

**NotesBench Disclosure Report**  
**for**  
**IBM @server xSeries 370**  
**using**  
**Lotus Domino Server 5.04a**  
**and**  
**Windows 2000 Advanced Server**

**Results Certified July 25, 2001**

**IBM Corporation**



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***Edition Notice***

## Executive Summary

The IBM® @server™ x370 demonstrated leadership performance running Lotus® Domino® Server Release 5.04a on Microsoft® Windows® 2000 Advanced Server. 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	12,800	17,423	0.426	\$7.31	\$5.37

The xSeries 370 server was configured with four 900 MHz<sup>1</sup> Intel® Pentium® III Xeon™ processors, 4GB<sup>2</sup> of memory, and 47 hard disk drives. Two Domino partitions, which were part of the same domain, shared a mail directory containing more than 36,000 person documents. For complete configuration details, see Appendix A: Overall Test Setup and Software Versions.

The server under test supported an R5Mail-Only workload of 12,800 active mail users (see price/performance results<sup>3</sup> above), configured with two Domino partitions.

IBM's xSeries Server Performance Laboratory in Research Triangle Park, NC, conducted the benchmark in June, and KMDS Technical Associates, Inc., audited the results in July 2001.

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 utilize the capability of the xSeries 370 system as a Domino Server 5.04 mail server configured with the ServeRAID Ultra160 SCSI Adapter for RAID-1 data redundancy.

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

<sup>2</sup> When referring to hard drive capacity, GB stands for one thousand million bytes. Total user-accessible capacity may be less.

<sup>3</sup> The price/performance results are based on IBM's estimated reseller pricing. IBM resellers set their own prices, and actual prices may vary.

## Test Methodologies

### *Test Setup and Hardware/Software Configuration*

The xSeries 370 system under test (SUT) was configured with four 900MHz Pentium III Xeon processors (2MB of ECC full-speed L2 write-back cache and 100MHz frontside bus per processor), 4GB of memory, 47 18.2GB 10K rpm hard disk drives. Six RAID-1 arrays, each composed of seven hard drives, which contained the mail files, were connected to a channel on a ServeRAID-4M Ultra160 SCSI Adapter. Five hard drives, two of which were contained in a RAID-0 array that was used as the boot disk and three of which were contained in a RAID-1 array that was used as Domino program drive, were connected to a ServeRAID-4L Ultra160 SCSI Adapter. A more detailed description of the configuration of the RAID-1 arrays is provided in Appendix A.

The network consisted of two LAN segments; each segment consisted of one 16-port IBM Type 8371-A16 switch and two 10/100 Ethernet Server Adapters were installed in the xSeries 370 system under test. The LAN segments were configured as follow:

- Segment 1 connected to partition 1 on the SUT to child drivers 1, 3, 5, 7, 9, 11, 13, and parent 1
- Segment 2 connected to partition 2 on the SUT to child drivers 2, 4, 6, 8, 10, 12, 14, and parent 2

The IBM xSeries 370 system under test ran Microsoft Windows 2000 Advanced Server and Domino Server 5.04a.

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 as recommended in the NotesBench operator's manual.

<b>R5Mail-Only Workload</b>
Server_Max_Concurrent_Trans=500
NSF_DBcache_MaxEntries=10000
NSF_Buffer_Pool_Size_MB=350
MailLogToEventsOnly=1
Log_MailRouting=10
Log_Sessions=0
Mail_Number_Of_MailBoxes=2
Server_Pool_Tasks=100
Max_Users=10001
DBMaxEntries=10000

In the Server-Configuration document for both partitions, two mail.boxes were used on each partition for mail routing.

