NotesBench Disclosure Report

for

IBM @server xSeries 360

using

Lotus Domino Server 5.09a

and

Windows 2000 Advanced Server

Results Submitted May 21, 2002

Results Certified June 6, 2002

IBM Corporation

IBM ®

Table of Contents

Executive Summary

The IBM xSeries 360 demonstrated leadership performance running Lotus® Domino® Server Release 5.09a on Microsoft® Windows® 2000 Advanced Server. The results detailed in this report were obtained using the NotesBench iNotes-Only workload.

Test Script	Maximum Users	NotesMark (tpm)	Ave. Response Time (sec)	$/User	$/NotesMark
iNotes-Only	6,750	3,492	1.502	$8.01	$15.48

The xSeries 360 server was configured with four of the 1.6GHz[1] Intel® Xeon™ Processor MP with Hyper-Threading Technology[2], 3GB of Double Data Rate (DDR) memory, and 17 hard disk drives. The Domino server contained more than 14,000 person documents. For complete configuration details, see Appendix A: Overall Test Setup and Software Versions.

The server under test supported an iNotes-Only workload of 6,750 active mail users (see price/performance results above).

IBM's xSeries Server Performance Laboratory in Research Triangle Park, NC, conducted the benchmark in April, and KMDS Technical Associates, Inc., audited the results in May 2002.

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 360 system as a Domino Server 5.09 mail server configured with the ServeRAID Ultra160 SCSI Adapter for RAID-1 data redundancy.

---

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

[2] Hyper-Threading Technology is Intel's implmentation of simultaneous multi-threading technology. It allows software to see twice the number of processors installed in the system (i.e., Window 2000 Advanced Server reports the SUT to have eight processors although it has only four physical processors installed).

Test Methodologies

Test Setup and Hardware/Software Configuration

The xSeries 360 system under test (SUT) was configured with four of the 1.6GHz Xeon Processor MP (256KB of ECC full-speed L2 write-back and 1MB L3 cache, and 400MHz frontside bus per processor), 3GB of DDR memory, seventeen 18.2GB 15K rpm hard disk drives. One RAID-1 array composed of 14 hard drives, which contained the mail files, was connected to a channel on a ServeRAID-4Mx Ultra160 SCSI Adapter. Three hard drives, one of which was contained in a RAID-0 array used as the boot disk, and two of which were contained in a RAID-1 array used as the Domino program drive and Domino data directory drive, were connected to another channel on the ServeRAID-4Mx Ultra160 SCSI Adapter. A more detailed description of the configuration of the RAID-1 arrays is provided in Appendix A.

The network consisted of a single LAN segment connected to a 24-port Cisco Catalyst 3500-XL Switch. The xSeries 360 server's onboard Ethernet interface was used.

The IBM xSeries 360 system under test ran Microsoft Windows 2000 Advanced Server with Service Pack 2 and Domino Server 5.09a.

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.

R5Mail-Only Workload
NSF_DBcache_MaxEntries=10000
NSF_Buffer_Pool_Size_MB=300
MailLogToEventsOnly=1
Log_MailRouting=40
Log_Sessions=0
Max_Users=10000
DBMaxEntries=10000

