SPECweb99 Result

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Hewlett-Packard: HP 9000 rp4440-8
Zeus Technology Limited: Zeus 4.2r3

SPECweb99 = 10601

Test Date: Jan-2004

Tester: Hewlett-Packard Company

Hardware Avail:	Mar-2004	OS Avail:	May-2004	HTTP Software Avail:	Jul-2003	Sup. Software Avail:	May-2004	SPEC license #:	3

Hardware

Vendor:	Hewlett-Packard
Model:	HP 9000 rp4440-8
Processor:	PA-8800 1.0 GHz
# Processors:	4 cores, 2 chips, 2 cores/chip
Primary Cache:	768KBI + 768KBD (on chip) per core
Secondary Cache:	32MB (off chip) shared by 2 cores
Other Cache:	None
Memory:	64GB (32x2GB)
Disk Subsystem:	1x36GB, 4x73GB (15K RPM)
Disk Controllers:	2 SCSI C1010 Fast Wide LVD (internal); HP DS2100
Other Hardware:	2 x HP ProCurve 4108gl Switch

Software

Operating System:	HP-UX 11i v1
File System:	See Notes
Other Software:	B3901BA HP C/ANSI C

HTTP Software

Vendor:	Zeus Technology Limited
HTTP Software:	Zeus 4.2r3
API:	ISAPI
Server Cache:	HP Network Server Accelerator (NSA HTTP) B.11.11.01.02
Log Mode:	Binary Log Format

Test Sponsor

Test Date:	Jan-2004
Tested By:	Hewlett-Packard Company
SPEC License:	3

Network

# of Controllers:	4
Network Controllers:	HP A7012A dual-port
# of Nets:	8
Type of Nets:	Gigabit Ethernet
Network Speed:	1 Gb/s
MSL (sec):	30 (Non RFC1122)
Time-Wait (sec):	60 (Non RFC1122)
MTU:	1500

Clients

# of Clients:	24
Model:	HP Integrity rx2600
Processor:	Intel Itanium2 900MHz
# of Processors:	2
Memory:	4GB
Network Controller:	HP A6825A
Operating System:	HPUX 11i v2
Compiler:	B3901BA HP C/ANSI C

Notes/Tuning Information

SUT Notes

All filesystems are HFS
1 73GB disk split into two logical volumes with LVM for OS
1 73GB disk with 64KB block size (def. 8KB) and 8KB fragments (def. 1KB)
mounted with largefiles, behind used for NSA logs
1 73GB disk with 64KB block size (def. 8KB) and 8KB fragments (def. 1KB)
mounted with largefiles, behind used for web logs
1 73GB disk mounted read-only used for the file_set
1 36GB disk used for /spec

Bound each Zeus and NSA instance to processor corresponding to its NIC
Bound cgi instance to the processor corresponding to NIC with lighter load (See Client Notes)
Processor binding is performed by "mpsched -c cpu# -p pid"
Set page size attribute for zeus.web binary
chatr +pd 16M +pi 16M zeus.web
Used Auto-Port Aggregation (APA) to aggregate pairs of GbE ports, interrupting same cpu, into single interfaces

Operating System Notes

Additional Software:
HP Network Server Accelerator (NSA HTTP) B.11.11.01.02
Auto-Port Aggregation (APA) Software J4240AA B.11.11.00

HP-UX Patches
PHKL_25233 select(2) and poll(2) hang
PHKL_25729 signals, threads enhancement, Psets Enablement
PHKL_25993 thread nostop for NFS, rlimit, Ufalloc fix

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Notes/Tuning Information (Continued)

Operating System Notes (Continued)

PHKL_25994 Thread NOSTOP, Psets Enablement, Ufalloc
PHKL_25995 eventport syscalls; socket close(2); ufalloc
PHKL_26197 Interrupt Migration Enablement
PHKL_27091 Core PM, vPar, Psets Cumulative, slpq1 perf
PHKL_27094 Psets Enablement Patch, slpq1 perf
PHKL_27317 detach; NOSTOP, Abort; Psets; slpq1 perf
PHNE_29825 cumulative STREAMS patch
PHNE_30656 cumulative ARPA Transport patch
PHNE_28778 APA cumulative patch

