AUDIT REPORT

Compaq Examines Lotus Domino Server Performance

Full Disclosure Report for Compaq ProLiant 5000 3xP6/200-512 KB L2 Cache 1024MB RAM with Lotus Domino R4.51 for Microsoft Windows NT 4.0

COMPAQ

ECG092.0997

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Prepared By
Internet Solutions

Compaq Computer Corporation

CONTENTS

NotesBench Test Results

SECTION 1 - EXECUTIVE SUMMARY

Test Sponsor

This NotesBench testing was sponsored by Compaq Computer Corporation. The NotesBench benchmark was developed and engineered by Lotus Development Corporation. Testing took place at the Compaq Internet Solutions laboratories in Houston, Texas in September 1997 and was audited by KMDS Technical Associates, Inc., in October 1997.

Test Methodologies

The tests were set up using three groups of hardware: the driving systems, the system under test, and the destination servers. The system under test was a ProLiant 5000 6/200-512 configured with three processors and 1024MB RAM. This system uses the Pentium Pro 200 MHz processor with a 512 KB L2 cache. The detailed hardware configuration and test procedure are provided in Section 3 of this report.

Conclusion

The mail (Mail) workload was run to simulate 3,400 mail users. The test ran nine hours and during which the system under test achieved 4484 NotesMark (transactions per minute or tpm) with an average response time of 0.643 seconds. Based on these results, the price/performance ratio is $10.09/NotesMark (or $13.30/user).

The Shared Discussion Database (DiscDB) workload was run to simulate 1,000 users, and ran nine hours. The system under test achieved 1425 NotesMark (transactions per minute or tpm) with an average response time of 0.147 seconds. Based on these results, the price/performance ratio is $31.75/NotesMark (or $45.24/user).

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SECTION 2 - BENCHMARKING OBJECTIVES

In the Notes Server Release 3, the maximum active user limit of 120 was set by internal Notes data structures. The limit was increased in Release 4 to ensure that the maximum capability of each operating system is fully exploited. Lotus Domino Server Release 4.5x provides many features to cover the Internet/Intranet functions. A question that is asked by most of our Notes customers is: "What is the maximum number of active Domino Release 4.5 user sessions for our environment?" The answer is determined by three criteria:

- The application profiling (what type of workload)
- The hardware configuration (for example, the number of system CPUs or the amount of memory)
- The operating system (OS)

NotesBench for Domino Server 4.5 has proven its maturity and usability since we first used it. We feel that the information provided in this report will help our customers in their planning processes. With the publication of this and future full disclosure reports, Compaq and Lotus are working together to provide information which will help Compaq Notes users in their activities associated with performance tuning, enterprise network design, and many other areas.

This report includes two workloads:

- Mail
- Shared Discussion Database (DiscDB)

All tests were performed on the Microsoft Windows NT 4.0 platform; similar performance information for other hardware configurations are forth coming.

SECTION 3 - TEST METHODOLOGIES

Test Configuration

Lotus Domino Server 4.51 was placed on six ProLiant 2000 (four 1xP5/166MHz, one 1xP5/133MHz, one 2xP5100/MHz) computers, and four ProLiant 4000(one 2xP5/133MHz, three 2xP5/100MHz) computers, totaling ten Clients, a System Under Test, and three ProLiant 4000 (4xP5/133MHz) computers as Destination Servers. All systems were connected over an isolated TCP/IP LAN using 100BaseT medium. All clients and destination servers were loaded with NT Server 4.0, the system under test was loaded with NT Server 4.0 Service Pack 3.

One NT parameter was changed for each system:

- The Foreground and Background Applications was set to "Equally Responsive" (Control Panel/System/Tasking)

In addition, two NT registers were changed as follows for each of the client systems:

- Hkey_Local_Machine/System/CurrentControlSet/Control/PriorityControl/Win32PrioritySeparation: REG_DWORD:0x0
- Hkey_Local_Machine/System/CurrentControlSet/Control/SessionManager/MemoryManager/LargeCacheSystemCache: REG_DWORD:0x0

All other NT Server parameters were constant for the remaining benchmark sequences. Any Domino Server specific parameter changes are listed in Appendix D's NOTES.INI files.

