SPECweb99_SSL Result

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IBM: IBM eServer pSeries 655
Zeus Technology Ltd.: Zeus 4.2r3

SPECweb99_SSL =3699

Test Date: May-2003
Tester: IBM

Hardware Avail:	Jul-2003	OS Avail:	Jul-2003	HTTPS Software Avail:	Jul-2003	Sup. Software Avail:	Jul-2003	SPEC license #:	11

Hardware

Vendor:	IBM
Model:	IBM eServer pSeries 655
Processor:	1700MHz POWER4+
# Processors:	4 cores, 4 chips, 1 core/chip, 4 chips/MCM
Primary Cache:	64KBI+32KBD (on chip) per core
Secondary Cache:	1536KB(I+D) unified (on chip) per chip
Other Cache:	128MB unified (off-chip)/MCM, 4 chips/MCM
Memory:	32GB (2 x 16GB)
Disk Subsystem:	2x36GB (10 KRPM) 16Bit SCSI Disks 16x18.2 SSA (10 KRPM) Disks (fast-write enabled)
Disk Controllers:	Wide/Ultra-2 SCSI I/O Controller IBM SSA 160 SerialDisk Adapter
Other Hardware:	1 x IBM Crypto Accelerator 2058 4 x Alteon ACESwitch 180

Software

Operating System:	AIX 5L V5.2(64bit)
File System:	JFS2
Other Software:	None

HTTPS Software

Vendor:	Zeus Technology Ltd.
HTTPS Software:	Zeus 4.2r3
API:	ISAPI
Server Cache:	None
Log Mode:	Binary CLF

Test Sponsor

Test Date:	May-2003
Tested By:	IBM
SPEC License:	11

Network

# of Controllers:	4
Network Controllers:	4 Gigabit Ethernet-SX PCI-X Adapter (14106802)
# of Nets:	4
Type of Nets:	Gigabit Ethernet
Network Speed:	1 Gb/sec
MSL (sec):	30 (Non RFC1122)
Time-Wait (sec):	60 (Non RFC1122)
MTU:	1500

Clients

# of Clients:	16
Model:	IBM pSeries 630
Processor:	1000 MHz Power4
# of Processors:	4
Memory:	8GB
Network Controller:	1 IBM Gigabit Ethernet-SX PCI-X Adapter (14106802)
Operating System:	AIX 5.2
Compiler:	IBM Cset++ Version 5.1

Notes/Tuning Information

SUT Notes

APAR IY44268 (misc AIX 5.2 code enhancements, include tcpip and Gb ethernet driver performance) was applied to AIX 5L V5.2
bindintcpu [interrupt level] [cpu] (interrupt affinity - bind 4 Ethernet interrupts to 4 cpu's(1 interrupt to 1 cpu))
bindprocessor [pid] [cpu] (process affinity - bind each Zeus child process to the CPU servicing the interrupts of the corresponding NIC)
maxpgahead=64(the maximum number of pages to be read ahead,default=8)
maxfree=304(the number of frames on the free list at which page stealing is to stop,default=256)
minperm=5%(the point below which the page-stealer will steal file of computational pages,default=20%)
maxperm=95%(the point above which the page stealing algorithm steals only file page,default=80%)
lgpg_size=16777216 (large_page size, default=0)
lgpg_regions=768 (large_page pool size, default=0)
4 different logs for 4 zeus instances (1 log per zeus instance)
Disk layout: 1 disk for OS, 1 disk for webserver, 14 disks striped for file_set, 2 disks striped for logfiles
Set Gigabit Ethernet driver attribute copy_bytes=256(copy packet from system memory to Gigabit Ethernet adapter if this many or less bytes, default=2048)
Set Gigabit Ethernet driver attribute intr_rate=2000(maximum number of receive interrupts per second that a Gb ethernet adapter will generate, default=0 (no limit))
no (network option) tuning:
no -o tcp_sendspace=65536(default socket send buffer size, default=16384)
no -o tcp_recvspace=65536(default socket receive buffer size, default=16384)
no -o somaxconn=10240(max listen backlog, default=1024)
no -o tcp_timewait=5(ensure that TIME_WAIT is at least 60 seconds, default=1)
no -o tcp_newreno=0(disables the modification to TCP's Fast Recovery algorithm as described in RFC2582, default=1)
no -o tcp_hashtab_size=128021(increase TCP PCB hash table size, default=24499)
one external 7040-61D I/O drawer used for 4 Gigabit ethernet adapters and one crypto accelerator 2058 card
one external 7133-D40 SSA drawer used for 16 SSA disks
MCM stands for Multiple Chip Module

