NotesBench Disclosure Report

for

IBM Netfinity 3500 M10

with

Lotus Domino 5.01 for Windows NT 4.0

Certified September 20, 1999

IBM Corporation

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Edition Notice

Executive Summary

Performance measurements using NotesBench were conducted with the IBM Netfinity* 3500 M10 (Model 8655-21Y) running Lotus** Domino** Server Release 5.01 on Microsoft** Windows** NT Server 4.0 with Service Pack 5. Results for the IBM Netfinity 3500 M10 are based on the NotesBench R5Mail-Only workload run on a RAID-1 configuration. The results are summarized in the following table.

Test Script	Maximum Users	NotesMark (tpm)	Ave. Response Time (sec)	$/User	$/NotesMark
R5Mail-Only	3,000	4,162	0.308	$6.65	$4.79

The IBM Netfinity 3500 M10, configured with one 550MHz[1] Intel** Pentium** III processor, 1GB of memory, and two 18.2GB and ten 9.1GB[2] hard disk drives (configured as a RAID-1 array), supported an R5Mail-Only workload of 3,000 active mail users. All configuration details are provided in Appendix A: Overall Test Setup and Software Versions.

The server under test supported an R5Mail-Only workload of 3,000 active mail users (see price/performance results[3] above). The R5Mail workload is considerably more intense than that for R4Mail. For example, R5Mail message size is 10 times larger than that of R4Mail. Meeting invitations have been added, and the Name and Address Book is required to hold twice as many names as the number of concurrent users. In addition to routing the mail, the server now must resolve every address lookup and deliver locally all mail generated. Because of these significant differences in workload, R5Mail-Only benchmark results should not be compared with R4Mail-Only results.

IBM's Netfinity Server Performance Laboratory in Research Triangle Park, NC, conducted the benchmark in August 1999, and KMDS Technical Associates, Inc., audited the results in September 1999.

NotesBench provides an objective method for evaluating the performance of different platforms running Lotus Domino Server Release 5.0x. 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 5.0x R5Mail-only users supported on a RAID-1 configuration of the IBM Netfinity 3500 M10 Model 8655-21Y. Performance measurements on IBM Netfinity servers using NotesBench for the Domino Server Release 5.0x are ongoing.

Test Methodologies

Test Setup and Hardware/Software Configuration

The IBM Netfinity 3500 M10 system under test used one 550MHz Pentium III processor (512KB of L2 write-back cache); 1GB of memory, and two 18.2GB and ten 9.1GB 10K-rpm Wide Ultra SCSI hard disks. Three Netfinity ServeRAID-3L Ultra2 SCSI Adapters were used for this test. The system under test and the client driver systems were connected to the SUT through a single 100Mbps Ethernet LAN segment, using the TCP/IP network protocol. An IBM PC Server 320 system was used as the source driver (parent) system; IBM IntelliStation** M PRO systems were used as the client drivers.

The IBM Netfinity 3500 M10 system under test (SUT) ran Microsoft Windows NT Server Version 4.0 and Domino Server Release 5.01. All clients used the SUT's Name and Address Book, which contained person documents for 6,000 mail recipients who were randomly selected by each active R5Mail user. The SUT contained mail files for 3,000 R5Mail users for the RAID-1 configuration.

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

R5Mail-Only Workload
Mail_Number_Of_MailBoxes = 1
Max_Users = 10000
NSF_DBcache_Maxentries = 10000
Server_Pool_Tasks = 100
Server_Max_Concurrent_Trans = 1000
Log_Sessions = 0
Log_MailRouting = 10
MailLogToEventsOnly = 1
MailUseProcess = 0
MailUseThreads = 1
MailMaxThreads = 4
Server_Show_Performance = 1
NAMES = names.nsf

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 mail data files were distributed across the E: and F: partitions. The Domino data and mail data link files were located on the D: partition.

