

## Aligning Business Organizations

Sun's approach for building energy-efficient datacenters

### Growing cost and complexity

If your company is like many, it changes over time through business cycles of expansion and contraction, mergers and acquisition. These cycles can cause real estate and technological inefficiency that has a significant impact on datacenter spaces.

The result of these cycles is inefficient, expensive, and inflexible datacenters that limit a company's ability to respond to new, emerging markets. Making things worse, inefficiency is hard to address at a corporate level because the CIO doesn't pay for power and real estate expenses, and the facilities

your business, working to understand your requirements and challenges before advising on technology or solutions. Sun can support your business by helping you understand the origins of inefficiency.

### Origins of inefficiency

Space and power inefficiency grows over time due to a number of factors that are common to most companies.

### Business cycles

Normal cycles of growth and contraction, acquisitions and spin-offs, cause churn in space and IT infrastructure.

### Highlights

- Reduce the real estate and technology inefficiency caused by business cycles of expansion and contraction
- Align key stakeholders in order to successfully develop an optimal datacenter strategy
- Improve business agility while increasing power and real estate efficiency with Sun's modular, pod-based datacenter designs
- Leverage Sun's datacenter strategy, design, and build services, which put Sun's experience to work through the entire datacenter lifecycle

Real companies expand and contract. They invent, develop, test, and deploy new products and services. They merge, acquire, and orchestrate an ever-changing workforce. Over time, these activities can lead to energy and real estate inefficiencies that affect the bottom line — no matter how successful the company.

organization doesn't know future power requirements, stripping it of the ability to plan state-of-the-art, energy-efficient spaces.

### Sun's Datacenter Strategy Consulting Service

Sun offers services to help reduce the inefficiency that results from expansion and contraction cycles. Sun's Datacenter Strategy Consulting Service aligns key stakeholders in your organization and follows a methodology to develop a datacenter infrastructure strategy that addresses all components of your IT ecosystem. Sun consultants focus on

### Corporate culture

In many companies, groups retain old equipment because it is considered "free" when it reaches zero book value. Since most groups do not pay the real estate or power bills out of their budget, they have a limited understanding of what space and utilities cost the company. With periodic reorganizations, old equipment can become orphaned and continue to consume space and power while satisfying no business need.

### The language gap

Core stakeholders tend to have different priorities and goals and speak different languages. The CIO, IT, and engineering organizations, and those who create and run enterprise applications, care about application performance and service levels, while the facilities organization cares about real estate and power expenses.

### Lack of visibility

The lack of visibility from one organization into another can result in unnecessary expense. The facilities organization doesn't always understand or even believe IT requirements. This lack of visibility causes them to react to the power and cooling requirements of each new generation of high-density equipment as it arrives rather than having a long-term, cost-effective plan for scaling power and cooling infrastructure to meet future requirements. Conversely, the IT organization understands new generations of equipment, but doesn't usually understand the time and expense it takes to implement large, high-density datacenter power and cooling infrastructure. Both of these blind spots can cause reactive behavior that is expensive to a company.

### Results of inefficiency

Real estate consumes both capital and operating expenses. The "capital is king" culture increases both energy and taxes. Equipment that organizations see as "working" and "paid for" can cost more in real estate space, energy, and taxes than new equipment.

Aging, fixed IT infrastructure limits the ability to adapt to changing business conditions, including rolling out new applications, expanding into new markets, handling mergers and acquisitions, and consolidating real estate. A more dense and more flexible infrastructure can adapt quickly to embrace new technology and business opportunities.

Finally, business changes drive new datacenter requirements. When changes in the technical infrastructure portfolio are not managed, duplication and inefficiencies can become very expensive, very fast.

### Aligning stakeholders

The key to changing patterns causing power and space inefficiency is to better align the organizations and stakeholders in a company.

The CFO, with ultimate visibility into current costs and potential benefits, ideally provides the incentive and funding needed to restructure the company's technical infrastructure and compute resources. The CIO and CTO need to understand how their technology choices impact the company's power and space consumption. The facilities organization needs a road map from which it can plan future requirements, helping it to take a proactive rather than a reactive stance. Every organization using datacenter space is a stakeholder and it is important to make them part of the process.

One approach is to establish an independent organization with both the authority and the financing needed to create and execute a technical infrastructure strategy. The process begins by characterizing your technical infrastructure portfolio in order to have a well-quantified starting point from which you can measure improvements in real estate and energy efficiency.

It is important to set realistic goals that are fully supported by stakeholders. Dictates are typically not effective. Instead, collaboration and buy-in are essential to a program's ability to identify problems and create solutions.

