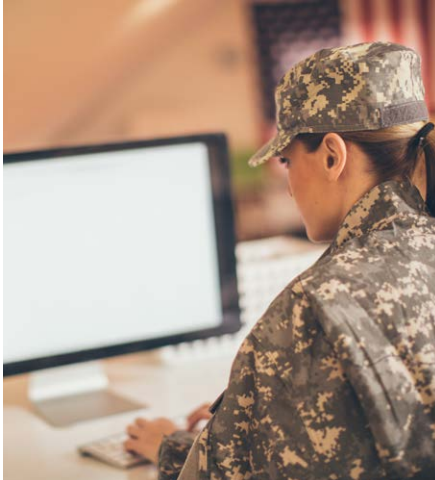# Complete Edge Solutions for Government Network Closets

A Vertiv Application Brief

VERTIV

Overview

Government agencies are using network closets to bring computing capabilities closer to critical operations and support growing digitization of business processes and services. Government staff are using more data, technology and devices than ever before to support their agencies' missions at edge locations. While there are multiple decisions to be made when planning expansions or upgrades to network infrastructure, one of the most basic is where to service or buy new. While agencies will likely want a mix based on their current infrastructure health, both upgrades and services can contribute to improved equipment availability, manageability and serviceability all with the ease of using the same provider and partner, Vertiv.

The Challenges

While network closets can be a powerful complement to traditional technology networks, they have some unique requirements that must be proactively addressed to make sure they function as intended. As you design network closets and specify equipment, requirements you will want to consider include:

- **Thermal management:** As small, enclosed spaces, network closets must be designed effectively to protect equipment from unsafe heat levels, which can harm performance and shorten asset life. Precision cooling solutions can keep network closet temperatures and humidity within the desire range, protecting equipment. They also enable remote monitoring of cooling and provide immediate alerts when corrective action is needed.

- **Airflow:** For network closets that can support it, consider installing racks in an open configuration and selecting the appropriate accessories to increase airflow. If you need more physical security, choose racks with a high percent of perforation in their doors to maximize airflow.

- **Cable management:** Racks with integrated and customizable cable management capabilities, such as front or rear cable entry, can make it easier to add new devices and protect airflow to all equipment.

- **Physical security:** Lockable front and rear doors safeguard valuable computing, storage and networking equipment from unauthorized access.

- **Scalability:** Consider creating a standardized, repeatable network closet design that can be used across building floors, locations and geographies to simplify monitoring, management and maintenance. Four-post racks can support more weight than two-post racks, making them a good choice for network closets that currently hold a large amount of equipment—or could in the future.

- **Easy installation:** Select rack systems that are designed for easy set-up with side and top panels that enable tool-less, single-person installation.

- **Serviceability:** Specifying racks with extra depth can enhance the serviceability of equipment and cable management, as can obtaining racks with removable top and side panels.

- **Longevity:** In addition to driving performance, cooling systems must be highly reliable and long-lasting, supporting continuous operations of up to 10 years.

Rack Solutions

The Vertiv™ VR Rack delivers durability, ease-of-installation and extra features that help you simplify IT equipment deployment, management and service. Available in multiple sizes with a full range of cable and airflow management accessories, Vertiv™ solutions make it easy to tailor to your rack or cabinet to the exact requirements of your equipment and application.

Vertiv™ VR Rack (TAA-Compliant)

The Vertiv VR Rack handles up to 3,000 pounds of equipment and is available in sizes of 42U, 45U and 48U to support a wide variety of equipment with scalability. With designed-in physical security, tool-less set-up and cable management, Vertiv VR Racks come complete with doors, side panels, 19-inch EIA rails, full-length PDU-mounting and cable management brackets and installation hardware. The TAA-compliant racks also feature a full complement of accessories that provide flexibility for cable management and optimized airflow through the rack. Key features include:

- **Perforated Doors:** Vertiv VR Racks feature a single 77% perforated front door and a split 77% perforated rear door to maximize airflow. The front door features lift-off hinges for easy removal and is field-reversible.

- **Lockable Doors:** Front and rear doors are lockable with interchangeable handles for an added layer of security.

- **Tool-less Cable Management:** Standard cable management is achieved using tool-less accessories on the vertical mounting rail or cable management brackets. In addition, the Vertiv VR Rack offers a complete range of cable management accessories that organize cables to minimize stress and enhance serviceability. Available accessories include horizontal cable mounting panels and side channels, vertical management kits, lobster claws and Velcro strips.

