Future proofing your network for 5G

Arrival of the 5G Era

451 Research called 5G "the most impactful and difficult network upgrade ever faced by the telecom industry," and with good reason. While the move from 3G to 4G was essentially linear, 5G is more of a reimagining of the cellular network. The changes are massive, but pale in comparison to the potential impact of fully realized 5G networks. According to IHS Markit, 5G is expected to generate some $12.3 trillion in annual revenue by 2035.

That 451 Research study, commissioned by Vertiv™, suggested a rush toward widespread 5G deployment shouldn't be a surprise. According to the survey, a whopping 86% of telecom operators expect to be delivering 5G services by 2021. And yet, almost two-thirds of those surveyed say they are still in the process of building out operational plans to support 5G.

If you see an industry leaping before it looks, you're not alone. Telecom operators are moving forward aggressively even as unanswered questions and challenges remain.

As standards evolve, new use cases are enabled, and networks are transformed, telecom operators, and the enterprises they support, will need to make significant investments in their network focused on supporting densification, adding computing and storage capacity at the edge, and adapting to 5G's higher energy requirements.

Vertiv has the expertise and technology portfolio to help network infrastructure architects (core and access), procurement teams, and third-party telecom consultants manage this historic transformation.
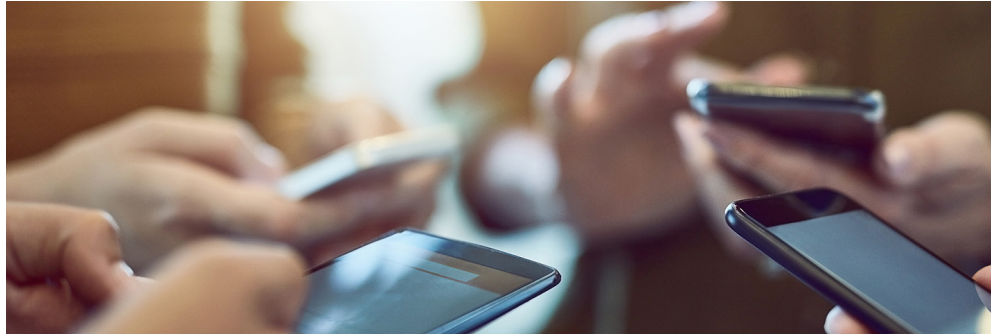
As we stand on the precipice of a mammoth 5G network transformation, telecom operators, data providers and enterprises are facing new challenges in all areas of the network.

5G CHALLENGES IN THE ACCESS NETWORK
Modularity and efficiency are key

- Massive roll out of sites that need to be monitored and maintained is needed in a short period of time
- Network advancement is driving dependence on critical applications that require greater reliance on system status and performance
- Increased data traffic will require more energy, increasing energy costs
- Cooling requirements and system dimensioning more critical than ever

5G CHALLENGES AT THE EDGE
High density, modular solutions for AC and DC loads are key

- The need for increased capacity and decreased latency drive new infrastructure which require more real estate or better use of existing space
- Data processing closer to the user in the telecom network will require greater mix of AC and DC infrastructure
- Due to criticality and governmental mandates, infrastructure and battery backup needs increase

5G CHALLENGES IN THE CORE
Reliability, monitoring and support of multiple power feed needs are key

- Extreme availability requirements drive greater redundancy needs and restructuring of large core sites
- More data processing capacity, often at existing sites, will demand increased power density
- Eliminating downtime requires real-time insight into power usage down to the fuse or circuit breaker level

ACCESS NETWORKS

Reliable, energy efficient DC power is critical to 5G network expansion and the reduction of operating cost.

NetSure™ IPE outdoor rectifiers facilitate major 5G roll outs.

- Fast and easy to deploy
- Assortment of installation kits, service panel and quick connector options
- Natural cooling, silent operation, maintenance-free, ideal for public areas
- High-efficiency solution minimizes energy costs
- Expand as you grow by paralleling multiple units

NetSure™ IPE

Vertiv™ Power Extend Converter systems support 5G radios which are drawing more energy.

- Instantly boost power to remote radios
- Use existing RRH cable

eSure™ C48/58-1000

eSure™ C48/58-1000

The 98% efficient eSure™ rectifier R48-3500E4 lowers operating cost in all load conditions.

- Benefit from instant energy savings on installed base with backward compatible rectifiers
- Minimize investment and optimize power efficiency at any load condition with ECO mode
- Save space with highest density (50.2 W/inch^3) in DC power industry

R48-3500E4
eSure™ Rectifier

EDGE DEPLOYMENTS

The high-capacity, low latency requirements of 5G are increasing the number of sites and causing a greater mix of data and telecom infrastructure at the edge.