The transaction logging option was enabled for this audit run. The log was located on the D: partition. Parameters set for the transaction log were as follows:

- TRANSLOG_AutoFixup=1
- TRANSLOG_UseAll=0
- TRANSLOG_Performance=2
- TRANSLOG_MaxSize=1000
- TRANSLOG_Path=d:\domino\Data\Tlog
- TRANSLOG_Status=1

Test Procedures

Six child drivers were used; the number of users simulated in child drivers 1 through 4 were, respectively, 750, 750, 750, and 750. 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, 3, 3, 3, and 3 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. The ramp-up time was approximately 2 hours.

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 30 minutes throughout the test run.

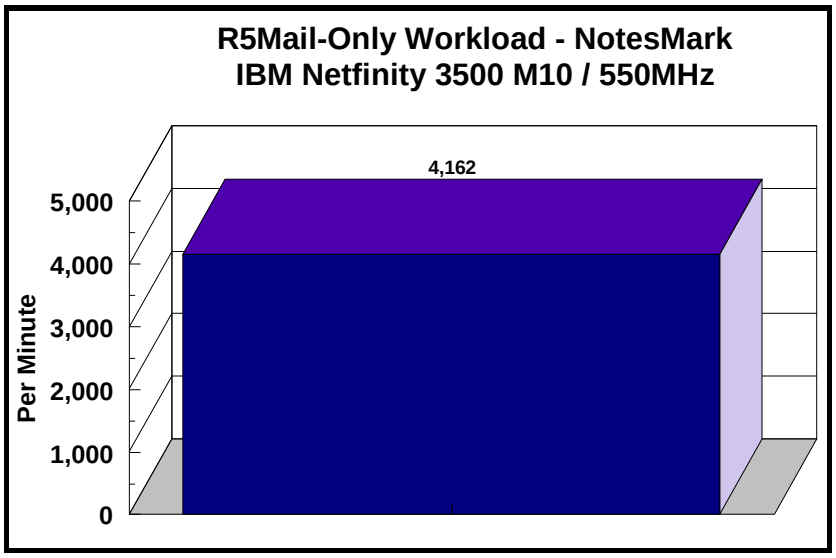
We also used the Show Stat Mail command on the server to verify that at least 90 percent of the mail generated during the test period was delivered to the local mail databases during the test period. In fact, during the test period, the SUT Domino Server delivered more than 99.9 percent of the mail generated to the local mail databases.

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

Data

IBM Netfinity 3500 M10 NotesMark Value for R5Mail-Only Test

The Netfinity 3500 M10 server ran for a period of six hours and demonstrated that it can support 3,000 concurrent active R5Mail users. The NotesMark throughput value was 4,162. Average response time was .308 seconds.



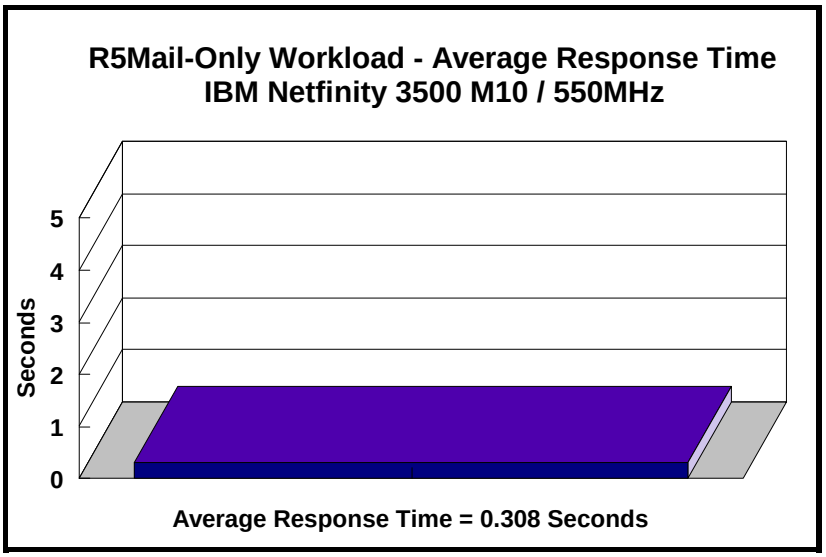
The R5Mail workload executes Notes transactions that model a server for mail users at sites that rely only on mail for communication. The resulting capacity metric for a mail-only server is the maximum number of users that can be supported before the average user response time becomes unacceptable.