In the Server-Configuration document for the Domino server, three mail.boxes were used 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
Debug_Outfile=j:\tmp\SUTINFO.TXT
```

All Notes server tasks were disabled except Router and HTTP.

All Domino mail files were located on the D: RAID-1 array. The Domino executable codes, Domino data directory, and mail database link files were located on the J: RAID-1 array.

Test Procedures

Several trial runs were conducted starting with a single Domino server to attempt to exhaust at least one of the system resources (e.g., 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 6,750 users were distributed over eight clients. Each client added 810 to 900 users to the system under test. The test ran for 12 hours, including ramp-up. Child 1 through child 3 simulated 900 users each; child 4 through child 8 simulated 810 users. The actual ramp-up period from startup of child 1 to the point when all 6,750 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 5.09a.

Data

xSeries 360 NotesMark Value for iNotes-Only Test

The xSeries 360 server demonstrated that it can support 6,750 concurrent, active users with this workload. The NotesMark throughput value was 3,492. Average response time was 1.502 seconds. The test ran error-free for a period of 12 hours.
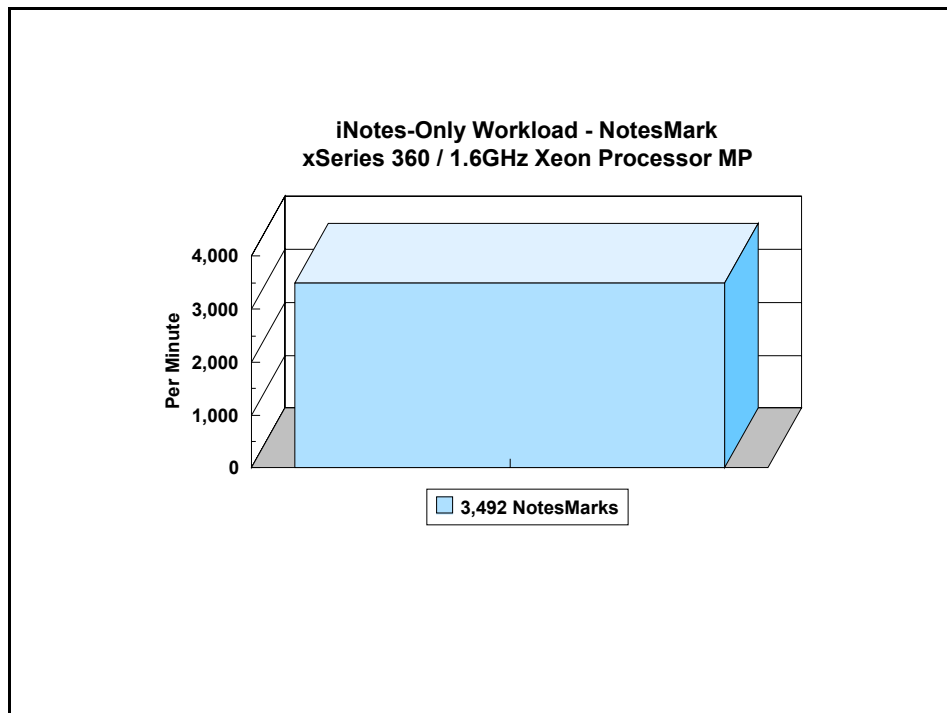
The iNotes Web Access workload executes Notes transactions that model a server for mail users that access their mail via the Web. The resulting capacity metric for a server is the maximum number of users that can be supported before the average user response time becomes unacceptable.

NotesNum Output for iNotes-Only Test

Min Start Time = 04/21/2002 10:14:37 PM   Max Stop Time = 04/22/2002 10:38:09 AM
Total Test Errors = 0
Total Test Time = 44640 sec

Test Run: Users = 6750   NotesMark = 3492   Response Time = 1502 msec (04/22/2002 04:02:00 AM to 04/22/2002 10:28:00 AM)

**iNotes-Only Workload - Average Response Time
xSeries 360 / 1.6GHz Xeon Processor MP**

Seconds

5
4
3
2
1
0

Average Response Time = 1.502 Seconds
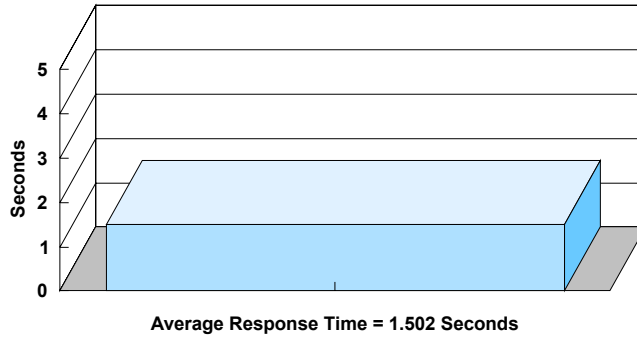
**iNotes-Only Workload - Users
xSeries 360 / 1.6GHz Xeon Processor MP**

iNotes-Only Users

8,000
6,000
4,000
2,000
0
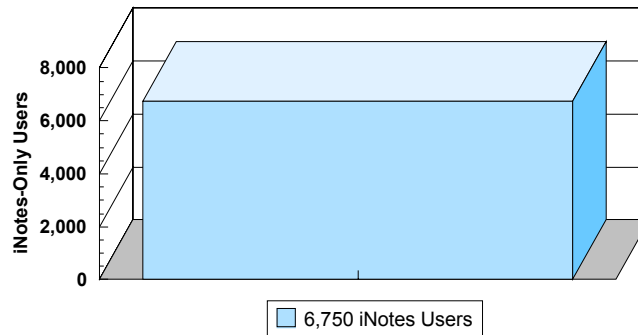
☐ 6,750 iNotes Users

Analysis

When configured optimally as described in this report, the xSeries 360 server demonstrated that it can manage the intense resource usage during ramp-up to 6,750 concurrent iNotes users with no errors at the clients. During the steady-state period on one of the successful 6,750-user run, the average CPU utilization was 94.48 percent. The average available memory was 818 MB.

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.

Conclusions

The test results demonstrate that the xSeries 360 configured as described in this report can support up to 6,750 concurrent, active iNotes users with a response time well below that permitted by the test criteria.

These results are based on running the xSeries 360 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

For the iNotes-Only test, Ten driver systems were used. Eight systems were configured as child drivers 1 through 8. Two parent systems were used; one parent controlled the run and the other collected the data from PERFMON and Domino Server.

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

- Child drivers 1-8
  - C: Partition (2GB - NTFS) - Windows 2000
  - D: Partition (6.5GB - NTFS) - Notes 5.09a code and data