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
Tcplp_TcplpAddress=0,192.1.1.x:1352
Debug_Outfile=j:\tmp\SUTyINFO.TXT
```

In the last two lines above, x is the net address and y is the partition number for the corresponding partition.

All Notes server tasks were disabled except Router.

All Domino data files were located on the D:, E:, F:, G:, H:, I:, and J: RAID-1 arrays. The Domino executable codes and data link files were located on the J: RAID-1 array. The first partition used the D:, E:, and F: arrays for the mail file; partition 2 used the G:, H:, and I: arrays.

## ***Test Procedures***

Several trial runs were conducted starting with a single Domino server to attempt to exhaust at least one of the system resources: 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 resource was installed. System resource utilization was monitored using Windows 2000 Performance Monitor (PERFMON), which enabled the system configuration to be optimized while balancing system resources.

The 12,800 users were distributed over 14 clients. Each client added 400 to 1,000 users to the system under test. The test ran for 12 hours and 9 minutes, including ramp-up. Child 1 through child 12 simulated 1,000 users each, child 13 and child 14 simulated 400 users each. The actual ramp-up period from startup of child 1 to the point when all 12,800 users were shown on the server console was approximately 6 hours. The test ran for more than 6 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 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.

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

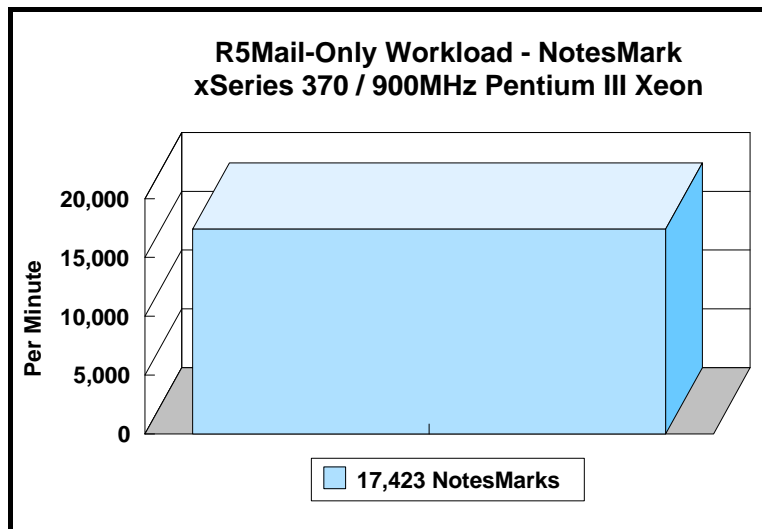
### ***Other NotesBench Tests***

IBM intends to continue conducting NotesBench measurements to further optimize and exploit the performance capability of the xSeries product line running Domino Server 5.04a.

## Data

### ***xSeries 370 NotesMark Value for R5Mail-Only Test***

The xSeries 370 server demonstrated that it can support 12,800 concurrent, active users with this workload. The NotesMark throughput value was 17,423. Average response time was 0.426 seconds. The test ran error-free for a period of 12 hours and 9 minutes.



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.

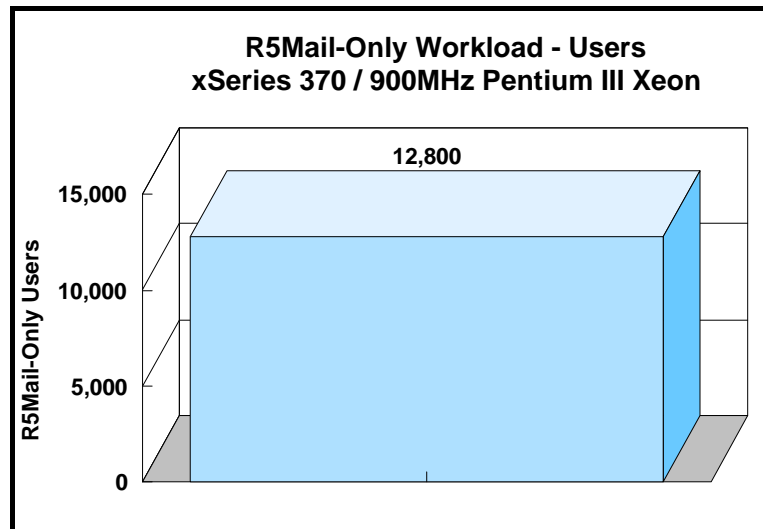
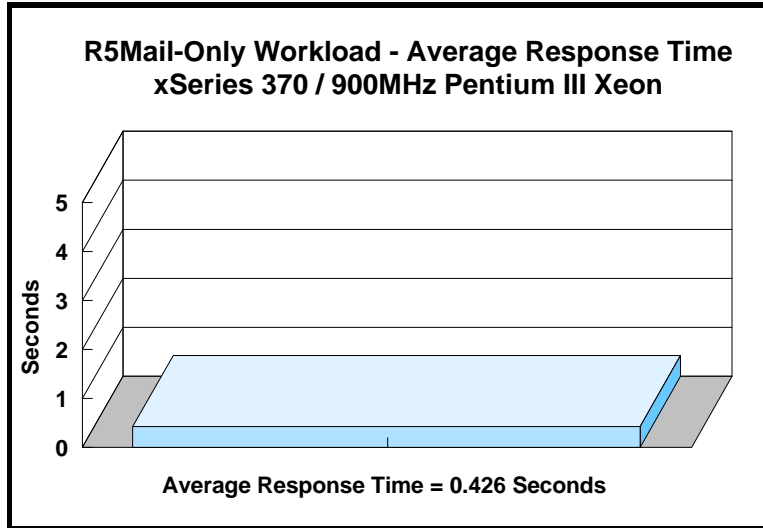
### NotesNum Output for R5Mail-Only Test

Min Start Time = 06/29/2001 09:25:48 AM Max Stop Time = 06/29/2001 06:28:06 PM

Total Test Errors = 0

Total Test Time = 32580 sec

Test Run: Users = 12800 NotesMark = 17423 Response Time = 426 msec (06/29/2001 11:47:00 AM to 06/29/2001 06:17:00 PM)





## Analysis

When configured optimally as described in this report, the xSeries 370 server demonstrated that it can manage the intense resource usage during ramp-up to 12,800 concurrent R5Mail users with no errors at the clients. During the steady-state period on one of the successful 13,000-user runs, the average CPU utilization was 98.8 percent. The average available memory was 1.08GB.

The transaction logging option was not enabled for this audit run. When this option is enabled, we recommended 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.

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## Conclusions

The test results demonstrate that the xSeries 370 configured as described in this report can support up to 12,800 concurrent, active R5Mail users with a response time well below that permitted by the test criteria.

These results are based on running the xSeries 370 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.

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## **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.

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## Appendix A: Overall Test Setup and Software Versions

### ***Number of Client Systems***

For the R5Mail-Only test, 16 driver systems were used. Fourteen of those systems were configured as child drivers (child 1 through child 14). Two parent systems were used to control the run.

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

- Child drivers 1-14
  - C: Partition (2GB - NTFS) - Windows 2000
