best “Open Systems Day” 20. April 2005
Migration auf 64Bit,
- steigt die Performance um Faktor 4?

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Sun microsystems

Agenda

- Sun – AMD Allianz
- Vorteile 64 Bit Computing
- Suns Opteron Systeme

Sun / AMD Partnerschaft

Opteron Server Market Leadership

TECHNOLOGIE-DOPPEL

Langfristige strategische Allianz mit dem Ziel, die leistungsfähigsten x64-Plattformen für skalierbare IT-Infrastrukturen auf den Markt zu bringen

- Sun baut ein breites Portfolio von AMD Opteron™ Prozessor-basierten Produkten
- Sun und AMD arbeiten zusammen an:
  - Optimierungen für Solaris, Linux und den Sun Java™ Plattformen für AMD Opteron Prozessoren
  - Skalierbarkeit jenseits von 4-fach AMD Opteron Prozessoren
  - Kohärenten HyperTransport Technologie-Implementierungen
  - Schaffung eines Industrie-Ökosystems für ISV- und IHV-Unterstützung

Warum 64-bit Computing?

- Speicher-Trends
  - Preise halbieren sich alle 18-24 Monate
  - Bestückung verdoppelt sich alle 18-24 Monate

- Daten-Trends
  - Datenbestand verdoppelt sich jährlich
  - Komplexität der Daten erhöht sich
    (z.B. multimediale Inhalte)

- Software-Trends
  - Applikationen fordern mehr Speicher
    (Objektorientierung, Komponenten-Architektur, Schichtenmodelle)

Die 4 GB Grenze der 32-bit Systeme wird bald zum Problem!

Heute schon auf 64 bit Hardware setzen?

- 64-bit Software wird relevant in der Server-Lebenserwartung
  - Neue Server werden die nächsten 5 Jahre genutzt
  - Linux/Solaris/ ist schon für 64-bit geeignet, Windows folgt in Kürze
  - Die 4GB Grenze schlägt bald zu

Opteron basierte Server bieten Zukunftsicherheit und Investitionsschutz

Kosten bei inkompatiblen 64-bit Architekturen?

- Bedeutet der Upgrade für Sie ...


zusätzliches Personal oder Consultants?


zusätzliche Hardware für Migration?

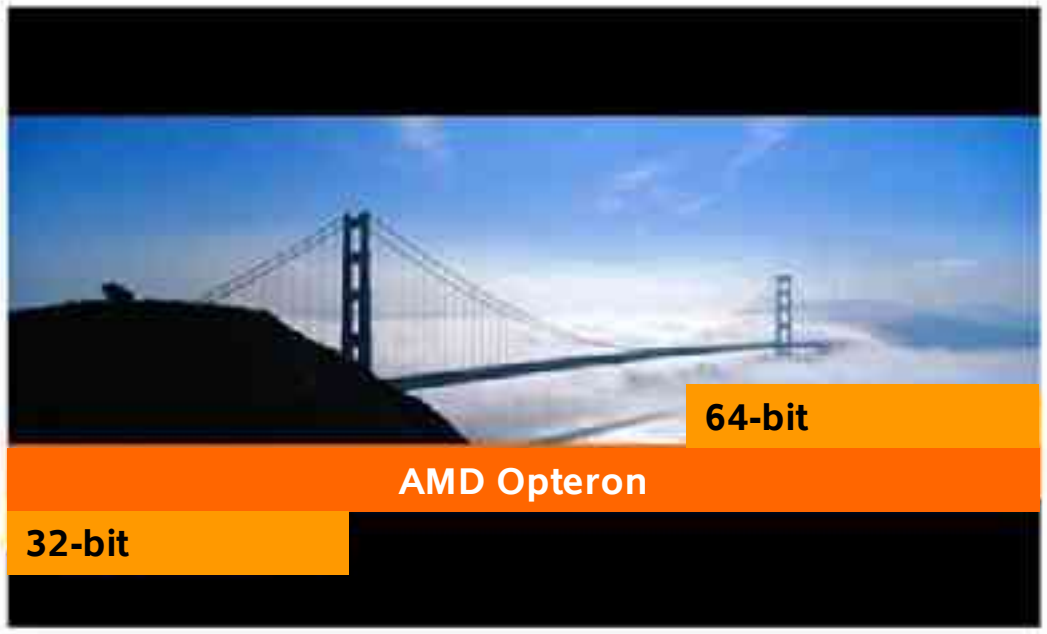

funktionelle Infrastruktur wegzuwerfen?


