrastructure systems enable monitoring of power continuity, efficiency and utilization in network closets and distributed sites. Our UPS solutions provide easy connectivity through communication cards while our intelligent rPDUs provide power usage monitoring down to the outlet level. Vertiv also offers 7x24 remote monitoring of distributed power systems by Vertiv engineers. Vertiv™ power monitoring solutions contribute to increased availability by providing the visibility that can prevent many problems and respond faster to any problems that do occur. When evaluating remote power monitoring, consider the following solutions:
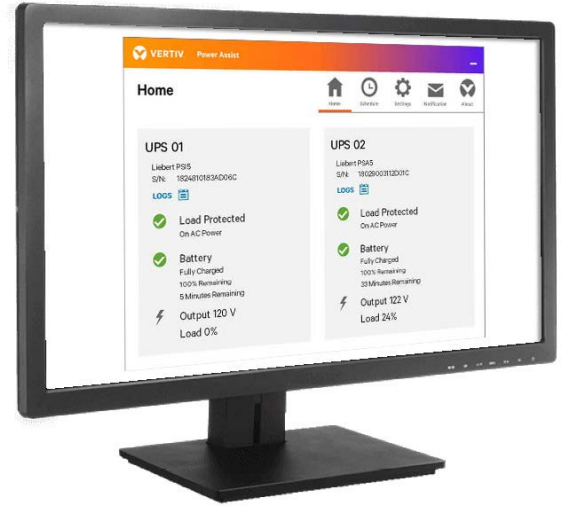
UPS Connectivity

Vertiv™ UPS solutions are available with communication cards to support a variety of communication protocols and management platforms. The cards can be added at the time of purchase or as an upgrade.

With a connected UPS, you can remotely monitor unit status and battery capacity to ensure the UPS can provide continuous power availability during an interruption in utility power.

A variety of environmental sensors can connect to the UPS communication card to enable monitoring of temperature, humidity, door closure and other variables through the UPS.

For managing UPS shutdown capability, Vertiv™ Power Assist is a free software used to gracefully shutdown an IT device when the UPS battery backup experiences a threatening condition.

Vertiv™ UPS communication cards can also support connectivity to building management and remote monitoring software such as Vertiv™ Environet™ Alert.

Vertiv™ Power Assist

Intelligent Rack Power Distribution Units (rPDUs)

Vertiv offers a full line of intelligent rPDUs under the Geist product brand to meet the application requirements of any distributed site, including Universal rPDUs that enable standardization across the network regardless of the equipment being supported.

Vertiv™ Geist™ Monitored rPDUs enable power monitoring at the unit and outlet level. Switched rPDUs expand on these capabilities to enable the remote cycling of IT equipment and the ability to lock individual outlets to protect against overloads.

These rPDUs feature hot swappable and upgradeable monitoring modules. They support monitoring of voltage, current, real power, apparent power and power factor to support power balancing, overload protection and energy usage reporting.

They can also support a small sensor network to enable monitoring of critical conditions such as temperature, humidity and door closure through the rPDU.

Vertiv™ Geist™ rPDUs come with embedded firmware to make device discovery and configuration fast and painless. Consolidation tools stop IP sprawl and the interface provides an aggregated view of your rPDUs for high level reporting. More robust monitoring and reporting can be performed through Vertiv™ Environet™ Alert software.

Vertiv™ Geist™ Monitored rPDU

Vertiv™ Geist™ Switched rPDU

Cooling System Monitoring

Vertiv offers space-saving dedicated cooling systems for small rooms and closets, including the Vertiv™ VRC rack-mount cooling system and the Vertiv™ Liebert® Mini-Mate3 ceiling-mount system. These systems not only provide the capacity, reliability and precise temperature and humidity control required to support IT applications, they are designed for easy connectivity and remote monitoring. They can support third-party protocols for integration with building management and DCIM systems and can be configured with a plug-in SNMP card for web-based monitoring over the network. They also support environmental sensors to monitor temperature and humidity conditions close to IT equipment.

Rack-Level Monitoring

Vertiv™ Geist™ Watchdog is a compact environmental rack monitoring solution with on-board temperature, humidity and dew point sensors and the capacity to support four external sensors. With Vertiv™ Watchdog you can view real time sensor data from a secure web interface and receive alerts via email, SNMP, or email-to-SMS. The solution is simple to install and configure and requires no special software.

Vertiv™ Geist™ Watchdog 15

Environmental Sensors

Sensors provide a simple and cost-effective way to monitor and manage environmental conditions of remote distributed locations. Vertiv has two environmental sensor product lines. The Liebert® SN line supports card enabled devices like the Liebert® GXT5, Liebert® PSI5, Liebert® MPH/X rPDU through the Unity and Intellislot communication cards. The Vertiv™ Geist™ sensors support the Vertiv™ Geist™ Rack PDUs and the Vertiv™ Watchdog.

