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SCALABILITY & CAPACITY PLANNING: BUILD VS. BUY

Considerations when Investing
in IT Infrastructure

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A white paper by

CyrusOne.

Overview:

This paper explores issues that arise when planning for growth of Information Technology infrastructure. The paper explains how colocation of data centers can provide scalability, enabling users to modify capacity quickly to meet fluctuating demand.

Target audience:

Managers, directors, technical staff, and others interested in learning about the relative merits of building on-premises data centers vs. leasing space/infrastructure in colocation centers.

Background information:

In information technology, scalability is defined as having IT costs rise linearly with increases in IT capacity. Infrastructure on demand (the ability to modify data-processing capacity quickly in response to demand) is the ultimate reflection of a scalable data center because it protects against under- or over-investment in IT infrastructure.

Unfortunately, on-premises data-center modifications take time, so changes must be made with an anticipation of future computational needs so as not to be obsolete upon completion. Predicting future computational capacity requirements is surprisingly difficult—even for a one-to-two year horizon. Further complicating matters is the need during infrastructure modifications to maintain continuity of service, data integrity, privacy, fault tolerance, and transaction monitoring for regulatory compliance.

Three basic options for modernization:

In-house data centers are often constrained by physical limitations (square footage, electrical/cooling capacity, etc.) and often reach a point at which modernization requires one of three basic choices: building a new facility, retrofitting the existing facility, or contracting with a colocation provider.

Choosing among these options is not simple, because the large number of factors to consider creates a combinatorial explosion of possible approaches. Predicting costs of new construction and retrofits is highly complex by itself. Determining likely downtime (and the costs to the business of the downtime) is similarly fraught with uncertainty. For each possible approach, there are considerations relating to data security, physical security and resilience in the face of power and cooling. Strategic decision-making requires analysis of the operational impacts arising from each approach.

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TABLE 1

Operational impacts of decision to build, retrofit, or buy data center services

ISSUE	BUILD/RETROFIT	COLOCATION
Capacity	Fixed	Scalable
Start-up time	24 to 36 months	On demand
Data security/reliability	Internal controls	External controls
Emergency resources	Can be outsourced	Included
Capital expenditures (typical)	$15K per kw @ 5MW utility load	None
Operational expenditures	Variable	Set by contract

Pros and Cons – Build/retrofit vs. colocation of data center services

Scalable IT infrastructure, whether internal or remotely located, provides the agility required for a business to maintain its competitive edge. Any of these three options (build, retrofit, colocate) can be tailored to meet the needs of a particular enterprise, although Total Cost to Operate (TCO) will vary widely.

Options 1 and 2 involve hefty capital expenditures (CAPEX), potential increased operational expenses (OPEX), plus heightened technical risk. Options 1 and 2 also involve substantial expenditures over time for maintenance and upkeep. Potential benefits include direct control over IT equipment, operations and staffing. Option 3 provides the closest approximation of immediate IT infrastructure on demand. Consensus is building among IT managers and CIOs that this approach offers the best balance of risk vs. reward.

TABLE 2

IT Infrastructure: Decision Points

OPTION 1	OPTION 2	OPTION 3
Build new data center	**Retrofit existing data center**	**Colocation**
• Buy or lease hardware?	• Include additional cooling and power capacity?	• Place enterprise-owned or leased hardware in the colocation center?
• Outsource maintenance of hardware?	• Upgrade existing or buy/lease new hardware?	• Include operation and maintenance in colocation contract or choose other service provider?
• Develop and support own software or outsource?	• Outsource maintenance of hardware or staff internally?	• Provide and support own software?
• Develop or buy computational services provided in the cloud (email, web services, etc.)	• Develop and support own software or outsource?	• Include cloud computational services (email, web services, etc.) in colocation contract?
	• Develop or buy computational services provided in the cloud (email, web services, etc.)	
	• CAPEX savings compared to build option?	

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Commonly shared issues/challenges:

Data Center Knowledge (DCK) conducts an annual survey to identify key issues and challenges faced by their clients. The list of top seven challenges (Table 3) is drawn from DCK's August 2011 results, based on more than 200 respondents in a broad range of public and private sector enterprises. Most of these challenges can be expressed in terms of overarching goals of network reliability, cost effectiveness and data security.

TABLE 3

TOP Seven IT infrastructure management challenges

1. **Scalability:** Create a flexible, optimized IT infrastructure.

2. **Capacity planning:** Leverage IT for strategic business outcomes.

3. **Data center extensibility:** Ensure sufficient space for growth. Avoid risks of under or over building.

4. **Implementation of new technologies:** Modernize while maintaining data security and reliability.

5. **Power & cooling:** About 25-50% of data center costs are attributed to power consumption. Achieving optimal power distribution is paramount.

6. **Colocation:** Select best data center service provider.

7. **Trends:** Support emerging trends, including a move to virtualized servers, cloud-based systems, web-based interfaces and mobile infrastructure with heterogeneous operating systems.

Looking Toward the Future: Cloud Computing and Colocation

"CyrusOne is the foundation that brings data-center technologies and services together. Whether a customer is placing its own corporate production servers into our facility or having its preferred service provider offer turnkey services in the safety and vendor neutrality of one of our facilities, we are the foundation that protects critical data processing applications. Service providers are building and maintaining cloud environments within our facilities. **What does this mean to the ecosystem? Everyone wins.** Customers who have used us for the corporate production data center feel more comfortable dipping their toes into cloud-based services hosted here, and getting started is as simple as extending a cross-connect from our facility to a cloud provider. The cloud providers don't have to build the data center to support the cloud, and they tap into an immediate customer base with CyrusOne."

SOURCE: COMMENTS BY CAROLINE BRELSFORD-CALDARERA, CYRUSONE, 09/08/2011

Summary: Minimize risk by choosing colocation

To build or retrofit a secure, reliable data center requires a long-term commitment and heavy up-front investment. Excess IT capacity ties up valuable capital, while under-investment in IT capacity leads to revenue loss. And because data-center requirements are in constant flux, a right-sized data center will not remain that way for long.

Colocation provides immediate access to a flexible, scalable data center without CAPEX investment. Aligning OPEX with revenues provides the competitive edge that comes from concentrating on the core business and not dealing with constant IT headaches, which include complex and domain-specific challenges like ensuring that data and applications are secure. Colocation provides optimal redundancy, efficiency, security and future-proof reliability with minimal technical risk. In addition, a scalable data center that quickly and precisely meets a company's changing business needs without redundancy is the inherently green solution. Furthermore, peace of mind comes from connecting with customers, partners, and suppliers across a secure, reliable network.

Revenue enhancement, cost avoidance, operational efficiencies and a smooth path to expansion: these are all immediate, concrete and measurable reasons to choose colocation.

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