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Creating Predictable IT Strategies in an Unpredictable Business Climate

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Introduction

There is no question that business environments will constantly change and business climates will continually shift. Therefore, IT management would benefit from developing and adopting strategies that would enable easy evolution of their IT infrastructure to best align with the needs of their dynamic business requirements, which the IT infrastructure supports.

However, despite technological advances, traditional IT approaches to meeting business needs have focused more on expediency through extending capital investment in infrastructure than on efficiency of investments. While capital-intensive strategies have worked in the past, the challenges of today, such as managing high energy prices and fluctuating real estate costs, make this approach unsustainable. In economic downturns in which access to capital is limited, infrastructure investment typically shifts from capital expenditure to operating expenditure through credit instruments such as financing and leasing. Therefore, managing the efficiency of recurring cost becomes more critical.

With this objective in mind, organizations are developing and enabling the following evolving IT business principles to align with dynamically changing IT business requirements and infrastructures:

- Enable conservation versus consumption
- Emphasize resiliency over recovery strategies
- Deploy self-evolving rather than replacement technologies
- Deliver automated versus manual management

Benefits

Enable Conservation Versus Consumption

Historically, many IT objectives or challenges have been overcome by simply investing in additional hardware or software technologies. However, this strategy is unsustainable — both from a fiscal and economic perspective and from an environmental, green, or ecological perspective.

Data storage is a prime example. Increasing desire to preserve digital assets as input toward predictive analysis, business analytics, business intelligence, data warehousing, and decision support systems, along with often confusing or conflicting regulatory retention requirements, has led to the attitude that storing all data forever may actually be a legally necessary action (especially in the case of legal discovery). However, the burden of infinite data retention is far beyond the fiscal feasibility

boundary of traditional storage systems. As a result, IT organizations need to look at technologies — such as data deduplication — that not only will preserve and archive data but also will do so in a way that takes the conservation approach.

To achieve the benefits of conservation, IT vendors must focus on delivering solutions that leverage modular design and enable consolidation or virtualization. These strategies can significantly cut the use of space and energy and have a positive impact on budgets.

Emphasize Resiliency over Recovery Strategies

While a disaster recovery (DR) plan is necessary, the development of a resilient IT platform can avoid the need to put the plan into action. When all is said and done, the invocation of a DR plan necessitates downtime because, by definition, a DR plan is not self-healing. Resilient IT platforms ultimately require minimal (preferably no) intervention and minimize (if not eliminate) the need to put DR plans into action altogether. As such, self-healing and fault tolerant technologies become more and more necessary as part of the core infrastructure, and thus organizations no longer need to simply rely on a "recovery" plan.

Deploy Self-Evolving Rather than Replacement Technologies

The introduction of additional servers must be measured in terms of units of compute power and ease of manageability. Using modular server designs — such as blade architectures, rack designs, and scalable SMP servers — that can build on top of each other and allow IT management to evolve their compute infrastructure to one that is measured by service-level requirements in a pay-as-you-grow manner is a more mature approach. This approach is better aligned with the business objectives of an organization compared with just a patchwork of servers.

In the case of storage, the quantity of data means that data migration is becoming more and more difficult. It is necessary to use policy-driven storage architectures that enable the addition of storage compute nodes as well as capacity nodes that can seamlessly collaborate across multiple generations so that the persistence and preservation of data can be achieved over a long period of time. This way, IT organizations can move away from traditional forklift upgrades to technologies that can evolve with a growing or changing business. Such an infrastructure enables investment protection over a longer period of time and thus is budget friendly and enables conservation.

Through a combination of virtual desktop and thin-client technologies, it is possible to delay upgrades in end-point clients despite advances and upgrades in client operating systems.

These approaches all save on capital as well as critical personnel resources that tend to be overused during nonproductive migrations.

Deliver Automated Versus Manual Management

Minimizing the involvement of human intervention has a number of benefits. Most notably, it can reduce faults caused by human error, but it can also minimize the need to increase staffing, enabling an existing IT staff to do more with the same or fewer personnel. This is a fiscally responsible approach to IT management.

A good deal has been done in terms of automating load balancing and self-tuning systems such that business and IT change dynamically with each other. IT organizations need to look toward technologies that can provide the next generation of automation — policy-driven management — so that the systems can adjust themselves with changes in IT demands. Automated and dynamic data movement, dynamic partitioning, and systemwide (read networkwide) management platforms are some approaches that enable this ideal to be achieved.