Both lines offer a wide range of sensors for temperature, humidity, leak detection and other readings. They are designed to enable monitoring within a rack or network closet and can be placed in any area to read temperature and humidity levels, and digital inputs. Sensor wiring connects to the Vertiv™ UPS communication card (SN) or intelligent rPDU (Geist™). Additionally, Vertiv has created an adapter to enable several of the SN sensors to work with the Vertiv Geist Rack PDUs.

Both product lines are available in integrated or modular configurations. The integrated sensors can be attached via a single cable and usually integrate two or more of these sensing points: temperature and humidity; temperature, humidity, dewpoint; multi-point temperature; and several other configurations.

Vertiv™ Liebert® SN Sensors

Vertiv™ Geist™ Sensor

IT Management and Troubleshooting

Remote access to IT equipment in distributed locations is becoming a necessity in today's dynamic healthcare environment. Whether installing patches or troubleshooting system problems, it simply isn't practical for technicians to have to travel to each distributed site to perform routine maintenance or diagnose problems. Vertiv offers both KVM switches and serial consoles that provide IT administrators with a complete remote management solution to access and control servers, networking equipment and other devices found in distributed locations. With remote IT access you can reduce the time required to diagnose, reconfigure, repair and restore servers, network devices and other hardware across all of your distributed sites.

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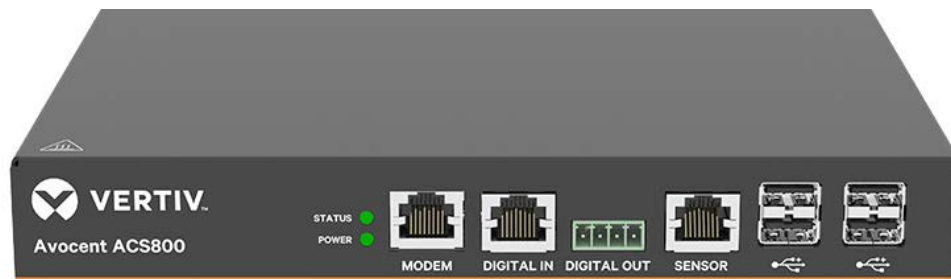
Vertiv™ Avocent® MergePoint Unity™ KVM Switches

The Avocent MergePoint Unity™ family of KVM switches include both KVM-over-IP and serial console technologies to provide a complete remote management solution to access and control servers, networking equipment and other devices. It enhances the in-band management typically done through the network interface controller (NIC) of IT equipment by providing secure and remote out-of-band connections directly to the physical KVM, USB and serial ports. Key features include:

• Serial adaptors support SSH connections and the Cisco pin-out to make connections to your equipment quick and easy

• Virtual media enables remote USB connections and support for smartcard/CAC readers

• Local and remote browser interface for easy setup and use

Vertiv™ Avocent® ACS 800

The Avocent ACS 800 is a compact and cost-effective serial console system that brings serial access, environmental monitoring, IoT integration and remote networking capability to distributed sites. The Avocent ACS 800 supports in-band and out-of-band management of both IT and infrastructure systems. Key features include:

• Fast, automated configuration with zero touch provisioning

• Access and troubleshoot remote locations using automatic network failover to cellular (and failback)

• Automatic pin-out detection for both Cyclades™ and Cisco pin-outs using straight through cables

• Support for Avocent® DSView™ management software

• Console event logging and notification, including "last gasp" capture and online and off-line data logging with time stamps

• Environmental sensor port to connect temperature, humidity, differential pressure, leak, door pin sensors (up to eight can be daisy chained)
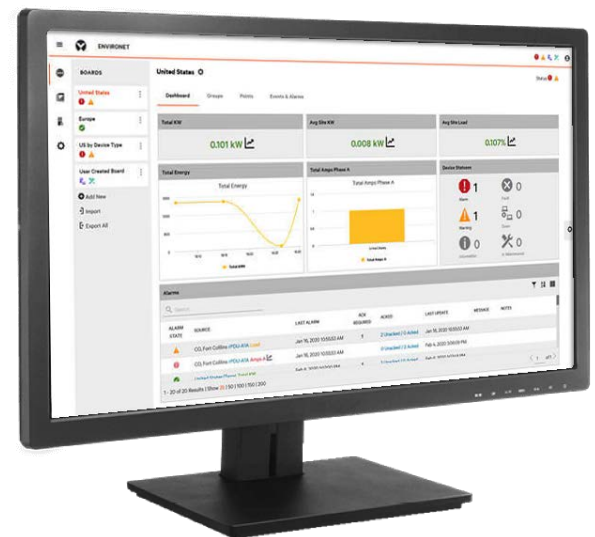

