

## HA Servers from NEC — Under the Radar, Above the Bar

Analyst: David Reine

### Management Summary

Mr. Murphy had it right. If something can go wrong, it will go wrong. This is why we teach our kids to look both ways before crossing the street and why we send our teenagers to Driver's Ed. to learn defensive driving before letting them behind the wheel of the family car. *Be prepared for whatever life throws at you* is the message that we learned and the message that we try to convey to those who rely upon us.

The same is true in the IT world as well. As the enterprise becomes more dependent upon electronic and electro-mechanical devices in the data center, the more likely it becomes that a single failure will bring that world crashing down. Moreover, it will crash down on your head, the CIO and/or IT Director responsible for the solution acquisition and on-going reliability. **No matter how reliable the manufacturers claim their server equipment to be, they always have an MTBF and an MTTR to quote: Mean Time Between Failure and Mean Time to Repair.** It is incumbent upon the IT department to heed Mr. Murphy and implement a solution that will provide continuous availability. If your mission-critical application server is going to fail (and it will), you need to prepare for it; you need to plan for it, and you need to test your preparedness. You need to establish the criteria that are important to you in selecting the high availability solution that meets your requirements. Reliability is definitely among those criteria, as are ease of use, space requirements, performance, and most certainly, cost.

**In 2003, there is no application upon which every enterprise has become more dependent upon than email. Unplanned downtime that affects your ability to send and receive mail messages will bring most enterprises to their knees very quickly. Unplanned downtime that loses order confirmations or approvals costs you money. What is it worth to you to keep your email server up and running?**

In reviewing the options available to your data center, your IT staff must determine which availability increasing technology to use and then select a solution that can provide a reliable, performant base from which to execute. Your staff needs to find a solution consistent with their skill sets. If those skill sets include Microsoft's *Windows Advanced Server* and Microsoft *Exchange*, then you need to review how the NEC *High Availability Exchange Server* might fit with your mission-critical environment. To understand in more detail, please read on.

### IN THIS ISSUE

➤ The Email Environment Today .....	2
➤ NEC Fault Tolerant Platform.....	2
➤ NEC HA Exchange Solution .....	4
➤ Conclusion .....	4

## The Email Environment Today

**There is no general-purpose IT application that has become more pervasive throughout the enterprise than email.** It has assumed a life of its own in almost every corporation, enterprise or SMB; every government agency, federal or local; every organization, profit or non-profit. Beyond the non-business purposes of catching up with friends, sending photos of grandchildren, and purchasing last minute travel bargains, email has become the lifeline through which corporations “talk” with customers and vendors. It is how government agencies provide services and information to their citizenry. It is the primary vehicle for political candidates to ask for your dollars and your vote. Checking email has become a standard daily practice for everyone with a login and password to the Internet. These examples, however, do not detail the way an enterprise expects to make business use of what has become a mission-critical application.

With a projected CAGR of almost 9% from 2002 to 2007, enterprises have learned to use email as a marketing tool to reach out to their customers, to advertise sales, and to process complaints. Manufacturing departments implement a secure electronic data interchange (EDI) with their vendors to keep factories running efficiently with just-in-time deliveries. Sales organizations accept orders and process confirmations with a vast new customer base, no longer limited by mode of transportation to reach a “bricks and mortar” facility. The implementation of supply chain management, value chain analysis, and quality of service studies, depend upon email to ensure timely transmission. This has forced the move of the email server away from a “PC implementation” under the responsibility of a junior programmer. **It is now a rack-mounted implementation in the data center where an IT Manager supervises the exchange of thousands of messages from hundreds of correspondents daily, and, incidentally, tries to forestall an invasion of viruses running rampant across the Internet.**

What happens then when the email server goes down, like every application server before it? *What happens when a virus strikes?* The sales department stops taking orders, manufacturing stops requesting raw materials, and accounting stops distributing invoices. Nothing serious - just the health and well being of the entire enterprise. In addition, *when an outage does occur, how long does it take to restore service? One hour? One day?*

Obviously, IT cannot allow this interruption to happen. **The data center has to take every precaution to ensure that the email server remains in continuous operation.** The question then becomes a configuration issue: *What components does the data center need to ensure the “high availability” or continuous access to the email system. Which application is best? What platform does it require? What operating system does it use? Who can maintain it? How much does it cost?* All of these are valid questions which have been addressed by NEC Solutions America, which has come up with a unique approach to maintaining continuous availability to business-critical servers.

