

NotesBench Disclosure Report
for
IBM Netfinity 6000R
using
Lotus Domino Server 5.03
and
Windows 2000 Advanced Server

Results Certified May 31, 2000



IBM Corporation

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Edition Notice

Executive Summary

The IBM Netfinity* 6000R server demonstrated leadership performance running Lotus** Domino** Server Release 5.03 on Microsoft** Windows** 2000 Advanced Server. The Netfinity 6000R achieved the highest number of R5Mail users recorded to date on a four-way Intel-based server and at a very attractive price/performance point.

The results detailed in this report were obtained using the NotesBench R5Mail-Only workload.

Test Script	Maximum Users	NotesMark (tpm)	Ave. Response Time (sec)	\$/User	\$/NotesMark
R5Mail-Only	12,000	16,585	0.177	\$7.08	\$5.12

The IBM Netfinity 6000R server was configured with four 700MHz¹ Intel** Pentium** III Xeon** processors, 4GB² of memory, and 32 hard disk drives. All configuration details are provided in Appendix A: Overall Test Setup and Software Versions.

The server under test, configured with two Domino partitions, supported an R5Mail-Only workload of 12,000 active mail users (see price/performance results³ above). Both partitions shared a common Domino Directory, which contained more than 24,000 person entries.

IBM's Netfinity Server Performance Laboratory in Research Triangle Park, NC, conducted the benchmark in May, and KMDS Technical Associates, Inc., audited the results in May 2000.

NotesBench provides an objective method for evaluating the performance of different platforms running Lotus Domino Server. 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 how to fully utilize the capability of the IBM Netfinity 6000R system as a Domino Server 5.03 mail server configured with the Netfinity ServeRAID-4H Ultra160 SCSI Adapter for RAID-1 data redundancy.

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

² When referring to hard drive capacity, GB stands for one thousand million bytes. Total user-accessible capacity may vary depending on operating environments.

³ The price/performance results are based on IBM's Estimated Reseller Price. IBM resellers set their own prices, and actual prices may vary.

Test Methodologies

Test Setup and Hardware/Software Configuration

The IBM Netfinity 6000R system under test (SUT) was configured with four 700MHz Pentium III Xeon processors (2MB of L2 write-back cache per processor), 4GB of memory, two 9.1GB 10K rpm hard disk drives, thirty 18.2GB 10K rpm hard disk drives, an integrated Ethernet controller, and one Netfinity 10/100 Ethernet PCI Adapter. Each of six RAID-1 arrays, which contained the mail files, was connected to a channel on one of three Netfinity ServeRAID-4H Ultra160 SCSI Adapters. A detailed description of the configuration of the RAID-1 arrays is provided in Appendix A.

The network consisted of two LAN segments. The LAN segments, each consisting of one 12-port SuperStack 10/100 Hub, were configured as follows:

- Segment 1 connected partition 1 on the SUT to child drivers 1, 3, 5, 7, 9, 11, and parent port 1.
- Segment 2 connected partition 2 on the SUT to child drivers 2, 4, 6, 8, 10, 12, and parent port 2.

The IBM Netfinity 6000R system under test ran Microsoft Windows 2000 Advanced Server Edition and Domino Server 5.03.

The RAID controller configuration value for Stripe Unit Size was set at 16KB. Write-back cache was enabled for all RAID-1 arrays.

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

R5Mail-Only Workload
Server_Max_Concurrent_Trans=1000
NSF_Buffer_Pool_Size=350000000
NSF_DBCache_MaxEntries=10000
SetMailLogToEventsOnly=1
Log_MailRouting=10
Log_Sesions=0
Mail_Number_Of_MailBoxes=2
Server_Pool_Tasks=100
Max_Users=10000
MailUseProcesses=0

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

```
No_Force_Activity_Logging=1  
Server_Show_Performance=1
```

Debug_Outfile=\\nbtest1\lastrun\SUTINFO.TXT

All Notes server tasks were disabled except Router.

All Domino data files and mail file links were located on the C: partition of a two-drive RAID-1 array. The Domino executables were located on the C: partition of the same two-drive RAID-1 array. The actual mail files were distributed among the 6 five-drive RAID-1 arrays (D:, E:, F:, G:, H:, and I:).

