

# Intel Corp. TIGPR2U Carrier Grade Server versus Sun Microsystems, Inc. Netra 20 Server Competitive Performance Evaluation using TimesTen Real-Time Event Processing Application

## Test Summary

*Premise: Network managers and architects implementing carrier-grade servers need to be certain that the servers they deploy are capable of performing at levels that meet the strenuous demands of the networks in which they are deployed. While carrier-grade solutions may have been limited in the past, new server solutions based on industry standards can offer higher performance than previously available choices.*

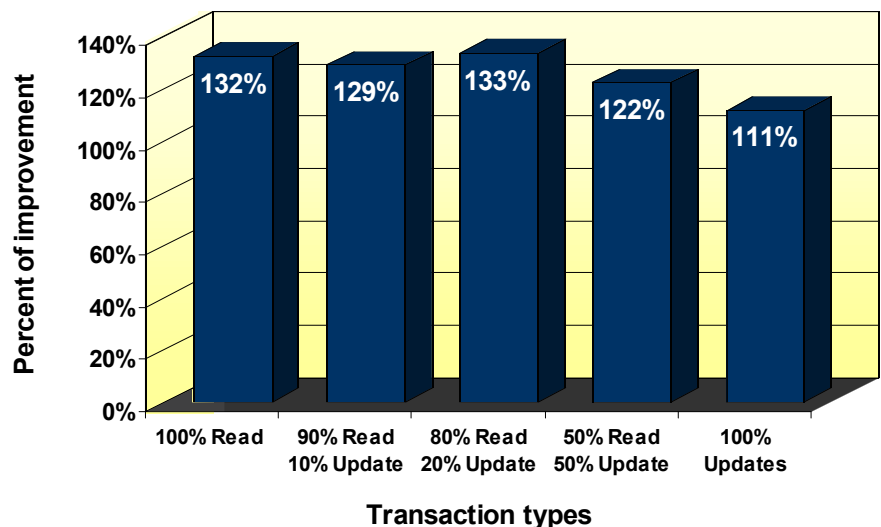
Intel Corporation commissioned The Tolly Group to evaluate its TIGPR2U Carrier Grade Server with two 2.4-GHz Xeon processors. The Intel TIGPR2U Carrier Grade Server (CGS) is a rack-mountable, high-performance server intended for use in telecommunications networks. Intel also requested that The Tolly Group test the performance of the Sun Microsystems, Inc. Netra 20 Server with two 900-MHz processors in a series of tests designed to gauge the capability of each server while performing a

### Test Highlights

- Outperforms the Sun Netra 20 by up to 133%
- Performs at a maximum rate of 60,183 read-only transactions per second in cursor-stability data isolation mode with maximum level optimization using eight processes
- Performs at a maximum rate of 78,683 read-only transactions per second in serializable data isolation mode with maximum level optimization using four processes
- Provides higher performance in a form factor 50% smaller than the Sun Netra 20