  - D: Partition (6.5GB - NTFS) - Notes 5.04a code and data

### ***Number of Server Platforms***

One server platform, the xSeries 370 with four 900MHz 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 (16.9GB - NTFS) - Windows 2000 Advanced Server (Boot Partition)
- D: Partition (60GB - NTFS) - Domino mail files
- E: Partition (60GB - NTFS) - Domino mail files
- F: Partition (60GB - NTFS) - Domino mail files
- G: Partition (60GB - NTFS) - Domino mail files
- H: Partition (60GB - NTFS) - Domino mail files
- I: Partition (60GB - NTFS) - Domino mail files
- J: Partition (20.5GB - NTFS) - Domino executables and Domino mail data subdirectory

### ***Network***

The network consisted of two segments. All child drivers, parents and SUT were connected to one of 16 ports on two IBM TYPE 8371 A-16 switches. Two 10/100 Ethernet Server Adapters were installed in the xSeries 370 system under test. The LAN segments were configured as follow:

- Segment 1 connected to partition 1 on the SUT to child drivers 1, 3, 5, 7, 9, 11, 13, and parent 1.
- Segment 2 connected to partition 2 on the SUT to child drivers 2, 4, 6, 8, 10, 12, 14, and parent 2.

## **Software Versions**

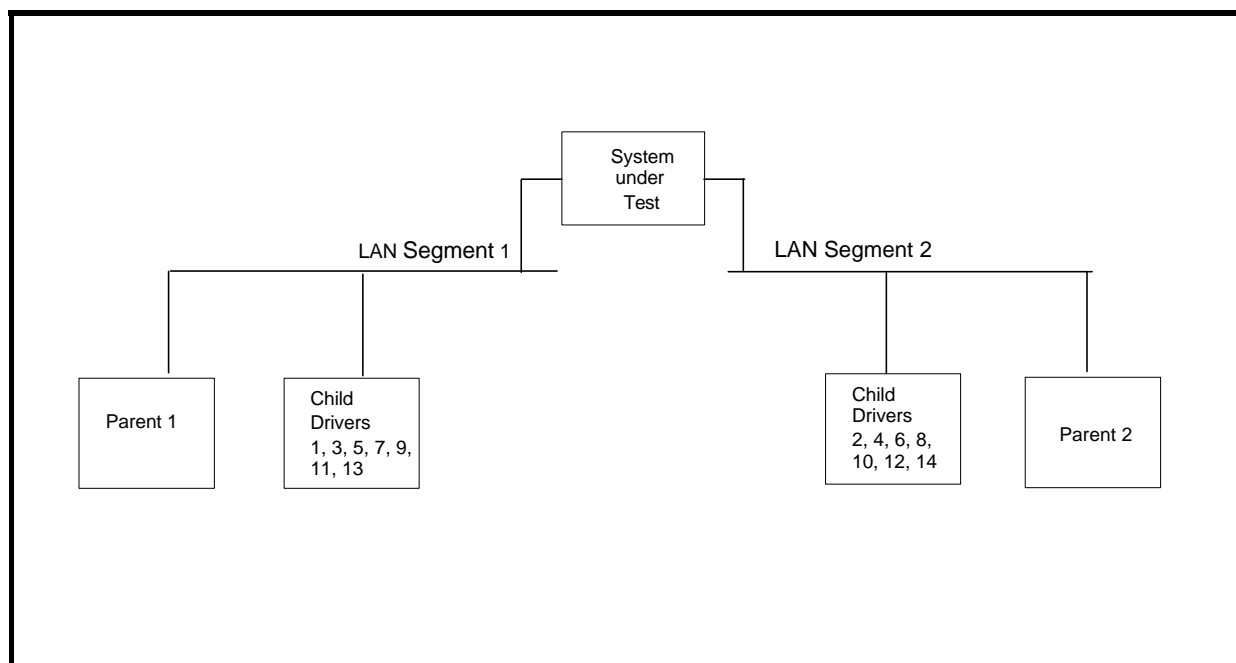
Software versions used on the system under test were as follows:

- Microsoft Windows 2000 Advanced Server and Service Pack 1
- Lotus Domino Server Release 5.04a for Windows 2000

Software versions used on the child and parent drivers were as follows:

- Microsoft Windows 2000 Professional for child drivers and Windows 2000 Server for the parent systems
- Lotus Domino Client Release 5.04a for Windows 2000
- NotesBench Version 5.04 - Windows/32, released August 10, 2000

## Test Setup Diagram



## Details of Configuration

System Under Test	Parent 2 Source Driver and Child Drivers 1-14	Parent 1 Source Driver
xSeries 370	IBM IntelliStation M Pro	IBM PC Server 325
4 x 900MHz Pentium III Xeon Processor	1 x 500MHz Pentium III	1 x 233MHz Pentium II
4GB Memory	256MB Memory	128MB Memory
47 x 18.2GB Drives (7 RAID-1 arrays)	1 x 9.1GB Drive	2 x 4.51GB Drive
1 x ServeRAID-4L Ultra160 SCSI Adapter 3 x ServeRAID-4M Ultra160 SCSI Adapter		
2 x 10/100 Ethernet Server Adapter	Integrated 10/100 Ethernet Controller	Integrated 10/100 Ethernet Controller
Microsoft Windows 2000 Advanced Server	Microsoft Windows 2000 Professional	Microsoft Windows 2000 Server

## Appendix B: System Configurations

Server under Test	
<b>System</b>	xSeries 370
<b>Processor</b>	4 x 900 MHz Pentium III
<b>Memory</b>	4GB
<b>Cache</b>	2 MB ECC Full-Speed L2 Cache per Processor
<b>RAID Controller</b>	1 x ServeRAID-4L and 3 x ServeRAID-4M Ultra160 SCSI Adapters
<b>Disk Drive</b>	42 x 18.2GB 10K rpm (configured as six RAID-1 arrays) 5 x 18.2GB 10K rpm (configured as one RAID-1 array, plus a RAID-0 for system boot)
<b>Network Interface</b>	2 x 10/100 Ethernet Server Adapter
<b>I/O</b>	PCI Bus (64 Bit/33 MHz)
<b>Operating System</b>	Microsoft Windows 2000 Advance Server
<b>Notes</b>	Lotus Domino Server Release 5.04a for Windows 2000

Parent 2 Source Driver and Child Drivers 1 - 14	
<b>System</b>	IBM IntelliStation M Pro
<b>Processor</b>	1 x 500MHz Pentium III
<b>Memory</b>	256MB
<b>Disk Drive</b>	1 x 9.1GB
<b>Network Interface</b>	Integrated 10/100 Ethernet Controller
<b>I/O</b>	PCI Bus
<b>Operating System</b>	Microsoft Windows 2000 Professional
<b>Notes</b>	Lotus Domino Client Release 5.04a for Windows 2000
<b>NotesBench</b>	NotesBench Version 5.04 - Windows/32, released August 10, 2000

Parent 1 Source Driver	
<b>System</b>	IBM PC Server 325
<b>Processor</b>	1 x 233MHz Pentium II
<b>Memory</b>	128MB
<b>Disk Drive</b>	2 x 4.51GB
<b>Network Interface</b>	Integrated 10/100 Ethernet Controller
<b>I/O</b>	PCI Bus
<b>Operating System</b>	Microsoft Windows 2000 Server
<b>Notes</b>	Lotus Domino Client Release 5.04a for Windows 2000
<b>NotesBench</b>	NotesBench Version 5.04 - Windows/32, released August 10, 2000

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## 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



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## Appendix D: NOTES.INI Settings

### *NOTES.INI for First Partition Server*

[Notes]