The transaction logging option was not enabled for this audit run. When this option is enabled, we recommend placing the transaction logging directory on a dedicated disk that is attached to a less-busy adapter on a less-busy PCI bus to improve response time.

Test Procedures

Several trial runs were conducted starting with both Domino Partition servers to attempt to exhaust at least one of the system resources (i.e., processor, memory or disk subsystem). When average user response time reached an unacceptable level before any one of these resources had been fully utilized, an additional disk array was installed. System resource utilization was monitored using Windows NT Performance Monitor (PERFMON), which enabled the system configuration to be optimized while balancing system resources.

The 12,000 users were distributed across 12 clients. Clients 1-12 each added 1,000 users to the system under test. The test ran at steady state for 8 hours. The actual ramp-up period from startup of child 1 to the point when all 12,000 users were shown on the server console was approximately 4 hours. The test ran for 8 hours after ramp-up. During the test runs, the tools used to determine steady state included the child driver RES files, Notesizer command outputs, and Domino Partition Server statistics output to the server console on a minute-by-minute basis.

To confirm steady state, we verified the number of users at the server and its logs. We confirmed steady state when the number of users on the SUT Domino Server console reached the intended number of users. We also used the Show Stat Mail command on the server to verify that at least 90 percent of the mail generated during the test period was delivered to the local mail databases during the test period. In fact, during the test period, the SUT Domino Server delivered more than 99.9 percent of the mail generated to the local mail databases.

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

ChildStagger in Minutes

The ChildStagger parameter was set between 10 to 22 minutes in the PARENT.INI files.

ThreadStagger in Seconds

Child 1 through child 12 each had a different setting for the ThreadStagger value. This parameter varied from a half second to 1-1/2 seconds. The purpose of the ThreadStagger value is used to help balance the workload during the initialization phase of the test.

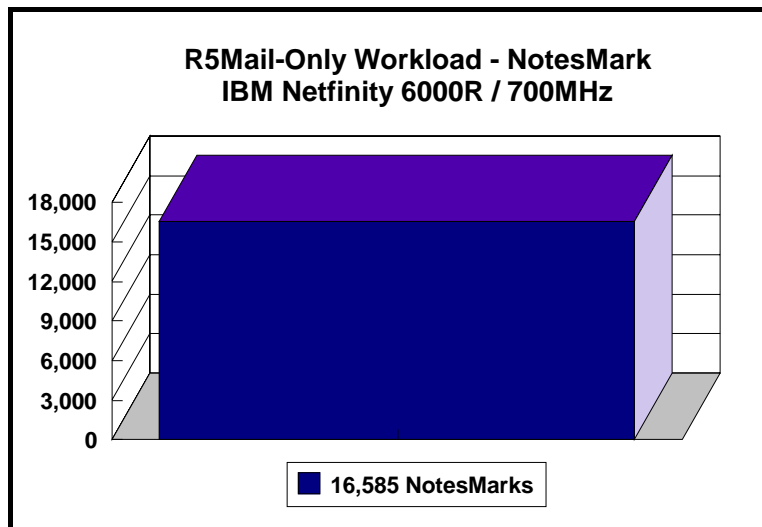
Other NotesBench Scripts

IBM intends to continue conducting NotesBench measurements to further optimize and exploit the performance capability of the Netfinity product line running Domino Server 5.03.

Data

IBM Netfinity 6000R NotesMark Value for R5Mail-Only Test

The IBM Netfinity 6000R server demonstrated that it can support 12,000 concurrent active users with this workload. The NotesMark throughput value was 16,585. Average response time was 0.177 seconds. The test ran error-free for 8 hours.



The R5Mail 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 Domino R5Mail-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, 2 documents added, 1 view scrolling operation, 1 database opened and closed, 1 view opened and closed, looking up of recipients and sending an invitation every 30 minutes, as well as some miscellaneous operations. In sending messages, each user creates and sends a mail message to NumMessageRecipients no more frequently than every 90 minutes. About every 90 minutes, each user creates a meeting invitation and responds to an invitation.

All R5Mail users access the name and address book, which resides on the SUT. All mail is delivered locally. With R4Mail, all users access a local name and address book, and mail is routed to destination servers. R5Mail message size is 10 times larger than R4Mail message size, and the name and address directory contains twice as many entries as the number of concurrent users.