### Intel TIGPR2U CGS Performance Improvement compared to Sun Netra 20

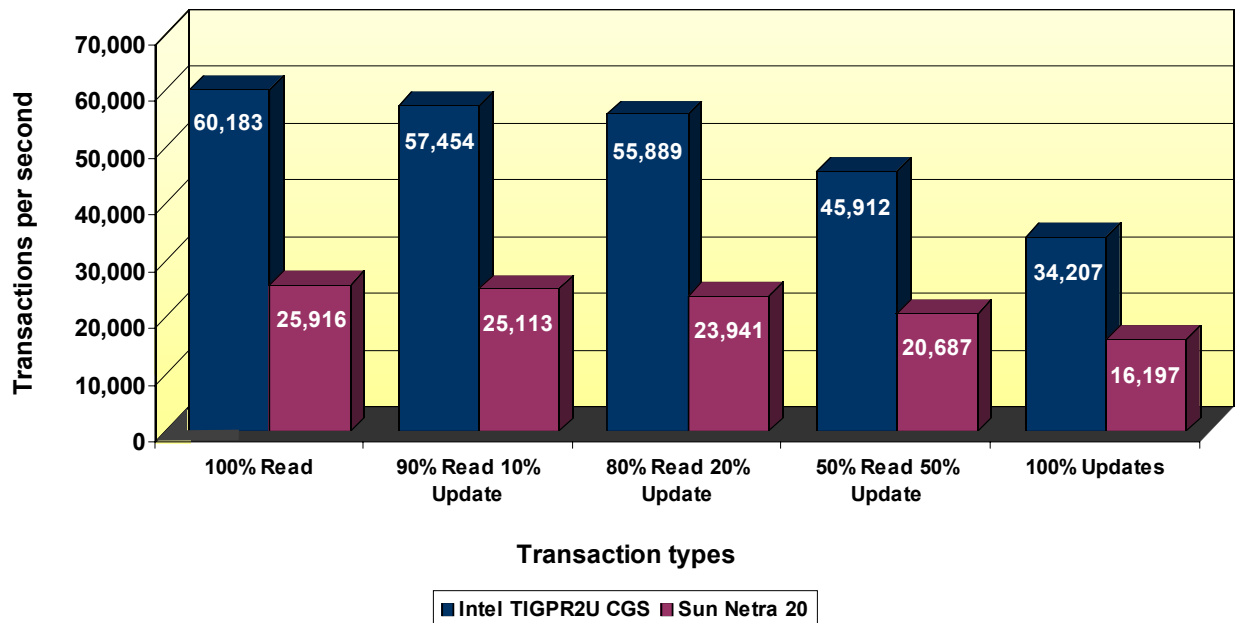
Using eight processes, cursor-stability data isolation mode and maximum level optimization as reported by TimesTen tptbm



Source: The Tolly Group, November 2002

Figure 1

**Server Performance with Cursor-Stability Data Isolation Mode  
Using Eight Processes and Maximum Level Optimization  
as reported by TimesTen tptbm**



Source: The Tolly Group, November 2002

Figure 2

variety of common in-memory database transactions that included read only, update only and varying combinations of both read and update, with and without optimization, using either serializable data isolation mode or cursor-stability data isolation mode.

The Tolly Group conducted database transaction rate tests on both servers using the TimesTen, Inc. 4.5 Real-Time Event Processing System "tptbm" performance benchmark. TimesTen is an infrastructure software product that enables very high performance event-processing applications to capture, store, use and distribute database

information in real-time. Testing was performed in November 2002.

Test results show that the Intel TIGPR2U demonstrated superior performance to the Sun Netra 20 in all scenarios tested.

## RESULTS

### TRANSACTION RATE WITH CURSOR-STABILITY DATA ISOLATION MODE ENABLED

Tolly Group engineers tested the transaction per second (tps) rate of the Intel TIGPR2U and the Sun Netra 20 using one and two processes in a combination of read/update transaction types

that included 100% read-only and update-only tests and mixed percentages of read/update tests with isolation level at two, i.e. cursor-stability data mode, and the SMPOptLevel set to zero, or no optimization.

Results show that with one process running the Intel TIGPR2U outperformed the Sun Netra 20 by 80% for read-only transactions, with the Intel TIGPR2U processing a maximum of 54,660 tps compared to the Sun Netra 20 at 30,345 tps. When Tolly Group engineers increased the number of processes to two, results show that the Intel TIGPR2U outperformed the Sun Netra 20 by 70% for read-only transactions, with

the Intel TIGPR2U processing a maximum number of 53,000 tps compared to the Sun Netra 20 at 31,212 tps.

Next, Tolly Group engineers reran the tests but set the SMPOptLevel to three, the maximum optimization level and used two, four and eight processes. Test results show that with two processes running the Intel TIGPR2U outperformed the Sun Netra 20 by 57% for read only transactions, with the Intel TIGPR2U processing a maximum of 60,127 tps compared to the Sun Netra 20 at 38,407 tps.

When Tolly Group engineers increased the number of processes to four, test results show that the Intel TIGPR2U outperformed the Sun Netra 20 by 120% with a 90% read and 10% update workload, with the Intel TIGPR2U processing a maximum of 69,495 tps compared to the Sun Netra 20 at 31,638 tps.