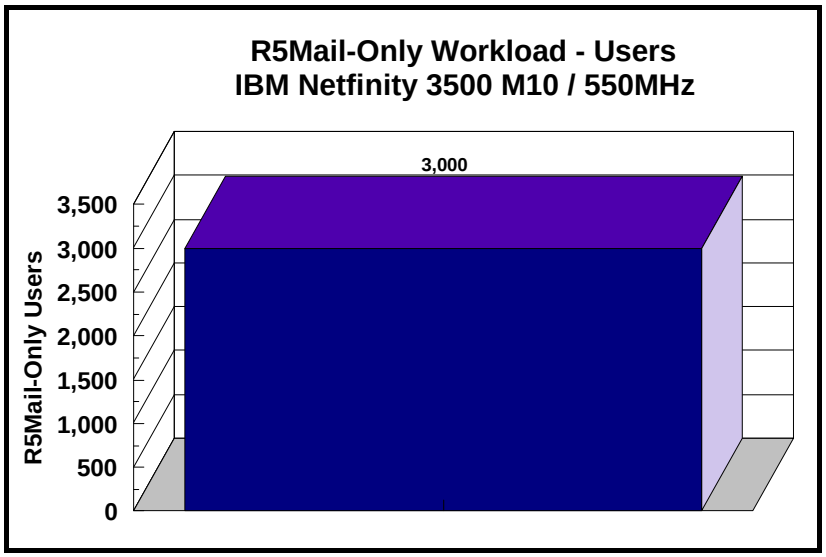
The Domino R5Mail-Only test script models an active user who is reading and sending mail. The script contains an average of 15 minutes of waiting; thus, the average user would execute this script a maximum of four times each hour. For each iteration of the test script, there are 5 documents read, 2 documents 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.

Compared with the previous Domino R4Mail-Only workload, the R5Mail-Only workload generates more data traffic at the system under test. 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 = 09/01/99 01:10:17 PM Max Stop Time = 09/01/99 10:35:43 PM
Total Test Errors = 0
Total Test Time = 33900 sec
Test Run: Users = 3000 NotesMark = 4162 Response Time = 308 msec (09/01/99 02:45:00 PM to 09/01/99 10:31:00 PM)