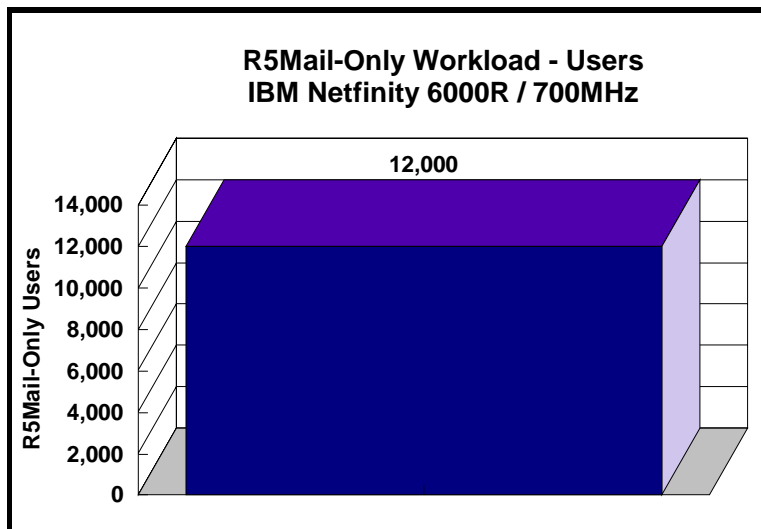
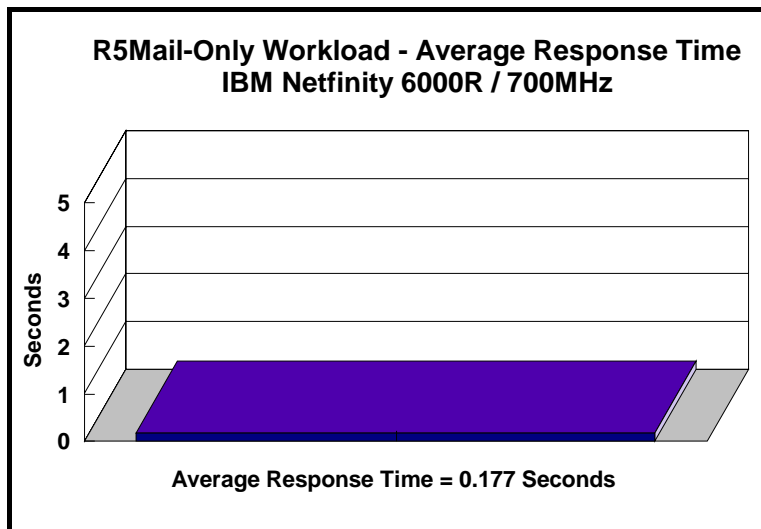
NotesNum Output for R5Mail-Only Test

Min Start Time = 05/19/2000 11:16:46 AM Max Stop Time = 05/19/2000 11:18:31 PM

Total Test Errors = 0

Total Test Time = 43320 sec

Test Run: Users = 12000 NotesMark = 16585 Response Time = 177 msec (05/19/2000 02:25:00 PM to 05/19/2000 10:56:00 PM)



Analysis

When configured optimally with two Domino partitions as described in this report, the IBM Netfinity 6000R server demonstrated that it can manage the intense resource usage that occurred during ramp-up to 12,000 concurrent R5Mail users with no errors at the clients.

Steady-State Performance Statistics

Use of PerfMon during the audit run showed that:

- Average processor utilization during ramp-up was slightly higher than processor utilization after ramp-up.
- Available memory decreased during ramp-up and increased during ramp-down.
- Queue lengths for disk I/O fluctuated during the run.

During steady state, the following PerfMon statistics were noted:

- Percentage of System Total Processor Utilization
 - Average: 68 percent
- Amount of Available Memory:
 - Average: 1.34GB
- Average Disk Queue Length for each array (D:, E:, F:, G:, H:, I:.) ranged from 2.55 to 3.0.
- Average Percentage of Free Disk Space available for each disk array was 26.75GB.
- Average Bytes/Second: 275KB per LAN segment
- I/O Statistics for a data array
 - Average I/O rate: 234 I/Os per second
 - Average Transfer Size: 12KB

Domino Partition Servers 5.03 allowed the use of multiple arrays to off-load user mail databases from the standard notes\data subdirectory.