Anwender neu zu schulen?


Software zu ändern oder gar auszutauschen?

Viele Kosten beim Umstieg auf
64 bit sind völlig unnötig!

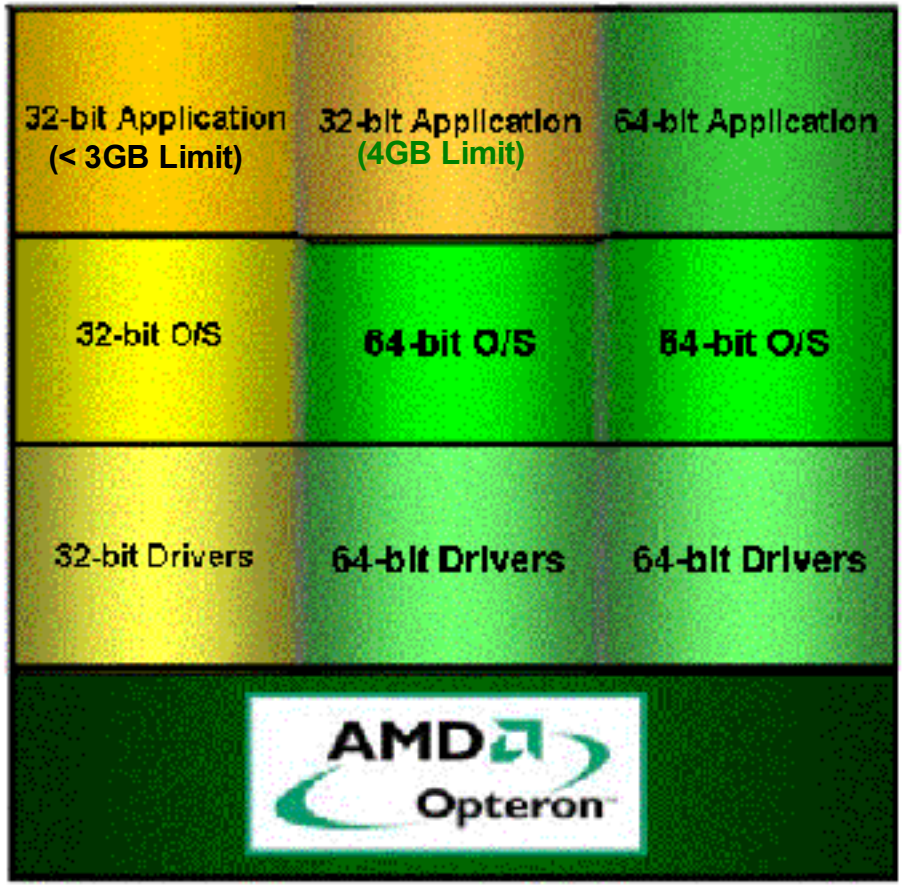
AMD Opteron
Die Brücke zu 64 bit für x64



ausgewogen + performant + flexibel

Der weiche Umstieg auf 64-bit

AMD: Eine Platfform



- Ihr heutiges 32-bit OS läuft drauf
- Das zukünftige 64-bit OS versteht sich mit Ihren 32-bit Applikationen
- 64-bit Applikationen ohne Grenzen

OS-Support

Support durch Partner

- debian
- Redhat
- SuSE
- Microsoft Windows 2000/2003

- Redhat EL 3.0
- SuSE LES 8
- Solaris 9/10

auf Sun-Preisliste supportet durch Sun

Mainstream Linux Distributionen und Solaris!

Sun bringt Top Technologie mit Opteron

Schöne Workstations seit 23 Jahren!