### Managing cultural issues

The most effective way to increase efficiency and datacenter flexibility is to consolidate and centralize datacenter spaces. This goal can conflict with the needs of some

client organizations whose employees need to have frequent, hands-on access to equipment. These needs can be addressed by characterizing each datacenter space by the kind of access its users require. This allows the spaces to be designed to meet user requirements, more fully meeting an organization's needs.

With the high value that some corporate cultures place on capital equipment, it can be difficult to get organizations to give up outdated systems without incentives. The cost savings of using new servers is so great, however, that it makes sense to replace servers as new datacenter spaces are populated. Budgeting for server replacement has an additional benefit: when organizations are offered new equipment in exchange for turning in their old, outdated systems, they are more likely to buy into and support the move to consolidate their equipment into a more central, shared infrastructure.

Sun's experience replacing its own server infrastructure in its Santa Clara, California, consolidation effort achieved more than an 80% reduction in square footage and a 60% reduction in utility power, all without down time or application porting.

### Turning strategy into action

With an organizational alignment of the various stakeholders in place, and with an inventory of current space and system requirements completed, a datacenter strategy can help reduce both power consumption and real estate footprint.

### The importance of sharing

Sharing technical infrastructure means consolidating and increasing density, which offers an opportunity to drive down costs by using more efficient power and cooling solutions. Sun uses an operating model based on a stack that includes physical, network, naming, compute, and storage layers. All

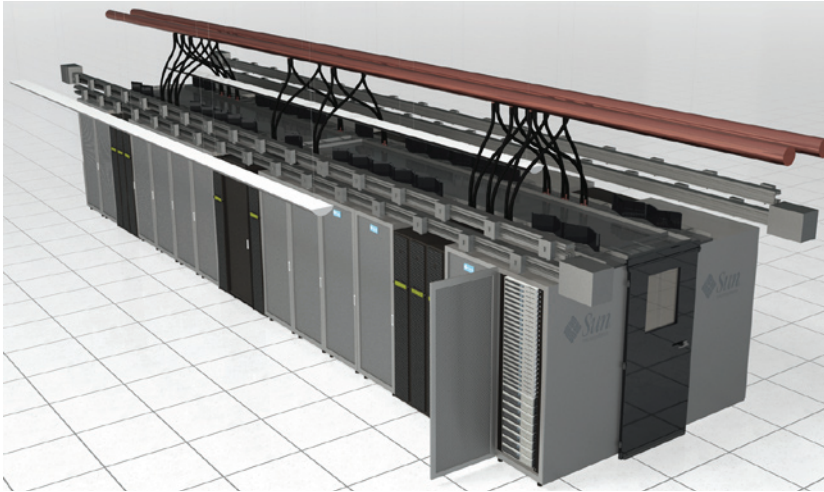


Figure 1. Sun's modular, pod-based deployment model uses self-contained groups of racks that optimize power, cooling, and cabling efficiencies.

layers are dependent on each other, so it is crucial to start with the foundation. The first goal is to implement the physical layer and succeed in getting organizations to share space, power, cooling, and cabling, thus reducing overall costs.

#### Modular deployment model

Because all users are sharing infrastructure, generic design and construction standards can be repeated across all of a company's datacenters. Consistent technical infrastructure standards can simplify and speed the process of building next-generation environments, helping to reduce costs while increasing a company's ability to respond to rapidly changing business conditions.

Nobody understands the needs of future datacenters better than Sun because Sun builds its own datacenters to accommodate its own next-generation systems. Sun understands through experience with its own datacenters that standards must be generic so that they can be adapted easily to accommodate variations from site to site. They also must support scalability and

mobility to help companies easily reconfigure spaces as needed.

#### Pod-based deployment model

One best practice is to use a modular, flexible, pod-based deployment model. A pod is a self-contained group of racks that optimize power, cooling, and cabling efficiencies to facilitate rapid and simple replication throughout a single datacenter and in datacenters across multiple geographic locations (Figure 1).

A small, rather than a large, pod size helps to maximize power, cooling, and cabling designs that can be used in both large and small datacenters. When an organization needs to grow, the pod design can be replicated as many times as necessary to provide the total aggregate space and infrastructure required. Pods act as a standard increment by which datacenter space can be scaled up and down as business cycles dictate — including reorganizations, acquisitions, expansions, consolidations, and new product development.