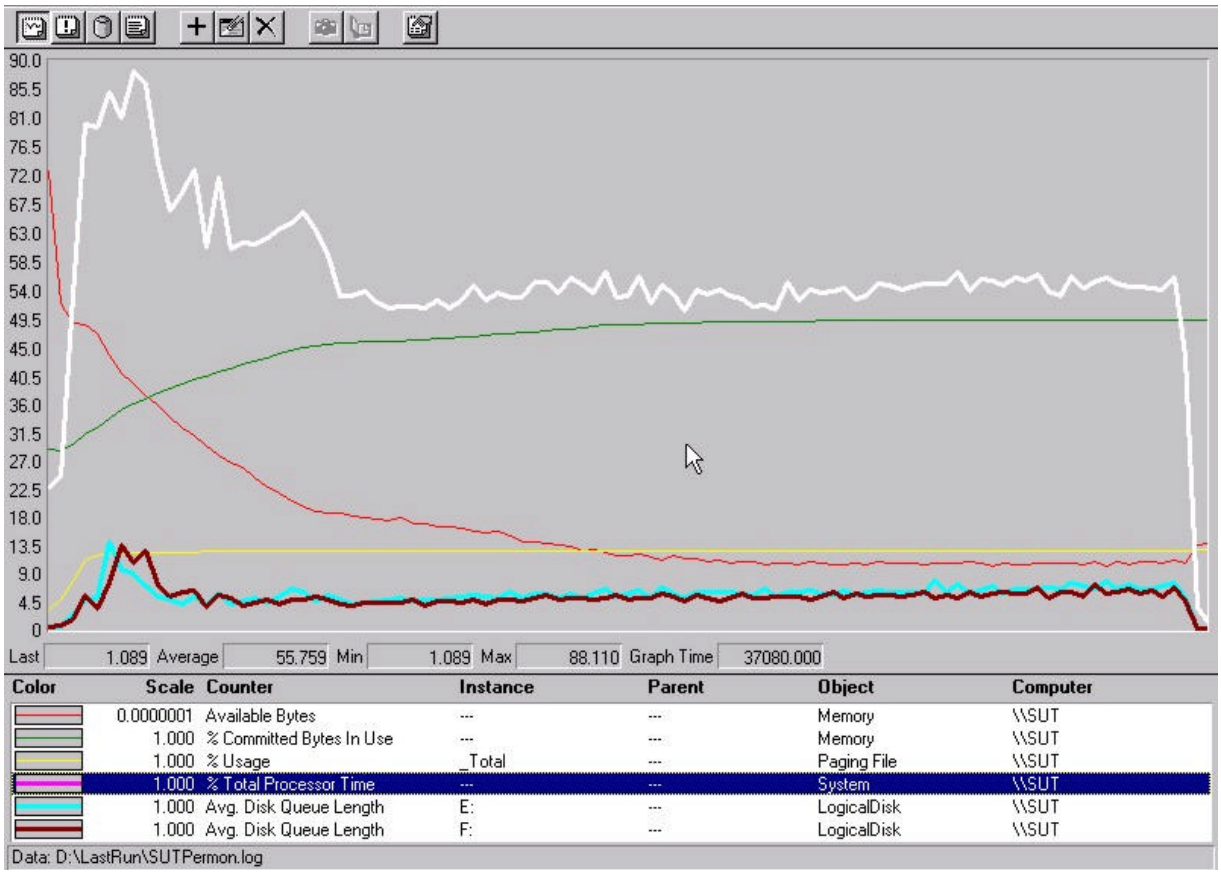


Analysis

PERFMON data was collected for a shorter run when the system was ramped up for about three hours. Ramp-up through shutdown is shown in the screen capture below.

Steady State Values	Domino Data in RAID-1
Maximum Concurrent Mail Users	3,000
Average CPU Utilization	58%
Average Memory Used *	851MB
Average Pagefile Usage	1.440
Average Physical Disk Q Length	6

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. All users ran error-free for more than 7 hours before the controller client performed an orderly stop of the run.



Conclusions

These NotesBench results demonstrate that the IBM Netfinity 3500 M10 (Model 8655-21Y) can support 3,000 R5Mail-only users. The results obtained are based on running the IBM Netfinity 3500 M10 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 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

Five driver systems were used. Four 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 100/10 Ethernet PCI Adapter.

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

C: Partition (1GB - NTFS) - Windows NT Workstation 4.0
D: Partition (7.2GB - NTFS) - Notes client 5.01

Number of Server Platforms

One server platform, the IBM Netfinity 3500 M10 with one 550MHz Pentium III processor 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 5.01 executables
- D: Partition (13.5GB - NTFS) - Domino 5.01 data and mail link files
- E: Partition (21.5GB - NTFS) - Actual NotesBench mail files
- F: Partition (21.5GB - NTFS) - Actual NotesBench mail files

Network

A single 100Mbps Ethernet LAN segment was used to connect all systems.