Finally, when Tolly Group engineers tested with a total of eight processes, results show that the Intel TIGPR2U outperformed the Sun Netra 20 by 133% with an 80% read and 20% update workload, with the Intel TIGPR2U processing a maximum of 55,889 tps compared to the Sun Netra 20 at 23,941 tps. (See Figures 1 and 2.)

#### TRANSACTION RATE WITH SERIALIZABLE DATA ISOLATION MODE ENABLED

Tolly Group engineers also tested the transaction per second (tps) rate of the Intel TIGPR2U and the Sun Netra 20 using one and two processes in a combination of read/update transaction types that included 100% read-only and update-only tests and mixed percentages of read/update tests with isolation level at zero, i.e. serializable data mode, and the SMPOptLevel at zero, or no optimization.

Results show that with one process running, the Intel TIGPR2U outperformed the Sun Netra 20 by 74% with a 90% read and 10% update workload, with the Intel TIGPR2U processing a maximum of 59,052 tps compared to the Sun Netra 20 at 33,931 tps. When Tolly Group engineers increased the number of processes to two, results show that the Intel TIGPR2U outperformed the Sun Netra 20 by 79% for read-only transactions, with the Intel TIGPR2U processing a maximum of 61,443 tps compared to the Sun Netra 20 at 34,294 tps.

Next, Tolly Group engineers reran the tests but set the SMPOptLevel to three, or the

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TIGPR2U  
Carrier Grade  
Server

Competitive  
Evaluation



Intel Corp.

#### Intel TIGPR2U Carrier Grade Server Product Specifications\*

##### Features

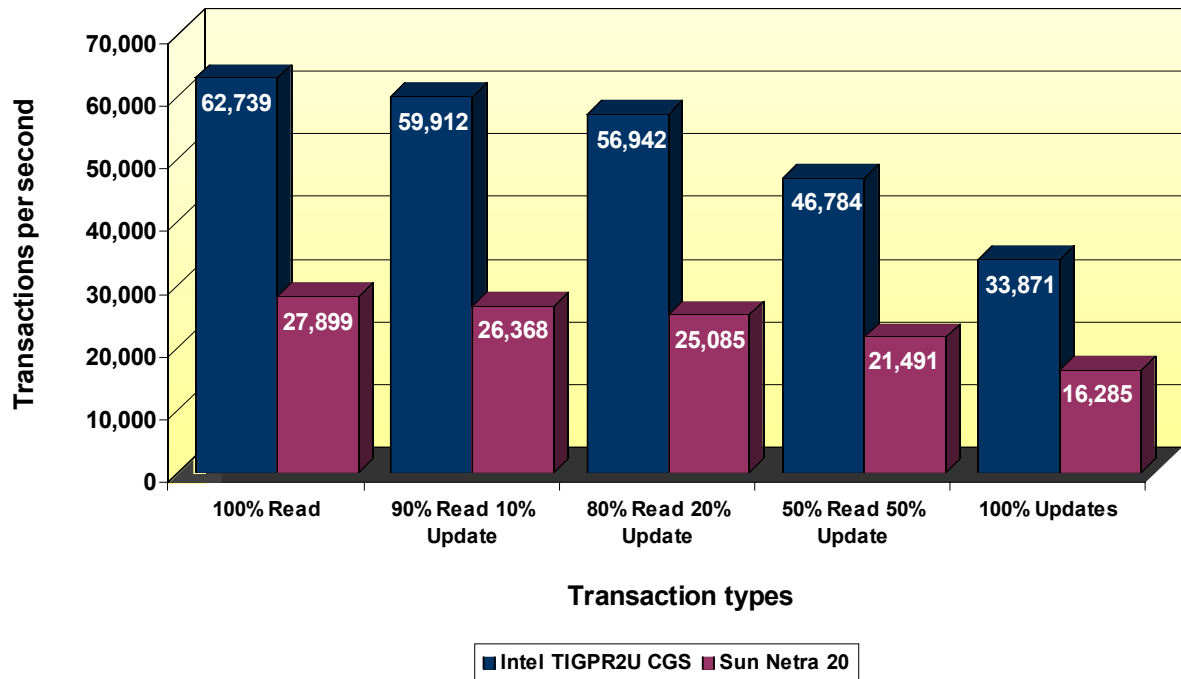
- 2 Xeon® processors – 2.4 GHz with 512K cache
- 533 FSB processor support
- 6 GB DDR-266 registered ECC SDRAM
- Integrated dual channel SCSI: 2xUltra320
- Integrated graphics with 8 MB
- Integrated dual 10/100/1000 Mbps Ethernet
- Intel server management 5.1 or higher
- Supports IPMI 1.5, ACPI
- NEBS-3 Certified (DC only) 2U x 500mm (20") Telecom chassis
- 3 low profile PCI-X slots (100-MHz)
- 3 full size PCI-X (100-MHz) or 3 5V FS 64/33 PCI slots
- Telecom server management 1.x
- Telecom alarms support
- Dual AC or Dual Telco (-75V to -38V) DC power supply
- CDROM
- Two 1" front-service, hot-swap disks

