PLAYBOOK
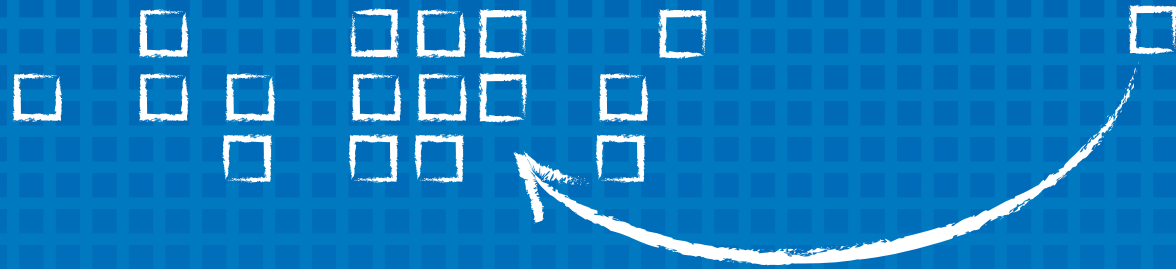## FOR CHANGE

How Do You Plan to Grow?
Evaluating Your Critical Infrastructure Can Help Uncover the Right Strategy

EMERSON
Network Power

How Do You Plan to Grow?

The world is becoming more digital every day. The demand for feature-rich, data-intensive IT applications is growing, but your critical infrastructure isn't. IT services is planning projects to provide new functionality to end-users. But you're convinced the infrastructure can't handle them, and the risk of downtime seems greater than ever. Clearly you need additional compute capacity, space, power and cooling, but you have a mandate to keep IT costs down.

There are a number of critical infrastructure expansion strategies with varied costs that you may consider.

Growth Options that Maximize Efficiency and Increase Capacity

Keep in mind some of these solutions can be combined, if appropriate.

Optimize Existing Infrastructure

How to do it:
- Make sure efficiency best practices like containment, economization and cooling aisle controls are adopted.
- Reallocate wasted or stranded capacity that is found during an infrastructure evaluation (see page 2).
- Virtualize a greater percentage of the servers.
- Bump up density to 12-14kW per rack.
- Turn off servers that aren't doing useful work.

What you'll get:
- Recovered capacity, greater efficiency, higher reliability.
- Cost savings.
- Space.
- And, maybe by optimizing your critical infrastructure, you'll be able to avoid more costly and difficult expansion methods.

Retrofit Existing Infrastructure

How to do it:
- Start by taking measures to optimize. A professional data center survey or assessment will show where you have opportunities.
- Upgrade equipment with newer, more efficient technologies.
- Implement controls to manage the whole data center.

What you'll get:
- Potentially enough capacity to support future growth. For example:
  - A new cooling system can provide 50 to 100 percent more cooling capacity.
  - On the power side, it's possible to add more UPS units to increase IT density and add new capacity for less than half the cost of a new facility.

Outsource

How to do it:
- Move data and applications to the cloud. You can select private or public cloud, a hybrid of the two, or a virtualized private cloud.
- Move non-core competency applications to the cloud.
- Move to a co-location facility, but realize co-los are not created equally. Some are cages and space that you deploy into; others provide suite-like accommodations that assign you dedicated critical power and cooling; others build to suit; some even install, wire and provision the IT infrastructure for you.

What you'll get:
- Expanded capacity without expanding bricks and mortar.

Deploy an Integrated, Modular Room(s)

How to do it:
- Add one or more complete, integrated, contained infrastructures outside your facility, or remotely, for overflow.

What you'll get:
- A complete data center and IT infrastructure without having to upgrade building systems, such as fire suppression and cooling.
- The most efficient technologies preconfigured and ready to go.
- Rapid deployment ability.
- Flexible and easy expansion to meet growth needs.

Get Creative

There's no easy answer about how to think outside the data center, but some organizations are getting creative with space they previously didn't think they could use. This may be a viable way to use your existing facility and increase efficiency, capacity and density. For instance, one creative organization is looking to add an additional 3 MW of capacity using the space on its roof by hoisting a rapid deployment configuration from the street via crane. Have you thought of using space on your roof?

Build a New Data Center

How to do it:

- There are many paths to a new data center, all of them complex, difficult and costly. Starting from scratch costs $1,000 to $1,500 per square foot on average.

What you'll get:

- The most advanced and efficient technologies.
- The ability to plan for long-term growth by investing in an all new, scalable critical infrastructure.
- Assurance there is ample capacity to support long periods of sustained IT growth.

Deciding which of these strategies is right for your organization requires knowing exactly what you have now. A thorough evaluation of your critical infrastructure is the way to find out.

## Evaluating Existing Critical Infrastructure

Two methods for effectively assessing existing critical infrastructure are:

- Bring in a trained professional to conduct a comprehensive, on-site efficiency assessment. Identifying inefficiencies will help you reclaim capacity.
- Use data center infrastructure management (DCIM) technology that provides real-time visibility into facilities (physical) and IT (logical) assets.

