NEC Takes Risk Out of Consolidation — Simplifies LAN Deployment, Reliability

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Management Summary

Whenever we make a decision, whether in our personal or professional life, that decision is based upon a risk/reward analysis – *is the risk small enough and is the reward great enough?* We try to balance all of the negatives with positives, and, hopefully, come out with a positive result. Some of our decisions are minor, should I have the steak and fries or the salad? I'll enjoy the steak more, but the salad is better for me. Some of the decisions, potentially, can have a more drastic result. Should I have one more drink with the guys before I get into my car to drive home or not? Should I drive home or call a cab? Some of our decisions, in fact, can mean life or death.

In our professional lives, we undergo the same decision-making process. We send out an RFP and get multiple responses. We evaluate them and rank them. Do you then give all of the business to the low-bidder, or do you award contracts to two bidders? It may be easier and less expensive to give all of the business to one company, however, what happens if that vendor has a problem making deliveries, or goes out of business? That can have a serious impact on the ability of your enterprise to do its job. Do you want to put all of your eggs in one basket? Is it safe? Does your enterprise allow multiple "C" level executives to fly on the same plane? A single crash could disrupt your management structure for months. There are times, however, when the risk is low enough and the reward is high enough, to take that plunge.

The enterprise IT infrastructure is an area that has seen a drastic increase in total cost of ownership (TCO) issues because of increased costs for software, energy, and administration. Reducing the number of inefficient application servers utilizing less than 20% of their compute power has become a top ten issue in every boardroom. Consolidating multiple applications onto fewer platforms, virtualizing the environment to share resources, is of the utmost concern to the CIO running out of floor space, electrical resources, and budget. The rewards of consolidation are well documented, as are the risks. What happens to the branch office in Boise if one of its servers crashes? How soon can it recover and get back online? How do you manage application recovery? The IT staff must address these risks before taking the first step to consolidation.

In fact, NEC has already taken that first step for you, reducing the risks, and increasing the rewards of consolidation. With the latest version of NEC's *ExpressCluster X LAN*, the data center can lower operational costs and manage the deployment and recovery of consolidated servers in mission-critical environments. To learn more about minimizing the risk and increasing the reward for your infrastructure, please read on.

Departmental Data Center Pains

A departmental data center faces the same issues as an enterprise data center:

- Inefficient utilization of server processing resources;
- Insufficient energy to run and cool the data center;
- Excessive server sprawl;
- Costly administrative overhead; and
- Lack of a timely backup/recovery process.

In the eyes of the CFO, **the data center must reduce the total cost of ownership (TCO) of the IT infrastructure.**

The enterprise is under attack from the complexity of out-of-control server proliferation, resulting in server installations running at utilization rates well under 20%. The IT staff has deployed over-provisioned platforms with direct-attached storage in departments and remote offices, each running one specific application. They consume too much valuable floor space and waste too much of the energy consumed to both run the platforms and, cool the data center. Server proliferation is also a major factor in the administrative complexity that burdens your data center staff. Server sprawl forces you to increase the staff necessary to manage your IT infrastructure. These factors combine to attack enterprise profitability. **The IT staff must find a way to simplify deployment, maintenance (both planned and unplanned), and management of mission-critical and business-critical applications**.

Increased Internet activity raises the need for processing and storage capacity, as well as 7x24 access. The IT staff can cope with the acquisition costs associated with the increased workload, but not the recurring costs from these acquisitions, i.e., hardware maintenance, floor space, administration, and energy, to name a few. **These are the greatest constraints to growth.** IT consumes over 75% of the energy in an average office.[1] With the recent increase in utility rates, depending upon where your data center is located, it can cost more to run your IT infrastructure for one year than it did to purchase it. You do not have to belong to Greenpeace to see the advantage of improving the *utilization* of the IT environment within each department or remote office. These expenses affect the TCO of the IT environment and reduce the profitability

of any enterprise, big or small. Limitations of available electricity even influence the ability of the enterprise to respond to mission-critical demands, especially when you exceed the capability of the local utility to supply your enterprise with the electricity needed to be competitive, regardless of the cost per kilowatt-hour.

Older servers in your environment typically use single-core, single-threaded commodity processors from Intel or AMD, with performance measured as a function of CPU clock speed. A 2GHz server is better than a 1GHz server, and 3GHz is better than 2GHz. Unfortunately, as clock speed rises, more electricity is required, thus generating more heat, increasing the need for cooling. **With the total cost of energy rising, the cost of powering and cooling a departmental data center can become prohibitive**. The existing environment, with inefficient single-application servers, no longer meets the needs of an evolving data center.

