IBM Netfinity 8500R with DB2 Universal Database Delivers Outstanding Performance with SAP R/3 Three-Tier SD Benchmark

November 4, 1999 ... Running the SAP** R/3 Three-Tier Sales and Distribution (SD) Benchmark, the IBM Netfinity* 8500R has delivered a new performance result. Configured with eight 550MHz Pentium** III Xeon** processors each with 2MB L2 cache, the Netfinity 8500R server achieved a result of 4,704 SD Benchmark users with 1.96 seconds average dialog response time on DB2* Universal Database V6.1 and Microsoft** Windows NT** Server 4.0. This represents a throughput of 1,416,000 dialog steps per hour, which is equivalent to 472,000 processed order line items per hour.

Benchmark Environment

The environment for this benchmark was an IBM Netfinity 8500R database server configured with eight 550MHz Pentium III Xeon processors, 4GB of main memory, and 601GB 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 1,416,000 dialog steps per hour with an average CPU utilization of 95 percent for the database server. The database server ran Microsoft Windows NT Server 4.0 with Service Pack 4.

Four Netfinity 8500R servers, configured with eight 550MHz Pentium III Xeon processors, running Windows NT Server 4.0 with Service Pack 4, were used as update servers. Twenty-four Netfinity 7000 M10 systems, each configured with four 500MHz Pentium III Xeon processors, running Windows NT Server 4.0 with Service Pack 4, were used as dialog servers. One IBM Netfinity 5500 M20 was used as a message/enqueue server. The database server and all application servers ran Microsoft Windows NT Server 4.0 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	1999036
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	November 4, 1999
Location	Research Triangle Park, NC, USA
Lead Engineers	IBM: Russ Stocker, Guiyun Cao, Paramjit Singh
Published	Yes

2. Detailed Hardware and System Software Configuration

Distributed System Database Server	
System Name / Model	IBM Netfinity 8500R
Processor Type / Clock Rate / Number of Processors	Intel Pentium III Xeon 550MHz / 8
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	66 External, Total Disk Space: 601GB

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/Enqueue	
System Name / Model	IBM Netfinity 5500 M20 / Model 8662-2RY
Processor Type / Clock Rate / Number of Processors	Intel Pentium III Xeon / 500MHz / 4
Cache (Size and Level)	1MB / Level 2
Memory	2GB
Operating System	Windows NT Server 4.0 with Service Pack 4
Number of Disks	1 (Total Disk Space: 4.51GB)

Application Server (4): Update	
System Name / Model	IBM Netfinity 8500R / Model 8681-6RY
Processor Type / Clock Rate / Number of Processors	Intel Pentium III Xeon / 550MHz / 8
Cache (Size and Level)	2MB / Level 2
Memory	2GB
Operating System	Windows NT Server 4.0 with Service Pack 4

Number of Disks	1 (Total Disk Space: 4.51GB)

Application Server (24): 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	2GB
Operating System	Windows NT Server 4.0 EE with Service Pack 4
Number of Disks	4 (Total Disk Space: 18.04GB)

Benchmark Driver (2)

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

Network Configuration

Type	100Mbps Switched Ethernet
Number of Segments	32 Segments attached to a switched hub
Speed	100Mbps Full-Duplex Ethernet

Network Configuration

Type	1000Mbps Switched GigaBit Ethernet
Number of Segments	29 Segments attached to a switched hub
Speed	1000Mbps Full-Duplex Gigabit Ethernet

3. Detailed R/3 Configuration

SAP R/3 Configuration	
SAP R/3 Version (Application)	SAP R/3 4.0 B
SAP R/3 Version (Kernel)	SAP R/3 4.0 B
Number of benchmark clients used	4,704

R/3 Module	Simulated Benchmark Users	Dialog Step / Hour	Average Response Time (Sec)	Average** CPU Utilization of Application Servers	Average** CPU Utilization of Database Server	Average DB Response Time (Sec)	Response Time Distribution
SD	4,704	1,416,000	1.96	61 %	95 %	d: 0.096 u: 0.349	60 % under 2 seconds