Professional Efficiency Assessments Help Map Opportunities for Future Growth
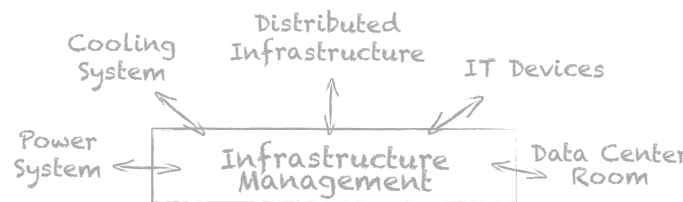
An on-site efficiency assessment helps you:

- Understand the dynamics, gaps and vulnerabilities in your critical infrastructure.
- Identify and leverage opportunities to increase availability, reduce costs and recover capacity.
- Leverage tools such as Computational Fluid Dynamics (CFD) to "see" the heat signature of your physical infrastructure.
- Obtain a performance baseline to track against in the future.

Data Center Infrastructure Management (DCIM) should optimize all subsystems of infrastructure operations holistically.
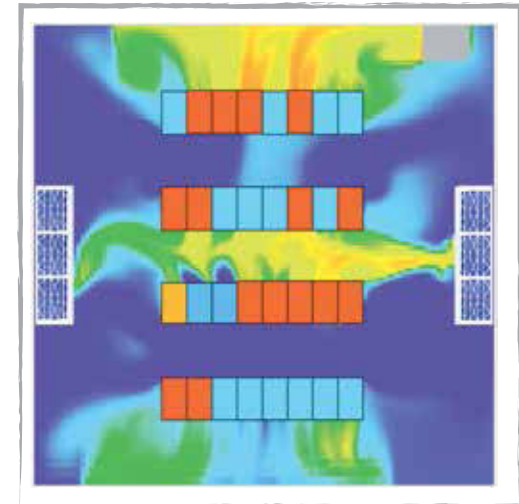
Power usage and thermal CFD shows how efficiently the data center is cooled and takes the temperature with respect to each air handling unit.

CFD analysis is especially useful for planning, because it maps out opportunities for future growth. For instance, it shows where heat can and cannot be added, enabling you to make decisions where to place additional equipment.

Achieving better or full ROI from new equipment, a major factor in any expansion plan, is another benefit of an assessment. You miss the opportunity to achieve the best ROI if power or cooling is upgraded without first getting a professional assessment. Assessments see beyond the equipment to issues that, if remedied, will improve its performance, such as unlocking cooling capacity by improving under-floor airflow or changing the new equipment setpoints to be more energy efficient.

How Do You Plan to Grow?

DCIM Technology Gives Real-Time Visibility to Critical Infrastructure Status

Where an on-site efficiency assessment examines the physical components of your infrastructure, a holistic DCIM system provides insight into both physical and IT systems. DCIM treats critical infrastructure as an ecosystem in which these systems interact. For example, computing demand is reported in real-time, therefore space, power and cooling can be allocated based on actual demand, eliminating the need to over-provision. This prevents wasting much needed capacity.

With the ability to see infrastructure performance in real-time, you don't have to guess your capacity or efficiency – you'll know precisely what they are. This allows you to make the most informed decisions possible when planning your growth strategy.

Follow Energy Logic 2.0 strategies when optimizing and upgrading your infrastructure to capture maximum efficiency. Adopting all 10 strategies has the potential to reduce energy consumption in a 5,000 square-foot facility to 408 kW – a 74 percent improvement in data center efficiency. Better efficiency means greater capacity

Link to Energy Logic 2.0

Decision Check List

Paths to growth can have advantages and disadvantages based on your organization and needs. Use this checklist to ensure the effectiveness of your growth strategy.

☐ **Financial Considerations**
Cost is typically the first consideration when looking to expand. Know your expectations for CAPEX and OPEX. Also consider the importance of budget flexibility and/or predictability over time.

☐ **IT/Data Center Security**
According to an *InformationWeek* survey, 57 percent of respondents cited security and data protection as a top requirement of their application infrastructure. The level of security measures available to protect data and IT equipment should play a key role in making a growth decision, such as outsourcing.

☐ **Physical Space Availability**
What is the amount of physical space available to support additional IT equipment and required infrastructure solutions? If building another facility is required, outsourcing may be an attractive option for large-scale expansions.

☐ **IT Control/Ownership**
If having physical control over IT equipment is important to your business, expanding your current infrastructure may be preferred to co-location.

☐ **Infrastructure Ownership (Equipment Age, Capacity, Availability)**
If major capital investments in power and cooling are needed to provide ongoing reliable IT support, funds available upfront for investing in this equipment (as well as the amount of extra capacity needed to support future growth) may be important to growth decisions.

☐ **Available IT Personnel and/or Infrastructure Expertise**
Do you have enough people who have the skills to maintain the new critical infrastructure? Hiring or outsourcing to maintain operational efficiency should be considered.

☐ **Applications and Long-Term Growth Potential**
Depending on the applications the infrastructure is supporting and the potential for long-termsustained growth in IT loads, certain growth \strategies may be better fits than others.

☐ **Speed of Deployment**
How quickly does the new IT equipment need to be deployed? Is there existing floor space available, or is new construction needed before data center equipment can be installed? Do you expect to move IT operations in the future, and if so, do you have flexibility to accommodate extended planned outages? These and many other questions related to the speed of new IT deployments may tip the scales in favor of a specific growth strategy.

About Emerson Network Power

Emerson Network Power provides efficient, reliable critical infrastructure solutions for data centers, communications networks, healthcare and industrial facilities around the world. With proven innovations in power, thermal management, IT solutions and a global network of service experts covering more than 150 countries, we make the future of communications and information technology possible.

We understand how data center infrastructure is becoming more complex at almost every level, and more essential to the success of the business than ever before. Get the insight and resources you need to lead your organization into the future at EmersonNetworkPower.com/CIOtopics.

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