Vertiv™ Avocent® ACS 800

Remote Monitoring Software

Vertiv™ Environet™ Alert is a comprehensive monitoring solution which collects the data you need to increase distributed site efficiency and reliability. With visibility and management of the remote environment, Environet Alert transforms the complexity of distributed site management into simplicity. With centralized access to real-time information from all the infrastructure systems in your distributed sites, Environet Alert enables you to proactively manage device health, provides immediate notification of alarm conditions, and supports collection, analysis and reporting of operating data. Key features include:

- Fast and easy do-it-yourself configuration

- Real-time monitoring and alerts protect critical infrastructure from performance issues, increased costs and downtime

- Single pane of glass view into your operations with immediate notification to appropriate personnel when critical data points are in alert or alarm status

- Customizable displays and intuitive user interface make it easy to focus on the data you care most about

- Easily connect to remote DCIM and building management systems or network management tools for a more complete picture of your network operations

Vertiv™ Environet™ Alert

Contract Services

Vertiv™ LIFE™ Services is available with a Vertiv service contract and provides continuous monitoring and data analysis of critical power systems by Vertiv engineers. Through LIFE Services, Vertiv experts take responsibility for the health of your critical assets 24 hours a day, seven days a week. The service includes:
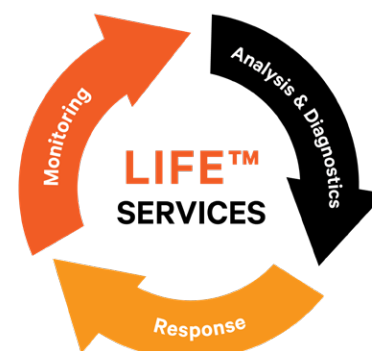
Remote Monitoring: The service monitors 150 unique parameters 24/7 to allow for early detection of trends and operating anomalies that may lead to critical failures if not addressed.

Data Analysis: Specially trained remote system engineers interpret critical system alarms and status messages to better understand their potential impact.

Remote Diagnosis: Using the extensive data collected, Vertiv engineers determine the cause of alarm conditions, identify potential future problems, and provide information on performance trends.

Rapid incident Response: With near-instant notification of issues followed by concurrent problem diagnosis and dispatching of an informed technician, LIFE Services significantly reduces Mean Time To Repair (MTTR) when problems cannot be resolved remotely.

Detailed Reports: The service provides summary reports of all alarm events to document performance.

Distributed Site Monitoring and Management

	Connectivity	Core Capabilities	Sensors Supported	Compatible Software	Additional Capabilities
UPS Monitoring	Intellislot communication card	• Unit status • Alarms • Battery capacity	• Environmental • Door closure • Leak detection	• Vertiv™ Power Assist • BMS • Vertiv™ Environet™ Alert	• Supported by LIFE™ Services
Dedicated Cooling Monitoring	Intellislot communication card	• Unit status • Alarms	• Environmental • Door closure • Leak detection	• BMS • Environet Alert	
Monitored rPDUs	Hot-swappable communication module	• Voltage • Current • Real power • Apparent power • Power factor	• Environmental • Door closure • Leak detection	• Complementary *Trellis™* Power Insight software • BMS • Environet Alert	• Supported by LIFE™ Services
Switched rPDUs	Hot-swappable communication module	• Voltage • Current • Real power • Apparent power • Power factor	• Environmental • Door closure • Leak detection	• Complementary *Trellis™* Power Insight software • BMS • Environet Alert	• Supported by LIFE™ Services • Turn on/off individual outlets
Vertv™ Geist™ Watchdog Environmental Monitoring	On-board network communications	• Environmental Monitoring • Alarms • Real time data	• Environmental • Door closure • Leak detection	• Environet Alert • BMS • Web user interface	
KVMs and ACS	In network or over IP	Remote access to servers and network devices		• Web user interface • DSView™	
Vertiv™ Environet™ Alert	SNMP; additional protocols with protocol converter	• Power continuity • Device monitoring • Environmental conditions • Data aggregation and reporting	Sensors communicating via SNMP	API for easy integration into larger BMSs	
Vertiv™ LIFE™ Services	HTTP	• UPS and battery system operating data • rPDU operating data		24/7 monitoring by Vertiv technical specialists	Remote problem resolution by infrastructure experts

Vertiv Partners Are Ready to Help

Need help configuring your closet? Vertiv has a network of partners available to help you. Find a Vertiv partner near you.