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*\*Vendor-supplied information not verified  
by The Tolly Group*

**Server Performance with Serializable Data Isolation Mode Using Eight Processes and Maximum Level Optimization**  
as reported by Times Ten tptbm



Source: The Tolly Group, November 2002

Figure 3

maximum optimization level, using two, four and eight processes. Test results show that with two processes running, the Intel TIGPR2U outperformed the Sun Netra 20 by 53% with an 80% read and 20% update workload, with the Intel TIGPR2U processing a maximum of 55,999 tps (See Figure 4) compared to the Sun Netra 20 at 36,587 tps.

When Tolly Group engineers increased the number of processes to four, test results show that the Intel TIGPR2U outperformed the Sun Netra 20 by 121% for read-only transactions, with the Intel TIGPR2U processing a maximum of 78,683 tps

compared to the Sun Netra 20 at 35,555 tps.

Finally, when Tolly Group engineers tested with a total of eight processes, results show that the Intel TIGPR2U outperformed the Sun Netra 20 by 127% for an 80% read and 20% update workload, with the Intel TIGPR2U processing a maximum of 56,942 tps compared to the Sun Netra 20 at 25,085 tps. (See Figures 3 and 4.)

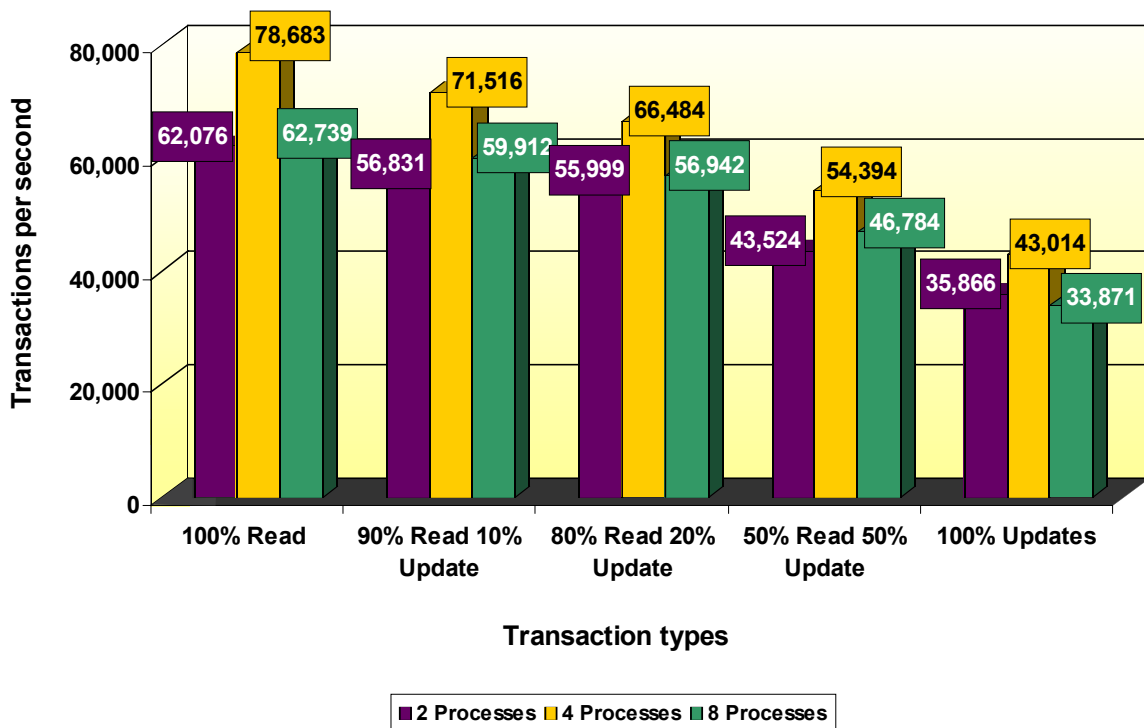
#### ANALYSIS

Processing power is a chief consideration for network architects looking to deploy servers in carrier-grade networks. This series of

tests specifically examined the performance of each server while performing common in-memory database transactions.

This series of tests demonstrated that the Intel TIGPR2U significantly outperformed the Sun Netra 20 by at least 29% regardless of transaction type or optimization level in both isolation levels of serializable data mode or cursor-stability data mode when running two processes. Performance differences were even more dramatic when the number of processes increased to a total of eight, with the Intel TIGPR2U outperforming the

**Intel TIGPR2U CGS Performance with Serializable Data Isolation Mode and Maximum Level Optimization as Reported by TimesTen tptbm**



Source: The Tolly Group, November 2002

Figure 4

Sun Netra 20 by at least 111% and by as much as 133%.

These results indicate that the Intel TIGPR2U is capable of performing well in carrier-class networks under taxing transaction rates.