Number of Server Platforms

One server platform, the xSeries 360 with four of the 1.6GHz Xeon Processor MP and 3GB of memory, was benchmarked.

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

- C: Single disk drive (18.1GB - NTFS) - Windows 2000 Advanced Server (Boot Partition)
- D: Partition (118.2GB - NTFS) - Domino mail files
- J: Partition (18.1GB - NTFS) - Domino executables and Domino mail data subdirectory

Network

The network consisted of one segment. All child drivers, parents and SUT were connected to one of 24-port Cisco Catalyst 3500-XL Switch. The xSeries 360 server's 10/100 Ethernet interface was used for connectivity.

Software Versions

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

- Microsoft Windows 2000 Advanced Server and Service Pack 2
- Lotus Domino Server Release 5.09a 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 5.09a for Windows 2000
- NotesBench Version 5.08 - Windows/32

Test Setup Diagram
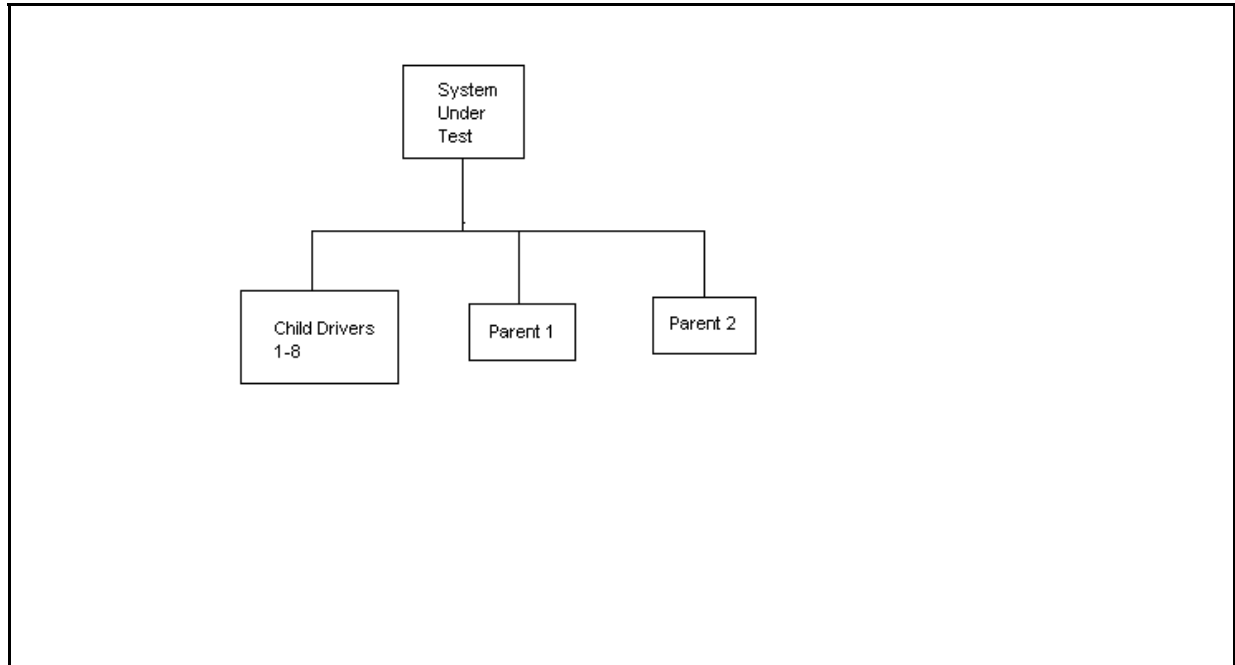
Details of Configuration

System Under Test	Parent Source Drivers and Child Drivers 1-8
xSeries 360	IBM IntelliStation M Pro
4 x 1.6GHz Xeon Processor MP	1 x 500MHz Pentium III
3GB Memory	256MB Memory
17 x 18.2GB Drives (2 RAID-1 arrays)	1 x 9.1GB Drive
1 x ServeRAID-4Mx Ultra160 SCSI Adapter	
Integrated 10/100 Ethernet Interface	Integrated 10/100 Ethernet Interface
Microsoft Windows 2000 Advanced Server	Microsoft Windows 2000 Professional

Appendix B: System Configurations

Server under Test	
System	xSeries 360
Processor	4 x 1.6GHz Xeon Processor MP
Memory	3GB
Cache	256KB ECC Full-Speed L2 and 1MB L3 Cache per Processor
RAID Controller	1 x ServeRAID-4Mx Ultra160 SCSI Adapter
Disk Drive	14 x 18.2GB 15K rpm (configured as one RAID-1 array) 3 x 18.2GB 15K rpm (configured as one RAID-1 array, plus a RAID-0 for system boot)
Network Interface	Integrated 10/100Mbps Ethernet Interface
I/O	PCI Bus (64 Bit/33MHz)
Operating System	Microsoft Windows 2000 Advanced Server
Notes	Lotus Domino Server Release 5.09a for Windows 2000

Parent Source Drivers and Child Drivers 1 - 8	
System	IBM IntelliStation M Pro
Processor	1 x 500MHz Pentium III
Memory	256MB
Disk Drive	1 x 9.1GB
Network Interface	Integrated 10/100 Ethernet Interface
I/O	PCI Bus
Operating System	Microsoft Windows 2000 Professional
Notes	Lotus Domino Client Release 5.09a for Windows 2000
NotesBench	NotesBench Version 5.08 - Windows/32

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 Domino Server

[Notes]

Directory=j:\notesr5\data
KitType=2
SetupDB=Setup.nsf
UserName=administrator
CompanyName=ibm
NotesProgram=j:\notesr5
InstallType=4
CONSOLE_Lotus_Domino_Server=80 300 7 175 86 843 417
WinNTIconPath=j:\notesr5\data\W32
Timezone=5
DST=1
$$HasLANPort=1
WWWDSP_SYNC_BROWSERCACHE=0
WWWDSP_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 1-2-3,0,_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 1-2-3,0,_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=Microsoft RTF,2,_XRTF,,.DOC,.RTF,,4,
EDITEXP3=CGM Image,2,_XCGM,,.CGM,.GMF,,8,
EDITEXP4=TIFF 5.0 Image,2,_XTIFF,,.TIF,,18,
EDITEXP5=Lotus 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=Microsoft Word 6.0,2,_XW4W,W4W49T/V0,.DOC,,2,
DDETimeout=10
NAMEDSTYLE0=0300426173696300000000000000000000000000000000000000000000000000000000000001010100000A000000000000
0100A0050A0000006400A0050A0000000000000000000000000000000000000000000000000000000000000000000000000000000000
009404000000000000
NAMEDSTYLE0_FACE=Default Sans Serif
