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Eight Critical Forces Shape Enterprise Data Center Strategies

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Through 2017, infrastructure and operations managers, architects and infrastructure planners must consider eight critical forces when developing enterprise data center strategies. By analyzing the potential impact of these forces, IT organizations will be better positioned to introduce technologies and to improve the quality of service delivery.

Key Findings

- Data center power and cooling problems will increase during the next five to 10 years.
- Organizations must focus attention on developing and testing disaster recovery and business continuity plans more thoroughly.
- Optimizing key operational processes will be essential to complement new technologies, such as virtualization and dynamic workload management.

Recommendations

- To plan appropriately for change, users must model the major forces affecting their large data centers through at least the next five years.
- Many large users will face a significant constraint in the amount of available floor space needed to house the ever-increasing volume of new hardware. Users must consider all options, from using host providers to building new data centers.

STRATEGIC PLANNING ASSUMPTION(S)

Power and cooling issues in servers and storage devices will become the single biggest issue in data center topology by 2008 (0.8 probability).

Through 2012, more than 50% of large enterprises will continue to have immature business continuity processes (0.7 probability).

During the next five years, most enterprise data centers will spend as much on energy (power and cooling) as they do on hardware infrastructure (0.6 probability).

ANALYSIS

Large, global enterprises developing new data center strategies throughout the next few years will require a holistic approach and type analysis different from that of the past five to seven years. The demand for new, high-quality facilities, geopolitical and socioeconomic factors, rapid changes in technologies and new financial models will come together through 2007 and 2008, forcing users to think differently about the future of their enterprise data centers. Users must be able to model and codify these different forces to have deterministic discussions and make important decisions. Users should consider eight critical forces when developing data center strategies.

Through 2012, a significant inflection point in data center strategies will arise out of a timely flow of different and often opposing socioeconomic and technical forces. On the global and social fronts, large enterprises must not ignore threats to IT services from political disruptions, yet at the same time must capitalize on the availability of highly skilled labor pools in geographies such as China, eastern Europe and India.

This socioeconomic dimension will affect short- and long-term decisions. For example, the location of the next generation of data centers worldwide presented a significant level of discussion in 2006. As the supply of quality facilities' starts to fall behind demand, Gartner views this as a critical decision point in 2007. Concerns such as security and stability of the region, transportation maturity, telecommunications development, availability of capital and the supply of skilled workers are analytical dimensions that should be considered by organizations considering developing a global, data center strategy.

Also, hosting personal data in different countries presents another type of risk, and compliance with new and tighter regulations will affect data retention processes. The effects of global socioeconomic changes on disaster recovery should not be underestimated. Enterprise data center strategies have come down to a balancing act between managing the costs of a defined level of IT service delivery and managing risks of the failure of that delivery. Thus, large enterprises have developed programs for disaster recovery and business continuity and have designed architectural road maps with attention to risk mitigation. During the next few years, organizations with global IT operations must do more thorough risk analysis and may need to invest more in disaster recovery programs.

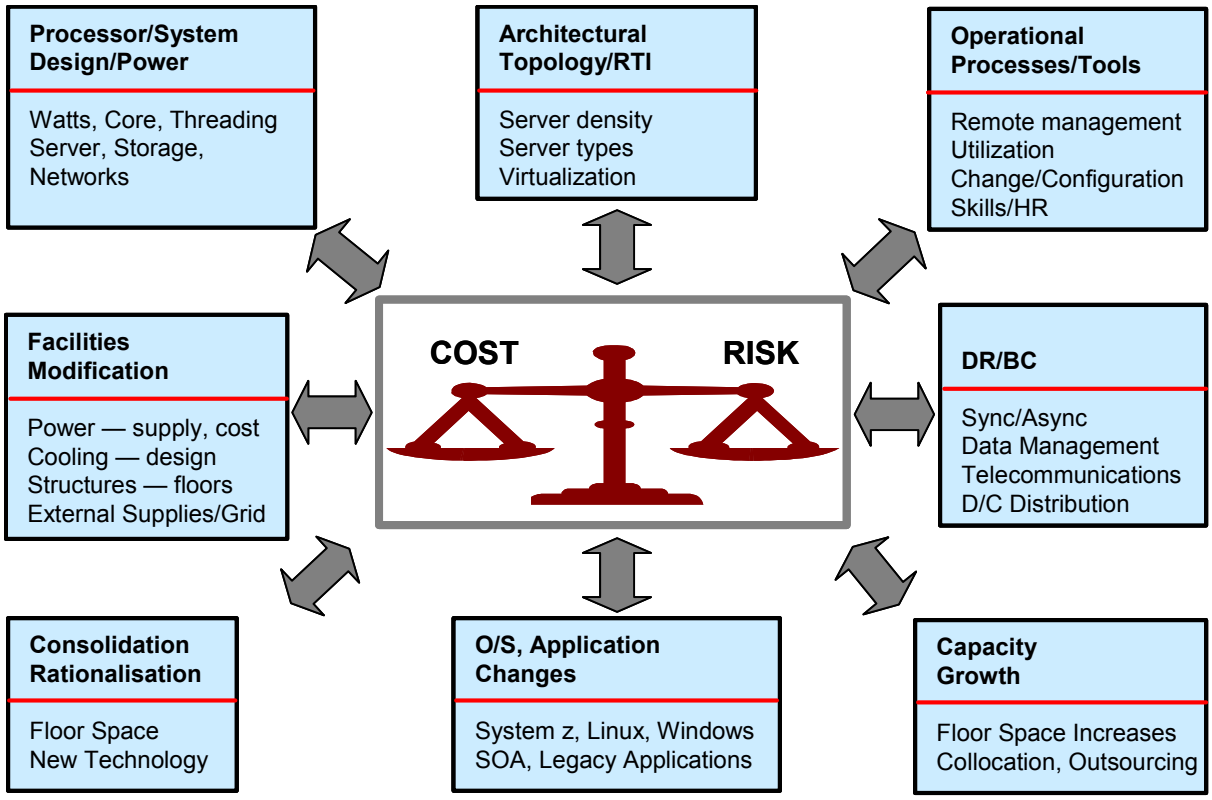
On the technical side, many evolving technologies will affect server architectures, storage capacities, and the type and scale of networks. For example, server and storage virtualization, multicore processors, new fabrics and improved server management tools will evolve rapidly through 2009, providing many new design approaches for system architects. New application designs relating to the Web services approach must integrate an array of legacy applications, and the ubiquitous nature of personal devices will add layers of architectural complexity. Furthermore, running large-scale, data centers by definition necessitates significant ongoing operational