```
Directory=j:\notesr5\sut1
KitType=2
SetupDB=Setup.nsf
UserName=administrator
CompanyName=ibm
NotesProgram=j:\notesr5
InstallType=4
CONSOLE_Lotus_Domino_Server=80 300 7 70 4 738 335
WinNTIconPath=j:\notesr5\sut1\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,
EDITIMP1=ASCII Text,0,_ITEXT,,TXT,,PRN,,C,,H,,RIP,,1,
EDITIMP2=Microsoft RTF,0,_IW4W,_IRTF,,DOC,,RTF,,2,
EDITIMP3=Lotus 1-2-3,0,_IW4W,_IWKSE,,WKS,,WK1,,WR1,,WRK,,WK3,,WK4,,123,,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=Lotus 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=Lotus Word Pro,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=Microsoft Excel,0,_IW4W,W4W21F/V4C,,XLS,,4,
EDITIMP31=Microsoft Word,0,_IW4W,W4W49F/V0,,DOC,,2,
EDITIMP32=GIF Image,0,_IGIF,,GIF,,18,
EDITIMP33=JPEG Image,0,_IJPEG,,JPG,,18,
EDITEXP1=ASCII Text,2,_XTXT,,TXT,,PRN,,C,,H,,RIP,,1,
EDITEXP2=Microsoft Word 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,
```



tcpip\_tcpipaddress=0,192.1.1.220:1352  
DBMaxEntries=10000  
Max\_users=10001  
NSF\_DBCache\_MaxEntries=10000  
Server\_Pool\_Tasks=100  
Server\_max\_Concurrent\_Trans=500  
No\_Force\_Activity\_Logging=1  
NSF\_Buffer\_Pool\_Size\_MB=350  
Debug\_OutFile=j:\tmp\sut1info.txt