- **Airflow Management:** Tightly packed racks or those in spaces such as closets and other small spaces can benefit from the Vertiv VR Rack's range of airflow accessories. Adding blanking panels to cover open spaces in the rack can promote proper airflow through equipment. You can also close gaps between the mounting rails and side panels with a recirculation kit.

- **Simple Cable Entry:** The top panel of the cabinet can be configured with removable openings for cable entry that can accommodate over 2,000 Cat 6 cables, simplifying set up and supporting enhanced cable management.

- **High Weight Capacity:** The strong rack frame supports load capacities of up to 3,000 pounds static and 2,250 pounds dynamic to deliver the scalability growing government networks require.

- **Usable Depth:** The Vertiv VR Rack frame offers more usable depth compared to other racks, enabling easier cable management and service.

- **Integrated Rail Alignment:** Guides on the rack frame enable the 19-inch rack rails to be accurately positioned without requiring measurement, speeding installation.

- **Shelves and Mounting Hardware:** Select from a range of optional shelves, brackets and mounting hardware to support heavy loads or accommodate peripherals.

- **Shock Packaging:** Vertiv VR Racks are available with shock packaging that enables racks to be shipped fully integrated with 2,000 pounds of items such as UPS, PDU and IT equipment for plug-and-play installation.

UPS Solutions

The UPS system provides backup power and power conditioning vital to the operation of the various systems in today's government network closets.

The first decision you must make when selecting a UPS system is determining the internal design of the system. Two types are available: line-interactive and double-conversion. Line-interactive UPS systems provide a cost-effective solution for many applications. Double-conversion UPS systems provide the level of protection required for critical applications.

Vertiv offers a family of line-interactive UPS systems through the Vertiv™ Liebert® PSI5 product line. Vertiv offers a family of double-conversion UPS systems through the Vertiv™ Liebert® GXT4 product line. Both products have models available in tower and rackmount configurations; however, this brief focuses on rackmount systems.

Vertiv™ Liebert® PSI5 Rackmount UPS (TAA-Compliant)

The Liebert® PSI5 family is available in capacities from 800 to 5,000 VA. Designed especially for network closet applications, the product line supports advanced pure sine wave output on battery to safeguard IT equipment and electronics. Key features and configuration options include:

- **Hot Swappable Batteries:** All models feature hot swappable batteries conveniently located behind the front bezel of the unit when mounted in the rack.

- **Maintenance Bypass:** For systems 3KVA and below, a Liebert® MicroPOD maintenance bypass can be configured with the UPS to allow the removal of the UPS without powering down the connected equipment. The 2U maintenance bypass can be installed on the floor or mounted to the UPS.

- **Connectivity and Monitoring:** Liebert® TAA-Compliant PSI5 models are available that include an installed network communications Simple Network Management Protocol (SNMP) card for remote monitoring and power management.

- **Sensors:** A variety of environmental sensors with integrated cables are available for all Vertiv Liebert PSI5 models to enable monitoring of temperature, humidity and door closure through the UPS.

- **External Batteries.** Additional battery units can be configured to Vertiv Liebert PSI5 UPS systems to support extended runtimes. Use the Vertiv™ runtime calculator to configure batteries for your system.

Vertiv™ Liebert® PSI5 Lithium-Ion UPS

The Liebert® PSI5 Lithium-Ion UPS is ideally suited to protect critical infrastructure in edge or distributed IT applications. Lithium-ion batteries have a life expectancy twice that of VRLA batteries – up to 10 years. That translates to fewer (if any) battery replacements over the lifespan of the UPS. You save on battery costs, as well as the labor to install them – an especially important issue at remote locations with few or no IT personnel on site. Key features and configuration options include:

- **Low Cost of Ownership:** The life expectancy of lithium-ion batteries is twice that of VRLA batteries – up to 10 years. That delivers up to 50% or more in TCO savings versus VRLA batteries.

- **Advance Early Warning of UPS System Status:** The Liebert PSI5 Lithium-Ion UPS offers audible and visual alarms to alert you to an input voltage fluctuation (buck/boost), output overload, low battery or replace battery condition.

- **Up to Seven Battery-Backed Outlets:** This option provides flexibility by accommodating additional equipment to be connected to the UPS.