Conclusions

The test results demonstrate that the IBM Netfinity 6000R configured using two Domino Partition servers can support up to 12,000 concurrent, active R5Mail-Only users with a response time well below that permitted by the test criteria. 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.

The remaining resources such as CPU power and physical memory, together with the expansion capability of the Netfinity 6000R (e.g., 8GB memory, 64-bit PCI slot), could allow the system to accommodate not only a higher number of mail users, but also additional Domino server tasks and other applications.

Statement by Auditor

The original “Lotus NotesBench Test Results Report Certification Letter” was signed by Daryl K. 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

Thirteen driver systems were used. Twelve of those systems were configured as client driver systems and one as the parent (source driver).

The client drivers were IBM IntelliStation M Pro systems, each configured with one 400MHz Pentium II processor. Each client driver was configured with 256MB of memory, one 8.4GB hard disk, and one IBM 10/100 Ethernet PCI Adapter.

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

- C: Partition (786MB - NTFS) - Windows 2000 Professional Edition
- D: Partition (7.2GB - NTFS) - Notes Client 5.03

Number of Server Platforms

One server platform, the IBM Netfinity 6000R with four 700MHz Pentium III Xeon processors and 4GB of memory was benchmarked.

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

- C: Single disk drive (9.1GB - NTFS) - Windows 2000 Advanced Server (Boot Partition), Domino Partition Server 5.03 executables and both Domino Partition servers' data directories and mail link files
- D: Partition (42.3GB - NTFS) - Domino mail files
- E: Partition (42.3GB - NTFS) - Domino mail files
- F: Partition (42.3GB - NTFS) - Domino mail files
- G: Partition (42.3GB - NTFS) - Domino mail files
- H: Partition (42.3GB - NTFS) - Domino mail files
- I: Partition (42.3GB - NTFS) - Domino mail files

Network

The network consisted of two LAN segments. The LAN segments, each consisting of two 12-port SuperStack 10/100 Hubs, were configured as follows:

- Segment 1 connected partition 1 on the SUT to child drivers 1, 3, 5, 7, 9, 11, and parent port 1.
- Segment 2 connected partition 2 on the SUT to child drivers 2, 4, 6, 8, 10, 12, and parent port 2.

Software Versions

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

- Microsoft Windows 2000 Advanced Server
- Lotus Domino Server Release 5.03
- NotesBench Version 5.03 - Windows/32, released April, 2000

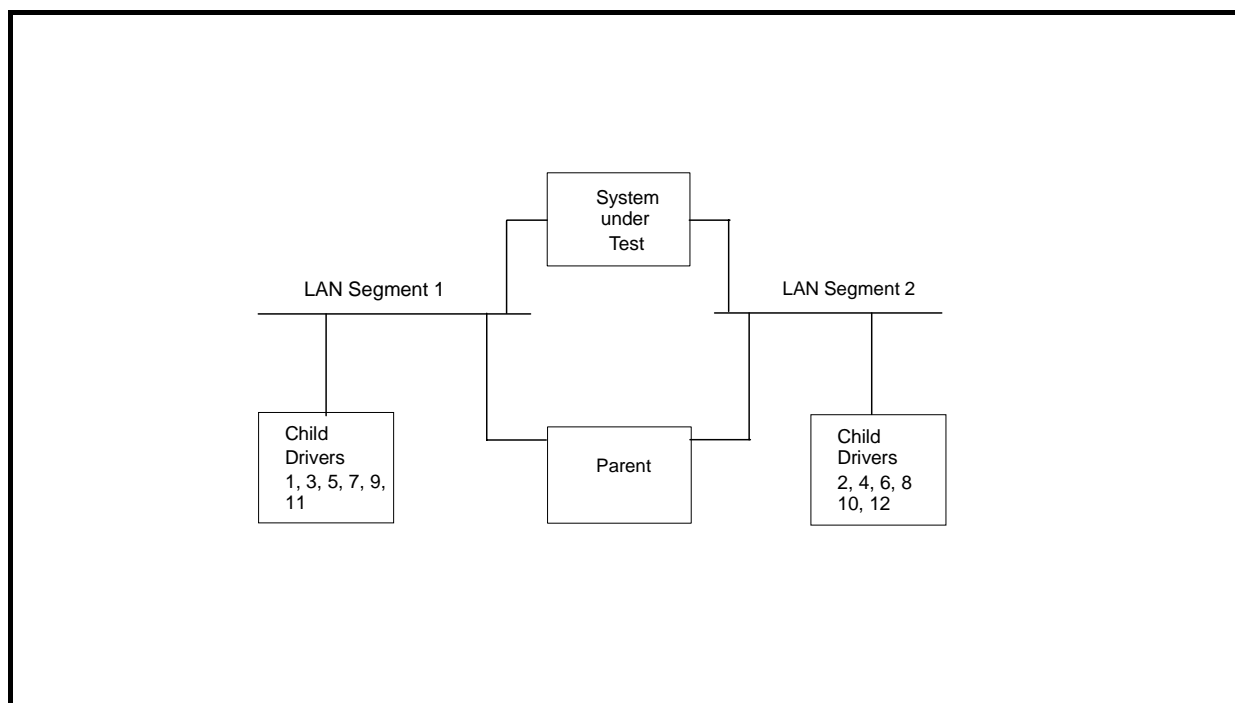
Software versions used on the child were as follows:

- Microsoft Windows 2000 Professional edition
- Lotus Domino Client Release 5.03 for Windows NT
- NotesBench Version 5.03 - Windows/32, released April, 2000

Software versions used on the parent driver were as follows:

- Microsoft Windows NT 4.0 Server with Service Pack 6.
- Lotus Domino Client-Administrator Release 5.03 for Windows NT
- NotesBench Version 5.03 - Windows/32, released April, 2000

Test Setup



Configuration

System Under Test	Child Drivers 1-12	Parent Source Driver
IBM Netfinity 6000R	IBM IntelliStation M Pro	IBM Personal 750
4 x 700MHz Pentium III Xeon Processor	1 x 400MHz Pentium Processor	1 x 100MHz Pentium Processor
4GB Memory	256MB Memory	128 MB Memory
2 x 9.1GB Drives (RAID-1 boot and code array) 30 x 18.2GB Drives (six RAID-1 mail arrays)	1 x 8.4GB Drive	1 x 4.51GB Drive
3 x ServeRAID-4H Ultra160 SCSI Adapter		
1 x Netfinity 10/100 Ethernet PCI Adapter 1 x integrated 10/100 Ethernet Controller	1 x Intel EtherExpress 10/100 PCI TX Adapter	2 x Intel EtherExpress 10/100 PCI TX Adapter
Windows 2000 Advanced Server	Windows 2000 Professional Edition	Windows NT 4.0 Server with Service Pack 6

Appendix B: System Configurations

Server under Test	
System	IBM Netfinity 6000R
Processor	4 x 700MHz Pentium III Xeon with 2MB L2 Cache
Memory	4GB
Cache	2MB L2 Write-Back Cache per Processor
RAID Controller	3 x Netfinity ServeRAID-4H Ultra160 SCSI Adapter
Disk Drive	2 x 9.1GB Drives (RAID-1 boot and code array) 30 x 18.2GB Drives (6 RAID-1 mail arrays)
Network Interface	1 x Netfinity 10/100 Ethernet PCI Adapter; 1 x integrated 10/100 Ethernet Controller
I/O	PCI Bus
Operating System	Microsoft Windows 2000 Advanced Server
Notes	Lotus Domino Partition Servers Release 5.03
NotesBench	NotesBench for Domino 5.03 - Windows/32, released April 2000

Clients 1-12	
System	IBM IntelliStation M Pro
Processor	1 x 400MHz Pentium II Processor
Memory	256MB
Disk Drive	1 x 8.4GB
Network Interface Adapter	1 x 10/100 Ethernet PCI Adapter
I/O	PCI Bus
Operating System	Microsoft Windows 2000 Professional Edition
Notes	Notes Client Release 5.03
NotesBench	NotesBench for Domino 5.03 - Windows/32, released April 2000