Test Procedure

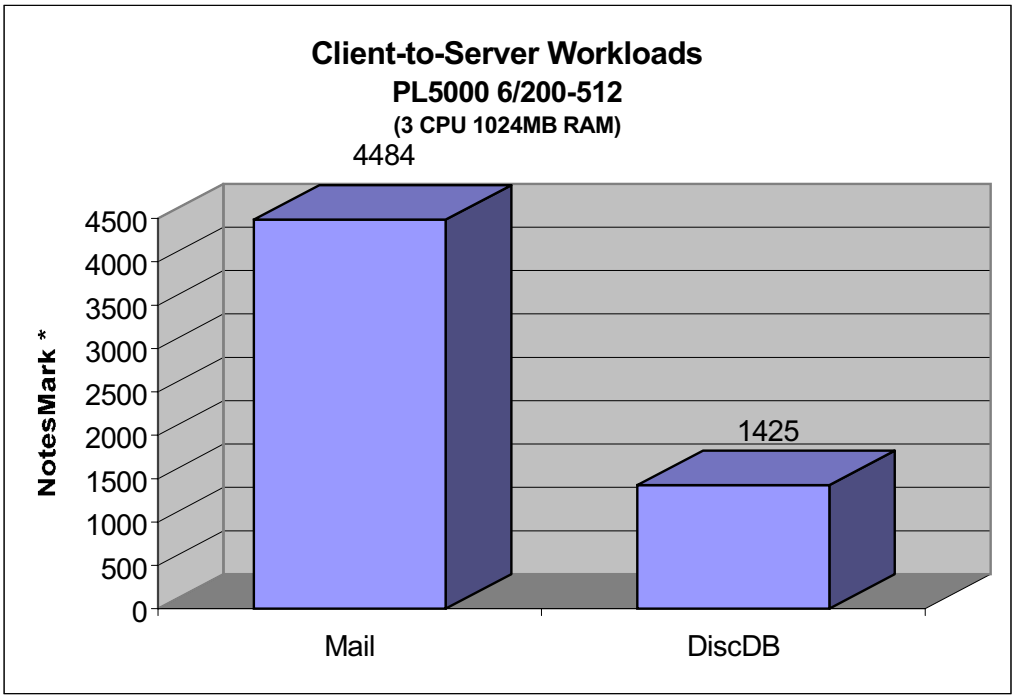
Compaq Internet Solutions Engineers first performed several trial runs to determine the best test duration and confirmation of Steady State. Both test duration and steady state were determined using real time monitor utilities from Windows NT. During the trial runs, we monitored the Windows NT Performance Monitor and also logged the whole test process. The resulting data is disclosed in the section "Analysis" of this document. The results were compared with the NotesBench Specification for conformity.

Actual testing began with the clients being added incrementally using a Childstagger value setting of 10 minutes specified in the parent Notes.ini. The Childstagger setting caused a delay of 10 minutes between clients during ramp up. Client systems nine and ten were using a Threadstagger value setting of three seconds specified in each client Notes.ini. The Threadstagger setting caused a delay of three seconds between threads. This was done because the system under test usually showed tremendous stress during the workload initialization stage. After the last client was started, we turned off Performance Monitor and only recorded the Domino related activities for the best performance results. All simulated users were connected approximately two hours after starting the test. The tests ran continuously for a total time of nine hours. The test ran for approximately seven hours after all client threads were connected to the system under test. Steady state was determined to be achieved during the test run by monitoring server output, the 3,400 connected Mail users as well as mail routing activity, and the 1,000 connected Shared discussion database users. The test data collected includes the following files:

- The SUT Notes.INI file and Log.nsf file
- All client's Notes.INI file
- The NotesNum utility results file

SECTION 4 - DATA

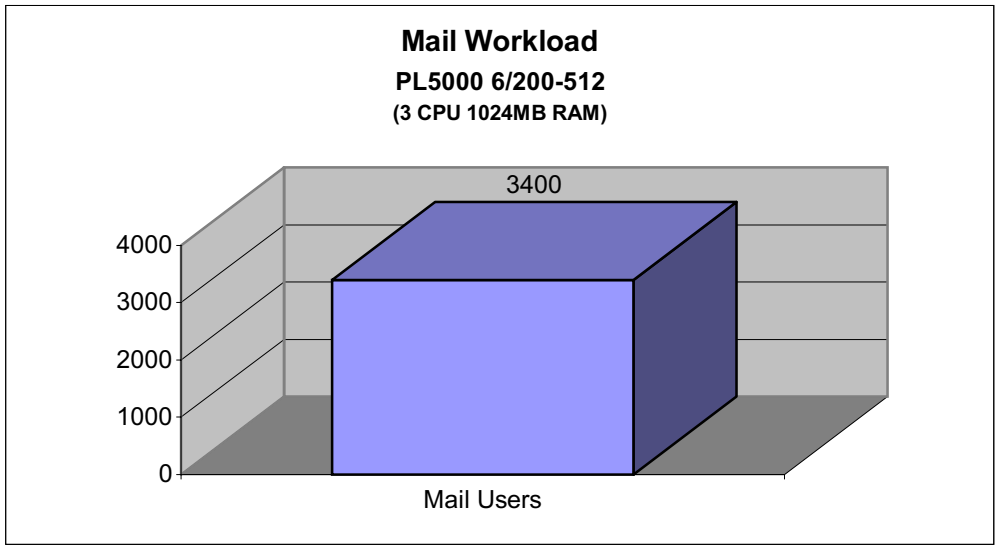
Lotus NotesMark Values for Benchmarked Configurations