- **Quicker Recharge:** Get back to max capacity quickly after an outage – the Liebert PSI5 Lithium-Ion UPS can recharge to 100% capacity in three hours or less.

- **Monitoring and Management:** The Liebert PSI5 Lithium-Ion UPS has the same monitoring and management systems as the other Liebert PSI5 UPS solutions, including the options for an installed network communications (SNMP) card and *Trellis*™ Power Insight Shutdown Software.

Vertiv™ Liebert® GXT4 UPS (TAA-Compliant)

The TAA-compliant Vertiv™ Liebert® GXT4 UPS, with a capacity of 1,000-3,000VA, is a compact and reliable solution for maintaining the health and availability of your IT infrastructure. Using on-line, double-conversion technology, the Vertiv Liebert GXT4 UPS protects equipment from the full range of power disturbances, including sags, surges and noise, without drawing on battery power, extending battery life and minimizing replacements. Features include:

- **Power-Factor Correction:** Prevents noise, harmonics and distortion from being passed on to connected loads or from being fed back to the utility.

- **Orderly Shutdown:** Provides three to 17 minutes of battery backup time at full load, ensuring ample time for an orderly shutdown. Optional matching external battery cabinets offer additional backup time.

- **Intelligent Battery Management:** Includes an efficient three-stage charging technique and comprehensive discharging protection that extends battery life.

- **Mounting Flexibility:** The Liebert GXT4 UPS can be deployed in a rack or tower configuration. Rack rails and tower supports
  are included.

- **Selectable ECO-Mode:** Connected equipment can be powered through the bypass while the inverter remains idle, reducing electricity consumption.

- **Warranty Protection:** Gain the industry's best warranty. Vertiv provides a no-hassle two-year warranty with advanced UPS replacement in the event of problems. Shipping is free for both original UPS return and the replacement unit. Optional one-year and three-year extensions also available.
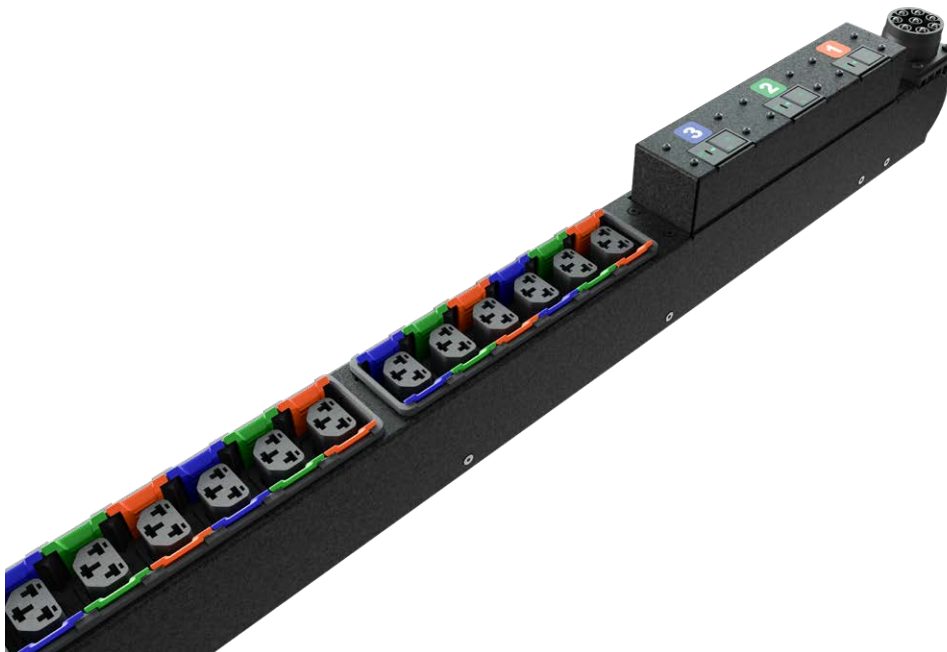
Rack PDU Solutions

Rack power distribution units (rPDUs) expand on the power distribution capabilities of the UPS while also enabling other important monitoring and management functions.

- When choosing an rPDU, determine whether you need a basic rPDU, a monitored rPDU or a switched PDU. Also consider the benefits of standardizing rPDUs across your network by using a universal rPDU with combination outlets.

