



## Your Trusted Partner in Automation

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things (IIoT). With over 35 years of industry experience, Moxa has connected more than 118 million devices worldwide and has a distribution and service network that reaches customers in more than 87 countries. Moxa delivers lasting business value by empowering industries with reliable networks and sincere service. Information about Moxa’s solutions is available at [www.moxa.com](http://www.moxa.com).

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## > Boost Uptime With Unfaltering Connections

Secure your DCI backbone with proven  
industrial reliability

# The AI-driven Paradigm Shift: The New Era of Infrastructure

Data centers have fundamentally transitioned from passive digital warehouses into high-performance engines powering the global AI economy. This massive infrastructure overhaul is reflected in a renovation market projected to reach \$73.83 billion by 2032, accelerating at a 16.17% CAGR, according to S&S Insider's Data Center Renovation Market Report. To accommodate generative AI and large-scale inference workloads, Tier III and Tier IV certifications have become the baseline for mission-critical reliability.

## The AI Mandate: Maximizing Compute Output

Success is no longer defined solely by how little energy is wasted, but by how effectively every watt is converted into computational intelligence. This requires reducing "stranded capacity" — the 20–30% of available power that often remains unused due to insufficient monitoring. By establishing a definitive source of truth through real-time telemetry, facilities can safely push power allocation to the limit. This high-fidelity data ensures that even under extreme load densities, performance is optimized and every kilowatt is used for compute.

## Cooling and Cyber-resilience: The New Frontier

Industry leaders have made targeted acquisitions to strengthen their data center liquid cooling and thermal management portfolios. This underscores the transition toward high-density AI workloads, where cooling and power infrastructure are strategic differentiators. As the power usage of racks exceeds 100 kW, traditional air cooling may become obsolete. The transition to liquid cooling demands high-fidelity, real-time visibility. Modern cooling distribution units (CDUs) require high-bandwidth networks to monitor thermal metrics in real-time.

Furthermore, as physical infrastructure and digital logic converge, hardware-embedded security will play an even more pivotal role. Modern infrastructure requires networking hardware that seamlessly supports IT communication protocols and simultaneously adheres to rigorous industrial cybersecurity standards such as IEC 62443-4-2. By securing the converged edge, operators ensure the backbone of the AI economy remains as resilient as the intelligence it produces.

# Navigating the Complexity of Modern Infrastructure

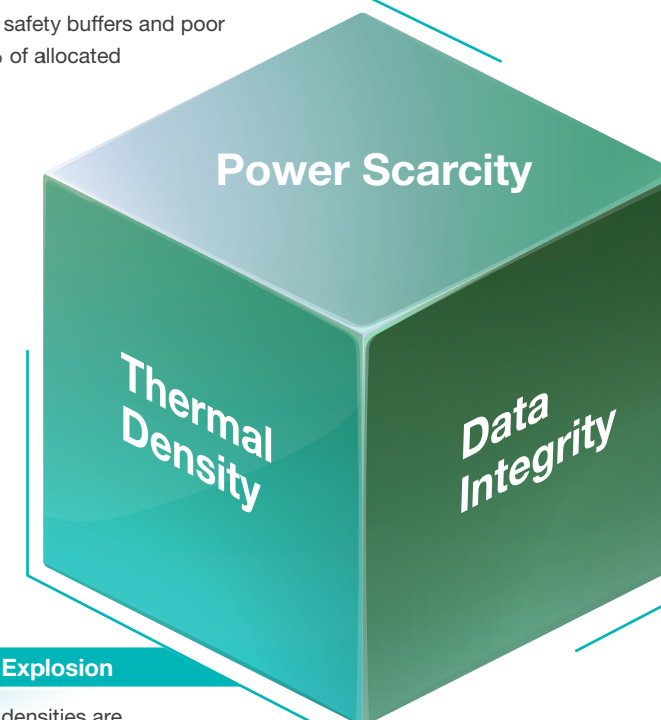
The transition to high-density compute environments has shifted data center design from general-purpose facilities to sophisticated, high-precision ecosystems. Supporting AI-scale workloads requires a seamless coordination of power, thermal management, and data communication.