1982

2005

Über 30 Weltrekorde für Suns Opteron Syteme

- Sun Fire™ V20z Server
  - Beste Leistung aller 2 CPU Systeme bei SPECjAppServer2002 Dual Node Benchmark
  - SPEC JBB2000 Benchmark – Bestes Dualprozessor Resultat in der 64-bit JVM Kategorie
  - Werltrekord Preis/Leistung bei SPECjAppServer2002 MultipleNode mit Solaris

- Sun Fire™ V40z Server
  - Werltrekord Leistung für ein Single System bei dem SPECweb99_SSL Benchmark
  - Rekord in der 4-Thread Kategorie bei dem SPEC OMPM2001 Benchmark
  - 4- Wege CPU Server 64-bit Weltrekord bei dem SPEC JBB2000

- Sun Java™ Workstation W1100z/W2100z
  - Fastest run-time and the best Composite Score on the EnSight graphics-oriented benchmark
  - World Record on OCUS Benchmark v4 for PTC Pro/ENGINEER Wildfire 2.0
  - Outperforming Dell Precision 670 workstation on compute intensive SPEC CPU2000 workloads
  - Record setting BLAST results with Solaris - beating Dell Precision 670 workstation with Linux

COMPLETE HIGH PERFORMANCE PRODUCT FAMILY

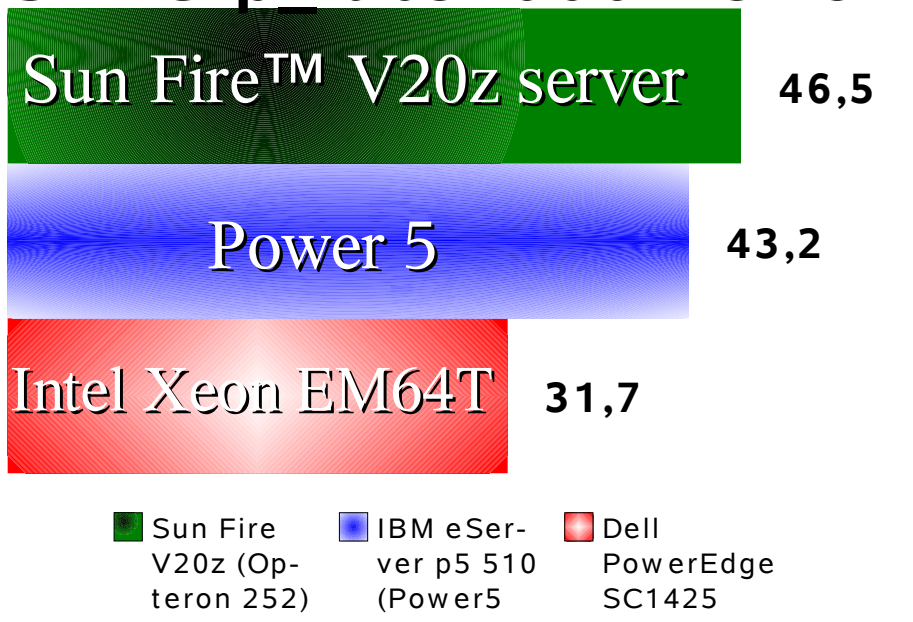
x86 category is comprised of Intel 8086, Intel 80186, Intel 80286, Intel 80386, Intel 80486, Pentium, Pentium Pro, Pentium II, Pentium III, Pentium 4, Opteron and Athlon64 processors

SPEC and the benchmark names SPECweb, SPECjAppServer, SPECjbb, SPECcpu and SPEComp are registered trademarks of the Standard Performance Evaluation Corporation. Benchmark results stated above reflect data published on www.spec.org as of 04/07/05. For the latest benchmark results, visitwww.spec.org. 2-way and 2 CPU systems have two cores. 4-way and 4 CPU systems have four cores. 64-bit systems have 64-bit capable implementation of the operating system and Java Virtual Machine.

Industry Leading x64 Performance

Run your applications faster

- Screaming performance with 64-bit AMD Opteron processors
  - Beats all 2-way Intel EM64T and Power5-based servers on floating point intensive SPECfp_rate2000 benchmark
- Direct Connect Architecture
  - CPUs are connected directly
  - Memory controller on chip
  - Physical memory and I/O are connected directly to the CPU for low latency and high bandwidth



