6 Key Challenges to Your Data Center

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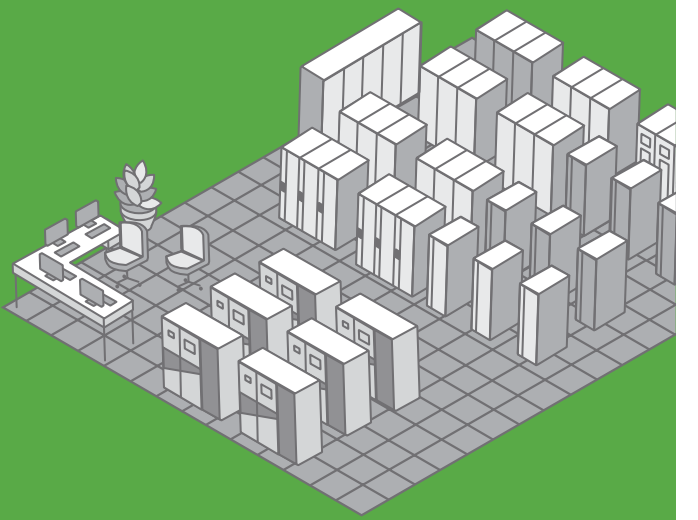

What stands between you and an optimized data center?

Addressing three key issues:

1. Efficiency: how can you make the most of your energy while ensuring reliability and availability?
2. Agility: as business needs change, how can your data center infrastructure keep pace?
3. Visibility: as your data center becomes more critical, can you ensure that it is always functioning at its peak performance?

In any data center, these issues are critical in optimizing data center performance, which is increasingly tied to business success. There are six key challenges linked to these three issues:

1. How do you improve the efficiency of your existing data center?
2. How do you add high-density racks in a low-density data center?
3. How can you extend the life of your data center by adding power and cooling?
4. How do you build a new data center?
5. How do you get visibility and control over your data center's key processes?
6. How do you implement a data center consolidation and virtualization project?

> Challenge 1

How do you improve the efficiency of your existing data center?

Data center efficiency isn't just about installing high-efficiency components. You also need to manage your data center via data center infrastructure management (DCIM) software in order to push your data center to the peak of its efficiency curve.

- First, benchmark your power usage effectiveness (PUE) through measurement and modeling to learn what needs improvement
- Focus on your cooling system. Hot aisle and cold aisle containment systems offer significant savings opportunities
- Install DCIM software to secure visibility and control in every part of your data center, allowing you to optimize efficiency, eliminate the silos between facilities and IT, and manage capacity more effectively

Outcomes

- Standardized and modular infrastructure can scale to accommodate capacity needs now and in the future, allowing for right-sized data center physical infrastructure (DCPI), a measure that can reduce energy consumption by 10 – 40 percent
- Simple, no-cost design decisions can reduce energy consumption by 20 – 50 percent, while major architectural changes can drive reductions of up to 90 percent!

> Challenge 2

How do you add high-density racks in a low-density data center?

Self-contained zones and pods can make high-density computing possible in low-density data centers. These pods offer more computing-per-watt and have no negative effect on existing infrastructure, but they do require getting your power and cooling infrastructure in shape.

- Start by leveraging design tools and assessments to help configure optimal placement of racks, air conditioners, and power equipment
- Next, deploy solutions such as modular, three-phase power, row-based cooling, and hot air or cold air containment in order to meet high-density zone requirements
- Maintain predictable operation even after moves, additions, and changes using DCIM software, which enables real-time monitoring and hot-spot prevention capabilities

Outcomes

- Scalable, “pay-as-you-grow” pods eliminate the need for a new data center build
- Electrical efficiency increases at fuller loads, so running high-density equipment actually decreases your data center’s PUE

> Challenge 3

How can you extend the life of your data center by adding power and cooling?

Most existing data centers were not built to handle today's densities, dynamics, or reliability requirements, but building a new data center is often too expensive. Work around this challenge with facility modules, which allow you to add capacity on an as-needed basis, like building blocks.

