

IBM Netfinity Delivers Leadership Performance on the SAP R/3 Three-Tier SD Benchmark

Running the SAP** R/3 Three-Tier Sales and Distribution (SD) Benchmark, the IBM Netfinity* 7000 M10 set a new performance record for four-way Intel-based servers configured with the 500MHz Pentium** III Xeon** processor with 2MB L2 cache. The IBM Netfinity 7000 M10 server achieved a result of 3,028 SD Benchmark users with 1.95 seconds average dialog response time on DB2* Universal Database V6.1 and Microsoft** Windows NT** Server 4.0. This represents a throughput of 913,000 dialog steps per hour, which is equivalent to 304,000 processed order line items per hour.

The Benchmark Environment

The environment for this benchmark was a IBM Netfinity 7000 M10 database server configured with four 500MHz Pentium III Xeon processors, 4GB of main memory, and 792GB of total disk space running Windows NT Server 4.0, DB2 Universal Database V6.1, and SAP R/3 Release 4.0 B. The measured throughput was 913,000 dialog steps per hour with an average CPU utilization of 98 percent for the database server. The database server ran Microsoft Windows NT Server 4.0 operating system with Service Pack 4.

Twenty Netfinity 7000 M10 systems, configured with four 500MHz Pentium III Xeon processors, running Windows NT Server 4.0 with Service Pack 4, were used as application servers. Sixteen of these IBM Netfinity 7000 M10 systems acted as dialog servers and four as update servers. One IBM Netfinity 7000 acted as a message/enque server. The database server and all application servers ran Microsoft Windows NT Server 4.0 operating system with Service Pack 4.

This benchmark fully complies with SAP's issued benchmark regulations and has been audited and certified by SAP. Details can be obtained from IBM and SAP AG. These benchmarks were completed at IBM's Netfinity Server Performance Laboratory in Research Triangle Park, NC, in a joint effort by IBM engineers at the RTP and Toronto laboratories.

1. General Information about Benchmark Environment

Certification Number	1999017
Hardware Partner	International Business Machines Corporation
Contact Name/Tel./Mail ID	Phil Horwitz / horwitzp @ us.ibm.com
R/3 Release	4.0 B
DBMS Version	DB2 Universal Database V6.1
Date	June 24, 1999
Location	Research Triangle Park, NC, USA
Lead Engineers	IBM: Steve Schormann, Russ Stocker
Published	Yes

2. Detailed Hardware and System Software Configuration

Distributed System Database Server (OSCDB)			
System Name / Model	IBM Netfinity 7000 M10		
Processor Type / Clock Rate / Number of Processors	Intel Pentium III Xeon 500MHz / 4		
Cache Size / Level	2MB / Level 2		
Memory	4GB		
Operating System	Microsoft Windows NT Server 4.0 with Service Pack 4		
Database System	DB2 Universal Database V6.1		
Number of Disks	87 External, Total Disk Space: 792GB		
I/O Subsystem			
Controller Number	Number of Disk Drives	RAID Level	Contents
1st ServeRAID-3H Ch. 1	10 x 9.1GB External Drives	RAID-0 Array	OS, Database
1st ServeRAID-3H Ch. 2	10 x 9.1GB External Drives	RAID-0 Array	Database Files
1st ServeRAID-3H Ch. 3	10 x 9.1GB External Drives	RAID-0 Array	SAPDATA
2nd ServeRAID-3H Ch. 1	10 x 9.1GB External Drives	RAID-0 Array	SAPDATA
2nd ServeRAID-3H Ch. 2	10 x 9.1GB External Drives	RAID-0 Array	SAPDATA
2nd ServeRAID-3H Ch. 3	10 x 9.1GB External Drives	RAID-0 Array	SAPDATA
3rd ServeRAID-3H Ch. 1	8 x 9.1GB External Drives	RAID-1 Array	Logs
3rd ServeRAID-3H Ch. 2	8 x 9.1GB External Drives	RAID-1 Array	Logs

Application Server (1): Message/Enque	
System Name / Model	IBM Netfinity 7000 / Model 8651-RH0
Processor Type / Clock Rate / Number of Processors	Intel Pentium Pro / 200MHz / 4
Cache (Size and Level)	1MB / Level 2
Memory	2048MB
Operating System	Windows NT Server 4.0 with Service Pack 4
Number of Disks	2 (Total Disk Space: 9GB)

Application Server (4): Update	
System Name / Model	IBM Netfinity 7000 M10 / Model 8680-8RY
Processor Type / Clock Rate / Number of Processors	Intel Pentium III Xeon / 500MHz / 4
Cache (Size and Level)	2MB / Level 2
Memory	2048MB
Operating System	Windows NT Server 4.0 with Service Pack 4
Number of Disks	3 (Total Disk Space: 13.5GB)

Application Server (16): Dialog	
System Name / Model	IBM Netfinity 7000 M10 / Model 8680-8RY
Processor Type / Clock Rate / Number of Processors	Intel Pentium III Xeon / 500MHz / 4
Cache (Size and Level)	2MB / Level 2
Memory	2048MB
Operating System	Windows NT Server 4.0 with Service Pack 4
Number of Disks	4 (Total Disk Space: 18GB)