## From Scarcity to Scalability: Solving the Power, Thermal, and Data Trilemma

Supporting AI-scale workloads requires a seamless coordination of power distribution, thermal management, and data integrity. These three pillars are no longer acting independently. They are the interconnected foundation that determines the data center's ability to scale.

### Reclaiming Stranded Capacity

- The Constraint: Heavily delayed connections to the public grid severely bottleneck AI expansion.
- The Waste: Conservative safety buffers and poor monitoring leave 20–30% of allocated power unutilized.
- The Solution: Shifting to on-site power generation and high-resilience backbone networks to ensure every watt is accounted for and utilized.



### Closing the Data Integrity Gap

- The Risk: Legacy "Gateway + PLC" models rely on sequential polling, risking dangerous data gaps and operational blind spots.
- The Evolution: Transitioning from fragmented components to a unified, high-integrity communication fabric.
- The Requirement: Integrating robust boundary protection and advanced cybersecurity to secure cross-system data exchange.

### Managing the Thermal Explosion

- The Density Surge: Rack densities are skyrocketing from 7 kW to 100 kW+, necessitating the shift to liquid cooling.
- The Monitoring Challenge: Liquid cooling requires a fivefold increase in sensory telemetry with sub-second frequency to pre-emptively detect potential failures.
- The Strategy: Implementing modular, scalable point detection to fit space-constrained environments and ensure futureproof thermal management.

# The Foundation of Performance: Translating Fragmented Needs into Unified Results

To resolve the friction points that often stall large-scale deployments, the communication fabric must be built on principles that support every stakeholder—from the initial design phase to long-term facility management. As a strategic partner providing connectivity from the utility grid to the server rack, Moxa synchronizes the objectives of EPCs, facility operators, and IT managers. By delivering secure, unified connectivity solutions, we transform fragmented data into a cohesive asset, ensuring optimized deployment and unwavering resilience during operation.



## Unwavering Operational Resilience

Sustained uptime and reduced maintenance overhead for facility operators

In mission-critical environments, communication failure is measured in operational instability. With 35+ years of industrial field experience, Moxa provides a hardened backbone engineered to withstand the extreme electrical and thermal loads of AI-scale power chains and cooling loops. By adhering to global standards like IEC 61850-3 and providing HSR/PRP zero-second failover, we ensure that your data remains as stable as the grid itself—from the utility entrance to the individual server rack.



## Seamless OT-IT Integration

Effortless integration of Modbus, BACnet, and IT protocols into a unified source of truth