Software Versions

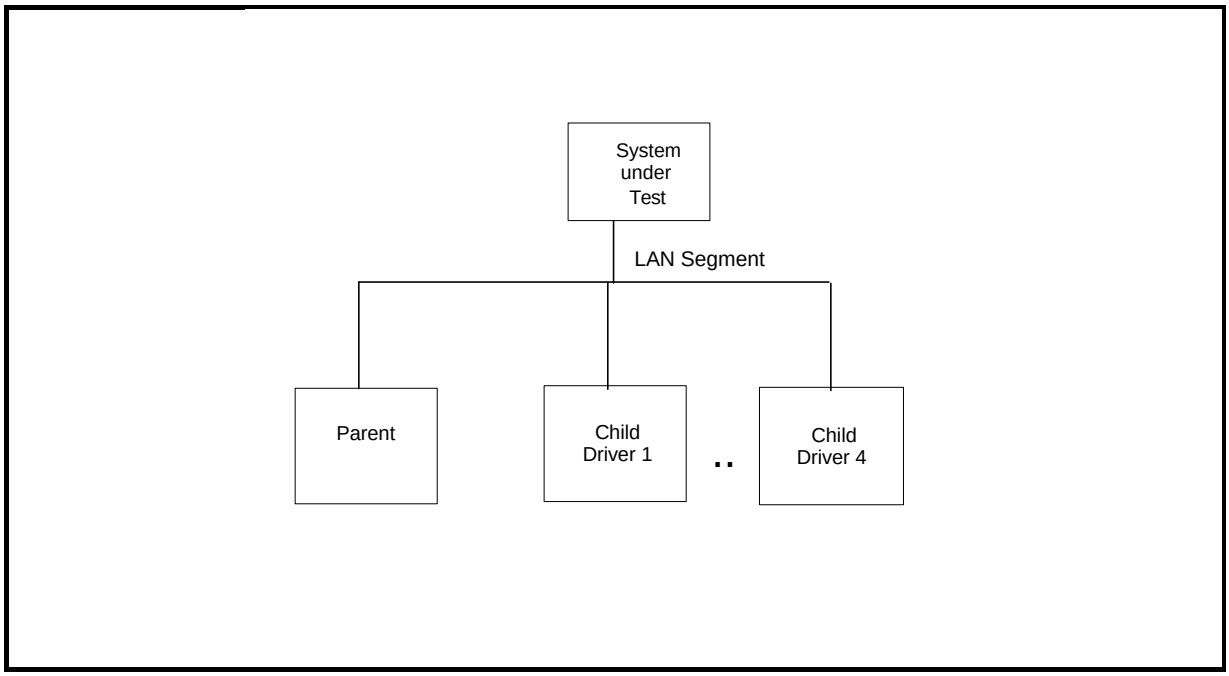
Software versions used on the system under test were as follows:

- Microsoft Windows NT Server 4.0 with Service Pack 5
- Lotus Domino Server Release 5.01
- NotesBench Version 5.0 - Windows/32, released March 12, 1999

Software versions used on the child drivers were as follows:

- Microsoft Windows NT Workstation 4.0 with Service Pack 5
- Lotus Domino Client Release 5.01 for Windows NT Workstation 4.0
- NotesBench Version 5.0 - Windows/32, released March 12, 1999

Test Setup Diagram



Details of Configuration

System Under Test	Child Drivers 1-4	Parent Source Driver
IBM Netfinity 3500 M10	IBM IntelliStation M PRO	IBM PC Server 320
1 x 550MHz Pentium III	1 x 400MHz Pentium II	1 x 100MHz Pentium Pro
1GB Memory	256MB Memory	128MB Memory
10 x 9.1GB Drives 2 x 18.2GB	1 x 8.4GB Drive	1 x 4.51GB Drive
3 x ServeRAID-3L Ultra2 SCSI Adapter		
IBM Ethernet 100/10 PCI Controller	IBM 100/10 Ethernet PCI Adapter	IBM 100/10 Ethernet PCI Adapter
Windows NT Server 4.0 with Service Pack 5	Windows NT Workstation 4.0 with Service Pack 5	Windows NT 4.0 Workstation with Service Pack 5

Appendix B: System Configurations

Server under Test	
System	IBM Netfinity 3500 M10
Processor	1 x 550MHz Pentium III Processor
Memory	1GB
Cache	512KB L2 Write-Back Cache
Disk Controller	3 x Netfinity ServeRAID-3L Ultra2 SCSI Adapter
Disk Drive	10 x 9.1GB 10K rpm Drives (10 drives contained two RAID-1 arrrays), 2 x 18.2GB 10K rpm drives (2 drives contained one RAID-1 array, including the boot drive)
Network Interface Adapter	Integrated Ethernet 100/10 Controller
I/O	PCI Bus
Operating System	Microsoft Windows NT Server 4.0 with Service Pack 5
Notes	Lotus Domino Server Release 5.01 for Windows NT Server 4.0
NotesBench	NotesBench Version 5.0 - Windows/32, released March 12, 1999

