



6 Things to Consider When
**DEPLOYING CABINETS
FOR AI APPLICATIONS**

2025



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From physical specifications and load capacity to deployment expectations, traditional data center cabinets aren't designed for the demands of artificial intelligence. To innovate, you need cabinets built for AI.

AI is transforming business operations. As these operations evolve, data center strategies and infrastructure must adapt to keep pace. By 2030, according to McKinsey, approximately 70% of data center capacity demand will come from the need to host advanced AI workloads. As this happens, the demand for dedicated AI infrastructure becomes more critical.

Case in point: data center cabinets. They're no longer simply metal boxes that house IT equipment. Instead, they play a key role in bringing AI initiatives to life. This shift changes everything about them—from physical specifications and load capacity to deployment expectations.

Here are six things to consider when choosing cabinets to support your AI applications.

1 WEIGHT CAPACITY: HOW MUCH CAN THE CABINET HOLD?

To handle large data sets and complex workloads, AI servers are built differently than typical servers. They feature advanced components like specialized processing units (GPUs and TPUs) and more storage drives to support higher performance requirements, learning capabilities, and faster processing. All this additional hardware increases the weight of an AI server.



Standard cabinets aren't designed to support the larger sizes and heavier weights of AI servers. Overloading a cabinet with hardware that exceeds the cabinet's weight capacity can create safety issues, lead to equipment damage, and disrupt business operations if the cabinet fails under a higher weight.

TIP: To maintain a safe, efficient, and reliable data center that supports AI, ensure the cabinet you choose is adequately rated for the weight of your AI servers. Because a single AI server can weigh as much as 300 lbs, select a cabinet that supports load capacities of up to 5,000 lbs (static) to handle expansion without concern.

2 AIRFLOW MANAGEMENT: CAN THE CABINET ENSURE PROPER COOLING?

The GPUs and TPUs inside AI servers call for higher power density, driving requirements to 100 kW per cabinet or more. Goldman Sachs predicts that by 2030, data center power demand will rise by 160% as a result of AI implementation. The power-hungry hardware that drives this technology also generates massive amounts of heat due to the intense computing tasks and applications it runs.

Just like traditional servers, AI servers require a stable ambient temperature and proper airflow to dissipate heat and minimize stress and failure. This means minimizing hot spots and maximizing cooling efficiency by removing hot exhaust air while allowing cool air to reach the hardware.

More cables also run through cabinets to support AI's high-density computing (see Cable Management, p. 7), which can impede airflow and impact cooling. The cables block the paths for cool air to travel through the cabinet; they can also prevent heat from dissipating properly.

To support airflow for high-density, and high-heat AI hardware, traditional cabinets won't cut it. They often lack features that support advanced cooling, such as rear door heat exchangers, modular containment options, and customizable airflow accessories. This makes it challenging to manage excess heat generation and minimize chilled air waste. Cabinets should be designed to keep AI hardware cool while minimizing chilled air waste.

TIP: Choose AI cabinets designed to optimize airflow for long-term savings. Features like blanking panels, sealed cable-entry points, floor skirts, and sealing kits can reduce airflow waste and decrease the amount of power required to cool AI infrastructure. They should also be flexible enough to accommodate the cooling option you choose, whether it's liquid cooling or an air/liquid hybrid. This not only ensures uptime and protects your hardware investments but also lowers operating costs.