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Notes/Tuning Information (Continued)

HTTP API Notes

Zeus PEPP-06 SPECweb99 toolkit used for dynamic content
post.log in /weblog directory instead of doc_root
./Configure --sendfile=no --locking=semop
Compiled with IBM VAC 6.0.0
CFLAGS=-q64 -qlargetype -O2 -qmaxmem=8192
LDFLAGS=-q64 -qlargetype -bnoentry -Wl -G -bexpall -bM:SRE -lc -lbsd

Client Notes

no (network option) tuning:
no -o delayack=3(delay ack for connection setup and shutdown,default=0)
no -o delayackports={443}(delay ack ports,default={})
no -o tcp_timewait=5(ensure that TIME_WAIT is at least 60 seconds,default=1)
no -o tcp_sendspace=65536(default socket send buffer size, default=16384)
no -o tcp_recvspace=65536(default socket receive buffer size, default=16384)
AIX (thread-scheduling option) tuning:
AIXTHREAD_SCOPE=S (AIX pthread environment variable, set all threads have system based contention scope={1:1}, default={8:1})
AIXTHREAD_SLPRATIO=1:1 (AIX pthread environment variable, controls the number of kernel threads that should be held in reserve for sleeping threads, default={12:1})
YIELDLOOPTIME=1000 (AIX pthread environment variable, controls the number of times to yield the processor before blocking on a busy lock, default=0)

Other Notes

Starts 4 instances of Zeus sharing a common docroot
Each Zeus child process was bound to the processor corresponding to its NIC
Zeus 4.2r3 global.cfg:
tuning!bind_any no
tuning!cache_files 100003
tuning!cache_large_file 1048576
tuning!cache_small_file 10240
tuning!cache_stat_expire 180000
tuning!cache_flush_interval 180000
tuning!cache_max_bytes 0
tuning!num_children 1
tuning!keepalive yes
tuning!ssl_keepalive yes
tuning!ssl_diskcache no
tuning!ssl_sessioncache_size 5003
tuning!keepalive_timeout 300
tuning!timeout 600
tuning!keepalive_max -1
tuning!listen_queue_size 9216
tuning!cbuff_size 1048576
tuning!multiple_accept yes
tuning!sendfile no
tuning!so_rbuff_size 32768
tuning!softservers no
tuning!unique_bind yes
tuning!use_poll no
tuning!cache_cooling_time 0
tuning!modules!cgi!cleansize 0
tuning!modules!cgi!cbuff_size 921632
tuning!modules!stats!enabled no
tuning!modules!nsapi!enabled no
tuning!modules!ssld!library libZica.so
tuning!modules!ssld!ica_lib /usr/lib/pkcs11/PKCS11_API.so64
tuning!modules!ssld!nworkers 256
tuning!modules!ssld!queuelen 10240
tuning!modules!ssld!failurecount 0 (the number of successive zeus.ssld failures
the web server will tolerate before fall back to software permanently, set to 0
so the web server will never fall back to software permanently, and always try to
contact zeus.ssld first. default 5)

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Notes/Tuning Information (Continued)

Other Notes (Continued)

Zeus_Site_Configuration (one per instance):
modules!cgi!enabled yes
modules!isapi!enabled yes
modules!security!enabled yes