Clients 1-4	
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 100/10 Ethernet PCI Adapter
I/O	PCI Bus
Operating System	Microsoft Windows NT Workstation 4.0 with Service Pack 5
Notes	Notes Client Release 5.01 for Windows NT Workstation 4.0
NotesBench	NotesBench Version 5.0 - Windows/32, released March 12, 1999

Parent Source Driver	
System	IBM PC Server 320
Processor	1 x 100MHz Pentium Pro Processor
Memory	128MB
Disk Drive	1 x 4.51GB
Network Interface Adapter	IBM 100/10 Ethernet PCI Adapter
I/O	PCI Bus
Operating System	Microsoft Windows NT Workstation 4.0 with Service Pack 5
Notes	Notes Client Release 5.01 for Windows NT Workstation 4.0
NotesBench	NotesBench Version 5.0 - Windows/32, released March 12, 1999

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

```
[Notes]

Directory=D:\Domino\Data
KitType=2
SetupDB=Setup.nsf
UserName=Jackal
CompanyName=Wacko
NotesProgram=C:\Domino
InstallType=4
;================NotesBench's Parameters==========================
Mail_Number_Of_MailBoxes=1
Max_Users=10000
NSF_DBcache_Maxentries=10000
Server_Pool_Tasks=100
Server_Max_Concurrent_Trans=1000
MAILLOGTOEVENTSONLY=1
LOG_SESSIONS=0
LOG_MAILROUTING=10
SERVER_SHOW_PERFORMANCE=1
MAILUSEPROCESSES=0
NAMES=names.nsf
No_Force_Activity_Logging=1
DEBUG_OUTFILE=\\NBTEST1\Lastrun\sutinfo.txt
;================================================================
CONSOLE_Lotus_Domino_Server=80 25 7 109 22 761 353
WinNTIconPath=D:\Domino\Data\W32
$$HasLANPort=1
WWWDSP_SYNC_BROWSERCACHE=0
WWWDSP_PREFETCH_OBJECT=0
EnablePlugins=1
Preferences=-2147480463
Region=en-US
AltNameLanguage=en
ContentLanguage=en-US
WeekStart=1
ViewWeekStart=2
NavWeekStart=2
XLATE_CSID=52
SPELL_LANG=1033
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,
EDITIMP9=HTML File,0,_IHTML,,.HTM,.HTML,,1,
EDITIMP17=WordPerfect 5.x,0,_IW4W,W4W07F/V1,.DOC,.WPD,,2,
EDITIMP21=WordPro 96/97,0,_IW4W,W4W12F/V0,.LWP,,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 spreadsheet,0,_IW4W,W4W21F/V4C,.XLS,,4,
EDITIMP31=Word for Windows,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=030042617369630000000000000000000000000000000000000000000000000000001010100000A000000000000100A0050A0000006400A
0050A000000000000000000000000000000000000000000000000000000000000000000000000009404000000000000
NAMEDSTYLE0_FACE=Default Sans Serif
NAMEDSTYLE1=030042756C6C6574000000000000000000000000000000000000000000000000000001010100000A000000000000000008070A00000064000
8070A00000000000000000000000000000000000000000000000000000000000000000000000000494040000000000000
NAMEDSTYLE1_FACE=Default Sans Serif
NAMEDSTYLE2=0300486561646C696E6500000000000000000000000000000000000000000000000010101010B0C000000000000100A0050A0000006400
A0050A000000000000000000000000000000000000000000000000000000000000000000000000009404000000000000
NAMEDSTYLE2_FACE=Default Sans Serif
$$$OpenSpecial=NotesNIC
$$$NotesNIC=CN=Home/OU=Notes/O=NET, welcome.nsf, Notes NIC Welcome, Notes Network Information Center on the Internet
DefaultMailTemplate=mail50.ntf
ServerTasks=Router,Replica,Update
;==
;ServerTasks=Router,Replica,Update,Amgr,AdminP,CalConn,Event,Sched,Stats,maps
;ServerTasksAt1=Catalog,Design
;ServerTasksAt2=UpdAll,Object Collect mailobj.nsf
;ServerTasksAt3=Object Info -Full
;ServerTasksAt5=Statlog
;==
TCPIP=TCP, 0, 15, 0
Ports=TCPIP
LOG_REPLICATION=1
LOG_SESSIONS=1
KeyFilename=server.id
CertificateExpChecked=server.id 07/09/99
CertifierIDFile=D:\Domino\Data\cert.id
MailServer=CN=SUT/O=NotesBench
ServerKeyFileName=server.id
Domain=NotesBench
Admin=CN=Admin/O=NotesBench
TemplateSetup=54
Setup=58
ServerSetup=50
DESKWINDOWSIZE=-4 -4 808 580
MAXIMIZED=1
ECLSetup=3
NAMES=names.nsf
$MIMESaveFormat=132
$headlineDisableHeadlines=0
EmptyTrash=0
MIMEPromptMultilingual=1
MIMEMultilingualMode=1
EnableJavaApplets=0
EnableActiveXInBrowser=1
EnableJavaScript=1
EnableJavaScriptErrorDialogs=1
EnableLiveConnect=1
ShowAccelerators=1
DisableImageDithering=1
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
FileDlgDirectory=D:\Domino\Data
Timezone=5
DST=1
CleanSetup=1
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
MTEnabled=0
SERVERS_FRAME_PERCENT=20
MONITOR_SCALE=1
ADMINWINDOWSIZEWIN=16 12 768 558
ADMINMAXIMIZED=0
AdminSetup=500
ShowCertifierRecoveryWarning_D:\Domino\Data\cert.id=1
HELPWINDOWSIZEWIN=47 49 729 462
Win32InfoboxPos=2 110
TRANSLOG_AutoFixup=1
TRANSLOG_UseAll=0
TRANSLOG_Style=0
TRANSLOG_Performance=2
TRANSLOG_MaxSize=1000

