NotesBench Disclosure Report

for

IBM Netfinity 5500 (RAID-1 / RAID-5)

with

Lotus Domino 4.61 for Windows NT 4.0

May 29, 1998

IBM Corporation

Table of Contents

Executive Summary

Performance measurements using NotesBench were conducted with the IBM Netfinity 5500 (Model 8660-1RU) running Lotus Domino Server Release 4.61 on Microsoft Windows NT Server Version 4.0 with Service Pack 3. Results for the IBM Netfinity 5500 are based on the NotesBench Mail-only workload run on a RAID-1 and a RAID-5 configuration. The results are summarized in the following table.

Test Script	Maximum Users	NotesMark (tpm)	Ave. Response Time (sec)	$/User	$/NotesMark
Mail-Only - RAID-1	3,100	4,128	0.104	$9.33	$7.00
Mail-Only - RAID-5	2,400	3,114	1.653	$12.05	$9.28

The IBM Netfinity 5500, configured with two 350MHz[1] Intel** Pentium** II processors, 1GB of memory, and thirteen 4.51GB[2] 10K-rpm hard disk drives (configured alternately as a RAID-1 and a RAID-5 array), supported a Mail-only workload of 3,100 and 2,400 active mail users, respectively (see price/performance results[3] above).

In addition to the IBM Netfinity 5500 system under test (SUT), the benchmarked configuration used four destination servers, 12 to 16 client driver systems, and one controller system. All systems were connected to the SUT through two 100Mbps Ethernet LAN segments, using the TCP/IP network protocol. Configuration details are provided in Appendix A: Overall Test Setup and Software Versions.

IBM's Server Performance Laboratory in Research Triangle Park, NC, conducted the benchmark in May, and KMDS Technical Associates, Inc., audited the results in June 1998.

NotesBench provides an objective method for evaluating the performance of different platforms running Lotus Domino Server Release 4.6x. NotesBench generates a transactions-per-minute (tpm) throughput metric, called a NotesMark, for each test, along with a value for the maximum capacity (number of users) supported, and the average response time.

Benchmarking Objectives

The benchmark objective was to provide customers with information on the number of Lotus Domino Server Release 4.61 Mail-only users supported on a high-end RAID-1 and RAID-5 configuration of the IBM Netfinity 5500 Model 8660-1RU, which ships with one 350MHz Pentium II processor. Performance measurements on IBM Netfinity servers using NotesBench for the Domino Server Release 4.6x are ongoing.

Test Methodologies

Test Setup and Hardware/Software Configuration

The IBM Netfinity 5500 system under test used two 350MHz Pentium II processors (512KB of L2 write-back cache); 1GB of memory, and thirteen 4.51GB 10K-rpm Wide Ultra SCSI hard disks. The integrated ServeRAID II Ultra SCSI PCI controller was used for this test; the integrated 100/10Mbps Ethernet controller was disabled and not used for this test.

Two 100Mbps Ethernet LAN segments were used. The system under test, the destination servers, and the driver systems were connected to the SUT through two 100Mbps Ethernet LAN segments, using the TCP/IP network protocol. An IBM PC Server 325 system was used as the source driver (parent) system; IBM PC 365 systems were used as the client drivers. Four IBM PC Server 330 systems were used as destination servers. Destination mail addresses were distributed across these four destination servers.

The IBM Netfinity 5500 system under test ran Microsoft Windows NT Server Version 4.0 and Domino Server Release 4.61. The Name and Address Book in all the clients contained person documents for 4,000 mail recipients who were randomly selected by each active Mail user. The server under test contained mail files for 3,100 Mail users for the RAID-1 configuration and 2,400 Mail users for the RAID-5 configuration. The public Name and Address Book contained 4,000 mail-recipient person documents and each of the four destination servers contained mail files for 1,000 recipients.

The following NOTES.INI parameters were modified as recommended in the NotesBench operator's manual:

Mail-Only Workload - RAID-1	Mail-Only Workload - RAID-5
LOG_MAILROUTING=20	LOG_MAILROUTING=10
MAILLOGTOEVENTSONLY=1	MAILLOGTOEVENTSONLY=1
MAILUSEPROCESS=0	MAILUSEPROCESS=0
MAILUSETHREADS=1	MAILUSETHREADS=1
MAILMAXTHREADS=4	MAILMAXTHREADS=4
SERVER_SHOW_PERFORMANCE=1	SERVER_SHOW_PERFORMANCE=1

The following parameters were added to suppress database activity logging after long runs and to capture server console output:

```
NO_FORCE_ACTIVITY_LOGGING=1
DEBUG_OUTFILE=_\\nbfstb2\lastrun\SUTINFO.log
```

All Domino server tasks were disabled except Replica, Router and Update.

All Domino data files were located on the D - partition. The Domino executables were placed on the C - partition

.

Test Procedures

For the run using RAID-1, 16 child drivers were used. The number of users simulated in child drivers 1 through 16 were, respectively: 230, 230, 230, 220, 220, 220, 210, 210, 210, 200, 190, 180, 170, 160, 150 and 70. The number of child drivers used and the number of users simulated by each child driver are defined by the "NumClientsN" parameters in the parent's NOTES.INI file. For each child driver, users' start times were staggered. Numerically by child driver they were, respectively, 2, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 5, 6, 6, 6, 6 and 7 seconds, as defined in the "ThreadStagger" parameter for each child driver. The start time of each child driver was staggered to allow sufficient time for all users simulated by each child driver to be connected at the SUT and to allow the SUT to settle for at least 5 minutes before releasing the users from the next child drivers.