Parent Source Driver	
System	IBM Personal Computer 750
Processor	1 x 100MHz Pentium Processor
Memory	128MB
Disk Drive	1 x 4.51GB
Network Interface Adapter	IBM 10/100 Ethernet PCI Adapter
I/O	PCI Bus
Operating System	Microsoft Windows NT Server with Service Pack 6
Notes	Notes Client Administrator Release 5.03
NotesBench	NotesBench for Domino 5.03 - Windows/32, released April 2000

Appendix C: Operating System Parameters

In the system under test, the following registry variables were changed from their default values of 2 to 0:

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 for First Partition Server

[Notes]

```
Directory=c:\lotus\domino\data1
KitType=2
SetupDB=Setup.nsf
UserName=Jackal
CompanyName=Wacko
NotesProgram=C:\Lotus\Domino
InstallType=4
CONSOLE_Lotus_Domino_Server=80 300 7 111 3 779 334
;=====NotesBench's Parameters=====
NSF_Buffer_Pool_Size=350000000
Max_Users=10000
NSF_DBCache_Maxentries=10000
Server_Pool_Tasks=100
Server_Max_Concurrent_Trans=10000
LOG_SESSIONS=0
MAIL_LOG_TO_MISCEVENTS=1
LOG_MAILROUTING=10
SERVER_SHOW_PERFORMANCE=1
MAILUSEPROCESSES=0
NAMES=c:\lotus\domino\data1\names.nsf
No_Force_Activity_Logging=1
DEBUG_OUTFILE=\\NBTEST\Lastrun\SUT1_info.txt
;=====
WinNTIconPath=c:\lotus\domino\data1\W32
Timezone=5
DST=1
$$HasLANPort=1
WWWDSPP_SYNC_BROWSERCACHE=0
WWWDSPP_PREFETCH_OBJECT=0
EnablePlugins=1
Preferences=2147486833
AltNameLanguage=en
ContentLanguage=en-US
WeekStart=1
ViewWeekStart=2
NavWeekStart=2
XLATE_CSID=52
SPELL_LANG=1033
Region=en-US
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,
```


DESKWINDOWSIZE=-4-4 808 580
MAXIMIZED=1
CleanSetup=1
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
TRANSLOG_AutoFixup=1
TRANSLOG_UseAll=0
TRANSLOG_Style=0
TRANSLOG_Performance=2
TRANSLOG_Status=0
MTEnabled=0
SCHEDULE_VERSION=3
WebAdminSetup=503
DominoConfigLevel=3
Tcpiip_TcpiipAddress=0,192.1.2.220:1352
EnableJavaApplets=1
ECLSetup=3
DontShowAdminHelp=2
SERVERS_FRAME_PERCENT=20
MONITOR_SCALE=1
ADMINWINDOWSIZEWIN=1612 768 558
ADMINMAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
AdminSetup=502
TASKS_FRAME_PERCENT=30
MONITOR_VIEW_TYPE=0
MONITOR_DATA_STORAGE_HOURS=168
FileDlgDirectory=C:\Lotus\Notes\Data

NOTES.INI for Second Partition Server

[Notes]

Directory=c:\lotus\domino\data2
KitType=2
SetupDB=Setup.nsf
UserName=Jackal
CompanyName=Wacko
NotesProgram=C:\Lotus\Domino
InstallType=4
CONSOLE_Lotus_Domino_Server=80 300 7 108 233 776 564
;=====NotesBench's Parameters=====
NSF_Buffer_Pool_Size=350000000
Max_Users=10000
NSF_DBcache_Maxentries=10000
Server_Pool_Tasks=100
Server_Max_Concurrent_Trans=10000
LOG_SESSIONS=0
MAIL_LOG_TO_MISCEVENTS=1
LOG_MAILROUTING=10
SERVER_SHOW_PERFORMANCE=1
MAILUSEPROCESSES=0
NAMES=c:\lotus\domino\data2\names.nsf
No_Force_Activity_Logging=1