```
TRANSLOG_Path=d:\domino\Data\Tlog
TRANSLOG_Status=1
Previous_TRANSLOG_Status=1
Previous_TRANSLOG_Path=d:\domino\Data\Tlog\
Previous_TRANSLOG_Style=0
TASKS_FRAME_PERCENT=30
MONITOR_VIEW_TYPE=0

MONITOR_DATA_STORAGE_HOURS=168
```

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. Also provided are prices obtained from CDW Computer Centers, Inc. (847-371-6003). The price/performance results in this document are based on CDW's pricing. 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	Reseller Unit Price	Extended Reseller Price
IBM Netfinity 3500 M10	8655-21Y	1	$2,309	$2,309	$2,297	$2,297
1 x 550MHz / 512KB L2 Cache Pentium III Processor						
1 x 64MB ECC DIMM						
Integrated 100/10Mbps Ethernet PCI Controller						
Netfinity ServeRAID-3L Ultra2 SCSI Adapter	01K7364	3	785	2,355	751	2,253
256MB SDRAM ECC DIMM	01K1132	4	695	2,780	680	2,720
Netfinity 18.2GB Wide Ultra SCSI Hard Disk	36L9807	2	1,329	2,658	1,287	2,574
Netfinity 9.1GB 10K Wide Ultra SCSI Hard Disk	36L9806	10	715	7,150	689	6,890
Netfinity EXP15 Rack Storage Expansion Enclosure	35202RU	1	2,419	2,419	2,317	2,317
IBM G42 14" (13.2" Viewable) Color Monitor	654000N	1	209	209	212	212
Software						
Windows NT Server 4.0	227-01025	1	683	683	683	683
Lotus Domino Server Release 5.0 included on ServerGuide* with IBM Netfinity 3500 M10 at no charge		1	0	0	0	0
Total System Price				$20,562		$19,946

Appendix H: Optional (Vendor-Defined Information)

None.

First Edition - September 1999

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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 provided by CDW Computer Centers, Inc. IBM resellers set their own prices, and actual prices may vary.