The AS/400 leads the league in Java performance

By John Carr, For InfoWorld Test Center

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The AS/400 proves a strong contender for executing high-volume, Web application strategies

Some people still view IBM’s AS/400 as merely a character-based legacy platform, but that’s light-years from today’s reality. The AS/400’s glittering appearance at several recent Java benchmark parties was reminiscent of Cinderella’s transformation and arrival at the ball. Stepping in quietly from the background, the AS/400 sparkled amid its Java rivals at the Volano, Specjbb2000, and other recent benchmark galas.

The AS/400 always has had a well-respected, though drab, image as a business computer suited to the unglamorous tasks of billing customers, tracking inventory, and balancing the company books. Meanwhile, its stepsisters, IBM’s RS/6000 and Netfinity servers, trace their roots to scientific and personal computing. By contrast, the AS/400 was designed from inception to be a solid and reliable business computer. Similar to Cinderella, the AS/400 has morphed from merely a character-based legacy platform to reliably host their e-business applications.

IBM’s AS/400 seemed to arrive at the Java benchmark parties already wearing Cinderella’s glass slippers. Running its latest operating system release, OS/400 Version 4, Release 5 (V4R5), it became the first server platform ever to post a six-digit number in the VolanoMark 2.1.2 Java benchmark.

The model tested was a 24-way processor AS/400E Model 840 with 4GB of memory. The configuration clocked an amazing 108,153 messages per second with 200 concurrent connections. This test score was four times the 25,131 messages per second posted by Sun Microsystems for its Solaris E6500 22-way processor server with 30GB of memory (see www.sun.com/software/solaris/java/benchmarks.html for more details about Sun’s benchmark).

Volano’s VolanoMark benchmark is a 100 percent pure Java benchmark that emulates a chat room by using long-lasting connections and high thread counts. Clients take turns broadcasting their messages to the group. The benchmark reports the average number of messages transferred by the server per second.

The most impressive result was a 12-way AS/400 configuration that achieved 23,942 messages per second with an unheard of 20,000 concurrent connections. Nothing else has come close to that score. Also amazing is that the 12-way messages per second remained nearly the same as it scaled up from 400 concurrent connections to beyond 12,000.

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behind-the-scenes back-office server to a leading-edge e-business platform.

**Business app testing**

The AS/400 was evaluated recently in a more realistic Java business application test. The Specjbb2000 benchmark from the Standard Performance Evaluation Corp., or SPEC (www.spec.org/osg/jbb2000), evaluates the performance of servers running a simulated order-processing system for a wholesale supplier in a three-tiered environment.

The benchmark simulates order placement, order status requests, payments, and other transactions. The three-tiered benchmark measures both the hardware and software of the server's JVM (Java virtual machine). The scalability of the hardware platform can be measured as well as the efficiency of the JVM's Just-in-Time (JIT) compilers, thread implementation, and garbage collection.

During the tests, the AS/400, equipped with IBM's new Silicon-on-Insulator (SOI) and copper chip technology, captured the top three finishing spots on the benchmark. (For more information on SOI and copper chip technology, see our Test Center Analysis) In particular, a 24-way Model 840 took the top spot with a stratospheric score of 80,348 operations per second.

When looking closely at the results (see chart) for the two-, four-, and eight-way processors, a very unique and important AS/400 architectural fact shows itself. Although the RS/6000, Netfinity, and others posted slightly higher operations-per-second scores, the maximum transaction time statistic differentiates them. In every JVM in the industry, except the AS/400, all processes must come to a complete halt while Java's “memory garbage collection” is performed. On the AS/400, this task runs concurrently with the business transactions.

So while Compaq's four-way processor slightly edged out the AS/400 in operations per second, it had nearly a 3-second maximum transaction time whereas the AS/400's time was negligible. As it scaled from a two-way to a 24-way processor configuration, the AS/400 continued to have the lowest maximum transaction time of all competitors.

Of course, benchmark performance is not the only thing that smart business leaders will want to consider when deciding on their e-business platform. The AS/400 via its support for logical partitioning also has the advantage of being specifically designed to handle organizational growth and change. As business needs and realities have changed, the AS/400 has changed in kind to meet new demands. Whether it's Java, e-commerce, ERP (enterprise resource planning), or data warehousing, the AS/400 seems to fit the glass slipper with ease. Business leaders who are serious about implementing a solid e-business server strategy should carefully examine the AS/400.

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