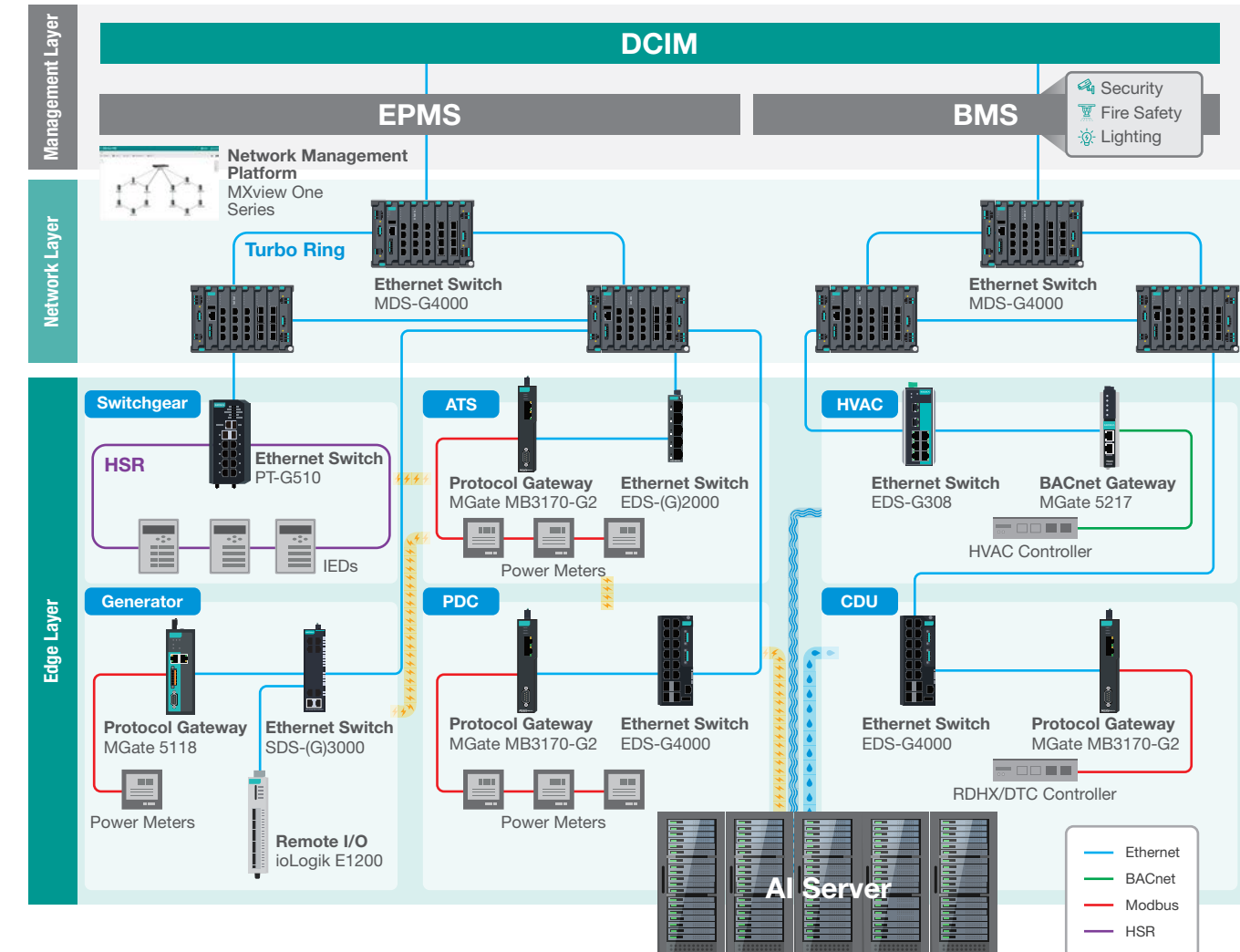
As infrastructure grows more complex, operators need tools that simplify management. Moxa eliminates protocol friction by providing intuitive gateways that effortlessly bridge the gap between southbound sensor data and northbound management systems. Our approach removes the need for extensive custom programming, allowing system integrators to focus on data utilization rather than troubleshooting connectivity.



## Accelerated Project Schedules

Faster site commissioning and optimized time-to-market for modular and prefabricated facilities

The rapid growth of the AI economy demands a swift transition from site design to full operational capacity. Moxa helps speed up this effort through modular connectivity frameworks and pre-validated architectures optimized for rapid deployment. Our compact hardware fits easily into space-constrained panels, enabling EPCs and contractors to meet aggressive commissioning schedules without compromising on data integrity.



# Engineered for High Density: Transforming Connectivity into a High-integrity Fabric

To meet the power and cooling demands of generative AI, data center technology is evolving from basic connectivity to a high-integrity communication fabric. Moxa's portfolio helps deliver the high-integrity OT backbone required to power and cool high-density AI server clusters. Our end-to-end connectivity fabric resolves the complexity challenge by harmonizing diverse data streams into a single, reliable management framework.

## The Power Chain

## Uninterrupted Energy Intelligence

Moxa provides a reliable communication foundation covering the electrical grid to the individual server rack, maximizing power availability and minimizing stranded capacity.

### Grid-to-rack Resilience

### High-density Telemetry



#### PT-G510 Series

IEC 61850-3 certified switches with HSR/PRP support for creating robust network redundancy.



#### MGate 5217 / MB3170-G2 Series

Protocol gateways act as the essential bridge in space-constrained panels for converting Modbus RTU data from PDCs and STSs into BACnet/IP.