For the run using RAID-5, 12 child drivers were used. The number of users simulated in child drivers 1 through 12 were, respectively: 230, 230, 230, 220, 220, 220, 210, 210, 210, 200, 140 and 80. For each child driver, users' start times were staggered. Numerically by child driver they were, respectively, 3, 3, 4, 4, 5, 5, 6, 6, 6, 7, 7 and 7 seconds. The start time of each child driver was staggered for the same reason as explained for the the RAID-1 run.

Our experience shows that ramp-up time increases non-linearly as a function of the number of users simulated by a child driver. This effect becomes even more pronounced as we approach the capacity of the server. Since the NotesBench audit rules do not put any restriction on ramp-up time, and we had a limited number of child drivers, the attempt to minimize ramp-up time was only carried far enough to ensure adequate benchmarking productivity. During the test runs, the tools used to determine steady state included Windows NT's PERFMON, the Notes Server SHOW command, and the child driver RES files. To confirm steady state, we monitored the number of users, the number of transactions per minute, and pending mail at the SUT. We confirmed steady state when:

- The SUT Domino Server console sustained the peak user load
- Pending mail did not become backlogged, as verified by:
  - Inspection of the mail-routing log at the SUT after the test run ended
  - Server Mail statistics collected every thirty minutes throughout the test run.

To ensure that the test results were reproducible, the tests were repeated, and the results were compared and found to be consistent.

Data

IBM Netfinity 5500 NotesMark Value for Mail-Only Test

The Mail workload was run for 9 hours, including ramp-up and steady state. The IBM Netfinity 5500 system configured with RAID-1 and RAID-5 demonstrated that it can support 3,100 and 2,400 concurrent active users, respectively. The NotesMark throughput value was 4,128 and 3,114, respectively. Average response time was 0.104 and 1.653 seconds, respectively. For the RAID-5 run, one error occurred before steady state. The system recovered and ran error-free for approximately 7-1/2 hours.

Mail-Only Workload - NotesMark
IBM Netfinity 5500

■ RAID-1 = 4,128
□ RAID-5 = 3,114
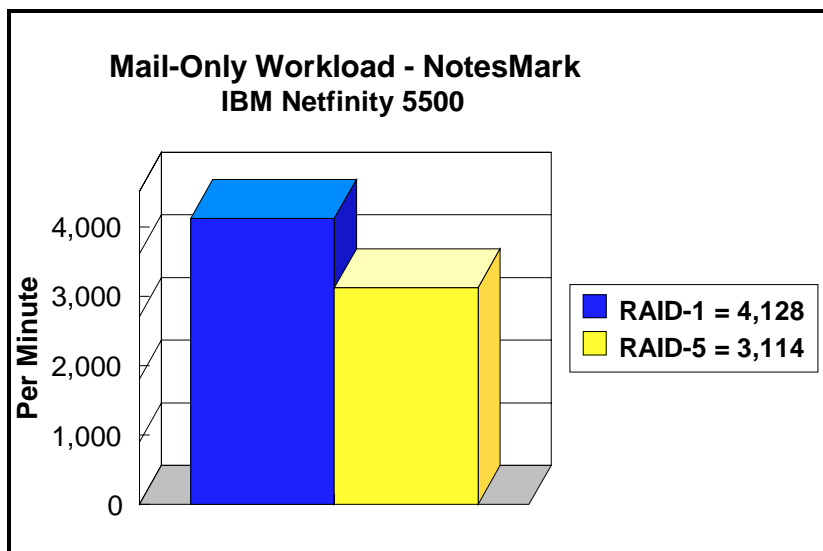
The Mail workload executes Notes transactions that model a server for mail users at sites that rely only on mail for communication. The resulting capacity metric for a mail-only server is the maximum number of users that can be supported before the average user response time becomes unacceptable.

The mail-only test script models an active user who is reading and sending mail. The script contains an average of 15 minutes of waiting; thus, the average user would execute this script a maximum of four times each hour. For each iteration of the test script, there are 5 documents read, 2 documents updated, 2 documents deleted, 1 view scrolling operation, 1 database opened and closed, 1 view opened and closed, and some miscellaneous operations. In sending messages, each user sends a mail message to NumMessageRecipients no more frequently than every 90 minutes.

NotesNum Output for Mail-Only Test (RAID-1 and RAID-5)