HP-UX Tunable Parameters:
dbc_max_pct=75 Max Buffer Cache Size as Percent of RAM (50)
dbc_min_pct=75 Min bufer Cache Size as Percent of RAM (5)
fs_async=1 Select asynchronous writes (0)
maxfiles=60000 Soft File Limit per Process (60)
maxfiles_lim=60000 Hard File Limit per Process (1024)
maxssiz_64bit=0x10000000 Max stack size(bytes) for 64-bit procs (0x800000)
nfile=600000 Max number of open files (790)
ninode=600000 Max number of inodes (444)
scsi_max_qdepth=64 Maximum number of SCSI Commands that can be Queued (8)
tcphashsz=16384 Relative Scaling Factor for TCP & IP Int. Tables(2048)
vps_ceiling=4096 Max System selected page size [KB] (16)
vps_pagesize=64 Default User page size [KB] (4)

HTTP Software Notes

Zeus Global Parameters:
tuning!bind_any no
tuning!cache_cooling_time 0
tuning!cache_files 58000
tuning!cache_flush_interval 86400
tuning!cache_large_file 60000
tuning!cache_max_bytes 0
tuning!cache_small_file 1000
tuning!cache_stat_expire 86400
tuning!cbuff_size 65536
tuning!keepalive yes
tuning!keepalive_timeout 1200
tuning!keepalive_max -1
tuning!listen_queue_size 8192
tuning!maxaccept 2048
tuning!max_connections 3500
tuning!sendfile_reservefd 56000
tuning!sendfile_minsize 1000
tuning!sendfile_maxsize 1048576
tuning!softservers no
tuning!so_rbuff_size 0
tuning!so_wbuff_size 1048576
tuning!timeout 6000
tuning!unique_bind yes
tuning!use_select yes
tuning!modules!cgi!cbuff_size 1048576
tuning!modules!isapi!enabled no
tuning!modules!nsapi!enabled no
tuning!modules!stats!enabled no
Zeus runningsite configuration:
modules!cgi!enabled yes
modules!isapi!enabled yes

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Notes/Tuning Information (Continued)

HTTP API Notes

Zeus ISAPI interface used
Zeus PEPP Toolkit (0.8) used for SPECweb99 dynamic content
./Configure --sendfile=yes --checkconfig=yes --locking=semop --ssl=no --64bit=yes
compiled with HP C/ANSI C developer's Bundle (B3901BA)
CFLAGS=+z +O2 -Ae +DA2.0W +DS2.0 -DUSE_SENDFILE_HP -DCHECK_CONFIG

Network Notes

Networking Tunable Parameters:
tcp_xmit_hiwater_def=1000000 Max unsent data triggers flow control(32768)
tcp_conn_request_max=4096 Max outstanding connection reqs (20)
tcp_conn_strategy=4096 Selects TCP connection strategy (0)

HP Network Server Accelerator (NSA HTTP) Tunables:
CacheMaxPct=10 NSA Cache Maximum Percentage of RAM (50)
CacheTimeout=60000 NSA cache reuse timeout in seconds (600)
LogFile=/nsa_logs/nsahttp_log Log file location (/var/nsa/nsahttp_log)
LogFormat=binary NSA log format (ASCII)
MaxURIDataLen=195 NSA Max size URI data (web page) to cache in KB (1024)
HP ProCure 4108gl Switch Configuration:
trunk command was used to trunk two links into one

Client Notes

Client code generated with ./configure --enable-posix-threads
Use client speed setting in rc file to force lighter load on one NIC
i.e. CLIENTS=s1[9] s2[9] s3[9] s4[10] s5[10] s6[10]
HP-UX Tunable Parameters:
max_thread_proc=800 Number of threads per process (64)
maxusers=256 Value of MAXUSERS macro (32)
ncallout=5000 Increase number of pending timeouts
nkthread=8000 Maximum number of system-wide threads (499)
ninode=5000 Maximum number of inodes (444)
nfile=4096 Maximum number of open files (790)

Other Notes

Tuning Disclosure: HP-20040122.txt
Dynamic API: HP-20020723-API.tar.gz