Vertiv™ Geist™ Combination Outlet C13 / C19 (TAA-Compliant)

The Combination Outlet C13 / C19 is a two-in-one receptacle functioning as both an IEC C13 and C19. Simplify the rack PDU buying process and accommodate ever-changing rack power requirements with the flexibility to connect C14 and C20 plugs in the same outlet. Key features include:

- **High Retention:** High retention outlets reduce the risk of costly downtime from accidental disconnections of the power cord. The Combination Outlet C13 / C19 is also P-Lock compatible for additional protection.

- **Flexible Cable Management:** Simplify cable management with the Combination Outlet C13 / C19 by simply connecting equipment to the closest available receptacle.

- **Easy Circuit Identification:** Easily identify circuits with color-coded P-Lock tabs. Streamline circuit and phase balancing with alternating outlets.

- **Simplified Procurement:** Choose your preferred power configuration with confidence that the Vertiv™ Geist™ rPDU will have the right combination of outlets available for rack equipment with C14 and C20 plug types.

- **Global Compliance:** The Combination Outlet C13 / C19 meets global electrical compliance requirements and is UL-Certified and CE-Marked.

![Vertiv logo]

Cooling and Airflow Management Solutions

Vertiv is a global leader in critical infrastructure that offers purposefully designed and innovative small space cooling solutions. Vertiv™ products have an outstanding reputation for reliability and are among the most efficient in their class. By offering multiple systems for small space cooling, Vertiv enables government delivery networks to optimize their investment in critical infrastructure and tailor the solution to IT capacity requirements and the physical space in which the equipment is installed.

Vertiv™ Geist™ SwitchAir™ (TAA-/BAA-Compliant)

Communication devices have different airflow requirements than servers. The front-to-back airflow design of IT equipment racks, particularly in a tight space, can restrict airflow through these devices.

The Vertiv Geist SwitchAir is a simple and effective rack-mount device that creates a path for cool air to flow from the front of the rack to a switch or router's air intake. Available in active (integrated fan) or passive models, the Geist™ SwitchAir™ is easy to install and works within the same rack space as the device it is supporting. It can be deployed as a standalone solution to improve airflow or as a complement to a dedicated cooling system. Features include:

- **Targeted Airflow Management:** Provides a path for cool air to flow to the intake of network switch equipment. Creates a barrier to effectively prevent hot exhaust air from entering switch intakes.

- **Improves Efficiency:** Provides network equipment with the same cold aisle air temperature as other devices in the rack, which reduces the likelihood of premature equipment failure due to high intake temperatures.

- **Fast Installation:** Easily install the SwitchAir™ into the front of the cabinet in the same U space as the network switch equipment.

- **Space-Neutral (Mostly):** All Geist SwitchAir models are classified by "U" height. In most cases, the SwitchAir is space-neutral within a cabinet, meaning that it doesn't take any space that could otherwise be occupied by other hardware.

- **Easy Selection:** Use the SwitchAir Finder to identify the right model with the airflow pattern needed for your installed network equipment. The most popular SwitchAir models are stocked by a variety of distribution partners, providing immediate availability. If your switch airflow path requires a built-to-order unit, please contact your preferred distribution partner to customize and purchase one.

![Geist SwitchAir rack-mount device]
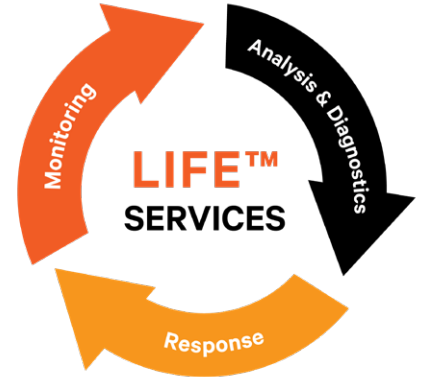
Contract Services

Vertiv™ LIFE™ Services are available with a Vertiv service contract and provide 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. This 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 proactively 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 reduce Mean Time to Repair (MTTR) when problems cannot be resolved remotely.

- **Detailed Reports:** The services provide summary reports of all alarm events to document performance.

Conclusion

Vertiv stands ready to help you design, equip, cool and monitor your network closet equipment to help achieve your government agency's objectives, protect valuable assets and ensure continuous operations. We have the expertise, end-to-end solution set and services to enable you to drive the most value from your network closet equipment investments, as you continue to evolve capabilities to meet the latest challenges and opportunities of the digital era.

To contact us or to get more information, visit us at www.vertiv.com/federal.

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