Min Start Time = 05/19/98 02:13:22 PM   Max Stop Time = 05/19/98 11:07:28 PM
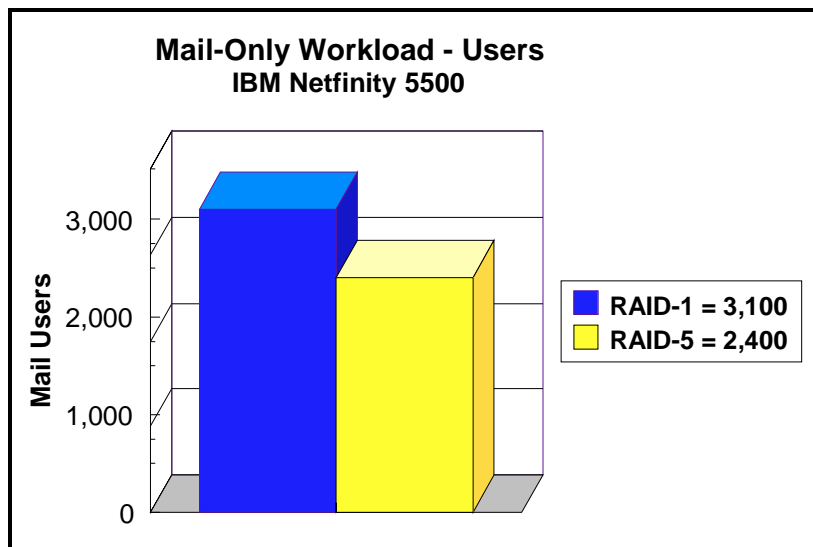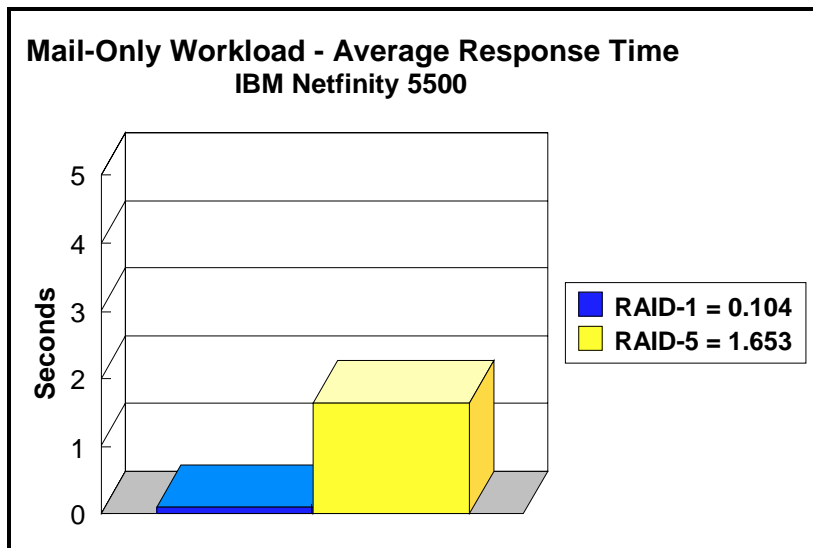Total Test Errors = 0
Total Test Time = 32040 sec
Test Run: Users = 3100   NotesMark = 4128   Response Time = 104 msec (05/19/98 07:43:00 PM to 05/19/98 10:46:00 PM)

Min Start Time = 05/28/98 03:04:57 PM   Max Stop Time = 05/29/98 03:36:30 AM
Total Test Errors = 1
Total Test Time = 45120 sec
Test Run: Users = 2400   NotesMark = 3114   Response Time = 1653 msec (05/28/98 07:53:00 PM to 05/29/98 03:21:00 AM)

Mail-Only Workload - Average Response Time
IBM Netfinity 5500

- RAID-1 = 0.104
- RAID-5 = 1.653

Mail-Only Workload - Users
IBM Netfinity 5500
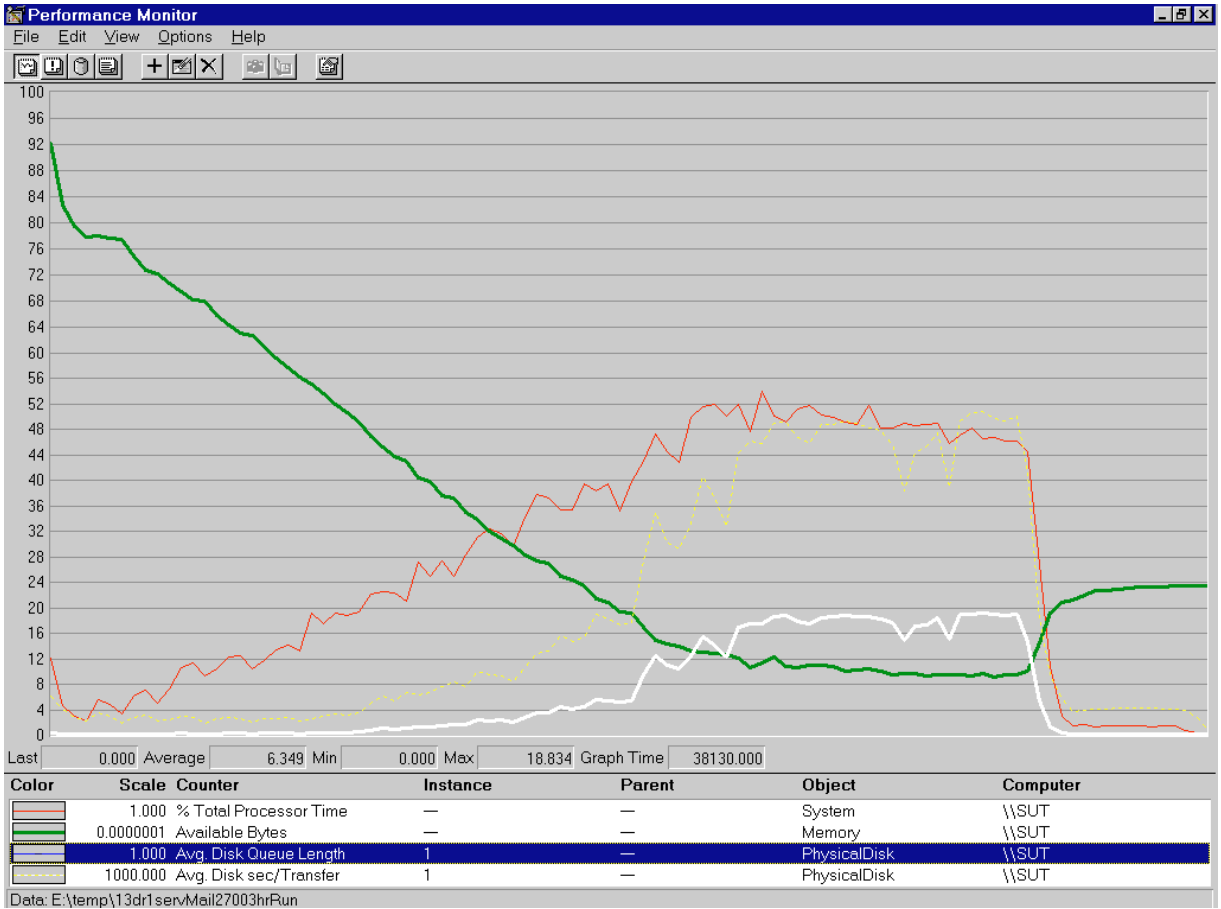
- RAID-1 = 3,100
- RAID-5 = 2,400

Analysis

PERFMON data was collected for a shorter run when the system was ramped up for about three hours. Ramp-up through shutdown the RAID-1 run is shown in the screen capture below. Steady-state statistics for both runs at a similar range of concurrent users are shown in the table on page 9.