## NEC Fault Tolerant Platform

Traditionally, IT deploys one of three different methods to ensure against application loss:

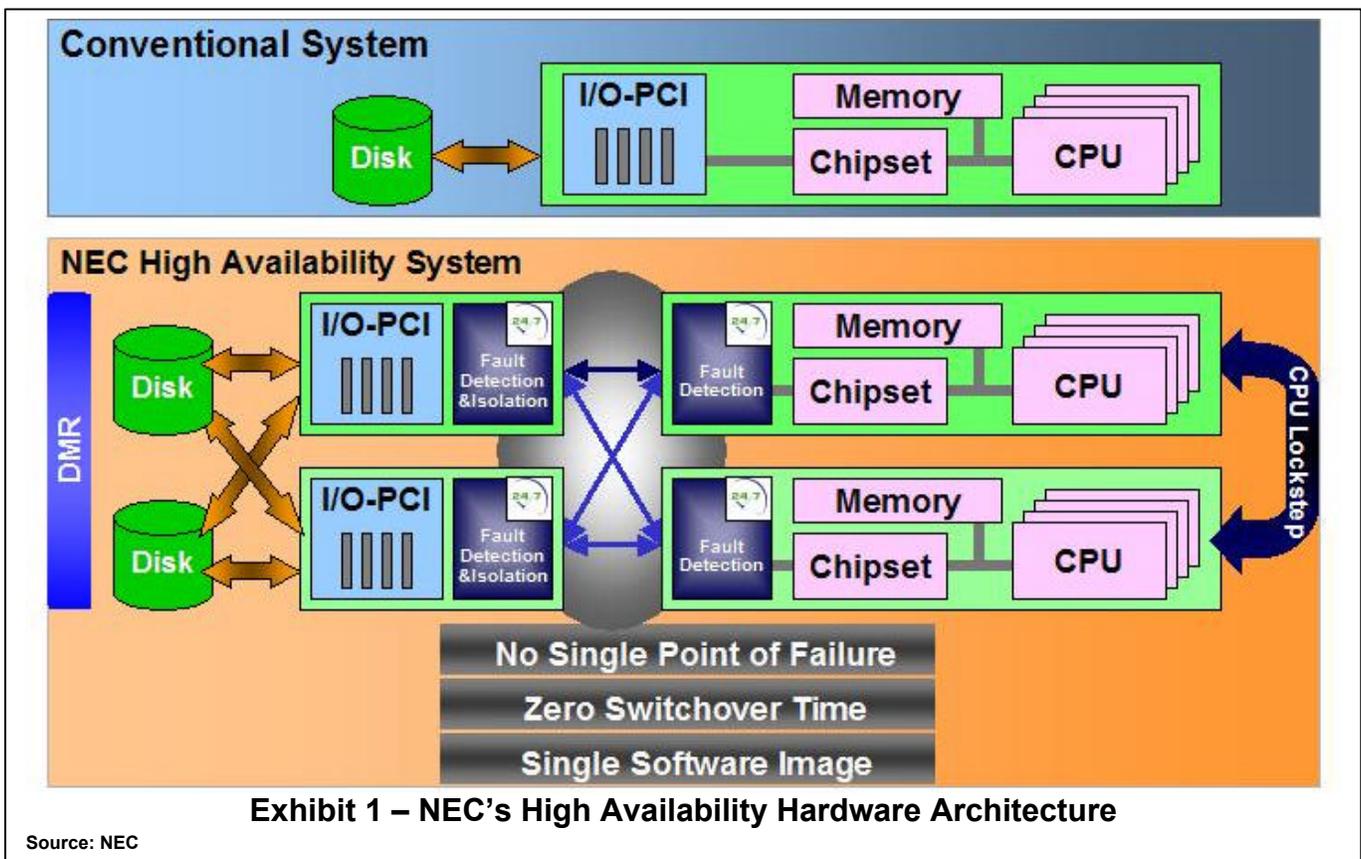
- ▶ IT can install multiple servers, each running the same application set, with the user base distributed across it. You may lose one server, but not the functionality.
- ▶ IT can implement a packaged high-availability clustered solution. This solution uses a failover concept, with multiple servers managed by a high availability application such as *Microsoft Clustered Server (MSCS)*. **However, not all applications are cluster aware!**
- ▶ The third option involves the installation of a single, highly-available server with continuous availability, typically built using fully redundant components on a proprietary platform.

NEC has chosen the third option, a fault-tolerant server, as the basis for their continuously available servers. However, instead of implementing a proprietary solution, NEC has chosen to use industry-standard building blocks, such as Intel microprocessors and the Microsoft *Windows* operating system (along with Linux as an option) as the foundation for their highly available server series. Combining these blocks with the *Dual Module Redundant* (DMR) architecture, licensed from NEC partner Stratus, NEC has developed a unique approach to the problem of server reliability. (See Exhibit 1 below.) This enterprise-class architecture, which would have cost as much as \$250,000 a year ago in a proprietary architecture, allows for the easy replacement of major sub-systems without user interruption via a commodity platform costing \$20,000.

By partnering with Intel, NEC has assured themselves of access to the right technology for each of their fault tolerant

servers: the *Xeon* microprocessor in the *Express5800/320Lb* and the *Pentium III* chip in their original FT offering, the *Express5800/320La*. The *320Lb*, the first Xeon processor-based server designed to provide mission-critical *Windows* applications with continuous availability, features redundant CPU modules to prevent hardware failures that cause system outages and downtime. These modules contain *Hyper-Threading*-enabled 2.4GHz Xeon processors that can be configured as 1-way or 2-way servers. Hyper-Threading allows a single physical processor to appear, logically, to the operating system and applications as two processors. This architecture allows a single processor to handle greater workloads with faster response times, thus providing greater performance with no single point of failure.