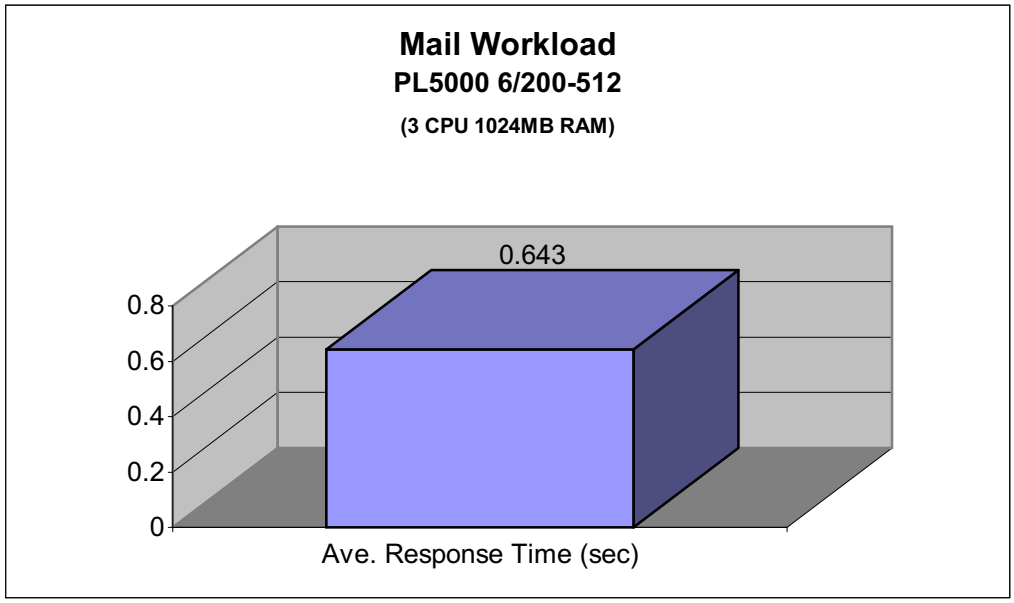


* NotesMark – transactions per minute or tpm

Mail-Only Users Per Server

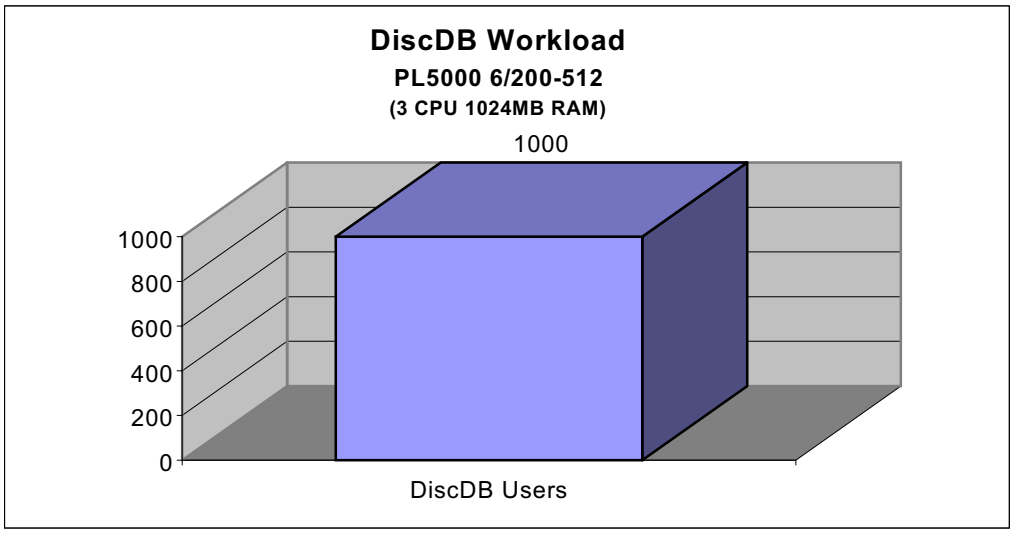
The MAIL workload models an active user reading and sending mail. An average user will execute this script 4 times per hour. For each iteration of the script, there are 5 documents read, 2 documents updated, 2 documents deleted, 1 view scrolling operation, 1 database opened and closed, 1 view opened and closed, and some miscellaneous operations. In sending messages, each user generates mail traffic approximately every 90 minutes.

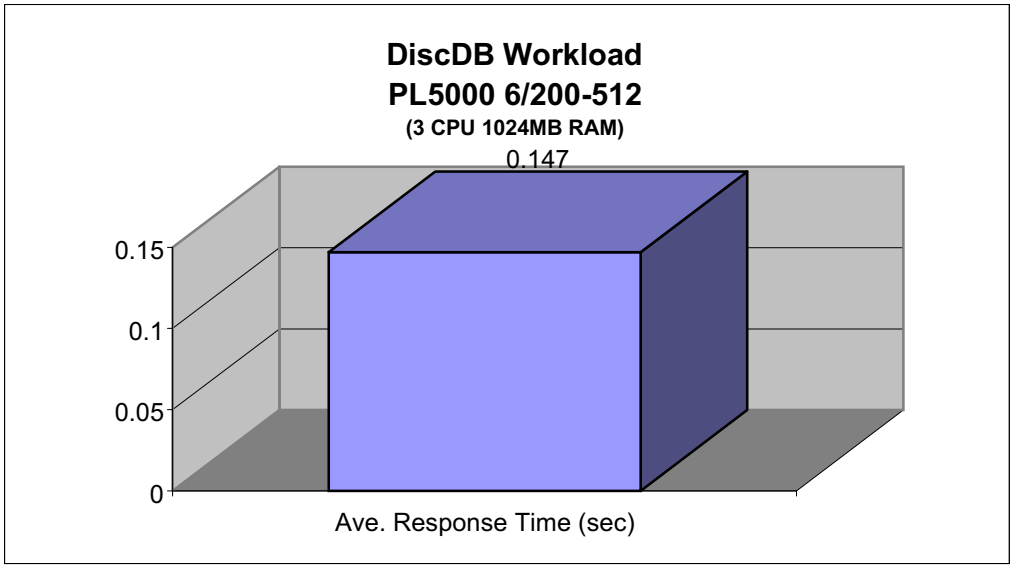




Shared Discussion Database – Users Per Server

The Shared Discussion Database (DiscDB) workload models a server for active users who are only performing heavy shared database operations. The DiscDB test script includes view operations in a shared database, navigation of unread documents, additions and updates to documents in a shared database. A significant difference between this workload and the MailDB workload is the update activity present only in the DiscDB workload. The DiscDB workload applies especially to sites that heavily utilize collaborative features of Domino.





WebWalker Performance Measured at the Server

This workload was not run for this test disclosure report. It may be included in subsequent reports.