Steady State Values	Domino Date in RAID-1	Domino Data in RAID-5
Maximum Concurrent Mail Users	3,100	2,400
Average CPU Utilization	48.7%	56.3%
Average Memory Used *	925MB	1018.8MB
Average Pagefile Usage	1.6%	1.9%
Average Physical Disk Q Length	17.3	5.8

*Average Memory Used is computed by subtracting the Average Available Bytes of Memory measured by PERFMON from the installed memory of 1GB. In both cases, the available memory bytes would be used as disk cache, helping to provide acceptable user response time at the respective concurrent-users level. Because of the significant system overhead required, PERFMON was not enabled or used for the audit run. For the RAID-1 run, all users ran error-free for more than 6-1/2 hours before the controller client performed an orderly stop of the run. For the RAID-5 run, all users ran error-free for approximately 7-1/2 hours before the controller client performed an orderly stop of the run.

| Performance Monitor |
| File | Edit | View | Options | Help |

	100								
	96								
	92								
	88								
	84								
	80								
	76								
	72								
	68								
	64								
	60								
	56								
	52								
	48								
	44								
	40								
	36								
	32								
	28								
	24								
	20								
	16								
	12								
	8								
	4								
	0								

Last | 0.000 | Average | 6.349 | Min | 0.000 | Max | 18.834 | Graph Time | 38130.000

Color	Scale	Counter	Instance	Parent	Object	Computer
	1.000	% Total Processor Time	—	—	System	\\SUT
	0.0000001	Available Bytes	—	—	Memory	\\SUT
	1.000	Avg. Disk Queue Length	1	—	PhysicalDisk	\\SUT
	1000.000	Avg. Disk sec/Transfer	1	—	PhysicalDisk	\\SUT

Data: E:\temp\13dr1servMail27003hrRun

Conclusions

These NotesBench results demonstrate that the IBM Netfinity 5500 (Model 8660-1RU) can support 3,100 Mail-only users if RAID-1 is used for the Domino data directory or 2,400 Mail-only users if RAID-5 is used. Although it may be possible to use fewer drives in a RAID-1 configuration and achieve lower price/performance, we used the same configuration for both RAID-1 and RAID-5 to enable customers to make a side-by-side comparison of the server's peak capacity with the identical configurations.

The results obtained are based on running the IBM Netfinity 5500 as a dedicated Domino server; the addition of other application workloads will affect the number of users supported as well as the response time. Achieving optimum performance in a customer environment is highly dependent upon selecting adequate processor power, memory and disk storage as well as balancing the configuration of that hardware and appropriately tuning the operating system and Domino software.

Statement by Auditor

The original "Lotus NotesBench Test Results Report Certification Letter" was signed by Dana M. Thompson, NotesBench Auditor for KMDS Technical Associates, Inc., and is on file at IBM.

Appendix A: Overall Test Setup and Software Versions

Number of Client Systems

Seventeen driver systems were used used for the RAID-1 configuration. Sixteen of those systems were configured as child drivers (child 1 through child 16). One system was configured as the parent (source driver).

Thirteen driver systems were used used for the RAID-5 configuration. Twelve of those systems were configured as child drivers (child 1 through child 12). One system was configured as the parent (source driver).

The child drivers were IBM PC 365 systems, each configured with one 200MHz Pentium Pro processor. Each child driver was configured with 64MB of memory, one 3.3GB hard disk, and one IBM 100/10 Ethernet PCI Adapter.

The disk configuration used for the child systems is as follows:

> C: Partition (512MB - NTFS) - Windows NT Workstation 4.0
> D: Partition (2GB - NTFS) - Notes 4.61

Number of Server Platforms

One server platform, the IBM Netfinity 5500 with two 350MHz Pentium II processors and 1GB of memory, was benchmarked.

The disk configuration used for the system under test is as follows:

- C: Partition (4GB - NTFS) - Windows NT Server Version 4.0 (boot partition) and Domino 4.61 executables
- D: Partition (18GB - NTFS) - Domino data

The disk configuration used for destination servers 1 through 4 is as follows:

- C: Partition (2GB - NTFS) - Windows NT Server Version 4.0 and Notes executables
- E: Partition (10GB - NTFS) - Domino data

Network

Two 100Mbps Ethernet LAN segments were used. One PC Server 325 was configured as a router and used to connect the servers and clients to the LAN segments.

Software Versions

Software versions used on the system under test were as follows:

- Microsoft Windows NT Server Version 4.0 and Service Pack 3
- Lotus Domino Server Release 4.61
- NotesBench Version 4.61 - Windows/32

Software versions used on the child drivers were as follows:

- Microsoft Windows NT Workstation Version 4.0 and Service Pack 3
- Lotus Notes Client for Windows NT Release 4.61
- NotesBench Version 4.61 - Windows/32