```
=====
SERVERS_FRAME_PERCENT=20
MONITOR_SCALE=1
ADMINWINDOWSIZEWIN=8 -5 984 715
ADMINMAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
AdminSetup=502
FileDlgDirectory=J:\notesr5\sut1
```

## **NOTES.INI for Child 1**

[Notes]

Directory=d:\notes\data  
KitType=1  
InstallType=6

```
=====
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=nchild1
MailTemplate=mail50.ntf
USESERVERNAB=1
ResultsDirectory=\\parent1\c$\results
DEBUG_OUTFILE=\\parent1\c$\results\res1
NumNotesLocalReplica=90
NumSharedNotes=900
NormalMessageSize=10000
ThreadStagger=0.4
```

```
=====
WinNTIconPath=d:\notes\data\W32
Timezone=5
DST=1
$$HasLANPort=1
WWWDSPP_SYNC_BROWSERCACHE=0
WWWDSPP_PREFETCH_OBJECT=0
EnableJavaApplets=1
EnablePlugins=1
Preferences=-2147480463
AltNameLanguage=en
ContentLanguage=en-US
WeekStart=1
ViewWeekStart=2
NavWeekStart=2
XLATE_CSID=52
SPELL_LANG=1033
Region=en-US
```



```

MAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
FileDlgDirectory=Y:\comanche\sut_2srv
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
ECLSetup=3
NAMES=names.nsf
$headlineDisableHeadlines=0
EmptyTrash=0
MIMEPromptMultilingual=1
MIMEMultilingualMode=1
EnableActiveXInBrowser=1
EnableJavaScript=1
EnableJavaScriptErrorDialogs=1
EnableLiveConnect=1
ShowAccelerators=1
DisableImageDithering=1
MaxDocToDelete=10000

```

## ***NOTES.INI for Parent Source Driver***

[Notes]