WebBuyer Performance Measured at the Server

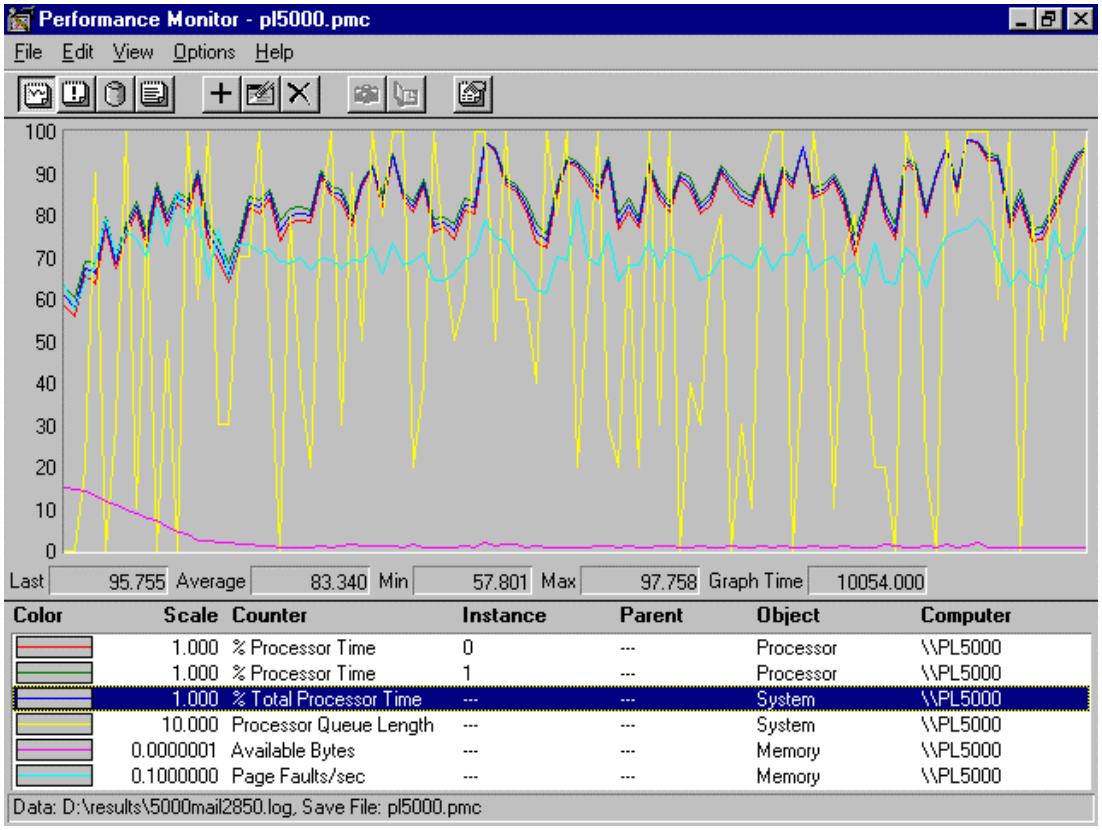
This workload was not run for this test disclosure report. It may be included in subsequent reports.

Mail Routing Hub Performance Measured at the Server

This workload was not run for this test disclosure report. It may be included in subsequent reports.

SECTION 5 - ANALYSIS

During the ramp up time, the system's CPU usually went up to 90% utilization and it continued to be stressed until all the users were connected to the server. The CPU subsystem utilization then dropped off and settled into a lower, steady rate of utilization depending on how many users were configured to run during the test. The CPU utilization rate averaged 79% during this test run. We will reveal more information about CPU utilization in our upcoming TechNote. The available memory decreased steadily as the system ramped up, while the amount of system cache used increased steadily. The NT Performance Monitor parameter, DiskPerf, provides useful information about the disk usage, but it also has a significant impact on the system under test, so we usually turned it off when we ran the actual test. The following is a sample Performance Monitor chart showing the typical resource utilization measurements captured for a system under test during a NotesBench test workload. This particular chart represents a sample of data collected during a test run for 2850 Mail users on a system configured with 768MB memory and 2xP6/200MHz CPU with a 512 KB L2 cache.



Price/Performance Ratios:

Mail Workload	4,484 NotesMark (tpm)	Price/Performance for System Throughput:	$10.09/NotesMark
	3,400 Users	Price/Performance for System Capacity:	$13.30/user

Discussion Database Workload	1,425 NotesMark (tpm)	Price/Performance for System Throughput:	$31.75/NotesMark
	1,000 Users	Price/Performance for System Capacity:	$45.24/user

NotesNum Output:

- **The 3400 Mail Users Test Report**

  Min Start Time = 09/23/97 11:13:33 AM Max Stop Time = 09/23/97 08:25:06 PM
  Total Test Errors = 0
  Total Test Time = 33120 sec

  Test Run: Users = 3400 NotesMark = 4484 Response Time = 643 msec (09/23/97 01:05:00 PM to 09/23/97 08:12:00 PM)

- **The 1000 Shared Discussion Database Users Test Report**

  Min Start Time = 09/25/97 09:42:28 AM Max Stop Time = 09/25/97 06:54:00 PM
  Total Test Errors = 0
  Total Test Time = 33120 sec

  Test Run: Users = 1000 NotesMark = 1425 Response Time = 147 msec (09/25/97 11:22:00 AM to 09/25/97 06:41:00 PM)