## The Thermal Chain

## High-fidelity Visibility for Hybrid Cooling

As AI workloads drive a fivefold surge in cooling telemetry, Moxa provides the high-integrity connectivity fabric for hybrid ecosystems, ensuring thermal management stays as adaptive as the compute load.

### CDU Resilience

### Environmental Harmony



#### EDS-G4000 Series MGate MB3170-G2 Series

Bridge critical Modbus data from liquid cooling loops with sub-second precision, ensuring zero-loss monitoring for high-value silicon.



#### EDS-G308 Series MGate 5217 Series

Integrate legacy air-cooling units into the BMS via BACnet/IP to eliminate data silos and optimize tokens-per-watt efficiency across the entire facility.

## Cybersecurity and Visualization

## The Hardened Baseline for Facility OT

To bridge the gap between critical OT infrastructure and IT governance for building a resilient network foundation, operators need full transparency. Moxa's approach combines IEC-62443 hardware security with centralized network visualization to ensure total situational awareness. By transforming complex system data into an actionable visual map, we empower facilities to create a cyber-resilient environment that meets the stringent requirements of global cybersecurity standards.

### Security-hardened Infrastructure

### Visualization

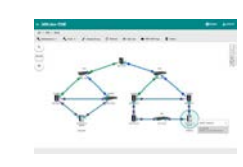


#### EDS-G4000 Series

Robust IEC 62443-4-2 SL2 certified switches to form a secure network foundation in line with the rigorous requirements of NIS2 and CRA.



#### MXview One Series



#### MXview Power Goose Message Visualization

# Bridging the Gap Between OT and IT With Industrial-grade Networking Solutions

In the era of high-density AI and hyper-scale growth, data center resilience depends on the seamless integration of physical infrastructure and digital intelligence. Moxa stands at the forefront of this convergence, providing the industrial-grade communication fabric required to transform isolated operational data into actionable IT insights. We specialize in bridging the gap between rugged field-level hardware and centralized management platforms, ensuring that mission-critical information flows without interruption.