High-Level Test Setup Diagram
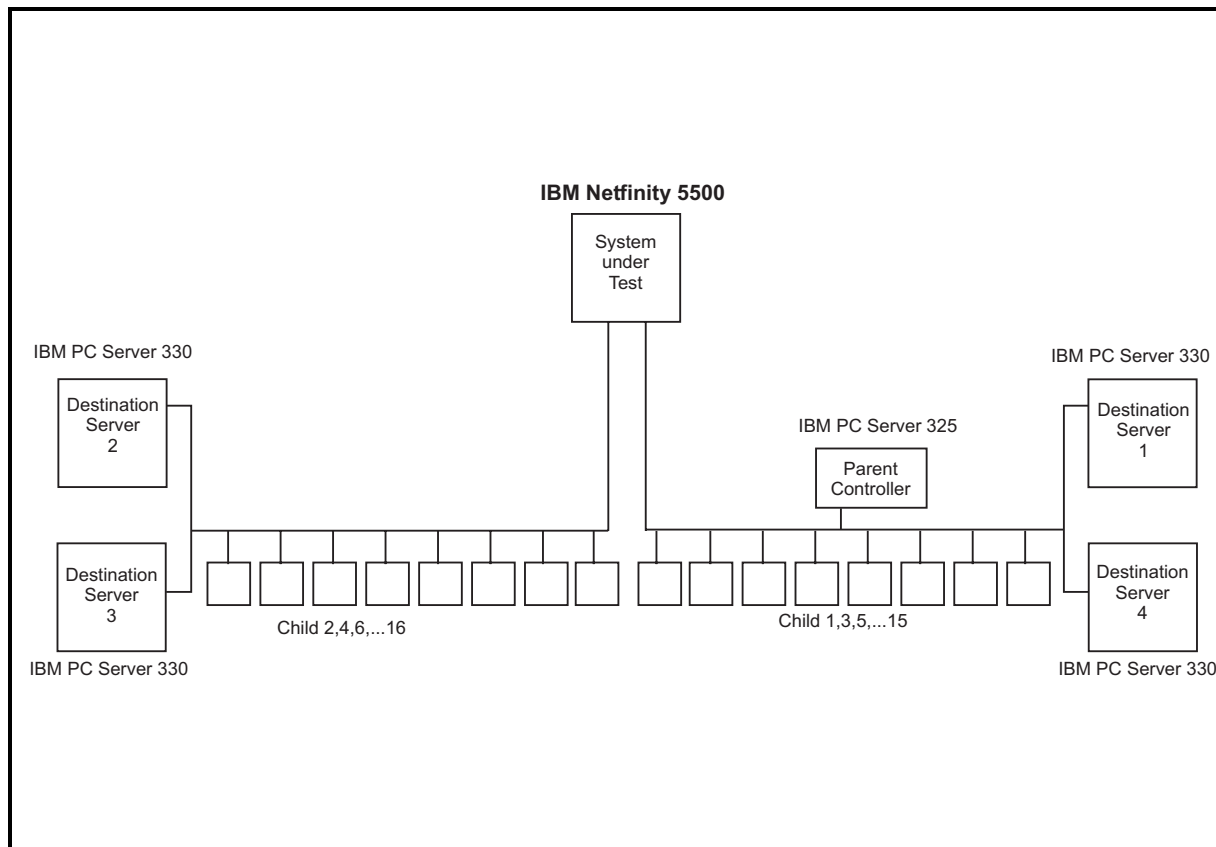
Details of Configuration

System Under Test	Destination Servers 1-4	Child Drivers 1-16	Parent Source Driver
IBM Netfinity 5500	IBM PC Server 330	IBM PC 365	IBM PC Server 325
2 x 350MHz Pentium II	1 x 200MHz Pentium Pro	1 x 200MHz Pentium Pro	1 x 200MHz Pentium Pro
1GB Memory	256MB Memory	64MB Memory	128MB Memory
13 x 4.51GB Drives	6 x 2.25GB Drives (RAID-0)	1 x 2GB Drive	1 x 4.51GB Drive
1 x ServeRAID II Ultra SCSI Controller	IBM SCSI-2 Fast/Wide Streaming RAID Adapter		
2 x IBM EtherJet 100/10 PCI Adapters	IBM 100/10 Ethernet PCI Adapter	IBM 100/10 Ethernet PCI Adapter	IBM 100/10 Ethernet PCI Adapter
Windows NT 4.0 and Service Pack 3	Windows NT 4.0 and Service Pack 3	Windows NT 4.0 and Service Pack 3	Windows NT 4.0 and Service Pack 3

Two 100Mbps Ethernet LAN segments were used. One IBM PC Server 325 was configured as a router and used to connect the servers and clients to the LAN segment.

Appendix B: System Configurations

Server under Test	
System	IBM Netfinity 5500
Processor	2 x 350MHz Pentium II Processor
Memory	1GB
Cache	512KB L2 Write-Back Cache
Disk Controller	Integrated ServeRAID II Ultra SCSI Controller
Disk Drive	13 x 4.51GB
Network Interface Adapter	2 x IBM EtherJet 100/10 PCI Adapter
I/O	PCI Bus
Operating System	Microsoft Windows NT Server 4.0 with Service Pack 3
Notes	Domino Server for Windows NT Release 4.61

Clients	
System	IBM PC 365
Processor	1 x 200MHz Pentium Pro Processor
Memory	64MB
Disk Drive	1 x 2GB
Network Interface Adapter	100/10 Ethernet PCI Adapter
I/O	PCI Bus
Operating System	Microsoft Windows NT Workstation 4.0
Notes	Notes Client for Windows NT Release 4.61

Appendix C: Operating System Parameters

The following registry variables were changed from their default values as shown:

> HKEY_LOCAL_MACHINE/System/CurrentControlSet/Control/PriorityControl\Win32PrioritySeparation:
> REG_DWORD:0

> HKEY_LOCAL_MACHINE/System/CurrentControlSet/Control/SessionManager/MemoryManager/
> LargeSystemCache: REG_DWORD:0

Appendix D: NOTES.INI Settings

NOTES.INI Files for the System under Test

RAID-1 Configuration

[Notes]