SECTION 6 - CONCLUSIONS

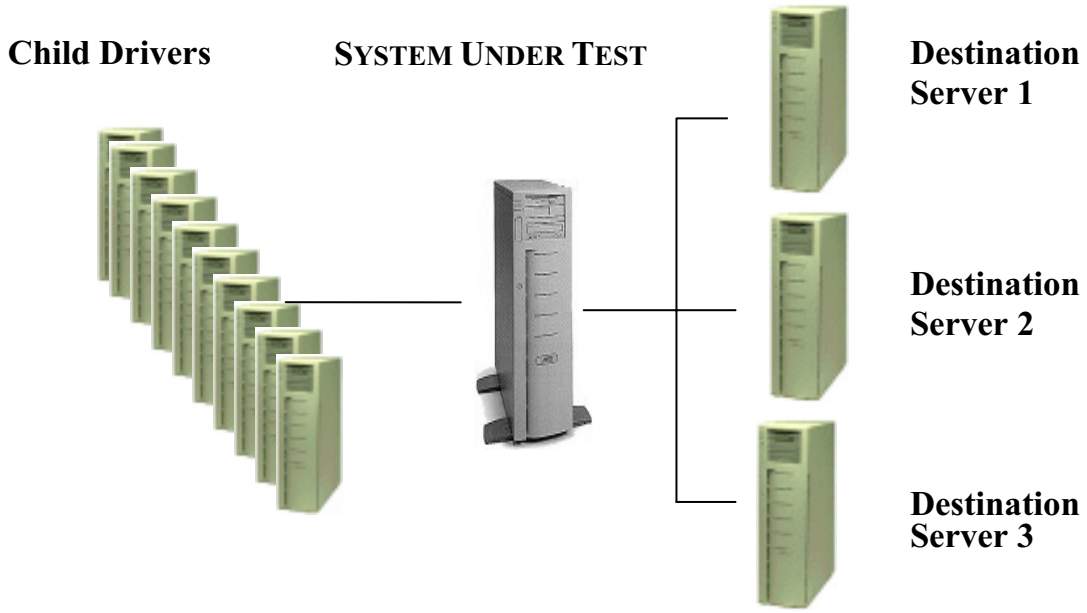
This report is intended to provide Compaq customers with an objective and verifiable set of performance data. Although NotesBench is a well designed and well written benchmark, we would like to caution our readers, that in the real world, server performance is highly dependent upon the application design and workload profiling. When using the performance data for capacity planning and performance management, readers should apply common sense and other business considerations too. For example, your business environment might include a mix of mail-only applications/users along with some database sharing activities. A successful server sizing might well depend on your business need and how you relate them to these benchmark results.

SECTION 7 - STATEMENT BY AUDITOR

See attached “NotesBench Tests Results Report Certification Letter”.

APPENDIX A - OVERALL TEST SETUP AND SOFTWARE VERSIONS

Test Setup



10 Driving Systems (Clients)	System Under Test	3 Destination Servers
See Appendix B	ProLiant 5000 3xP6/200MHz 512KB L2 Cache 1024MB Memory 1x2.1 GB System Volume, Paging File 7x2.1 GB Data Volume RAID0	See Appendix B

Software Versions

- **Client Systems:** Windows NT Server 4.0, Service Pack 3 with Domino Server 4.51 and NotesBench Version: 145 - Windows/32
- **System Under Test:** Windows NT Server 4.0, Service Pack 3 with Domino Server 4.51 and NotesBench Version: 145 - Windows/32
- **Destination Server:** Windows NT Server 4.0, Service Pack 3 with Domino Server 4.51 and NotesBench Version 145 - Windows/32

APPENDIX B - SYSTEM CONFIGURATION

Server (System Under Test)

ProLiant 5000
3 P6/200MHz 512KB L2 Cache
1024MB Memory
1x2.1GB System Volume, Paging File, NTFS (C:)
7x2.1 GB Data Volume, NTFS RAID 0 (D:)

Clients

ProLiant 2000 (1)
1 P5/166MHz
64MB Memory
2x1GB Disk

ProLiant 2000 (2)
1 P5/166MHz
96MB Memory
2x1GB Disk

ProLiant 2000 (1)
1 P5/166MHz
128MB Memory
2x1GB Disk

ProLiant 2000 (1)
1 P5/133MHz
96MB Memory
2x1GB Disk

ProLiant 2000 (1)
2 P5/100MHz
64MB Memory
2x1GB Disk

ProLiant 4000 (2)
2 P5/100 MHz
96MB Memory
1x2.1GB Disk

ProLiant 4000 (1)
2 P5/100 MHz
64MB Memory
1x2.1GB Disk

ProLiant 4000 (1)
2 P5/133 MHz
64MB Memory
1x2.1GB Disk

Destination Servers

ProLiant 4000(1)
4xP5/133MHz
224MB Memory
1x1GB Systems Volume, NTFS (C:)
7x1GB Data Volume, NTFS (D:)

ProLiant 4000(1)
4xP5/133MHz
256MB Memory
1x1GB Systems Volume, NTFS (C:)
7x1GB Data Volume, NTFS (D:)

ProLiant 4000(1)
4xP5/133MHz
296MB Memory
1x1GB Systems Volume, NTFS (C:)
7x1GB Data Volume, NTFS (D:)

Network Equipment

3COM Super Stacker II Hub 100 TX

APPENDIX C - OPERATING SYSTEM PARAMETERS VALUES

All clients were loaded with NT Server 4.0. One NT parameter was changed for each client system:

- The Foreground and Background Applications was set to “Equally Responsive” (Control Panel/System/Tasking)

In addition, two NT registers were changed as follows for each of the client systems:

- Hkey_Local_Machine/System/CurrentControlSet/Control/PriorityControl/Win32PrioritySeparation: REG_DWORD:0x0
- Hkey_Local_Machine/System/CurrentControlSet/Control/SessionManager/MemoryManager/LargeCacheSystemCache: REG_DWORD:0x0

APPENDIX D - NOTES PARAMETERS

Mail and DiscDB Workload Test

System Under Test Notes.ini

```
[Notes]

KitType=2
Directory=d:\notes\data
WinNTIconPath=d:\notes\data\W32
$$HasLANPort=1
EnableJavaApplets=1
EnablePlugins=1
Preferences=-2146825103
Passthru_LogLevel=0
Console_LogLevel=2
VIEWIMP1=Lotus 1-2-3
Worksheet,0,_IWKSV,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,
VIEWIMP3=Structured Text,0,_ISTR,,.LTR,.CGN,.STR,
VIEWIMP4=Tabular Text,0,_ITAB,,.PRN,.RPT,.TXT,.TAB,
VIEWEXP1=Lotus 1-2-3 Worksheet,0,_XWKS,,.WKS,.WK1,.WR1,.WRK,
VIEWEXP3=Structured Text,0,_XSTR,,.LTR,.CGN,.STR,
VIEWEXP4=Tabular Text,1,_XTAB,,.LTR,.RPT,.CGN,.TAB,
EDITIMP1=ASCII Text,0,_ITEXT,,.TXT,.PRN,.C,.H,.RIP,
EDITIMP2=MicrosoftWord RTF,0,_IRTF,,.DOC,.RTF,
EDITIMP3=Lotus 1-2-3
Worksheet,0,_IWKSE,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,
EDITIMP4=Lotus PIC,0,_IPIC,,.PIC,
EDITIMP5=CGM Image,0,_IFL,,.GMF,.CGM,
EDITIMP6=TIFF 5.0 Image,0,_ITIFF,,.TIF,
EDITIMP7=BMP Image,0,_IBMP,,.BMP,
EDITIMP8=Ami Pro,0,_IW4W,W4W33F/V0,.SAM,
EDITIMP17=WordPerfect 5.x,0,_IW4W,W4W07F/V1,.DOC,
EDITIMP22=PCX Image,0,_IPCX,,.PCX,
EDITIMP28=Binary with Text,0,_ISTRNGS,,.*,
EDITIMP29=WordPerfect 6.0/6.1,0,_IW4W,W4W48F/V0,.WPD,.WPT,.DOC,
EDITIMP30=Excel 4.0/5.0,0,_IW4W,W4W21F/V4C,.XLS,
EDITIMP31=Word for Windows 6.0,0,_IW4W,W4W49F/V0,.DOC,
EDITIMP32=GIF Image,0,_IGIF,,.GIF,
EDITIMP33=JPEG Image,0,_IJPEG,,.JPG,
EDITEXP1=ASCII Text,2,_XTEXT,,.TXT,.PRN,.C,.H,.RIP,
EDITEXP2=MicrosoftWord RTF,2,_XRTF,,.DOC,.RTF,
EDITEXP3=CGM Image,2,_XCGM,,.CGM,.GMF,
EDITEXP4=TIFF 5.0 Image,2,_XTIFF,,.TIF,
EDITEXP5=Ami Pro,2,_XW4W,W4W33T/V0,.SAM,
EDITEXP14=WordPerfect 5.1,2,_XW4W,W4W07T/V1,.DOC,
EDITEXP21=WordPerfect 6.0,2,_XW4W,W4W48T/V0,.DOC,
EDITEXP22=WordPerfect 6.1,2,_XW4W,W4W48T/V1,.WPD,.WPT,.DOC,
EDITEXP23=Word for Windows 6.0,2,_XW4W,W4W49T/V0,.DOC,
DDETimeout=10
```

```
NAMEDSTYLE0=020042617369630000000000000000000000000000000000000000000000
000000000000000000000001010100000A000000000000100A0050000A0050000
000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000
NAMEDSTYLE1=020042756C6C657400000000000000000000000000000000000000000000
000000000000000000000001010100000A000000000000000807000008070000
000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000400000000000000000
NAMEDSTYLE2=0200486561646C696E650000000000000000000000000000000000000000
000000000000000000000010101010B0C000000000000100A0050000A0050000
000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000
$$$OpenSpecial=NotesNIC
$$$NotesNIC=CN=Home/OU=Notes/O=NET, welcome.nsf, Notes NIC
Welcome, Notes Network Information Center on the Internet
;ServerTasks=Replica,Router,Update,Stats,AMgr,Adminp,Sched,CalConn
ServerTasks=Replica,Router,Update
;ServerTasksAt1=Catalog,Design
;ServerTasksAt2=UpdAll,Object Collect mailobj.nsf
;ServerTasksAt5=Statlog
TCPIP=TCP, 0, 15, 0
LAN0=NETBIOS, 0, 15, 0
VINES=VINES, 0, 15, 0
SPX=NWSPX, 0, 15, 0
AppleTalk=ATALK, 0, 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
DisabledPorts=LAN0,VINES,SPX,AppleTalk,COM1,COM2,COM3,COM4,COM5
LOG_REPLICATION=0
LOG_SESSIONS=0
ExistingServerName=integration_srv
KeyFilename=user.id
CertificateExpChecked=d:\notes\data\user.id 09/22/97
MailSystem=0
MailServer=CN=pl5000/O=compaq
ServerKeyFileName=pl5000.id
Domain=compaq
Admin=CN=admin/O=compaq
TemplateSetup=2
Setup=49
ServerSetup=7
ZONE_SET=1
Timezone=6
DST=1
ECLSetup=3
DESKWINDOWSIZE=0 0 566 424
WINDOWSIZEWIN=25 5 574 470
MAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
```

```
WinNTIconHidden=0
WinNTIconRect=-1 -1 1 25
FileDlgDirectory=N:\notes\data
;
Log_MailRouting=10
MailLogToEventsOnly=1
SERVER_SHOW_PERFORMANCE=1
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
CONSOLE_Lotus_Domino_Server=80 25 7 15 28 659 351
```