Key Trends

The major trend faced by all sectors of the IT industry is the concept of efficiency. IT efficiency is a very broad term and can be very encompassing. Some of the basic areas of IT efficiency are data, operational, environmental, and cost efficiency. It is only through the achievement of efficiency in these and other areas that an IT organization can truly meet its obligation and achieve IT excellence.

Data Efficiency

The concept of data efficiency is not new. However, in more recent years, the explosion of content has made data reduction technologies and data optimization technologies a critical part of the efficiency equation.

With the explosion of data — IDC predicts that despite the economic downturn, new capacity will increase at a CAGR of 48.6% through 2012 — the need to optimize what is stored becomes critical. As such, data deduplication has gone from a nice-to-have to a mainstream and necessary function in any storage architecture today. Additionally, moving deduplication technologies from a back-end postprocess operation to an active inline task, much like RAID technology is today, is becoming one of the most desired functions in storage systems.

Operational Efficiency

There have been many attempts over the years to achieve ultimate operational efficiency. Through server, storage, and network convergence and consolidation, the ability to achieve efficiency in operation becomes more realistic. However, consolidation and convergence are only the first steps in achieving this goal; these processes must be augmented by virtualization technologies that can best utilize the resources available from the consolidated infrastructure.

Once virtualized, operational efficiency can be better achieved as resources can be dynamically and appropriately allocated from a global pool of resources as opposed to islands of resources. Allocating these resources, however, requires that the necessary systems management software be in place that can automate and leverage the available resources and dynamically adjust based on parameters that are suitable for each respective organization.

Environmental Efficiency

With power, cooling, space, and facility costs increasing exponentially, the need to achieve environmental efficiency becomes paramount. Environmental efficiency goes beyond efficient power and cooling handlers to environmentally conscious servers and storage systems.

In many cases — for example, with storage, given the number of disk drives spinning in a datacenter — the efficiency of components within a system can become critical.

Cost Efficiency

Finally, cost efficiency is still a critical factor when measuring the overall efficiency of an IT organization. Systems within the IT infrastructure also need to be conscious of achieving cost efficiency. The ability to reuse components such as backplanes and power supplies, the ability to scale out, and the ability to leverage cross-generational systems become critical considerations.

Additionally, the ability to use capacity-optimized components such as lower-cost capacity-optimized drives and storage tiering enables additional cost efficiencies.

Finally, as much as cost efficiency is minimizing capital and operational expenditures, it must also include a strategy to procure and invest in resilient and reliable systems to avoid operational costs associated with downtime and maintenance.

Considering NEC

NEC Corporation, a Global 200 firm with roughly $46 billion in revenue and $3.5 billion in annual R&D investment, is focused heavily on communications and computers. Better known in the United States for its plasma and LCD displays and PBX communications, NEC Corporation celebrated its 109th anniversary in 2008.

In Japan, where the company is headquartered, NEC is the leading provider of technology. NEC's offerings cover the full spectrum of size and solutions, including supercomputers. In the United States, NEC Corporation of America, a U.S. subsidiary of NEC Corporation, has historically conducted business through OEM channels.

NEC server products are used by two leading storage system vendors, and the NEC fault tolerant solution is OEMed by a leading continuous availability server vendor. NEC has invested in R&D facilities around the world, including two in the United States, and partners with leading academic institutions, including Princeton, Stanford, Rutgers, and Purdue universities.

Today, NEC brings to the market diverse product families as part of the NEC Dynamic IT Infrastructure:

Datacenter:

- NEC Express5800/1000 series Intel IA64 Itanium and Xeon x86 processor–based enterprise servers
- NEC Express5800/300 series fault tolerant servers
- NEC ExpressCluster (known as ClusterPRO in Japan) high-availability software
- NEC Express5800/100 Sigmablade server systems, which contain server, storage, and network components in a cost-effective design
- NEC Express5800/100 and NEC's Series3800/100 general-purpose rack and tower servers based on Intel Xeon processors

Advanced virtualization technologies:

- NEC Virtual PC Center (VPCC) virtual desktop solution, which leverages infrastructure software from VMware and is composed of thin clients, servers, and storage for a complete plug-configure-play solution
- Sigma System Center for policy-driven automated systems management