```

;
;   Begin Notesbench variables for PARTITION 1
;
; *****
NodeName=parent1
; Runtime in minutes

Runtime=540
;Runtime=980

;ChildStagger=1,1;25,2;45,3;62,4;80,5;110,6;130,7;165,8;205,9;220,10
;ChildStagger=1,1;25,2;50,3;65,4;85,5;95,6-10
;ChildStagger=1,1;25,2;40,3;55,4;60,5;66,6;70,7;75,8;85,9
ChildStagger=1,1;8,2;10,3;15,4-5;22,6;27,7;32,8;35,9

NumClients1=1000
NumClients2=1000
NumClients3=1000
NumClients4=1000
NumClients5=1000
NumClients6=1000
NumClients7=400
NumClients8=950
NumClients9=5
;NumClients10=810
;NumClients11=1000
;NumClients12=1000
;NumClients13=1000
;NumClients14=1000
;NumClients15=1000
;NumClients16=1000
;NumClients17=1000
;NumClients18=1000
;NumClients19=1000
;NumClients20=1000
ResultsDirectory=c:\results
DEBUG_OUTFILE=c:\results\notesnum_sut1.txt
;----End
; *****
;
;   Multirun Variables
; *****
; ProbeIntervalDelay=wait after end of one run before starting next

```

```

; ProbeWaitTime=wait to start Probe (default=15mins)
; ProbeRunTime=#minutes probe will collect stats
;;ProbeInterval=2800,2900,3000
;;ProbeIntervalDelay=30
;;ProbeWaitTime=30
;;ProbeRunTime=180
; ProbeRunTime=2 because we want 240 minutes of runtime after ramp-up
; without overhead of PROBE
; Next line cause command 'show stat' to execute on SUT console
; before start of each multi-run and when ramped up for that run
; Mail statistics required for audit at ramp-up and before ramp-down
;;ProbeTestIncrementCMD=show stat mail
;;ProbeTestIncrementCMD=show stat database
;;NBTestReset=1
*****
; Server.Planner Variables
*****
Directory=c:\notes\data
KitType=1
InstallType=1
;-----End
;-----End
WinNTIconPath=c:\notes\data\W32
Timezone=5
DST=1
$$HasLANPort=1
WWWDSPP_SYNC_BROWSERCACHE=0
WWWDSPP_PREFETCH_OBJECT=0
EnableJavaApplets=1
EnablePlugins=1
Preferences=-2147480463
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,
EDITIMP1=ASCII Text,0_ITEXT,,TXT,.PRN,.C,.H,.RIP,,1,
EDITIMP2=Microsoft RTF,0_IW4W_IRTF,.DOC,.RTF,,2,
EDITIMP3=Lotus 1-2-3,0_IW4W_IWKSE,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,.123,,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=Lotus 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=Lotus Word Pro,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=Microsoft Excel,0_IW4W,W4W21F/V4C,.XLS,,4,
EDITIMP31=Microsoft Word,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,

```



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## **Appendix E: Network Configuration**

The standard TCP/IP stack provided by Microsoft Windows 2000 Advanced Server was used.

In the system under test, the network adapter speed for the 10/100 Ethernet Server Adapter was changed from the default 'Auto' to 100Mbps. This forced the Duplex Mode to 'full'.



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## **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 Extended Price
<b>IBM xSeries 370 with one 900MHz / 2MB Pentium III Xeon</b>	8681-3RX	1	\$19,114	\$19,114
900 MHz / 2 MB L2 Cache Processor Upgrade	19K4637	3	6,599	19,797
1GB 133MHz ECC SDRAM RDIMM Memory	33L3056	4	2,369	9,476
ServeRAID-4L Ultra160 SCSI Adapter	37L6091	1	745	745
ServeRAID-4M Ultra160 SCSI Adapter	37L6080	3	1,435	4,305
18.2GB 10K Ultra160 SCSI Hard Disk Drives	37L7205	47	419	19,693
EXP300 Rack Storage Expansion Enclosure	35311RU	4	3,179	12,716
10/100 Ethernet Server Adapter	06P3601	2	99	198
E54 15" (13.8" Viewable) Color Monitor	6331N2N	1	168	168
<b>Software</b>				
Windows 2000 Advance Server		1	2,399	\$2,399
Lotus Domino R5 Enterprise Server (List Price)		1	4,995	4,995
<b>Total System Price</b>				<b>\$93,606</b>

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## Appendix H: Vendor-Defined Information

None.

## **First Edition - July 2001**

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