The Sample Destination Server Notes.ini

```
[Notes]

KitType=2
Directory=d:\notes\data
WinNTIconPath=d:\notes\data\W32
$$HasLANPort=1
EnableJavaApplets=1
EnablePlugins=1
Preferences=-2146825103
Passthru_LogLevel=0
Console_LogLevel=2
VIEWIMP1=Lotus 1-2-3
Worksheet,0,_IWKSV,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,
VIEWIMP3=Structured Text,0,_ISTR,,.LTR,.CGN,.STR,
VIEWIMP4=Tabular Text,0,_ITAB,,.PRN,.RPT,.TXT,.TAB,
VIEWEXP1=Lotus 1-2-3 Worksheet,0,_XWKS,,.WKS,.WK1,.WR1,.WRK,
VIEWEXP3=Structured Text,0,_XSTR,,.LTR,.CGN,.STR,
VIEWEXP4=Tabular Text,1,_XTAB,,.LTR,.RPT,.CGN,.TAB,
EDITIMP1=ASCII Text,0,_ITEXT,,.TXT,.PRN,.C,.H,.RIP,
EDITIMP2=MicrosoftWord RTF,0,_IRTF,,.DOC,.RTF,
EDITIMP3=Lotus 1-2-3
Worksheet,0,_IWKSE,,.WKS,.WK1,.WR1,.WRK,.WK3,.WK4,
EDITIMP4=Lotus PIC,0,_IPIC,,.PIC,
EDITIMP5=CGM Image,0,_IFL,,.GMF,.CGM,
EDITIMP6=TIFF 5.0 Image,0,_ITIFF,,.TIF,
EDITIMP7=BMP Image,0,_IBMP,,.BMP,
EDITIMP8=Ami Pro,0,_IW4W,W4W33F/V0,.SAM,
EDITIMP17=WordPerfect 5.x,0,_IW4W,W4W07F/V1,.DOC,
EDITIMP22=PCX Image,0,_IPCX,,.PCX,
EDITIMP28=Binary with Text,0,_ISTRNGS,,.*,
EDITIMP29=WordPerfect 6.0/6.1,0,_IW4W,W4W48F/V0,.WPD,.WPT,.DOC,
EDITIMP30=Excel 4.0/5.0,0,_IW4W,W4W21F/V4C,.XLS,
EDITIMP31=Word for Windows 6.0,0,_IW4W,W4W49F/V0,.DOC,
EDITIMP32=GIF Image,0,_IGIF,,.GIF,
EDITIMP33=JPEG Image,0,_IJPEG,,.JPG,
EDITEXP1=ASCII Text,2,_XTEXT,,.TXT,.PRN,.C,.H,.RIP,
EDITEXP2=MicrosoftWord RTF,2,_XRTF,,.DOC,.RTF,
EDITEXP3=CGM Image,2,_XCGM,,.CGM,.GMF,
EDITEXP4=TIFF 5.0 Image,2,_XTIFF,,.TIF,
EDITEXP5=Ami Pro,2,_XW4W,W4W33T/V0,.SAM,
```

