

# Express5800 Enterprise Servers

## Powerhouse for Large-scale Virtualization & Database Workloads



# More cores. More threads. More memory. More I/O. 2X the performance.



## At a Glance

- 6<sup>th</sup> generation NEC enterprise-class server based on Intel® Enterprise Architecture
- Performance and scalability for large database and transaction-intensive workloads
- Advanced reliability, availability and serviceability for large-scale virtualization and mission critical applications
- Hardware redundancy and system monitoring to minimize risk of single point of failure
- Flexible use of cores for peak performance
- Optimal balance of price, performance and energy efficiency

## Overview

NEC's Express5800/A2000 Series is an enterprise-class quad CPU server based on the new Intel® Xeon® processor E7-4800 v2 product family. It represents a new generation of mission critical servers built specifically to support highly virtualized environments and heavy database workloads. Up to 4TB of memory, 60 cores and 120 threads can be housed in the 4U chassis, enabling a single NEC Express5800/A2000 Series server to deliver the compute power of nine legacy servers.\*

Loaded with features previously available only on mainframe or UNIX platforms, the NEC Express5800/A2000 Series enterprise server offers performance, scalability and high availability for mission critical applications.

## Solution

### Superior Performance for Heavy Workloads

Large ERP systems, such as SAP®, and large database systems, like SQL Server® or Oracle®, can easily operate at the high speeds of the scaled-up CPU configuration of the Express5800/A2000 Series server with large memory capacity.

Equipped with up to 4 CPUs of the Intel Xeon processor E7-4800 v2, the NEC Express5800/A2000 Series server offers twice as much performance over the previous generation server. This performance gain is achieved through 50% more cores and 50% more threads for a total of 60 cores and 120 threads. Processing speeds can handle workloads ranging from complex scientific applications to basic web serving and infrastructure functions regardless of space, power or budget constraints.

The Express5800/A2000 Series server offers a large memory footprint for a maximum of 16 memory slots per CPU socket for up to 4TB of memory in a 4 CPU configuration. Integrated memory controllers and Intel QuickPath Technology offer outstanding memory performance and flexibility supporting leading memory technologies.

Improving data throughput is essential for high performance computing, so the Express5800/A2000 Series server can now support up to 16 PCIe 3.0 cards. I/O latency and power draw is reduced by integrating I/O with Data Direct I/O. These enhancements have doubled the OPM (orders per minute) rate of the Express5800/A2040b server for a 123.7% better transactional performance per watt on database workloads.\*

## High Availability for Mission Critical Uses

Virtualization and business critical applications demand highly available systems. A single server failure can have a devastating effect on multiple applications and many users, ultimately stopping a business in its tracks. NEC's enterprise servers are designed from the ground up to be as fault resilient as possible, and reduce planned and unplanned downtime. Intel Run Sure Technology with NEC's mainframe-inspired reliability, availability, and serviceability (RAS) features deliver uptime designed for business critical workloads.

With high availability features previously available only on mainframe or UNIX systems, this x86 NEC server comes equipped with a spare (redundant) service processor, spare clock, and spare south bridge (I/O controller hub) to minimize the risk of a Single Point of Failure. It also offers a unique memory module hot-add feature, which allows memory to be added without requiring a server reboot. These advanced features ensure extremely high uptimes, making it ideally suited for enterprise mission critical use.

The Express5800/A2000 Series servers offer superior failure analysis. Numerous sensors granularly monitor the key components of the server. If an anomaly is detected, the component is isolated and, if a failure occurs, detached until the faulty component can be replaced. The Predictive Failure Analysis feature prevents CPU failure by de-allocating the failing CPU core. Certain configurations of the NEC Express5800/A2000 Series servers offer core sparing, which automatically transitions the workload to an available spare core in the event of de-allocating a failing core.

MCA on NEC enterprise servers offers OS-assisted system recovery from certain uncorrectable errors. A failure can be recovered even when uncorrectable errors are detected during a CPU operation, such as reading memory or cache data. The NEC Express5800/A2000 server is the only server with Dynamic Memory Page De-Allocation, which can keep that system operating when correctable errors happen beyond the threshold by dynamically de-allocating the memory page.