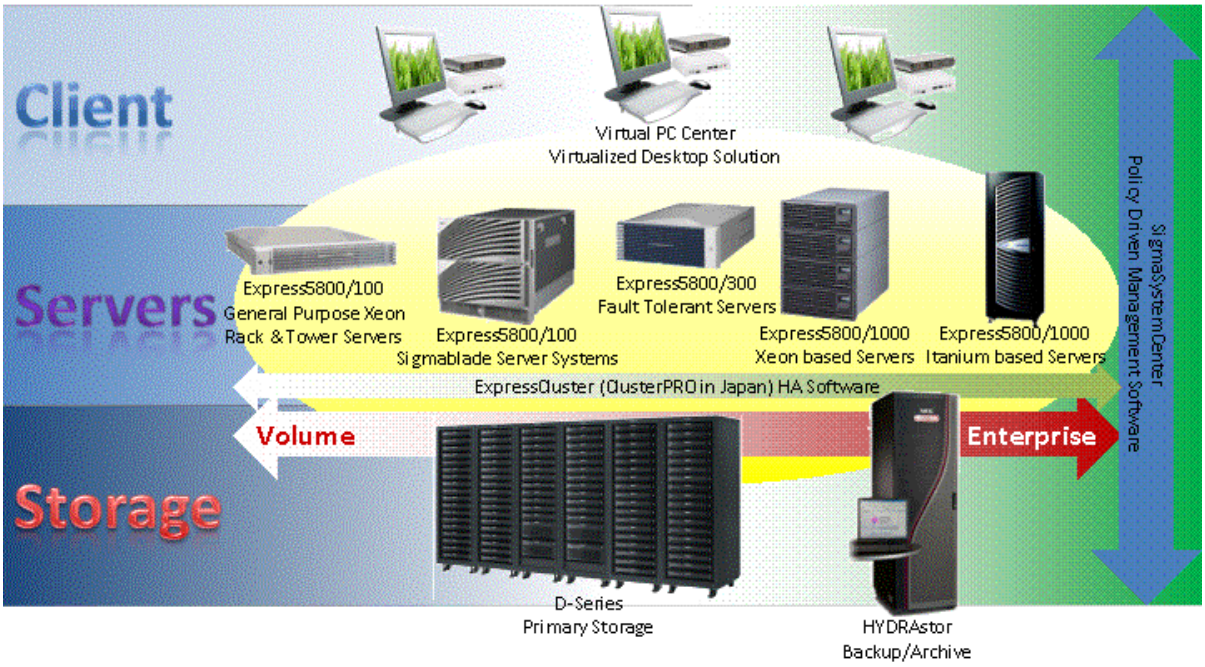
Storage:

- HYDRAstor secondary backup and archive storage solution
- D-Series primary storage

As Figure 1 shows, NEC offers a complete set of IT offerings for a dynamic IT infrastructure that range from client and servers to storage and system software and from general-purpose volume products to highly specialized enterprise solutions. With its innovations, NEC is providing alternatives to end users looking to make significant changes and improve their efficiency and operating costs, now and in the future.

Figure 1

NEC Product Families



Source: NEC, 2009

Challenges

As it stands, NEC faces three major obstacles to success:

1) Brand recognition
2) Mature markets
3) Delivery of solutions

Brand Recognition

Perhaps the single greatest challenge facing NEC is not the range of products it offers but the perception of who NEC is and the products it offers. Outside of Japan, NEC is best known for its electronics offerings (such as monitors) and its PBX communications business.

Convincing the potential customer base that it has mission-critical corporation products that transcend electronics may prove to be a big challenge for NEC.

Mature Markets

The majority of NEC's products are being offered in very mature markets. Enterprise servers, general-purpose servers, and blade servers are dominated by the top three server vendors. In the storage segment, despite being the tenth largest storage supplier in the world, NEC represents only 1% of the worldwide storage market, whereas the top nine vendors have accumulated over 84% of the market. In the fault tolerant server world, NEC's major OEM is actually the market leader with decades of brand leadership in this part of the market, even though NEC is the manufacturer behind this vendor.

Though the markets listed above are mature, with great barriers to entry, NEC VPCC, Express5800/1000 series Itanium and large-scale Xeon x86 processor–based enterprise servers, and HYDRAstor offer NEC the most opportunities.

Delivery of Solutions

In Japan, large enterprise customers are used to acquiring and procuring entire turnkey solutions from vendors such as NEC; outside of Japan, NEC has historically offered its products as components of an overall solution. Additionally, NEC has derived much of its business through the OEM channel.

Conclusion

Although over 70% of NEC's revenue is generated from the Japanese domestic market, NEC has set a vision toward a greater emphasis on the rest-of-world opportunity. In the United States, NEC intends on selling consolidation, virtualization, deduplication, and business continuity enablement solutions as part of its dynamic IT infrastructure offering.

As part of this strategy, NEC is increasing its efforts on branded offerings in addition to OEM sales, building on cloud computing enablement, and leveraging local and regional partnerships to extend its branding into opportunities outside Japan.