** as in SAP Operating System Monitor

*** as in SAP Workload Monitor

Hardware Disclosure		
Quantity	**Part Number**	**Description**
Database Servers (1)		
1	8681- 6RY	IBM Netfinity 8500R
7	28L4735	IBM Netfinity 550MHz/2MB L2 Cache Processor
4	94G7385	IBM Netfinity 1024MB Memory Expansion Kit
3	37L6086	IBM ServeRAID-3HB Ultra2 SCSI Adapter
1	34L0901	IBM Ethernet 100/10 PCI Adapter
1	710012	Alteon ACEnic 1000Base-SX PCI Adapter
7	3520-2RU	IBM Netfinity EXP15 Rack Storage Enclosure with Redundant Power
66	36L9806	9.1GB 10K Wide Ultra SCSI Hard Disk Drive
1	93069000	IBM Netfinity Rack
1	94G6669	Side Panel Kit
Dialog Servers (24)		
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	4.51GB 10K Wide Ultra SCSI Hard Disk Drive
10	93069000	IBM Netfinity Rack
Update Servers (4)		
1	8681-6RY	IBM Netfinity 8500R
7	28L4735	IBM Netfinity 550MHz/2MB L2 Cache Processor
2	94G7385	IBM Netfinity 1024MB Memory Expansion Kit
1	34L0901	IBM Ethernet 100/10 PCI Adapter
1	710012	Alteon ACEnic 1000Base-SX PCI Adapter
1	36L9806	9.1GB 10K Wide Ultra SCSI Hard Disk Drive
1	93069000	IBM Netfinity Rack
Enqueue Server (1)		
1	8662-2RY	IBM Netfinity 5500 M20
4	33L5054	500MHz/1MB L2 Cache Pentium III Xeon Processor
4	94G7385	IBM Netfinity 512MB Memory Expansion Kit
1	34L0901	IBM Ethernet 100/10 PCI Adapter
1	710012	Alteon ACEnic 1000Base-SX PCI Adapter
1	01K8009	4.51GB 10K Wide Ultra SCSI Hard Disk Drive

The SAP standard application benchmark performed on October 31, 1999, by **IBM** in Raleigh, NC, USA, was certified on November 4, 1999 with the following data:

Number of benchmark users:	4,704 SD (Sales & Distribution)
Average dialog response time:	1.96 seconds
Throughput:	23,600 SAPS (1,416,000 dialog steps/h)
Equivalent to (line items / hour):	472,000 processed order line items
Average DB request time (seconds):	0.096 (dialog) / 0.349 (update)
CPU utilization database server:	95%
CPU utilization application servers:	61% (dia: 65%, upd: 49%, msg/enq: 25%)
Operating System all servers:	Windows NT 4.0
RDBMS:	DB2 UDB V6.1
R/3 Release:	4.0 B
Total disk space:	601 GB

Configuration:

1 Database Server: IBM Netfinity 8500 R, 8-processors SMP, Pentium III Xeon 550 MHz, 2 MB Second Level Cache, 4 GB main memory

29 Application Servers:
24 Dialog servers: IBM Netfinity 7000 M10, 4-processors SMP, Pentium III Xeon 500 MHz, 2 MB Second Level Cache, 2 GB main memory
4 Update servers: IBM Netfinity 8500 R, 8-processors SMP, Pentium III Xeon 550 MHz, 2 MB Second Level Cache, 2 GB main memory
1 Msg/Enqueue: IBM Netfinity 5500 M10, 4-processors SMP, Pentium III Xeon 500 MHz, 1 MB Second Level Cache, 2 GB main memory

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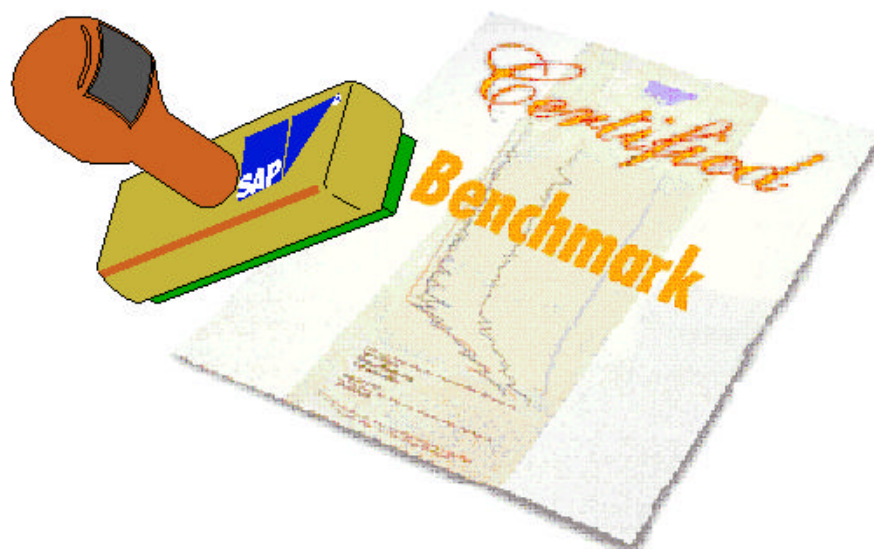
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