Other enhancements include memory scrubbing that monitors for errors, and Double Device Data Correction (DDDC), which can remove two DRAM devices in case of a failure. Even memory and I/O cards can be added without stopping the system.

## Exceptional Scalability for Large-Scale Virtualization

High performance, high availability servers are the foundation for virtualizing large, mission critical business applications, such as ERP, CRM or email. These applications require high application uptimes and tend to be quite large, many times consuming the entire capacity of older generation servers.

The larger performance capacity of the Express5800/A2000 Series server brings the benefits of virtualization to large workloads and transaction-intensive applications. More applications can run on a single server than ever before. A high performance server with faster processing speeds benefits a larger number of applications and users. The Express5800/A2000 Series server provides a rich resource pool capable of supporting numerous virtual machines.

One Express5800/A2000 Series server can easily carry the load of multiple older generation servers with no decrease in application performance. Lab testing has validated a 9:1 consolidation rate with the Express5800/A2000 Series server, which translates into one Express5800/A2000 Series server replacing nine legacy servers.\*

With 4TB of memory available per unit, there is no bottleneck of memory resource for virtualization consolidation. Enterprises can realize TCO advantages because the high performance Express5800/A2000 server reduces the number of servers required to support large-scale virtualization and consolidation environments.

Building upon the record-breaking performance of NEC scalable enterprise servers, the Express5800/A2000 Series server easily adapts to changing business requirements. Memory hungry virtualization solutions, compute-intensive databases, and mission critical business operations benefit from the flexibility to scale and configure NEC server platforms. Custom configurations allow customers to populate 2, 3 or 4 sockets, and enable or disable cores based on performance requirements. Customers benefit from this "pay as you grow" methodology by adding more CPUs and enabling more cores to meet application performance demands.

### Flexibility of Capacity Optimization

Idle hardware can be eliminated to improve IT cost efficiency and performance by automatically offloading various workloads to the secondary instances. Capacity optimization (COPT) allows customers to disable cores initially and turn on cores as workloads increase. Available for the first time as a dynamic feature that does not require a server reboot on Linux based systems, COPT ensures that hardware resources are optimized to maximize the technology investment.

## Case Study: Edgenet Mission Critical SaaS

Based in Atlanta, Georgia, Edgenet collects, optimizes, and distributes data used by online retailers, search engines and consumers. The company's systems process data for millions of products. To ensure a positive customer experience, Edgenet must export critical product data quickly and efficiently to online retailers and search engines that provide the data to shoppers. Fast access to consumer buying data is critical for satisfied customers and successful retailers.

Equipped with Microsoft® SQL Server® 2012 running on the NEC Express5800/A2000 Series server, Edgenet has built a mission critical Software-as-a-Service (SaaS) offering while reducing total cost of ownership (TCO), improving scalability, and simplifying management. This enterprise-class performance, availability and business intelligence have enabled Edgenet to deliver ever-more-complex services to its customers, while retaining an established level of customer ease-of-use. It can simplify high availability and disaster recovery, help analysts understand data more quickly, and add value to its services.

## Cost Savings Through Efficiency

Total savings and efficiency gains are achieved through simplification. A proven 9:1 server consolidation rate lowers software costs by up to 27% for large-scale workloads.\* By consolidating several servers to a single server, the components are lighter weight and draw less power for better energy efficiency.

The Express5800/A2000 Series servers offer configurations that provide the optimal balance of price, performance and energy efficiency. Open and affordable, this latest NEC enterprise server delivers a smaller footprint, better operational efficiency, and reduces server sprawl.

As the foundation to a cloud-ready platform, NEC enterprise servers help customers unlock the potential of large-scale virtualization and the cloud for their organizations. Advanced capabilities ensure that NEC's enterprise servers can create and scale customized business solutions fast, from server to private, public or hybrid clouds.

\* Based on testing conducted by Principled Technologies on November 2013 between the NEC Express5800/A2040b enterprise server powered by Intel® Xeon® processor E7-4890 v2 and the HP ProLiant DL385 G6 legacy server.

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