Rapidly implement Vertiv™ Outdoor Enclosures in your edge technology refresh.

- Standardize your network infrastructure to simplify ordering, deployment and installation
- Leverage factory integration services to receive IT-ready infrastructure on site.
- Simplify deployment and expansion with Vertiv's global service organization of skilled local experts

Vertiv™ Outdoor Enclosures

Space saving NetSure™ Inverter Systems maximize efficiency at 5G and Edge sites.

- Save precious space with market leading inverter power density (24 VA/in^3) while leveraging the same battery bank for both AC and DC loads
- Minimize cost for energy with dual conversion functionality and high-efficiency operation up to 96.3%
- Intelligently control full site performance with a single interface for AC and DC back-up via the NCU controller


NetSure™ Inverter System

CORE FACILITIES

Due to the proliferation of 5G edge sites, core sites will consolidate and densify. The need for availability and constant monitoring is even higher than before.

Intelligent Load Management enables increased visibility and detailed understanding of all loads in your telecom central office or data center.

- Prevent overload with early warning of load buildup based on predefined threshold values
- Keep track of load variations with current reading down to the individual fuse or breaker
- Get load information by each customer or data rack on site to help with load balancing and site planning
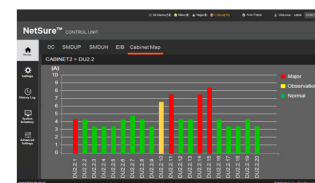
Web Interface

Whether your site includes 400V DC, 48V DC, AC Power or a combination of all three, 400V DC Power is the most cost effective and efficient way to design your next core facility.

- Significantly reduce cabling and installation costs compared to 48V DC power
- Free up floor space by centralizing and consolidating back up power
- Minimize CapEx by building out power capacity as demand grows

*NetSure™ 400V
DC Power System*

The oncoming 5G evolution presents new infrastructure challenges and is driving an important shift in expectations for network performance. Vertiv™ possesses a rare combination of expertise and solutions that ensure connectivity and availability across all network facilities, anywhere in the world. Our portfolio helps ensure seamless network operation and includes some of the most respected brands in the information ecosystem, such as Avocent®, Geist™, Liebert® and NetSure™. We streamline and simplify deployment by acting as a single source for power, cooling, monitoring, racks and integrated solutions and services for telecom customers.

Key Questions for Determining Your Network Readiness

1. How will we meet the demand for edge computing?
MEC sites open the 5G edge to revenue-generating third-party services. As the demand for these sites grows, speed-of-deployment, standardization and manageability will be critical.

Questions to Ask:
- How much compute/storage capacity will be required by the typical MEC site?
- How will MEC sites scale as more capacity is required?

Solutions to Consider: Fully-integrated outdoor and indoor systems that include power, thermal management, and remote monitoring in standardized enclosures that retain configuration flexibility.

2. Can we tailor availability levels to service requirements?
With criticality requirements varying across a 5G network, a flexible availability strategy will enable capital investments to be optimized while ensuring high availability for critical applications.

Questions to Ask:
- What 5G-enabled applications will require high levels of availability at the edge?
- What applications can tolerate lower levels of availability?
- Do we have the intelligence in place to identify, prioritize, and route this traffic effectively?

Solutions to Consider: Intelligent monitoring and efficient AC and DC backup power and power distribution systems.

3. Will we have the capacity to support higher energy consumption and more data?
Infrastructure systems sized for a pre-5G world may not be able to handle the increased load 5G places on the network.

Questions to Ask:
- How will 5G impact thermal management requirements across each layer of the distributed network?
- How can we leverage free cooling to reduce thermal management costs across the network?
- How will 5G impact the thermal management requirements of switching cabinets?

Solutions to Consider: Modular and scalable AC and DC backup power systems and dedicated edge cooling solutions, including systems designed to economically keep hard-working switches cool.

4. How can we mitigate higher energy consumption?
With energy consumption on the rise, implementing energy-saving technologies can help ensure energy costs don't erode the expected profitability of 5G services.

Questions to Ask:
- What will be the long-term impact of 5G energy requirements on operating budgets?
- Where do energy inefficiencies exist in the network?
- What energy-saving strategies and technologies are available today that weren't available when equipment was deployed?

Solutions to Consider: DC power systems that leverage ultra high-efficiency modules and economized energy modes; integrated outdoor enclosures that use outside air for free cooling; use of sustainable energy sources like solar; and lithium-ion batteries.