## Power Systems

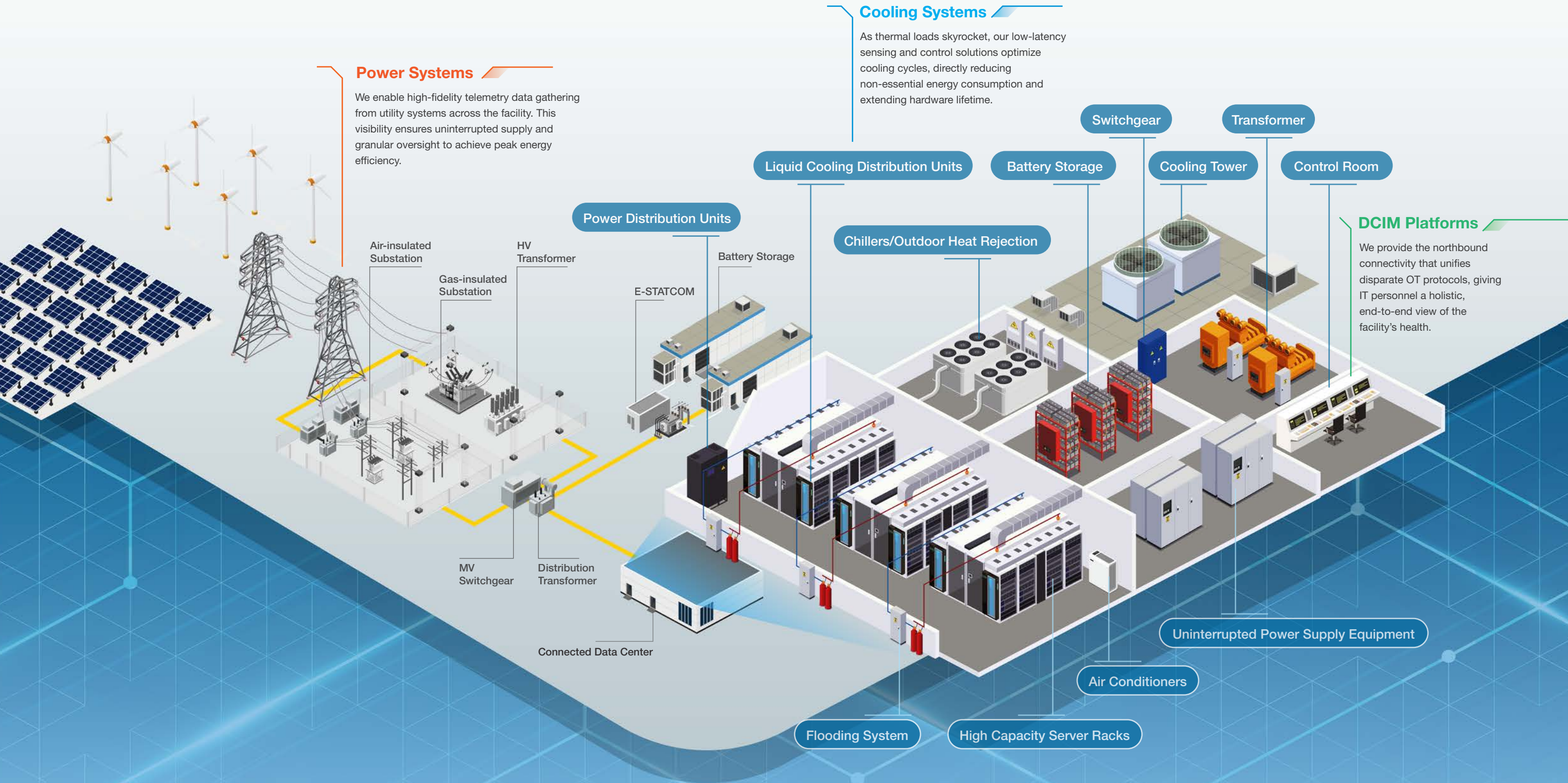
We enable high-fidelity telemetry data gathering from utility systems across the facility. This visibility ensures uninterrupted supply and granular oversight to achieve peak energy efficiency.

## Cooling Systems

As thermal loads skyrocket, our low-latency sensing and control solutions optimize cooling cycles, directly reducing non-essential energy consumption and extending hardware lifetime.