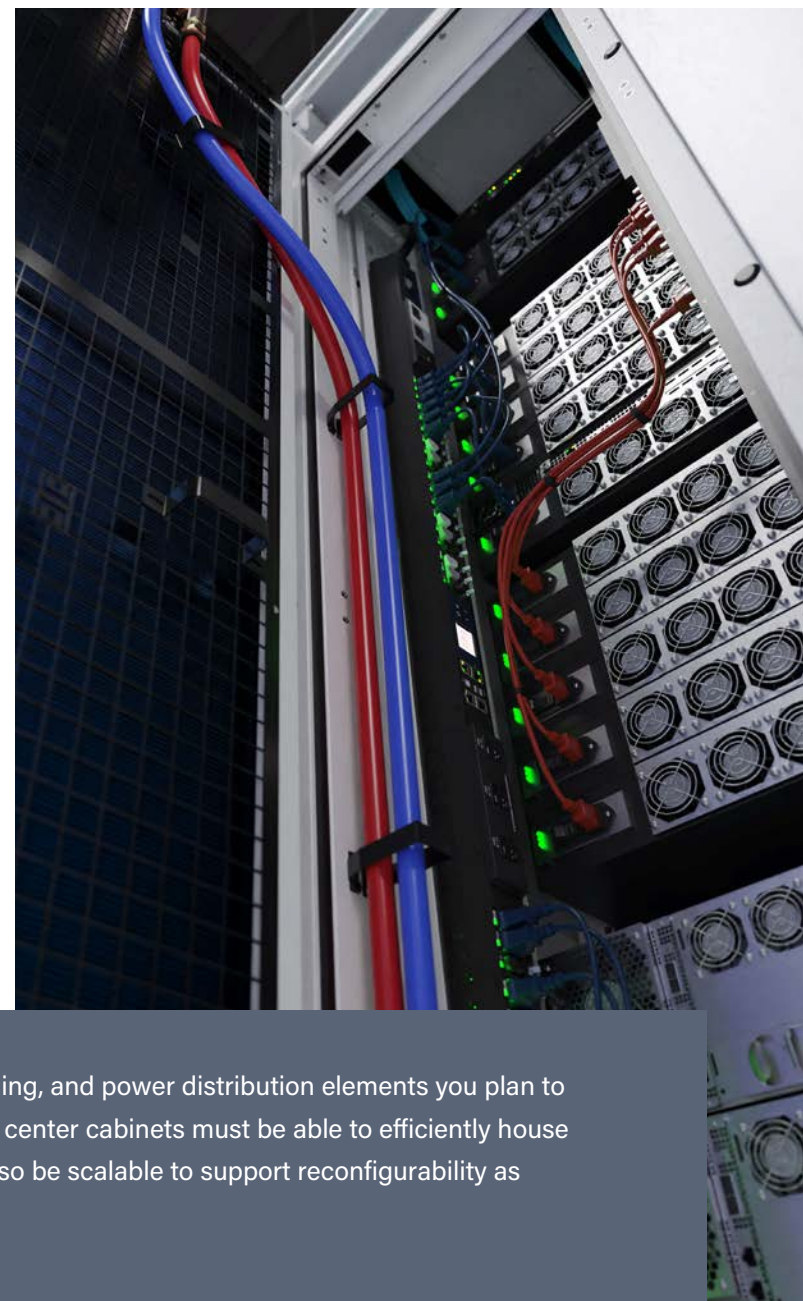
3 HARDWARE INTEGRATION: WILL THE CABINET SEAMLESSLY SUPPORT EXISTING & FUTURE COMPONENTS?

The high-performance components that make up an AI server require a purpose-built cabinet for seamless integration, ensuring stable connections, efficient cooling, and easy maintenance.

Proper hardware integration also maximizes the use of available space so data centers can support more hardware to scale AI capabilities without increasing their physical footprint.

A key aspect of hardware integration in AI cabinets is the inclusion of components like rear door heat exchangers, which efficiently dissipate heat generated by AI hardware. Integrating heat exchangers into cabinets makes efficient cooling possible without taking up valuable floor space or implementing complex external systems. A flexible cabinet that can accommodate between four and eight power distribution units (PDUs) is another critical consideration for efficient power management.

TIP: Be sure the cabinet you choose can accommodate and integrate the AI hardware, cooling, and power distribution elements you plan to deploy. Because AI's computing requirements are different from traditional workloads, data center cabinets must be able to efficiently house and manage all the components necessary to ensure optimal AI performance. They must also be scalable to support reconfigurability as hardware and technology evolve.