KitType=2
Directory=d:\notes\data
SETUPDB=SETUP.NSF
USERNAME=Me
COMPANYNAME=MyPlace
; **
;
; NotesBench parm changes
;
SERVER_SHOW_PERFORMANCE=1
MAILUSEPROCESSES=0
MAILUSETHREADS=1
MAILMAXTHREADS=4
MAILLOGTOEVENTSONLY=1
Log_MailRouting=20
No_Force_Activity_Logging=1
; DEBUG_OUTFILE=\\filesevr\lastrun\sutinfo.txt
DEBUG_OUTFILE=c:\svrdata\sutinfo.txt
;**
;
MTATEMP=C:\TEMP
WinNTIconPath=d:\notes\data\W32
$$HasLANPort=1
WWWDSP_SYNC_BROWSERCACHE=0
WWWDSP_PREFETCH_OBJECT=0
EnableJavaApplets=1
EnablePlugins=1
Preferences=-2146956175
Passthru_LogLevel=0
Console_LogLevel=2
VIEWIMP1=Lotus 1-2-3 Worksheet,0,_IWKSV,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,,4,
VIEWIMP3=Structured Text,0,_ISTR,,.LTR,.CGN,.STR,,1,
VIEWIMP4=Tabular Text,0,_ITAB,,.PRN,.RPT,.TXT,.TAB,,1,
VIEWEXP1=Lotus 1-2-3 Worksheet,0,_XWKS,,.WKS,.WK1,.WR1,.WRK,,4,
VIEWEXP3=Structured Text,0,_XSTR,,.LTR,.CGN,.STR,,1,
VIEWEXP4=Tabular Text,1,_XTAB,,.LTR,.RPT,.CGN,.TAB,,1,
EDITIMP1=ASCII Text,0,_ITEXT,,.TXT,.PRN,.C,.H,.RIP,,1,
EDITIMP2=MicrosoftWord RTF,0,_IRTF,,.DOC,.RTF,,2,
EDITIMP3=Lotus 1-2-3 Worksheet,0,_IWKSE,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,,4,
EDITIMP4=Lotus PIC,0,_IPIC,,.PIC,,8,
EDITIMP5=CGM Image,0,_IFL,,.GMF,.CGM,,8,
EDITIMP6=TIFF 5.0 Image,0,_ITIFF,,.TIF,,18,
EDITIMP7=BMP Image,0,_IBMP,,.BMP,,18,
EDITIMP8=Ami Pro,0,_IW4W,W4W33F/V0,.SAM,,2,
EDITIMP17=WordPerfect 5.x,0,_IW4W,W4W07F/V1,.DOC,,2,
EDITIMP22=PCX Image,0,_IPCX,,.PCX,,18,
EDITIMP28=Binary with Text,0,_ISTRNGS,,.*,,1,
EDITIMP29=WordPerfect 6.0/6.1,0,_IW4W,W4W48F/V0,.WPD,.WPT,.DOC,,2,
EDITIMP30=Excel 4.0/5.0,0,_IW4W,W4W21F/V4C,.XLS,,4,
EDITIMP31=Word for Windows 6.0,0,_IW4W,W4W49F/V0,.DOC,,2,
EDITIMP32=GIF Image,0,_IGIF,,.GIF,,18,
EDITIMP33=JPEG Image,0,_IJPEG,,.JPG,,18,
EDITEXP1=ASCII Text,2,_XTEXT,,.TXT,.PRN,.C,.H,.RIP,,1,
EDITEXP2=MicrosoftWord RTF,2,_XRTF,,.DOC,.RTF,,4,

```
EDITEXP3=CGM Image,2,_XCGM,,.CGM,.GMF,,8,
EDITEXP4=TIFF 5.0 Image,2,_XTIFF,,.TIF,,18,
EDITEXP5=Ami Pro,2,_XW4W,W4W33T/V0,.SAM,,2,
EDITEXP14=WordPerfect 5.1,2,_XW4W,W4W07T/V1,.DOC,,2,
EDITEXP21=WordPerfect 6.0,2,_XW4W,W4W48T/V0,.DOC,,2,
EDITEXP22=WordPerfect 6.1,2,_XW4W,W4W48T/V1,.WPD,.WPT,.DOC,,2,
EDITEXP23=Word for Windows 6.0,2,_XW4W,W4W49T/V0,.DOC,,2,
DDETimeout=10
NAMEDSTYLE0=02004261736963000000000000000000000000000000000000000000000000000000000000000001010100000A000000000000
0100A0050000A00500000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000
NAMEDSTYLE1=020042756C6C6574000000000000000000000000000000000000000000000000000000000001010100000A000000000000
0000080700000080700000000000000000000000000000000000000000000000000000000000000000000000000000040000000000000
000
NAMEDSTYLE2=0200486561646C696E6500000000000000000000000000000000000000000000000000000000010101010B0C00000000000
0100A0050000A00500000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000
$$$OpenSpecial=NotesNIC
$$$NotesNIC=CN=Home/OU=Notes/O=NET, welcome.nsf, Notes NIC Welcome, Notes Network Information Center on the Internet
ServerTasks=Router,Replica,Update
; ServerTasks=Router,Replica,Update,Stats,Amgr,Sched,CalConn,AdminP,Report,Event
; ServerTasksAt1=Catalog,Design
; ServerTasksAt2=UpdAll,Object Collect mailobj.nsf
; ServerTasksAt5=Statlog
TCPIP=TCP, 0, 15, 0
VINES=VINES, 0, 15, 0
SPX=NWSPX, 0, 15, 0
AppleTalk=ATALK, 0, 15, 0
LAN2=NETBIOS, 2, 15, 0
LAN3=NETBIOS, 3, 15, 0
LAN4=NETBIOS, 4, 15, 0
LAN5=NETBIOS, 5, 15, 0
LAN6=NETBIOS, 6, 15, 0
LAN7=NETBIOS, 7, 15, 0
LAN8=NETBIOS, 8, 15, 0
COM1=XPC,1,15,0,
COM2=XPC,2,15,0,
COM3=XPC,3,15,0,
COM4=XPC,4,15,0,
COM5=XPC,5,15,0,
Ports=TCPIP,WAN2
DisabledPorts=VINES,SPX,AppleTalk,LAN2,LAN3,LAN4,LAN5,LAN6,LAN7,LAN8,COM1,COM2,COM3,COM4,COM5
LOG_REPLICATION=0
LOG_SESSIONS=0
ExistingServerName=S1
KeyFilename=sut1.id
CertificateExpChecked=d:\notes\data\sut1.id 05/14/98
MailServer=CN=SUT1/O=PARTITION
Domain=DOMINO
Admin=CN=Admin/O=PARTITION
Timezone=5
DST=1
TemplateSetup=15
Setup=52
ServerSetup=8
NAMES=names.nsf
EmptyTrash=0
WeekStart=1
WAN2=TCP,0,15,0,,12288,
SDI_WINDOW=0
DESKWINDOWSIZE=16 23 420 288
MAXIMIZED=1
WinNTIconCommonConfig=Universal
WinNTIconSize=2
```

```
WinNTIconPos=2
WinNTIconHidden=0
WinNTIconRect=-1 -1 641 25
FileDlgDirectory=c:\notes
CONSOLE_Lotus_Domino_Server=80 25 7 0 66 652 397
ECLSetup=3
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
```