NAMEDSTYLE1=030042756C6C657400000000000000000000000000000000000000000000000000000000000001010100000A00000000000
0000008070A000000640008070A000000000000000000000000000000000000000000000000000000000000000000000000000000000000
049404000000000000
NAMEDSTYLE1_FACE=Default Sans Serif
NAMEDSTYLE2=0300486561646C696E6500000000000000000000000000000000000000000000000000000000010101010B0C00000000000
00100A0050A0000006400A0050A0000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0009404000000000000
NAMEDSTYLE2_FACE=Default Sans Serif
DefaultMailTemplate=mail50.ntf
ServerTasks=Router,HTTP
;ServerTasks=Router,Replica,Update,Amgr,AdminP,CalConn,Event,Sched,Stats,HTTP,maps
;ServerTasksAt1=Catalog,Design
;ServerTasksAt2=UpdAll,Object Collect mailobj.nsf
;ServerTasksAt3=Object Info -Full
;ServerTasksAt5=Statlog
TCPIP=TCP, 0, 15, 0
LAN0ip=NETBIOS, 0, 15, 0
VINES=VINES, 0, 15, 0
SPX=NWSPX, 0, 15, 0
AppleTalk=ATALK, 0, 15, 0
LAN1=NETBIOS, 1, 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
Ports=TCPIP,LAN0ip
DisabledPorts=VINES,SPX,AppleTalk,LAN1,LAN2,LAN3,LAN4,LAN5,LAN6,LAN7,LAN8,COM1,COM2,COM3,COM4,COM5
LOG_REPLICATION=1
LOG_SESSIONS=0
KeyFilename=User.ID
CertificateExpChecked=User.ID 04/15/2002
CertifierIDFile=j:\notesr5\data\cert.id
MailServer=CN=sut/O=ibm
ServerKeyFileName=server.id
Domain=ibm
Admin=CN=administrator/O=ibm
TemplateSetup=66
Setup=62
ServerSetup=55
DESKWINDOWSIZE=-4 -4 1032 748
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
WebAdminSetup=509
DominoConfigLevel=3

ECLSetup=3
SERVERS_FRAME_PERCENT=20
MONITOR_SCALE=1
ADMINWINDOWSIZEWIN=29 5 984 715
ADMINMAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
Win32InfoboxPos=2 110
FileDlgDirectory=J:\crusader
AdminSetup=502
AdminLastServer=CN=sut/O=ibm
ShowCertifierRecoveryWarning_j:\notesr5\data\cert.id=1
NewUserServer=CN=sut/O=ibm
;===
server_show_performance=1
mailuseprocesses=0
MailLogToEventsOnly=1
Log_mailRouting=40
DBMaxEntries=10000
Max_users=10000
NSF_DBCache_MaxEntries=10000
;Server_Pool_Tasks=100
;Server_max_Concurrent_Trans=1000
No_Force_Activity_Logging=1
NSF_Buffer_Pool_Size_MB=300
Update_No_Fulltext=1
LogAgentManager=0
;DominoAsynchronizeAgents=1
Debug_OutFile=j:\temp\sutinfo.txt
;==
BROWSERSIZE=148
DesignWinSplitterPos=174 743
DESIGNWINDOWSIZEWIN=20 15 984 715
DESIGNMAXIMIZED=0

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=nchild2
;MailTemplate=mail50.ntf
;=========iNotes========
MailTemplate=iNotes5.ntf
;NBiNotes=1
;HTTPNABView=$People/M
WebAuthenticationOff=1
WebPreferencesOff=1
HTTPHost=sut.ibm.com
RecipientDomain=ibm.com

Domail=ibm.com
;======================
USESERVERNAB=1
ResultsDirectory=\\parent1\c$\results
DEBUG_OUTFILE=\\parent1\c$\results\res1
;NumNotesLocalReplica=90
;NumSharedNotes=900
ThreadStagger=3
;==
;==
;
WinNTIconPath=d:\notes\data\W32
Timezone=5
DST=1
$$HasLANPort=1
WWWDSP_SYNC_BROWSERCACHE=0
WWWDSP_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 1-2-3,0,_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 1-2-3,0,_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=Microsoft RTF,2,_XRTF,,.DOC,.RTF,,4,
EDITEXP3=CGM Image,2,_XCGM,,.CGM,.GMF,,8,
EDITEXP4=TIFF 5.0 Image,2,_XTIFF,,.TIF,,18,
EDITEXP5=Lotus 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=Microsoft Word 6.0,2,_XW4W,W4W49T/V0,.DOC,,2,
DDETimeout=10
NAMEDSTYLE0=0300426173696300000000000000000000000000000000000000000000000000000000001010100000A000000000000
0100A0050A0000006400A0050A00000000000000000000000000000000000000000000000000000000000000000000000000000000
009404000000000000
NAMEDSTYLE0_FACE=Default Sans Serif