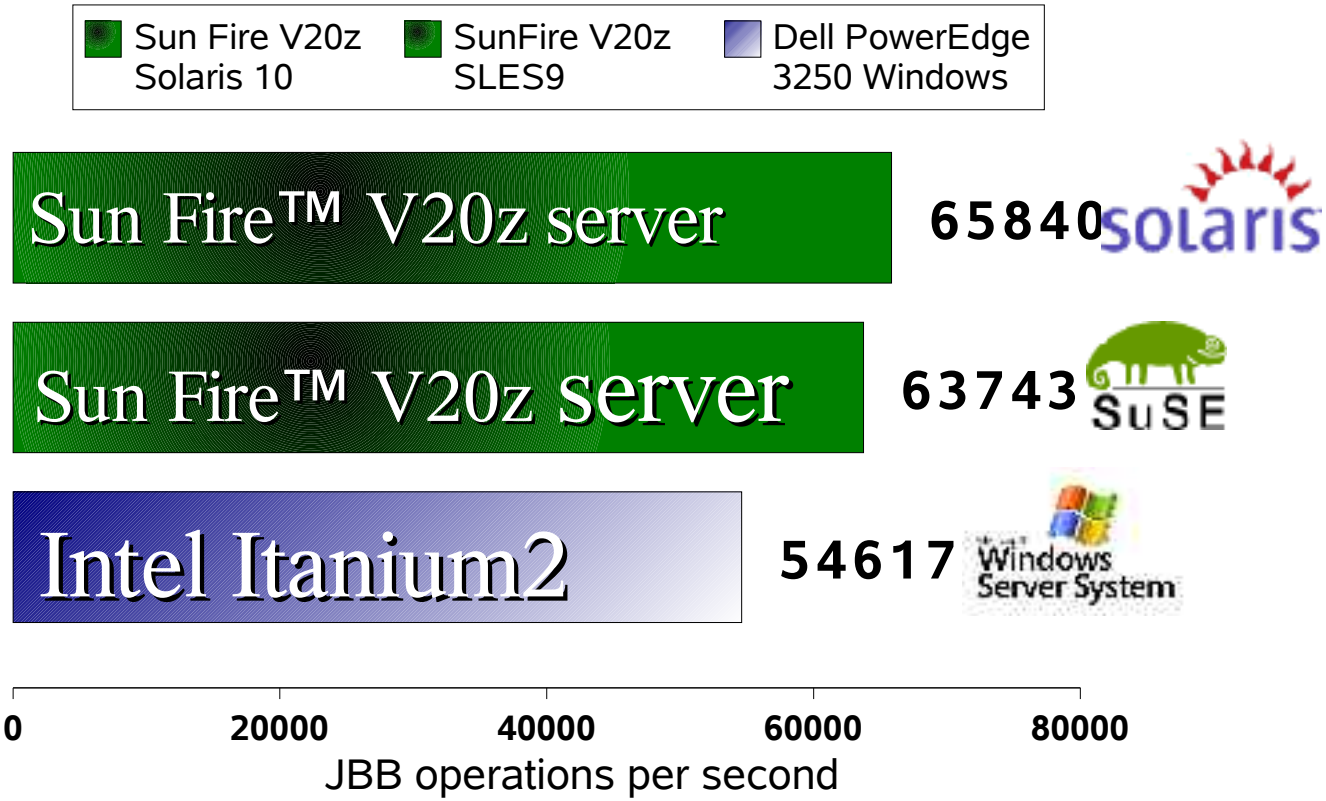
solaris redhat SuSE Windows Server System

AMD 64 Opteron

SPEC, SPEC CPU2000, SPECint and SPECfp are the registered trademarks of the Standard Performance Evaluation Corporation. For the latest SPEC CPU2000 benchmark results, visit http://www.spec.org/cpu2000/results/. Competitive results were obtained on 4/7/2005. 2-way and 2 CPU systems have two cores. Sun Fire V20z server (2xAMD Opteron processor Model 252, SLES9): SPECfp_rate2000 – 46.5. IBM eServer p5 510 (2x1.65 GHz Power5, AIX): SPECfp_rate2000 – 43.2. Dell PowerEdge SC1425 (2x3.6 GHz Xeon 2MB L2,Windows 2003 server): SPECfp_rate2000 - 31.7

2-way 64-bit Record on SPEC JBB2000

- Sun Fire V20z server leads the pack with x64 stack
  - Benchmark emulates wholesale order processing