The *Express5800/320Lb* delivers the highest levels of system availability for Microsoft *Windows 2000* environments, where system reliability is the essential mission-critical business factor for contin-



uous availability. As you can see in Exhibit 1, NEC has implemented a “lockstep” technology using duplicated, fault-tolerant components for CPU, memory, and I/O. **These components process the same instructions and computations at the same time. Whenever a fault occurs, the result appears as a mismatch between modules and the faulty module is removed from service while processing continues without any disruption to the user environment.** Therefore, the Express5800/ 320Lb can maintain 99.999% uptime, with only 5 minutes of unplanned downtime annually.

### NEC HA Exchange Solution

Using the Express5800 320 series as a platform, NEC is one of the first vendors to create an integrated fault-tolerant email solution using the Microsoft *Windows 2000 Advanced Server* platform. The *HA-Exchange Solution* provides small and medium enterprises, as well as departments within large enterprises, with a reliable, continuously available, email server designed to eliminate email downtime. See Figure 2 for a complete list of components integrated into the HA-Exchange solution.

In addition to the 320 server from NEC, the Exchange Server solution is composed of the Windows and Exchange products from Microsoft and a comprehensive set of services made available by NEC to assist in the implementation of the solution. Exchange 2000 has experienced significant growth in the past three years, exceeded only by the projected growth of Exchange 2003 for the near future. **Moreover, NEC provides an availability guarantee as part of their terms and conditions to protect the investment that the CFO and CIO make in this architecture. This guarantee ensures that Exchange email applications are not impacted by unplanned downtime associated with hardware failures.**

### Conclusion

With both customer aggravation and employee dissension rising as each minute of email outage continues, the question

#### Exhibit 2 – NEC's HA-Exchange Solution

- ▶ Express5800/320 Series Server
  - Fault Tolerance for under \$25K
- ▶ Microsoft Windows 2000 Advanced and 2003 Enterprise Server
- ▶ Microsoft Exchange 2000 and 2003 Std. and Enterprise Editions
- ▶ Symantec AntiVirus Software
  - Protection from network corruption
- ▶ NEC's EXPRESSBUILDER Installation Guide
- ▶ NEC's ESMPRO System Manager
- ▶ NEC's Assured Availability Services
  - To assist with specifications, installation and testing

becomes not whether a fault tolerant email solution is required, but which continuously-available solution to implement. NEC's HA-Exchange offers a solution that:

1. Provides 99.999% hardware uptime;
2. Eliminates the inventory of spare parts because of component redundancy;
3. Reduces software licensing and operation costs;
4. Completely eliminates restore time;
5. Maintains user transparency to any component failure; and
6. Is affordable.

With hardware failures the #1 cause of email server failures, IT cannot avoid the acquisition and implementation of a fault tolerant system. NEC is first on the scene with an affordable, guaranteed hardware solution to the critical email availability problem. It is reasonable to expect your CIO or IT Director to want to fix the infrastructure now before moving to Exchange 2003. Now is the time to check it out.



### ***About The Clipper Group, Inc.***

***The Clipper Group, Inc.***, is an independent consulting firm specializing in acquisition decisions and strategic advice regarding complex, enterprise-class information technologies. Our team of industry professionals averages more than 25 years of real-world experience. A team of staff consultants augments our capabilities, with significant experience across a broad spectrum of applications and environments.

***The Clipper Group can be reached at 781-235-0085 and found on the web at [www.clipper.com](http://www.clipper.com).***

### ***About the Author***

***David Reine is a Senior Contributing Analyst for The Clipper Group.*** Mr. Reine specializes in enterprise servers, storage, and software, strategic business solutions, and trends in open systems architectures. He joined The Clipper Group after three decades in server and storage product marketing and program management for Groupe Bull, Zenith Data Systems, and Honeywell Information Systems. Mr. Reine earned a Bachelor of Arts degree from Tufts University, and an MBA from Northeastern University.

- ***Reach David Reine via e-mail at [dave.reine@clipper.com](mailto:dave.reine@clipper.com) or at 781-235-0085 Ext. 30. (Please dial “1-30” when you hear the automated attendant.)***

### ***Regarding Trademarks and Service Marks***

***The Clipper Group Navigator, The Clipper Group Explorer, The Clipper Group Observer, The Clipper Group Captain's Log, and “clipper.com”*** are trademarks of The Clipper Group, Inc., and the clipper ship drawings, “*Navigating Information Technology Horizons*”, and “*teraproductivity*” are service marks of The Clipper Group, Inc. The Clipper Group, Inc., reserves all rights regarding its trademarks and service marks. All other trademarks, etc., belong to their respective owners.

### ***Disclosure***

Officers and/or employees of The Clipper Group may own as individuals, directly or indirectly, shares in one or more companies discussed in this bulletin. Company policy prohibits any officer or employee from holding more than one percent of the outstanding shares of any company covered by The Clipper Group. The Clipper Group, Inc., has no such equity holdings.