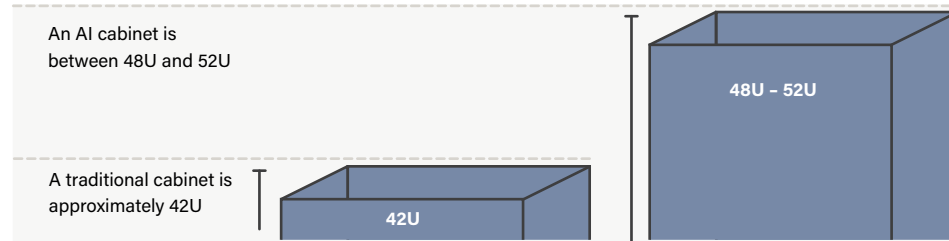
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SIZE:

HOW TALL, DEEP, AND WIDE IS THE CABINET?

To optimize costs and space, data centers need to leverage every vertical rack unit possible. Efficient use of vertical space also makes AI hardware maintenance and management easier, bringing all components together within a small area instead of being spread out across multiple racks.

To accommodate AI infrastructure requirements, AI cabinets are typically taller, deeper, and wider than traditional cabinets.



This increase in size allows the cabinets to house more equipment and better manage cables and PDUs. Taller, wider cabinets also help future-proof data centers by making it fast and simple to accommodate additional hardware as AI technology progresses.



TIP: Choose taller, deeper, and wider cabinets. Consider models with heights of 48U through 52U. In terms of depth, AI cabinets can be up to 54 inches deep. When it comes to width, consider cabinets that are up to 36 inches wide. These dimensions will help you adequately support not only AI hardware but also liquid cooling and power distribution. Selecting a cabinet that's taller, deeper and wider than what you require today can also prepare your data center for upgrades without replacing cabinet infrastructure or adding additional cabinets.



5 CABLE MANAGEMENT: CAN THE CABINET SUPPORT A SIGNIFICANT INCREASE IN CABLING?

AI environments can require five to ten times more cables to connect high-performance components compared to traditional servers. For example, cabling to support extensive inter-server connectivity is critical to ensure efficient communication between GPUs and other components, such as network switches. These requirements create a more complex cabling architecture compared to cabling for traditional server setups.

To ensure proper cooling, optimize cable performance, and make moves, adds, and changes faster and easier—with less opportunity for error—all these cables must be managed effectively.

TIP: Look for cabinets that offer built-in management features, such as vertical and horizontal managers, cable rings and grommets, and tie mounts to keep cables organized and support proper airflow. This can ensure proper cable bend radius, minimize strain, and ensure easy access for accelerated maintenance—all while optimizing space.

6

DEPLOYMENT SPEED: HOW FAST CAN THE CABINET BE SET UP?

As AI technology evolves and scales, data centers need to be able to rapidly deploy hardware to keep up with advancements. Fast AI cabinet deployment brings AI-powered products and services to market sooner, which can improve ROI and offer a competitive advantage.

Preloaded cabinets reduce labor time and costs associated with onsite assembly and configuration. Because components are integrated and tested before shipping, they also cut down on the possibility of errors during setup.



TIP: Accelerate deployment speed by choosing pre-integrated, ready-to-install AI cabinets that are transit tested according to International Safe Transit Association (ISTA 3B) standards. When the cabinets arrive onsite, they'll be fully operational, completely populated, and ready to deploy, reducing installation time and costs.

PREPARING FOR THE FUTURE WITH AI CABINETS

To support new technology, data centers need to rethink what it will take to support greater workloads in a smaller footprint. AI-ready cabinets can help you optimize the performance of your AI infrastructure.

Legrand's cabinet solutions are accelerating major AI data center deployments around the globe, balancing innovation with practicality. Acting as your experienced partner, we can make sure you have cabinet solutions to support your AI initiatives—today, tomorrow, and beyond.

Learn more here.

www.legrand.us/cabinets/ai



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