Conserving space is another important factor in carrier networks. The Intel TIGPR2U provides two 10/100/1000 Ethernet ports while the Sun Netra 20 offers only one 10/100 Ethernet port. Moreover, the Intel TIGPR2U has six PCI extension slots while the Sun Netra 20 has only four. The Intel TIGPR2U server form factor at 2U is

half that of the Sun Netra 20 at 4U, thereby offering more than double the processing power for the available space.

**TEST CONFIGURATION AND METHODOLOGY**

The Tolly Group tested an Intel Corp. Carrier Grade Server Platform, version TIGPR2U, equipped with dual Xeon 2.4-GHz processors and 256 Mbytes RAM running Red Hat Linux 8 version 2.4.18-14smp and a Sun Microsystems, Inc. Netra 20 Server, equipped with dual 900-MHz UltraSparc III

CuProcessors and two Gbytes RAM running Solaris 8 version SunOS 5.8.

Each device under test (DUT) ran the TimesTen, Inc. Real Time Event Processing System software, version 4.5.21 32-bit. For system benchmarking, the "tptbm" performance benchmark was executed on one, two, four, and eight process configurations of the DUT; engineers configured four-process and eight-process configurations via multi-threading of the processors. Tolly Group engineers conducted seven iterations of each test and results

were averaged. No external connections were required to run this benchmark, since it runs as a stand-alone benchmark in the server under test.

## EQUIPMENT ACQUISITION AND SUPPORT

The Sun Netra 20 Server was acquired through normal product distribution channels. The Tolly Group

contacted executives at Sun Microsystems, Inc. and invited them to provide a higher level of support than available through normal channels. Sun did not respond to several invitations. The Tolly Group verified product release levels and shared test configurations with Sun executives in order to give them an opportunity to optimize their device. Upon completion of testing, in accordance with The Tolly

Group Fair Testing Charter, results were shared with Sun executive who neither acknowledged nor disputed tests results.

## TOLLY GROUP SERVICES

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For info on the Fair Testing Charter, visit: [www.tolly.com/About/ftc.asp](http://www.tolly.com/About/ftc.asp)

## PROJECT PROFILE

**Sponsor:** Intel Corp.

**Document number:** 202160

**Product Class:** Carrier-class server

**Products under test:**

- Intel Corp. Carrier Grade Server, version TIGPR2U
- Sun Microsystems, Inc. Netra 20

**Testing window:** November 2002

**Software status:**

- Generally available

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