```
NAMEDSTYLE1=030042756C6C6574000000000000000000000000000000000000000000000000000000000000001010100000A00000000000
0000008070A000000640008070A000000000000000000000000000000000000000000000000000000000000000000000000000000000000
049404000000000000
NAMEDSTYLE1_FACE=Default Sans Serif
NAMEDSTYLE2=0300486561646C696E650000000000000000000000000000000000000000000000000000000000000101010B0C00000000000
00100A0050A0000006400A0050A0000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0009404000000000000
NAMEDSTYLE2_FACE=Default Sans Serif
DefaultMailTemplate=mail50.ntf
TCPIP=TCP, 0, 15, 0
LAN0=NETBIOS,0,15,0,,12288,
VINES=VINES, 0, 15, 0
SPX=NWSPX, 0, 15, 0
COM1=XPC,1,15,0,,12288,
COM2=XPC,2,15,0,,12288,
COM3=XPC,3,15,0,
COM4=XPC,4,15,0,
COM5=XPC,5,15,0,
Ports=TCPIP
DisabledPorts=LAN0,COM1,COM2,VINES,SPX,COM3,COM4,COM5
KeyFilename=nchild2.id
CertificateExpChecked=nchild2.id 04/10/2002
$headlineClientId=C51BC164:6BA9A11B-85256B97:00681363
MailServer=CN=sut/O=ibm
MailFile=mail\nchild2.nsf
TemplateSetup=66
Setup=62
Location=Office (Network),9A2,CN=nchild2/O=ibm
$IEVersionMajor=5
ECLSetup=3
DESKWINDOWSIZE=20 15 984 715
WINDOWSIZEWIN=20 15 984 715
MAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
NAMES=names.nsf
$headlineDisableHeadlines=0
EmptyTrash=0
MIMEPromptMultilingual=1
MIMEMultilingualMode=1
EnableActiveXInBrowser=1
EnableJavaScript=1
EnableJavaScriptErrorDialogs=1
EnableLiveConnect=1
ShowAccelerators=1
```

NOTES.INI for Parent Source Driver

