SPECsfs97 Result

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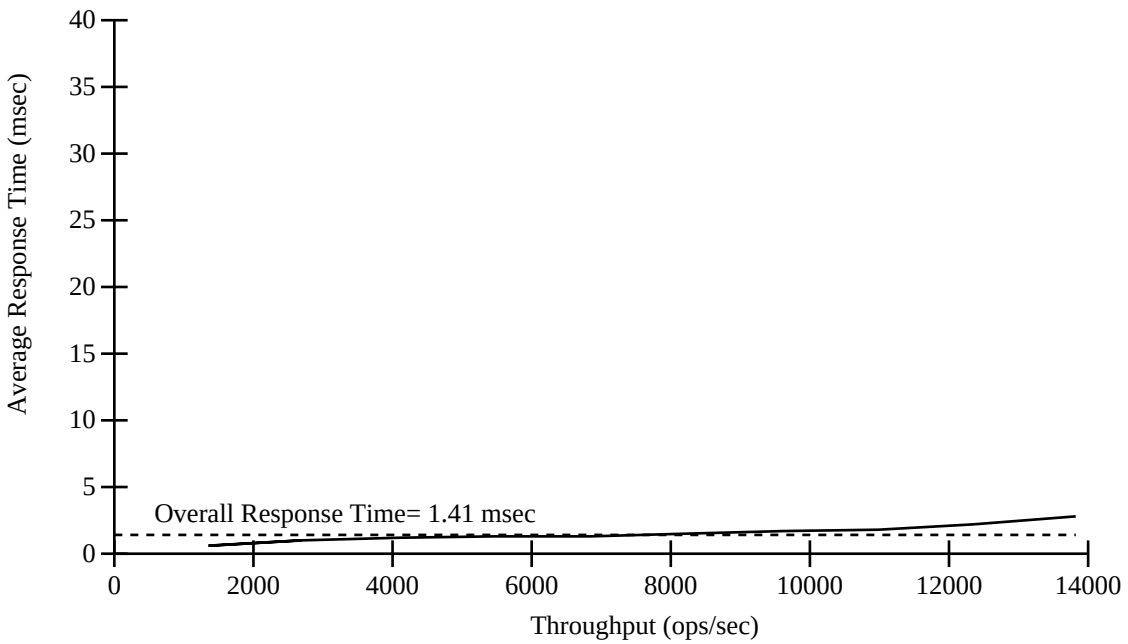
Network Appliance, Inc.
F825c Failover Cluster

SPECsfs97_R1.v3=

13822 Ops/Sec (Overall Response Time = 1.41 msec)

Tested:	August 2002	By:	Network Appliance, Inc.	License #:	33	Hardware Avail:	August 2002	Software Avail:	August 2002

Throughput (ops/sec)	Average Response (msec)
1355	0.6
2689	1.0
4109	1.2
5462	1.3
6837	1.3
8197	1.5
9628	1.7
10986	1.8
12347	2.2
13822	**2.8**



CPU, Memory and Power

Model Name:	F825c Failover Cluster
Processor:	733-MHz Intel Pentium III Coppermine
# of Processors:	2 cores, 2 chips, 1 core/chip (1 per node)
Primary Cache:	16 KB I + 16 KB D
Secondary Cache:	256 KB on-die
Other Cache:	N/A
UPS:	none
Other Hardware:	X1930B cluster adapter card (1 per node - see notes)
Memory Size:	2048 MB (1024 MB per node)
NVRAM Size:	256 MB (128 MB per node)
NVRAM Type:	DIMMs on PCI cards
NVRAM Description:	minimum 15-day battery-backed shelf-life

Server Software

OS Name and Version:	Data ONTAP 6.3
Other Software:	Cluster Option
File System:	WAFL
NFS version:	3

Network Subsystem

Network Type:	Gigabit Ethernet
Network Controller Desc.:	X1025D PCI adapter card
Number Networks:	1 (N1)
Number Network Controllers:	2 (1 per node)
Protocol Type:	TCP
Switch Type:	Extreme BlackDiamond 6808 (N1)
Bridge Type:	N/A
Hub Type:	N/A
Other Network Hardware:	N/A

Server Tuning

Buffer Cache Size:	default
# NFS Processes:	N/A
Fileset Size:	130.5 GB

Disk Subsystem

Number Disk Controllers:	4
Number of Disks:	100
Number of Filesystems:	2
File System Creation Ops:	default
File System Config:	6 RAID-groups of 8 disks each
Disk Controller:	X2050A FC-AL adapter card (256 KB RAM standard)
# of Controller Type:	4
Number of Disks:	25/25/25/25
Disk Type:	X234B 36GB FC-AL
File Systems on Disks:	F1/F1/F2/F2
Special Config Notes:	see notes

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Load Generator (LG) Configuration

Number of Load Generators:	14
Number of Processes per LG:	4
Biod Max Read Setting:	2
Biod Max Write Setting:	2
LG Type:	LG1
LG Model:	Supermicro SuperServer 6010H
Number and Type Processors:	2 x 1.0-GHz Pentium III
Memory Size:	1024 MB
Operating System:	SunOS 5.8 Generic_108529-11 i86pc i386
Compiler:	cc, used SFS97_R1 Precompiled Binaries
Compiler Options:	N/A
Network Type:	Intel Pro/1000 T Server Adapter

Testbed Configuration

LG #	LG Type	Network	Target File Systems	Notes
1/2/../14	LG1	N1	F1,F2	N/A

Notes/Tuning Information

Other Notes

-NetApp's embedded operating system processes NFS requests from the network layer without any NFS daemons, and uses non-volatile memory to improve performance.
-The tested system was a failover cluster comprised of two nodes joined by a cluster interconnect.
-The cluster option was licensed and enabled.
-Each disk controller had two FC-AL loops, one primary and one secondary. Only the primary loops were active.
-Each node was the owner of one filesystem, but the disks were dual-attached so that, in the event of a fault, they could be controlled by the other node via a secondary loop.
-The F1 filesystem was striped across both primary loops of the first node. The F2 filesystem was striped across both primary loops of the second node.
-Each filesystem was composed of six RAID-4 groups; each RAID-group was composed of 7 data disks and 1 parity disk. Four spare disks were present.
-Server tunings:
-date 0801 -- set clock to 8:01am for reproducibility
-options minra 1 -- minimize file read-ahead
-options no_atime_on 1 -- to disable access time update
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