The data center staff needs to find a way to change the server paradigm in order to reduce wasted resources, both electrical and human. They need to find ways to minimize the number of servers and storage devices required, without increasing the risks of unplanned outages. Consolidation onto fewer servers is an accepted enterprise strategy to reduce the TCO of data center infrastructure that is now moving into the departmental and remote office arena, virtualizing more mission-critical applications, especially database applications, on fewer, more performant systems. **Now, the data center must find a way to reduce the risks of *losing continuous business operations* because of putting an entire department or remote office on a reduced architecture.**

Risks of Consolidation

One of the greatest risks of consolidation is the fear of losing access to the target *Windows* or *Linux* servers from unplanned outages. By putting all of your eggs in a single basket, or in this case, all of your business-critical applications, such as e-mail, database (i.e., *SQL*, *Oracle*, or *DB2*), or web server, on a single platform, or cluster of scale-out servers, the data center staff expose themselves to just that risk. What happens when, not if, that environment crashes? Does the network lose reliable access to critical data and applications? How long will the outage last? How can the department or remote office maintain full functionality? **High availability and scalability to support any size single domain are essential in any consolidated, transactional environment.**

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[1] See the March 31, 2007, issue of Clipper Notes entitled *Reducing Cost and Improving Performance – Consolidating the Smaller Data Center*, which is available at http://www.clipper.com/research/TCG2007049.pdf.

In addition, how does the IT staff handle planned outages? What happens when a facility needs to upgrade the operating platform, or application software? Does the 7X24 environment continue to respond to mission-critical activity? Any consolidated server requires a fast and easy upgrade capability, with continuity of operations.

NEC has developed a tool to abate these risks. Their *ExpressCluster* software family provides an essential high-availability clustering solution, delivering fast recovery and high reliability to maximize business-critical applications and data availability. NEC has targeted one member of that family, *ExpressCluster X LAN,* specifically at LAN configurations.

NEC's ExpressCluster X LAN

ExpressCluster X LAN is an enhanced high-availability solution ensuring application and data availability in a LAN environment with expanding requirements. It offers high cluster scalability with a smooth transition between platforms to optimize resource utilization. It provides integrated application and data protection, monitoring key platforms, enabling a fast and easy recovery in the event of an outage, restoring service within minutes to a standby platform. This enables your department/remote office to maintain continuity for business-critical systems such as Microsoft *Exchange* or web services and mission-critical applications such as Microsoft *SQL*, Oracle *DB*, and IBM *DB2*. ExpressCluster also allows the IT staff to optimize resource utilization easily, according to dynamic business needs. ExpressCluster allows the staff to scale-up and redistribute the workload across the server network to meet peak loads or scale-down to reduce electrical consumption and heat output by powering down unnecessary platforms during off-peak periods.

The major features of ExpressCluster X LAN include:

- Transactional data protection through synchronous data mirroring with write-order preservation – a single cluster partition can now support up to eight mirrored disk partitions, simplifying configuration, with an option to skip initial full disk mirroring for known synchronized disks;
- Automatic failover from primary to secondary server during planned or unplanned downtime events with no data loss, reducing maintenance costs and time to recover – with cluster configuration either active/active or active/passive – restoring full cluster functionality upon primary restore;

- Scripted workload migration for planned maintenance activities within a resource group – individual resources can now be migrated to reduce potential system downtime;
- Reliable data and application backup/recovery with no additional servers, minimizing deployment and operational expenses to lower TCO in active/active configurations;
- Extensive web-based resource management of cluster components – with continuous monitoring of network interfaces, disk I/O, and applications across a variety of primary and secondary LAN platforms, including consistent management of Windows and Linux servers; and
- A virtual server ID to facilitate communication with either the primary or secondary server during failover events.

One of the enhancements for this release extends support to the *Standard Edition* of Microsoft Exchange Server. Previous versions of NEC's ExpressCluster only supported the *Enterprise Edition*. Standard Edition represents 85% of the Exchange installed base.

Conclusion

NEC has clearly targeted ExpressCluster X LAN as an integrated application and data high availability solution for departments and branch offices of larger enterprises. They did not design it for the SMB, which does not preclude mid-sized organizations from taking advantage of its *superior* functionality.

With *superior* performance, ExpressCluster can deliver a fast and automatic system recovery with real-time synchronous data mirroring and robust resource monitoring in both active/active and active/passive environments. With *superior* usability, the IT staff can manage all protected applications (Windows or Linux) and data stores from a single web-based workstation, and can do so transparently with NEC's virtual server identity. With support for standard operating systems and applications, as well as internal and external disk mirroring, ExpressCluster also contributes to *superior* TCO.

If your enterprise is looking to improve the reliability and lower the TCO of departmental and remote office IT environments, look at NEC's ExpressCluster X LAN. It may be the reliability choice that your enterprise needs.

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