## DCIM Platforms

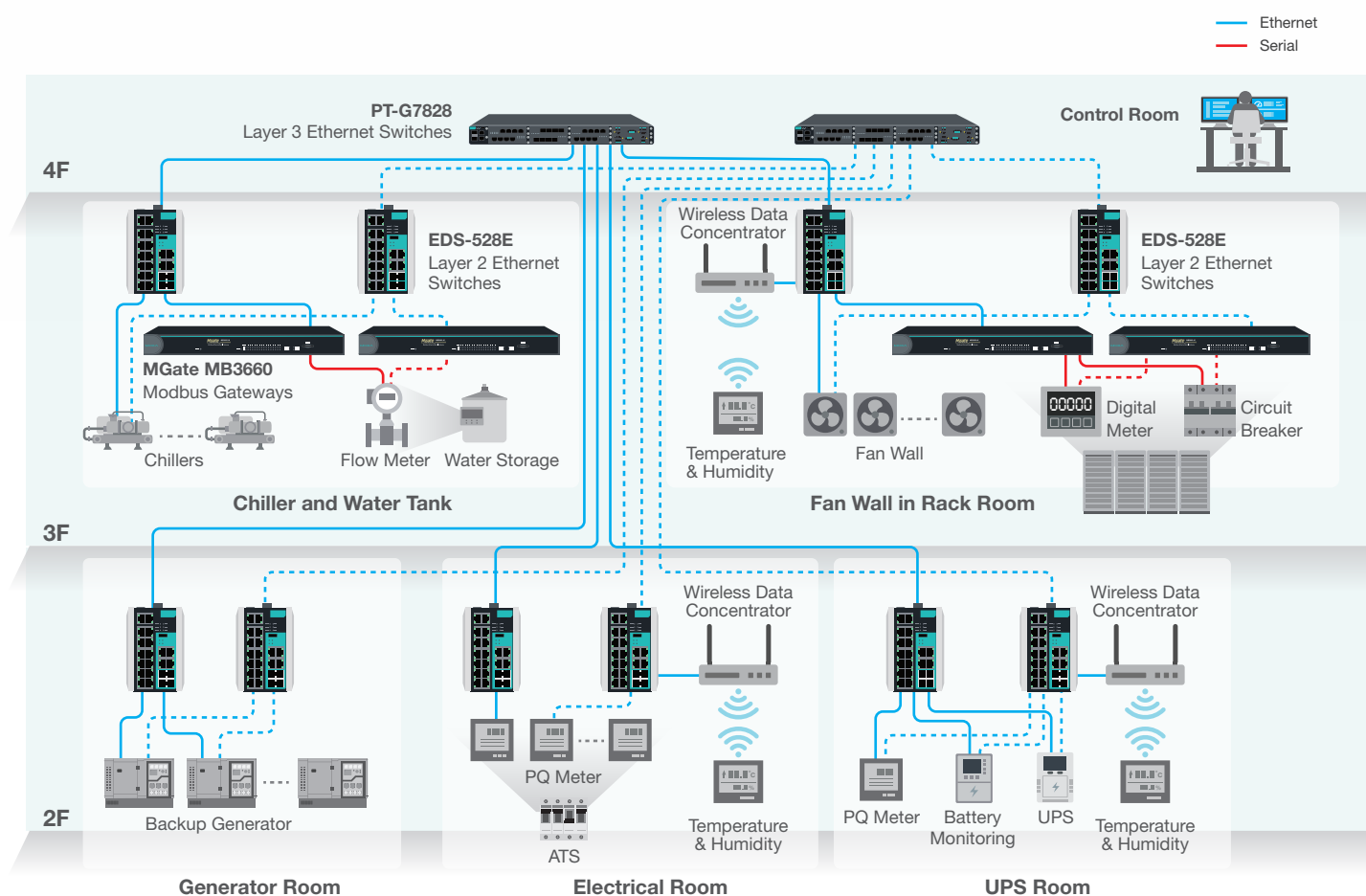
We provide the northbound connectivity that unifies disparate OT protocols, giving IT personnel a holistic, end-to-end view of the facility's health.



# The Blueprint of Success: High-fidelity Intelligence in Action

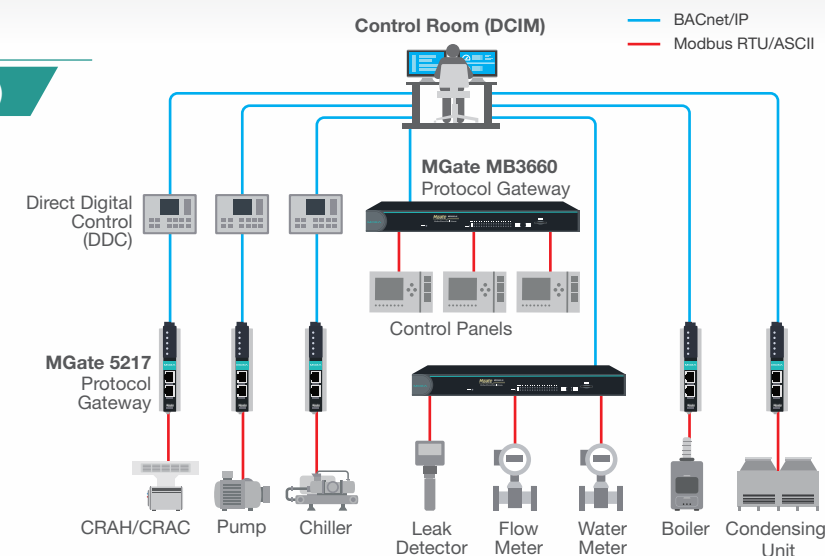
## Data Center Infrastructure Management (DCIM)

Moxa optimizes multi-floor DCIM by harmonizing power and cooling data across thousands of endpoints. Addressing high-EMI challenges, our IEC 61850-3 certified switches and active-polling MGate gateways ensure high-fidelity, real-time telemetry. This unified communication fabric eliminates operational blind spots, providing the resilient, scalable foundation required for mission-critical AI-scale workloads.