Benchmark Driver (1)	
System Name / Model	IBM RS/6000* PowerServer Model F50
Processor Type / Clock Rate / Number of Processors	IBM PowerPC* 266MHz / 4
Memory	3072MB
Operating System	AIX* 4.2.1
Number of Disks	8

Benchmark Driver (2)	
System Name / Model	IBM RS/6000* PowerServer Model F40
Processor Type / Clock Rate / Number of Processors	IBM PowerPC* 166MHz / 4
Memory	1024MB
Operating System	AIX* 4.2.1
Number of Disks	8

Network Configuration	
Type	100Mbps Switched Ethernet
Number of Segments	24 Segments attached to a switched hub
Speed	100Mbps Full-Duplex Ethernet

3. Detailed R/3 Configuration

SAP R/3 Configuration	
SAP R/3 Version (Application)	SAP R/3 4.0 B (Hot Package 6)
SAP R/3 Version (Kernel)	SAP R/3 4.0 B (372)
Number of benchmark clients used	31

R/3 Module	Simulated Benchmark Users	Dialog Step / Hour	Average Response Time	Average** CPU Utilization of Application Servers	Average** CPU Utilization of Database Server	Average DB Response Time	Response Time Distribution
SD	3,028	913,000	1.95	61 %	98 %	d: 159 ms u: 363 ms	57 % under 2 seconds

** as in SAP Operating System Monitor

*** as in SAP Workload Monitor

Hardware Disclosure		
Quantity	Part Number	Description
Database Servers (1)		
1	8680-8RY	IBM Netfinity 7000 M10
3	28L4735	IBM Netfinity 500MHz/2MB L2 Cache Processor
8	01K8045	IBM Netfinity 512MB Memory Expansion Kit
1	01K8004	Memory Card
3	01K7207	IBM ServeRAID-3H Ultra2 SCSI Adapter
1	34L0901	IBM Ethernet 100/10 PCI Adapter
9	3520-2RU	IBM Netfinity EXP15 Rack Storage Enclosure with Redundant Power
87	01K8499	IBM EXP10 9.1GB 10K Wide Ultra SCSI Hard Disk Drive
1	93069000	IBM Netfinity Rack
1	94G6669	Side Panel Kit
Dialog Servers (16)		
1	8680-8RY	IBM Netfinity 7000 M10
3	28L4735	IBM Netfinity 500MHz/2MB L2 Cache Processor
8	01K8045	IBM Netfinity 256MB Memory Expansion Kit
1	34L0901	IBM Ethernet 100/10 PCI Adapter
4	01K8009	IBM Netfinity 4.51GB 10K Wide Ultra SCSI Hard Disk Drive
Update Servers (4)		
1	8680-8RY	IBM Netfinity 7000 M10
3	28L4735	IBM Netfinity 500MHz/2MB L2 Cache Processor
8	01K8045	IBM Netfinity 256MB Memory Expansion Kit
1	34L0901	IBM Ethernet 100/10 PCI Adapter
3	01K8009	IBM Netfinity 4.51GB 10K Wide Ultra SCSI Hard Disk Drive
7	93069000	IBM Netfinity Rack
Enque Server (1)		
1	8651-RH0	IBM Netfinity 7000
3	94G7147	IBM Netfinity 200MHz/1MB L2 Cache Processor
8	94G7385	IBM Netfinity 512MB Memory Expansion Kit
1	34L0901	IBM Ethernet 100/10 PCI Adapter
2	01K8009	IBM Netfinity 4.51GB 10K Wide Ultra SCSI Hard Disk Drive

THE INFORMATION CONTAINED IN THIS DOCUMENT IS DISTRIBUTED ON AN AS IS BASIS WITHOUT ANY WARRANTY EITHER EXPRESSED OR IMPLIED. The use of this information or the implementation of any of these techniques is the customer's responsibility and depends on the customer's ability to evaluate and integrate them into the customer's operational environment. While each item has been reviewed by IBM for accuracy in a specific situation, there is no guarantee that the same or similar results will be obtained elsewhere. Customers attempting to adapt these techniques to their own environment do so at their own risk. This publication was produced in the United States. IBM may not offer the products, services, or features discussed in this document in other countries, and the information is subject to change without notice. Consult your local IBM representative for information on products and services available in your area.

*IBM, Netfinity, DB2, RS/6000, PowerPC and AIX are registered trademarks of International Business Machines Corporation.

**Intel, Pentium and Xeon are trademarks or registered trademarks of Intel Corporation.

**Microsoft is a registered trademark and Windows and Windows NT are trademarks of Microsoft Corporation in the United State and/or other countries.

**SAP is a registered trademark of SAP AG.

Other company, product, or service names, which may be denoted by two asterisks (**), may be trademarks or service marks of others.

Published by the IBM Netfinity Server Performance Laboratory, IBM Corp.

© Copyright International Business Machines Corporation 1999. All rights reserved.

Permission is granted to reproduce this document in whole or in part, provided the copyright notice as printed above is set forth in full text at the beginning or end of each reproduced document or portion thereof.

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.