- Begin identifying capacity constraints using data center assessments and audits, and identify your end goal — what capacity goals are you ultimately trying to achieve?
- Standardized, pre-assembled, and integrated power and cooling modules allow you to deploy additional data center capacity faster, cheaper, and more reliably, and can be shipped and installed in one piece
- Enable right-sizing of capacity to match changing IT loads with scalable power and cooling designs

Outcomes

- Avoid building out a new data center
- Preserve IT space — facility modules can be shipped in one piece and installed outdoors
- Add power and cooling capacity up to 60 percent faster by eliminating field work
- Save 20 percent on upfront costs and cut energy costs by up to 30 percent compared to traditional power and cooling infrastructure

> Challenge 4

How do you build a new data center?

If you are looking to build a new data center, following an established procedure is vital in preventing downstream mistakes. But for some reason, proper system planning remains a major challenge for smaller IT facilities. It is helpful to look at system planning as a data flow model, with a standardized sequence of tasks.

- Begin by setting design parameters with standardized tools and methods
- Planning stages offer the greatest potential for downstream implementation mistakes, so make sure to follow a pre-established system planning sequence
- Employ modular and scalable architecture to right-size DCPI, which saves on upfront costs but empowers you to expand easily in the future
- Partner with a single-source data center expert who can:
  - > Provide end-to-end design and build services
  - > Integrate power, cooling, and management systems
  - > Offer field service to ensure ongoing successful operation

Outcomes

- Enjoy predictable cost and performance via standardized designs
- Deploy projects that have effective specifications for capacity, density, growth plan, availability, efficiency, and budget
- With proper design, small data centers can be as efficient and cost-effective as large data centers

> Challenge 5

How do you get visibility and control over your data center's key processes?

Now that IT complexity, high densities, and virtualization are the norm rather than the exception, having visibility and control over your entire data center domain is critical to its success. The most comprehensive way to achieve this power is with DCIM software, with its context-aware monitoring capabilities.

DCIM enables you to:

- Meter, collect, and report load and environmental information from your power and cooling solutions in real time
- Define and automate actions that maximize availability and efficiency
- Enable real-time centralized management, customized reporting, and complete management of a multi-vendor physical infrastructure
- Optimize inventory and workflow
- Simulate and understand changes to the data center

Outcomes

- Maximize availability by quickly assessing and resolving physical infrastructure events
- Eliminate energy waste by performing energy management from utility mains to plug and through a 24/7 monitoring capability that shows you when your system isn't running at optimal performance
- Adapt efficiently to changing IT conditions

> Challenge 6

How do you implement a data center virtualization and consolidation project successfully?

Virtualization and consolidation have the potential to reduce energy consumption by 10 – 40 percent, maximize availability, and free up space. But virtualization can also create challenges such as hot spots if your DCPI is not agile enough to deal with a dynamic IT environment.

- Scalable power and cooling solutions match consolidated or growing IT loads, which facilitates right-sized DCPI and a lower PUE
- Adjust to migrating IT loads in real time with close-coupled, row-based cooling solutions featuring variable-speed fans
- Meet high-density zone requirements with a hot-aisle containment system
- DCIM software is critical to any successful virtualization or consolidation project because it unites IT and facilities, allowing you to manage changing IT loads safely and efficiently

Outcomes

- Increased availability via physical infrastructure that automatically and dynamically responds to migrating virtual loads
- Avoid system downtime through management software that automatically migrates IT loads away from failing components or risky environmental conditions
- Rapidly deploy power and cooling distribution to support high-density zones that result from consolidation

Conclusion

Data center optimization has become a key contributor to business success. Pre-engineered, integrated data center architecture and DCIM software make installation, repairs, and operation more efficient and reliable. With these solutions, you can address efficiency, capacity, budgetary, and management challenges head on.

Learn more about data center optimization by contacting 2NSystems today.

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