TCPIP=TCP, 0, 15, 0
Ports=TCPIP
TcpiptcpipAddress=0,192.1.20.220:1352
LOG_REPLICATION=0
LOG_SESSIONS=0
ExistingServerName=CN=sut/O=ibm
KeyFilename=c:\lotus\domino\data2\sut2.id
CertificateExpChecked=sut2.id 04/27/2000
ServerKeyFileName=sut2.id
MailServer=CN=sut2/O=ibm
Domain=ibm
Admin=admin
TemplateSetup=60
Setup=60
ServerSetup=50
DESKWINDOWSIZE=-4-4 808 580
MAXIMIZED=1
CleanSetup=1
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
TRANSLOG_AutoFixup=1
TRANSLOG_UseAll=0
TRANSLOG_Style=0
TRANSLOG_Performance=2
TRANSLOG_Status=0
MTEabled=0
SCHEDULE_VERSION=3
WebAdminSetup=503
DominoConfigLevel=3
EnableJavaApplets=1
ECLSetup=3
DontShowAdminHelp=2
SERVERS_FRAME_PERCENT=20
MONITOR_SCALE=1
ADMINWINDOWSIZEWIN=1612 768 558
ADMINMAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
AdminSetup=502
CertifierIDFile=C:\Lotus\Domino\Data\cert.id
ShowCertifierRecoveryWarning_C:\Lotus\Domino\Data\cert.id=1
NAMES=names.nsf
\$headlineDisableHeadlines=0
EmptyTrash=0
MIMEPromptMultilingual=1
MIMEMultilingualMode=1
EnableActiveXInBrowser=1
EnableJavaScript=1
EnableJavaScriptErrorDialogs=1
EnableLiveConnect=1
ShowAccelerators=1
DisableImageDithering=1
FileDlgDirectory=C:\Lotus\Domino\Data\ids
TASKS_FRAME_PERCENT=30
MONITOR_VIEW_TYPE=0
MONITOR_DATA_STORAGE_HOURS=168
AdminLastServer=sut2/ibm
Win32InfoboxPos=2 110

NBCONFIG.INI for Child Drivers

```
*****
; NotesBench parms
*****
; NotesBench parms
*****
NthIteration=6
Tmp=Notestmp
MaxSessions=100
NumAddLocalReplica=1
NumDeleteLocalReplica=1
NumStampLocalReplica=1
NumUpdateLocalReplica=1
NormalMessageSize=10000
NumMessageRecipients=3
NumMailNotesPerUser=100
AttachmentSize=500000
LargeMessageSize=32000
NodeName=ws01
MailTemplate=mail50.ntf
USESERVERNAB=1
ResultsDirectory=\\parent\results
DEBUG_OUTFILE=\\parent\results\res1
NumNotesLocalReplica=90
NumSharedNotes=900
NormalMessageSize=10000
ThreadStagger=0.5
Domain=IBM;*****
```

Appendix E: Network Configuration

The standard TCP/IP stack provided by Microsoft Windows 2000 Advanced Server. In the system under test, all network adapter speeds were set for 100 Mbps at Full Duplex mode.

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	IBM Estimated Reseller Enterprise Price
IBM Netfinity 6000R	8682-2RY	1	\$9,362	\$9,362
1 x 700MHz Pentium III Xeon Processor / 2MB L2 Cache 1 x Integrated 10/100Mbps Ethernet Controller				
700MHz / 2MB L2 Cache Processor Upgrade	00N7944	3	6,135	18,405
256MB DIMM	33L3115	16	779	12,464
Netfinity ServeRAID-4H Ultra160 SCSI Adapter	37L6889	3	2,098	6,294
Netfinity 9.1GB 10K-3 Wide Ultra2 SCSI Hot-Swap Hard Disk Drives	36L9748	2	479	958
Netfinity 18.2 10K-3 Wide Ultra2 SCSI Hot-Swap Hard Disk Drives	36L9749	30	849	25,470
Netfinity EXP200 Rack Storage Expansion Enclosure	35301RU	3	2,595	7,785
Netfinity 10/100 Ethernet PCI Adapter	34L1501	1	95	95
IBM G42 14" (13.2" Viewable) Color Monitor	654000N	1	169	169
Software				
Windows 2000 Advanced Server		1	3,919	3,919
Lotus Domino Server Release 5.03		1		
Total System Price				\$84,921

Appendix H: Vendor-Defined Information

None.

First Edition - May 2000

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