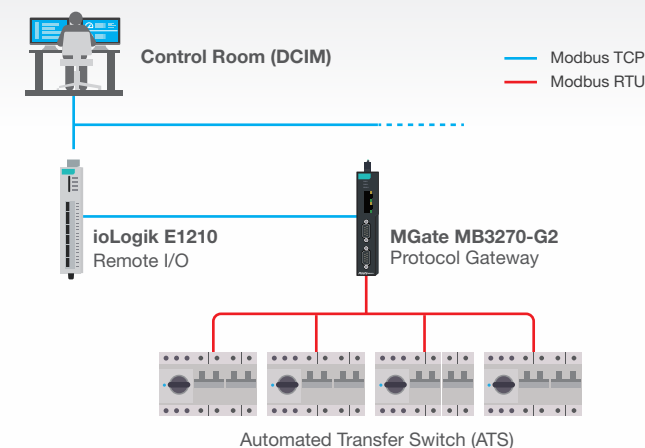
## Building Management System (BMS)

Moxa optimizes BMS performance by bridging the protocol gap between legacy Modbus mechanical hardware and BACnet/IP management layers. Our MGate Series provides high-density, low-latency conversion and built-in diagnostics, delivering the scalable, real-time thermal visibility required to prevent hotspots and improve facility-wide power usage effectiveness (PUE).



## Automated Transfer Switch (ATS)

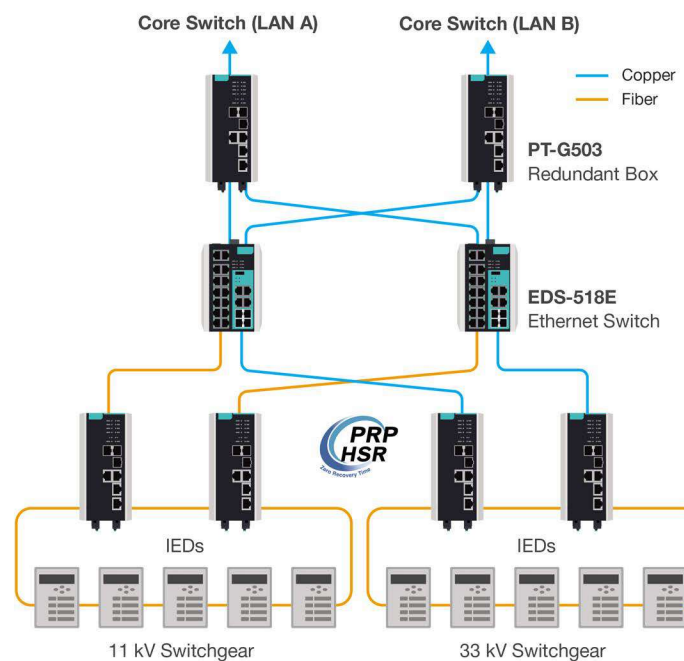
Moxa secures ATS operations by bridging Modbus RTU/TCP and SNMP while passing rigorous enterprise-grade vulnerability scans. Our MGate and ioLogik solutions provide HTTPS encryption and password management, ensuring cyber-resilient remote monitoring. With our security-hardened solutions, operators can ensure continuous power availability while complying with the modern data center security standards.