RAID-5 Configuration

```
[Notes]

KitType=2
Directory=d:\notes\data
SETUPDB=SETUP.NSF
USERNAME=Me
COMPANYNAME=MyPlace
;*****************************************
;
;  NotesBench parm changes
;
SERVER_SHOW_PERFORMANCE=1
MAILUSEPROCESSES=0
MAILUSETHREADS=1
MAILMAXTHREADS=4
MAILLOGTOEVENTSONLY=1
Log_MailRouting=10
No_Force_Activity_Logging=1
DEBUG_OUTFILE=\\filesevr\lastrun\sutinfo.txt
;*****************************************
MTATEMP=C:\TEMP
WinNTIconPath=d:\notes\data\W32
$$HasLANPort=1
WWWDSP_SYNC_BROWSERCACHE=0
WWWDSP_PREFETCH_OBJECT=0
EnableJavaApplets=1
EnablePlugins=1
Preferences=-2146956175
Passthru_LogLevel=0
Console_LogLevel=2
VIEWIMP1=Lotus 1-2-3 Worksheet,0,_IWKSV,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,,4,
VIEWIMP3=Structured Text,0,_ISTR,,.LTR,.CGN,.STR,,1,
VIEWIMP4=Tabular Text,0,_ITAB,,.PRN,.RPT,.TXT,.TAB,,1,
VIEWEXP1=Lotus 1-2-3 Worksheet,0,_XWKS,,.WKS,.WK1,.WR1,.WRK,,4,
VIEWEXP3=Structured Text,0,_XSTR,,.LTR,.CGN,.STR,,1,
VIEWEXP4=Tabular Text,1,_XTAB,,.LTR,.RPT,.CGN,.TAB,,1,
EDITIMP1=ASCII Text,0,_ITEXT,,.TXT,.PRN,.C,.H,.RIP,,1,
EDITIMP2=MicrosoftWord RTF,0,_IRTF,,.DOC,.RTF,,2,
EDITIMP3=Lotus 1-2-3 Worksheet,0,_IWKSE,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,,4,
EDITIMP4=Lotus PIC,0,_IPIC,,.PIC,,8,
EDITIMP5=CGM Image,0,_IFL,,.GMF,.CGM,,8,
EDITIMP6=TIFF 5.0 Image,0,_ITIFF,,.TIF,,18,
EDITIMP7=BMP Image,0,_IBMP,,.BMP,,18,
EDITIMP8=Ami Pro,0,_IW4W,W4W33F/V0,.SAM,,2,
EDITIMP17=WordPerfect 5.x,0,_IW4W,W4W07F/V1,.DOC,,2,
EDITIMP22=PCX Image,0,_IPCX,,.PCX,,18,
EDITIMP28=Binary with Text,0,_ISTRNGS,,.*,,1,
EDITIMP29=WordPerfect 6.0/6.1,0,_IW4W,W4W48F/V0,.WPD,.WPT,.DOC,,2,
EDITIMP30=Excel 4.0/5.0,0,_IW4W,W4W21F/V4C,.XLS,,4,
EDITIMP31=Word for Windows 6.0,0,_IW4W,W4W49F/V0,.DOC,,2,
EDITIMP32=GIF Image,0,_IGIF,,.GIF,,18,
EDITIMP33=JPEG Image,0,_IJPEG,,.JPG,,18,
```

```
EDITEXP1=ASCII Text,2,_XTEXT,,.TXT,.PRN,.C,.H,.RIP,,1,
EDITEXP2=MicrosoftWord RTF,2,_XRTF,,.DOC,.RTF,,4,
EDITEXP3=CGM Image,2,_XCGM,,,.CGM,.GMF,,8,
EDITEXP4=TIFF 5.0 Image,2,_XTIFF,,.TIF,,18,
EDITEXP5=Ami Pro,2,_XW4W,W4W33T/V0,.SAM,,2,
EDITEXP14=WordPerfect 5.1,2,_XW4W,W4W07T/V1,.DOC,,2,
EDITEXP21=WordPerfect 6.0,2,_XW4W,W4W48T/V0,.DOC,,2,
EDITEXP22=WordPerfect 6.1,2,_XW4W,W4W48T/V1,.WPD,.WPT,.DOC,,2,
EDITEXP23=Word for Windows 6.0,2,_XW4W,W4W49T/V0,.DOC,,2,
DDETimeout=10
NAMEDSTYLE0=02004261736963000000000000000000000000000000000000000000000000000000000000000001010100000A000000000000
0100A0050000A005000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000
NAMEDSTYLE1=020042756C6C6574000000000000000000000000000000000000000000000000000000000000000001010100000A000000000000
00000807000008070000000000000000000000000000000000000000000000000000000000000000000000000000000000040000000000000
000
NAMEDSTYLE2=0200486561646C696E650000000000000000000000000000000000000000000000000000000000000010101010B0C00000000000
0100A0050000A005000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000
$$$OpenSpecial=NotesNIC
$$$NotesNIC=CN=Home/OU=Notes/O=NET, welcome.nsf, Notes NIC Welcome, Notes Network Information Center on the Internet
ServerTasks=Router,Replica,Update
;  ServerTasks=Router,Replica,Update,Stats,Amgr,Sched,CalConn,AdminP,Report,Event
;  ServerTasksAt1=Catalog,Design
;  ServerTasksAt2=UpdAll,Object Collect mailobj.nsf
;  ServerTasksAt5=Statlog
TCPIP=TCP, 0, 15, 0
VINES=VINES, 0, 15, 0
SPX=NWSPX, 0, 15, 0
AppleTalk=ATALK, 0, 15, 0
LAN2=NETBIOS, 2, 15, 0
LAN3=NETBIOS, 3, 15, 0
LAN4=NETBIOS, 4, 15, 0
LAN5=NETBIOS, 5, 15, 0
LAN6=NETBIOS, 6, 15, 0
LAN7=NETBIOS, 7, 15, 0
LAN8=NETBIOS, 8, 15, 0
COM1=XPC,1,15,0,
COM2=XPC,2,15,0,
COM3=XPC,3,15,0,
COM4=XPC,4,15,0,
COM5=XPC,5,15,0,
Ports=TCPIP,WAN2
DisabledPorts=VINES,SPX,AppleTalk,LAN2,LAN3,LAN4,LAN5,LAN6,LAN7,LAN8,COM1,COM2,COM3,COM4,COM5
LOG_REPLICATION=0
LOG_SESSIONS=0
ExistingServerName=s1
KeyFilename=sut1.id
CertificateExpChecked=d:\notes\data\sut1.id 05/28/98
MailServer=CN=SUT1/O=PARTITION
Domain=DOMINO
Admin=CN=Admin/O=PARTITION
Timezone=5
DST=1
TemplateSetup=15
Setup=52
ServerSetup=8
NAMES=names.nsf
EmptyTrash=0
WeekStart=1
SDI_WINDOW=0
WAN2=TCP,0,15,0,,12288,
DESKWINDOWSIZE=16 23 420 288
MAXIMIZED=1
```

WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=0
WinNTIconRect=-1 -1 641 25
FileDlgDirectory=c:\notes
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
CONSOLE_Lotus_Domino_Server=80 25 7 0 44 652 375

Appendix E: Network Configuration

The standard TCP/IP stack provided by Microsoft Windows NT Server 4.0 was used.

In the system under test, the network adapter speed was changed from the default 'Auto' to 100Mbps. This forced the Duplex Mode to 'Half'.

Under the 'Advanced' configuration option, the following three parameters were changed from their default values to double the default value:

- Coalesce Buffers
- Receive Buffers
- Transmit Control Block

At the destination servers, under 'Advanced' configuration options for the Ethernet adapter, the following three parameters were changed from their default values to double their default values:

- Coalesce Buffers
- Receive Buffers
- Transmit Control Block

Appendix F: Guidelines for Information Usage

This report is intended for IBM Business Partners, customers, and IBM marketing and technical support personnel. The report may be distributed in accordance with the requirements stated in the Edition notice.

Appendix G: Pricing

The table provides the IBM Estimated Reseller Price to end users for the U.S. only. Actual Reseller prices may vary, and prices may also vary by country. Prices are subject to change without notice. For additional information and current prices, contact your local IBM representative.

Item Description	Order Number	Qty	IBM Estimated Reseller Unit Price	Extended IBM Estimated Reseller Price
IBM Netfinity 5500	8660-1RU	1	$6,499	$6,499
1 x 350MHz / 512KB Pentium II Processor				
1 x 64MB ECC DIMM				
Integrated Wide Ultra SCSI Controller				
Integrated 100/10Mbps Ethernet PCI Controller				
IBM 256MB SDRAM ECC DIMM	01K8043	4	1,555	6,220
IBM Netfinity 350/100MHz Processor Upgrade	10L5883	1	1,479	1,479
IBM Netfinity 4.51GB 10K Wide Ultra SCSI Hard Disk	01K8009	3	819	2,457
IBM Netfinity EXP10 4.51GB 10K Wide Ultra SCSI Hard Disk	01K7960	10	819	8,190
IBM Netfinity EXP10 Rack Storage Expansion Enclosure	35201RU	1	2,947	2,947
IBM EtherJet 100/10 PCI Adapter	76H2342	2	109	218
IBM G42 14" (13.2" Viewable) Color Monitor	654000N	1	224	224
Software				
Windows NT Server 4.0	227-01025	1	676	676
Lotus Domino Server Release 4.61 included on ServerGuide* with IBM Netfinity 5500 at no charge		1	0	0
Total System Price				$28,910

Appendix H: Optional (Vendor-Defined Information)

None.

First Edition - May 1998

Notes

[1]   MHz only measures microprocessor internal clock speed, not application performance. Many factors affect application performance.

[2]   When referring to hard disk capacity, GB equals one billion bytes. Total user-accessible capacity depends on operating environment.

[3]   The price/performance results are based on pricing IBM's Estimated Reseller Prices to end users. IBM resellers set their own prices, and actual prices may vary.