```
[Notes]

Directory=c:\notes\data
KitType=1
InstallType=2
;=========================================================================================
;
;    Begin Notesbench variables for parent 1
;
; *********************************************
NodeName=parent1

Runtime=780
;ChildStagger=1,1;30,2;38,3;48,4;58,5
ChildStagger=1,1;52,2-4;48,5-8
NumClients1=900
```

```
NumClients2=900
NumClients3=900
NumClients4=810
NumClients5=810
NumClients6=810
NumClients7=810
NumClients8=810
NumClients9=300
NumClients10=500
NumClients11=500
NumClients12=500
NumClients13=500
NumClients14=500
NumClients15=500
NumClients16=500
NumClients17=500
NumClients18=500
NumClients19=500
NumClients20=500
ResultsDirectory=c:\results
DEBUG_OUTFILE=c:\results\notesnum_sut.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
;;Probe_Interval=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
;*********************************************
;;CPDatabase=c:\notesb3\data\Server.Planner.nsf
;;SUTMachineID=Teton600
;--------------------------------------------------------End
;--------------------------------------------------------End
WinNTIconPath=c:\notes\data\W32
Timezone=5
DST=1
$$HasLANPort=1
WWWDSP_SYNC_BROWSERCACHE=0
WWWDSP_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 1-2-3,0,_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 1-2-3,0,_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=Microsoft RTF,2,_XRTF,,.DOC,.RTF,,4,
EDITEXP3=CGM Image,2,_XCGM,,.CGM,.GMF,,8,
EDITEXP4=TIFF 5.0 Image,2,_XTIFF,,.TIF,,18,
EDITEXP5=Lotus 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=Microsoft Word 6.0,2,_XW4W,W4W49T/V0,.DOC,,2,
DDETimeout=10
NAMEDSTYLE0=0300426173696963000000000000000000000000000000000000000000000000000000000000001010100000A000000000000
0100A0050A0000006400A0050A000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
009404000000000000
NAMEDSTYLE0_FACE=Default Sans Serif
NAMEDSTYLE1=030042756C6C65740000000000000000000000000000000000000000000000000000000000001010100000A00000000000
0000008070A000000640008070A000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
049404000000000000
NAMEDSTYLE1_FACE=Default Sans Serif
NAMEDSTYLE2=0300486561646C696E65500000000000000000000000000000000000000000000000000000000000010101010B0C00000000000
00100A0050A0000006400A0050A000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
009404000000000000
NAMEDSTYLE2_FACE=Default Sans Serif
DefaultMailTemplate=mail50.ntf
TCPIP=TCP, 0, 15, 0
LAN0=NETBIOS,0,15,0,,12288,
VINES=VINES, 0, 15, 0
SPX=NWSPX, 0, 15, 0
COM1=XPC,1,15,0,,12288,
COM2=XPC,2,15,0,,12288,
COM3=XPC,3,15,0,
COM4=XPC,4,15,0,
COM5=XPC,5,15,0,
Ports=TCPIP
DisabledPorts=LAN0,COM1,COM2,VINES,SPX,COM3,COM4,COM5
KeyFilename=user.id
CertificateExpChecked=user.id 04/11/2002
$headlineClientId=5507B56B:C3A80181-85256B98:0043F39E
MailServer=CN=sut/O=ibm
MailFile=mail\administ.nsf
TemplateSetup=66
Setup=62
Location=Office (Network),9A2,CN=administrator/O=ibm
$IEVersionMajor=5
ECLSetup=3
DESKWINDOWSIZE=20 15 984 715
WINDOWSIZEWIN=20 15 984 715

MAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=1
WinNTIconRect=0 0 0 24
NAMES=names.nsf
$headlineDisableHeadlines=0
EmptyTrash=0
MIMEPromptMultilingual=1
MIMEMultilingualMode=1
EnableActiveXInBrowser=1
EnableJavaScript=1
EnableJavaScriptErrorDialogs=1
EnableLiveConnect=1
ShowAccelerators=1

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 integrated ethernet adapter was changed from the default 'Auto' to 100Mbps. This forced the Duplex Mode to 'full'.

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 List Price for the U.S. only. 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 List Price	IBM Extended Price
xSeries 360 with: **2 x 1.6GHz/1MB Xeon Processor MP** **4 x 512MB PC1600 DDR ECC RDIMMs** **10/100Mbps Ethernet Interface**	8686-6RX	1	18,309	18,309
1.6 GHz Xeon Processor MP Upgrade	19K4647	2	6,199	12,398
512MB PC1600 DDR ECC RDIMM Memory	33L3283	2	499	998
ServeRAID-4Mx Ultra160 SCSI Adapter	06P5736	1	999	999
18.2GB 15K Ultra160 SCSI Hard Disk Drives	06P5767	17	439	7,463
EXP300 Rack Storage Expansion Enclosure	35311RU	2	3,179	6,358
E54 15" (13.8" Viewable) Color Monitor	633147N	1	149	149
Software				
Windows 2000 Advanced Server		1	2,399	2,399
Lotus Domino R5 Enterprise Server (List Price)		1	4,995	4,995
Total System Price				$54,068

Appendix H: Vendor-Defined Information

None.

First Edition - June 2002

THE INFORMATION CONTAINED IN THIS DOCUMENT IS DISTRIBUTED ON AN AS IS BASIS WITHOUT ANY WARRANTY EITHER EXPRESSED OR IMPLIED. The use of this information or the implementation of any of these techniques is a customer's responsibility and depends on the customer's ability to evaluate and integrate them into the customer's operational environment. While each item has been reviewed by IBM for accuracy in a specific situation, there is no guarantee that the same or similar results will be obtained elsewhere. Customers attempting to adapt these techniques to their own environment do so at their own risk.

In this document, any references made to an IBM licensed program are not intended to state or imply that only IBM's licensed program may be used; any functionally equivalent program may be used.

This publication was produced in the United States. IBM may not offer the products, services, or features discussed in this document in other countries, and the information is subject to change without notice. Consult your local IBM representative for information on products and services available in your area..

Trademarks

IBM, ServeRAID, IntelliStation, xSeries and the e-business logo are trademarks or registered trademarks of International Business Machines Corporation.
Lotus and Lotus Notes are registered trademarks and Notes and Domino are trademarks of Lotus Development Corporation.
Intel and Xeon are trademarks or registered trademarks of Intel Corporation.
Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and other countries.
Other company, product, or service names may be trademarks or service marks of others.