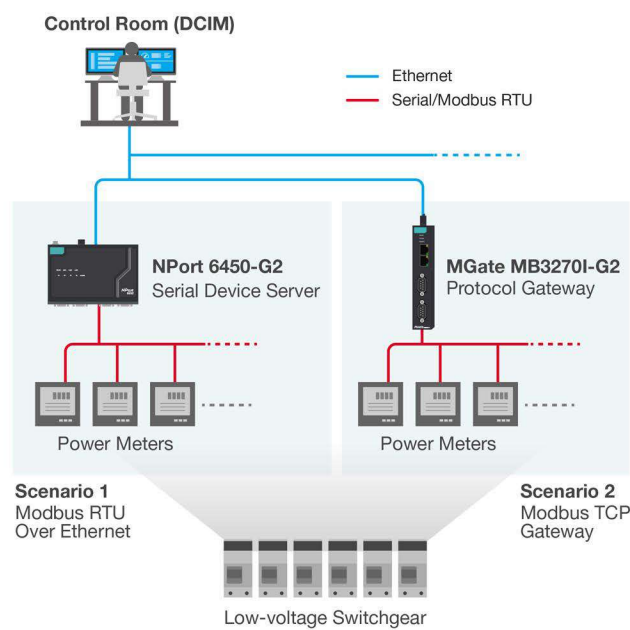
### Medium-voltage Switchgear HSR Network

Moxa provides the tools to build zero-recovery-time redundancy for MV switchgear (11 kV/ 33 kV), securing the primary power entry point against catastrophic failure. By implementing HSR/PRP with IEC 61850-3 certified switches, we enable seamless IED protection and GOOSE messaging. By combining extensive industrial network design expertise with pre-validated solutions, Moxa helps build the high-availability network foundation needed to meet the strict requirements for mission-critical AI deployments.



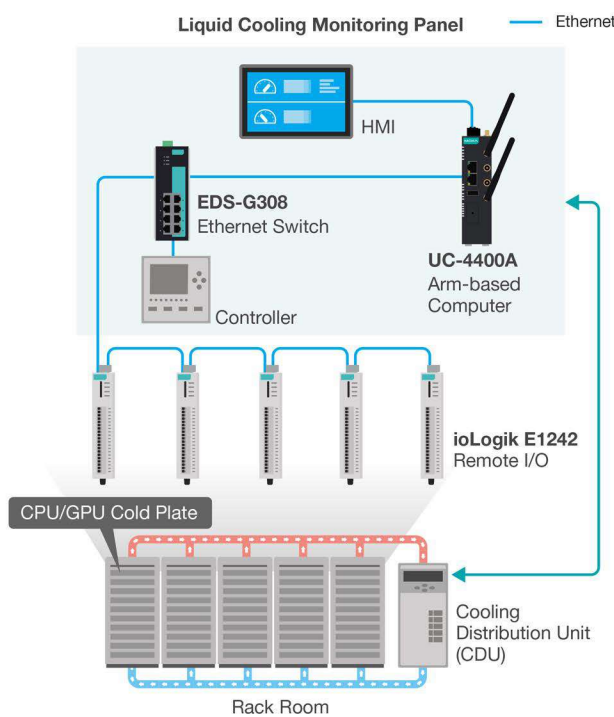
### Low-voltage Switchgear System

Moxa enables high-fidelity power monitoring by bridging serial meters with Ethernet fabrics. Our insulation NPort and MGate solutions protect against EMI while providing remote monitoring and Ethernet cascading to simplify panel wiring. Integrated diagnostic and CLI tools ensure rapid, error-free commissioning of the critical power chain.



### Hybrid-cooled System

Moxa secures 2 megawatt hybrid-cooled direct-to-chip (DTC) server rows by integrating high-density leak detection and pressure monitoring. Our ioLogik E1242 and UC-4400A controllers act as the system brain, providing sub-second emergency shut-off logic. This safety-first architecture ensures high-density AI clusters remain thermally stable and protected from liquid-related risks.



### Power Distribution Cabinet (PDC)

Moxa's connectivity fabric secures the power chain's last mile by bridging PDCs and STS units to the EPMS. Moxa's ioLogik I/Os aggregate digitalized sensor data while our MGate gateways perform high-speed protocol conversion and pass this data on to the control via an EMI-resistant connection with our EDS switches. This ensures real-time visibility and remote control of high-density racks while maximizing uptime.