expenses. Although the location of facilities may reduce labor costs, improvements in delivery processes are expensive. New data center topology must manage legacy technologies and be future-proofed to deal with new infrastructure designs.

Building new data centers is a multimillion-dollar investment that should be capitalized over an ever-decreasing period. Moreover, as energy and facilities' design points increase rapidly during the next three to five years, new data centers must be designed and built around a modular concept. Financing such large capital projects will force many organizations to question whether they should own such a facility and, if so, how best to finance it. For example, some users may choose to carry the cost themselves, while others may seek a shared cost and risk model with partners.

These changes present a step change in complexity in analyzing future needs of users and the type of centralized IT facility best suited to deliver those needs. The problem for large organizations is that a strategy in a particular area of new data center design has positive and negative effects and may overlap with the strategy in another area. For example, in moving to smaller floor space, highly dense blade systems may appear to improve server costs and space issues, but may end up requiring more electricity and have a negative effect on system availability. Thus, the eight forces in Figure 1 should help to codify the issues to provide a meaningful analysis.

Figure 1. Eight Critical Forces Affecting Enterprise Data Centers



Source: Gartner (February 2007)

These eight critical forces cover a broad selection of technologies and processes.

1. Processor/System Design/Power

- The growing issue of dense hardware power and cooling
- The use of utility and grid architectures
- The speed of embracing new technologies

2. Architectural Topology and Real-Time Infrastructure

- The need to manage a heterogeneous hardware environment
- The growth of x86 platforms
- The move toward multicore systems
- The use of chip-based virtualization techniques

3. Operational Processes and Tools

- Maturity of core operational service delivery processes
- The use of monitoring and measuring tools
- The move toward real-time Infrastructure

4. Disaster Recovery and Business Continuity

- Applying risk mitigation and compliance procedures to core technologies
- Dealing with social threats that disrupt technology use

5. Capacity Growth

- Growth of server and storage hardware
- Growth of new data centers
- Short-term use of hosting providers

6. Operating System and Application Changes

- Effects of the growth of new, application development projects
- Changes in operating system topology — growth of Linux
- Effects of business process optimization on application development

7. Consolidation and Rationalization

- Improving asset use
- Managing physical data center consolidation projects
- Moving consolidation from project to process

8. Facilities Modification

- Introduction of water-cooled systems
- Environmental and energy designs for new hardware and data centers

- Managing spiraling energy costs

For each of these forces, Gartner has viewed the net potential impact for users as a result of that force alone. For users to obtain a holistic perspective, they should weigh these sometimes contradictory effects in the context of their specific situation. For example, for some users, changing operational processes and tools may be more important than modifying their data center facilities. Other businesses may have undergone a merger and may need to focus on infrastructure consolidation. Depending on the situation, the different priorities will become apparent. However, in all cases, Gartner advises users to be aware of the impact of all of these forces, even if the impact of some is low. This is because of the rapidly changing nature of data centers throughout the next five or more years.

Recommendations

IT organizations planning enterprise data center strategies in the next five or more years should consider the eight key forces covered here. In each case, the effects of each of the forces must be considered as they pertain to the other forces and to the financial and social dynamics of each situation.

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