The innovative, yet simple approach of deploying infrastructure in pod-sized increments allows organizations to reconfigure and adapt the model to different uses without having to design each one from scratch. Sun works with your technical teams to determine a modular design that fits with your specific needs — whether the design is used in the brick-and-mortar datacenters described so far, or whether the design is deployed in a containerized datacenter.

The Sun™ Modular Datacenter is a highly optimized pod design deployed within an enhanced shipping container. It can be used in a wide variety of indoor and outdoor settings including corporate campuses and remote, rugged locations. Just as with brick-and-mortar pods, a Sun MD requires external power, cooling, and network connections. The Sun MD is an ideal solution for datacenters that have run out of space, need the flexibility to relocate their infrastructure, or have temporary needs for more computing infrastructure.

#### Sun — your partner through the datacenter lifecycle

Sun offers a range of datacenter consulting services that help you through the process of developing a datacenter strategy, designing the datacenters themselves, and building them (Figure 3).



Figure 2. A Sun™ Modular Datacenter is a pod design deployed within its own container.

### Sun's Datacenter Strategy Consulting Service

This service offering starts you on the right foot by working with your key business and IT stakeholders to understand your requirements and recommend the most effective, efficient strategy for building or transforming your datacenters with a unified facilities, business, and IT perspective.

Sun consultants can help you to rightsize your new datacenter or extend the life of existing facilities and infrastructure, helping to dramatically reduce energy costs and increase both real estate and server utilization.

Sun consultants can help align your business continuity plan with your datacenter strategy and IT architecture. We model the cost of different scenarios and help to build a compelling business case for the changes that your organization needs to make.

Your datacenter strategy helps align all of your stakeholders, rationalize growth and real estate decisions, provide guidance as to

when to retrofit existing datacenters or build new ones, and when to use brick-and-mortar versus container-based datacenters.

### Sun's Datacenter Design Consulting Service

Sun's Datacenter Design Consulting Service helps you to build a datacenter solution that meets your key strategy requirements, helping to optimize designs and expedite deployment. Sun consultants design a comprehensive operating model that helps reduce risk, pinpoint costs, and provide engagement management and metrics.

Sun consultants advise you on optimal design configurations and related technology choices. They use an unbiased approach that helps you select the best infrastructure that meets your needs.

Whether you are designing a new brick-and-mortar building or retrofitting existing space, Sun creates 3D architecture blueprints based on building data. When designing for container-based datacenters, Sun consultants

#### Learn More

Please visit [sun.com/datacenterdesign](http://sun.com/datacenterdesign) for more information on Sun's datacenter consulting services.

Contact your Sun representative to discuss your datacenter strategy.

Take a tour of Sun's energy-efficient datacenters or learn more about Sun's innovative pod design at: [sun.com/aboutsun/environment/green/datacenter.jsp](http://sun.com/aboutsun/environment/green/datacenter.jsp)

assess the site, specify site preparation parameters, and design hookups to site infrastructure including power, networking, and the chilled water system.

### Sun's Datacenter Build Service

Sun Datacenter Build Service uses Sun's project management expertise to manage your entire datacenter construction process. Sun partners help to provide local pricing and cost estimation services. And Sun sees the project to completion by managing suppliers and construction companies to make the entire process streamlined and efficient.

### Meeting your goals with Sun Services

With more than 25 years of hands-on experience in datacenter innovation, there is no better partner than Sun to deliver the services that help you reach your goals.

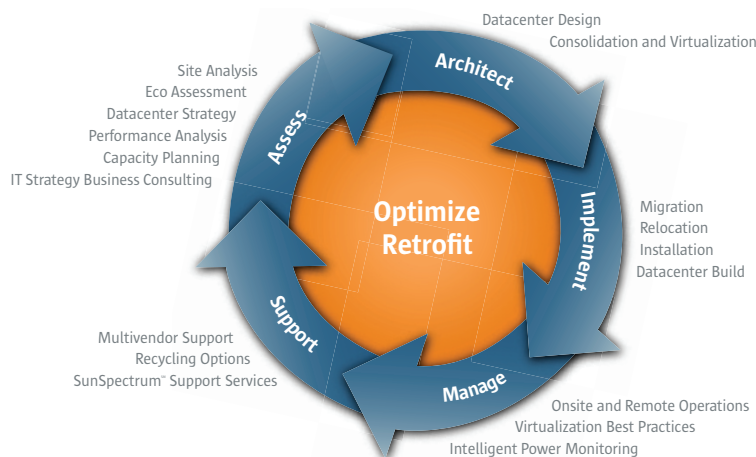


Figure 3. Sun datacenter consulting services support you through the datacenter lifecycle, with service offerings for every phase.