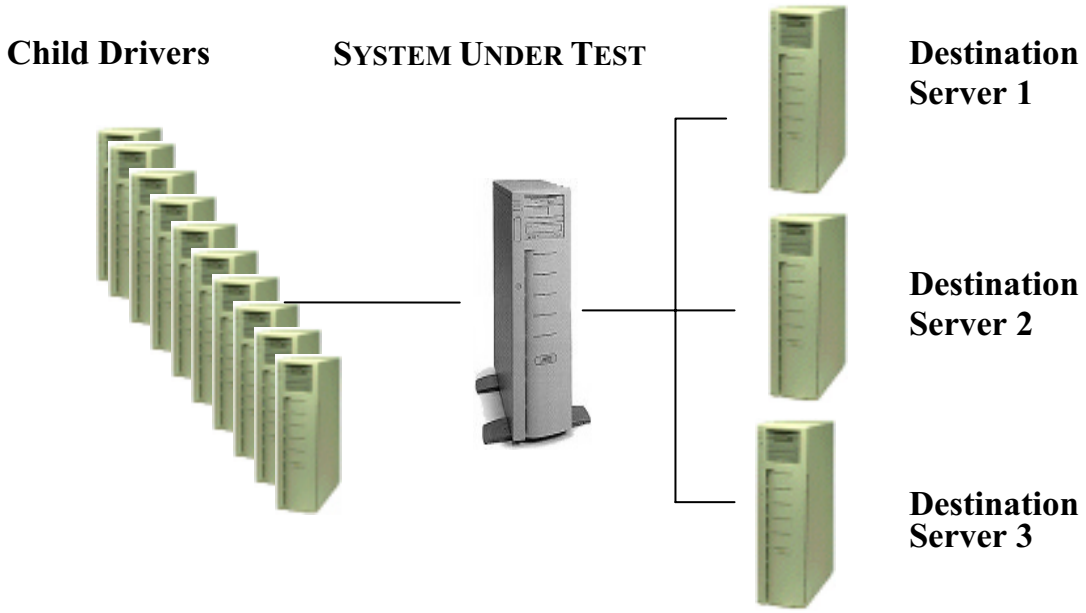
```
EDITEXP14=WordPerfect 5.1,2,_XW4W,W4W07T/V1,.DOC,
EDITEXP21=WordPerfect 6.0,2,_XW4W,W4W48T/V0,.DOC,
EDITEXP22=WordPerfect 6.1,2,_XW4W,W4W48T/V1,.WPD,.WPT,.DOC,
EDITEXP23=Word for Windows 6.0,2,_XW4W,W4W49T/V0,.DOC,
DDETimeout=10
NAMEDSTYLE0=020042617369630000000000000000000000000000000000000000000000000
000000000000000000000001010100000A0000000000000100A0050000A0050000
000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000
NAMEDSTYLE1=020042756C6C6574000000000000000000000000000000000000000000000000
000000000000000000000001010100000A0000000000000000807000008070000
000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000004000000000000000
NAMEDSTYLE2=0200486561646C696E650000000000000000000000000000000000000000000
000000000000000000000010101010B0C0000000000000100A0050000A0050000
000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000
$$$OpenSpecial=NotesNIC
$$$NotesNIC=CN=Home/OU=Notes/O=NET, welcome.nsf, Notes NIC
Welcome, Notes Network Information Center on the Internet
;ServerTasks=Replica,Router,Update,Stats,AMgr,Adminp,Sched,CalConn
ServerTasks=Replica,Router,Update
;ServerTasksAt1=Catalog,Design
;ServerTasksAt2=UpdAll,Object Collect mailobj.nsf
;ServerTasksAt5=Statlog
TCPIP=TCP, 0, 15, 0
LAN0=NETBIOS, 0, 15, 0
SPX=NWSPX, 0, 15, 0
VINES=VINES, 0, 15, 0
AppleTalk=ATALK, 0, 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
DisabledPorts=LAN0,SPX,VINES,AppleTalk,COM1,COM2,COM3,COM4,COM5
LOG_REPLICATION=0
LOG_SESSIONS=0
ExistingServerName=integration_srv
KeyFilename=user.id
CertificateExpChecked=d:\notes\data\user.id 09/22/97
MailSystem=0
CertifierIDFile=d:\notes\data\cert.id
MailServer=CN=s1des1/O=compaq
ServerKeyFileName=s1des1.id
Domain=compaq
Admin=CN=admin/O=compaq
TemplateSetup=2
Setup=49
ServerSetup=7
ZONE_SET=1
Timezone=6
DST=1
ECLSetup=3
```

```
DESKWINDOWSIZE=16 23 420 288
WINDOWSIZEWIN=33 5 570 470
MAXIMIZED=0
WinNTIconCommonConfig=Universal
WinNTIconSize=2
WinNTIconPos=2
WinNTIconHidden=0
WinNTIconRect=-1 -1 563 25
FileDlgDirectory=L:\notes\data
PhoneLog=2
Log=log.nsf, 1, 0, 7, 40000
BCASEWINDOWSIZE=16 23 420 288
CONSOLE_Lotus_Domino_Server=80 25 7 1 42 653 373
```

Appendix E - Network Configuration Files

The IP stack used was the MS Windows NT Advance Server 4.0 stack. There were no parameter changes made to the default installations of either Windows NT or Lotus Domino 4.51

NETWORK CONFIGURATION



10 Driving Systems (Clients)

See Appendix B

System Under Test

ProLiant 5000
3xP6/200MHz 512KB L2 Cache
1024MB Memory
1x2.1 GB System Volume, Paging File
7x2.1 GB Data Volume RAID0

3 Destination Servers

See Appendix B

APPENDIX F - GUIDELINES FOR INFORMATION USAGE

This report is intended for use of Compaq's customers. However, it may be freely copied and distributed, as long as the entire report remains intact.

APPENDIX G - SYSTEM PRICING:

Compaq Computer Corporation	Parts No.	Unit Price	Qty	Sub Total
ProLiant 5000 6/200 (512-KB cache)	221000-001	$10,995.00	1	$10,995.00
2 Pentium Pro Processor Boards w/ 1xP6/200 CPUs, 1P6/200-512 Processor				
ProLiant 5000 System Architecture				
CD-ROM; Integrated Fast-Wide SCSI-2				
SmartStart, Compaq Insight Manager				
Compaq System Configuration Utility				
Netelligent 10/100 TX PCI UTP Controller				
Memory				
256-Megabyte Memory Expansion Kit (4x64MB buffered EDO DIMMs)	241772-B21	$4,085.00	4	$16,340.00
Storage				
Compaq Smart-2P Array Controller	194753-001	$2,217.00	1	$2,217.00
ProLiant Storage System	189600-001	$895.00	1	$ 895.00
2.1-GB Pluggable Fast-Wide SCSI-2 Drive	146742-007	$772.00	8	$6,176.00
Processor Upgrades				
Pentium Pro 200/512K Kit	219443-001	$1,915.00	2	$3,830.00
Misc. Compaq Items				
Compaq V50 Color Monitor	264150-001	$367.05	1	$ 367.05
Software				
Microsoft Windows NT Server v.4.0	N/A	$929.00	1	$ 929.00
Domino Server 4.5 SMP	N/A	$3,495.00	1	$3,495.00
Configuration Total				**$45,244.05**