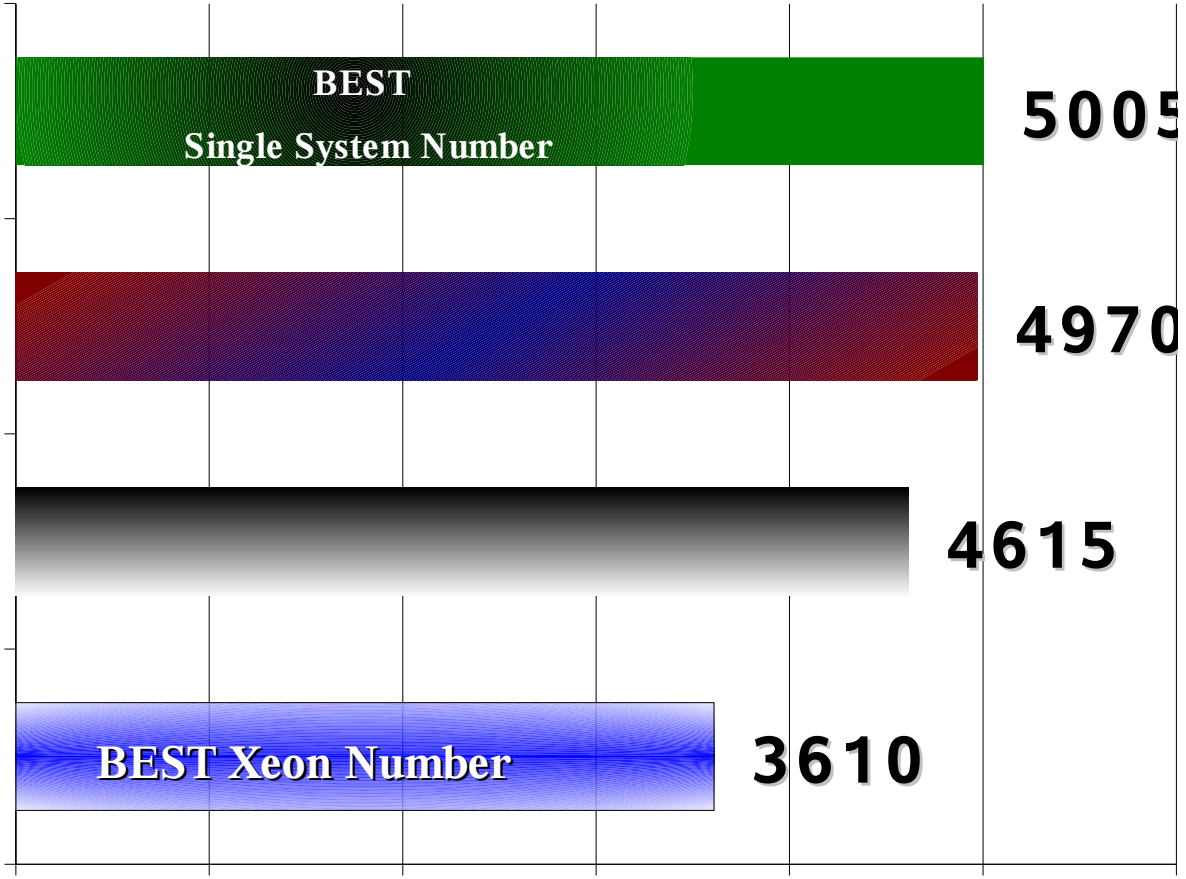
64-bit Platform
\+ 64-bit Solaris OS
\+ 64-bit Java VM
= **Performance Advantage**

- ✔ Faster than Linux 0n the same platform
- ✔ Beats than Dell PowerEdge 3250 server, a 2 x 1.5 GHz Intel Itanium2 based platform, by 20%

SPEC and the benchmark name SPECjbb are registered trademarks of the Standard Performance Evaluation Corporation. Competitive benchmark results stated above reflect data published on www.spec.org as of 4/7/05. For the latest SPECjbb2000 benchmark results, visit http://www.spec.org/jbb2000/results/. 2-way and 2 CPU systems have two cores. 64-bit systems have 64-bit capable implementation of the operating system and Java Virtual Machine. Sun Fire V20z server (2xAMD Opteron Model 252, SLES9): 63,743 JBBops/s. Sun Fire V20z server (2xAMD Opteron Model 252, Solaris 10): 65,840 JBBops/s. Dell PowerEdge 3250 server (2x1.5 GHz Intel Itanium2, Windows Server 2003): 54,617 JBBops/s.

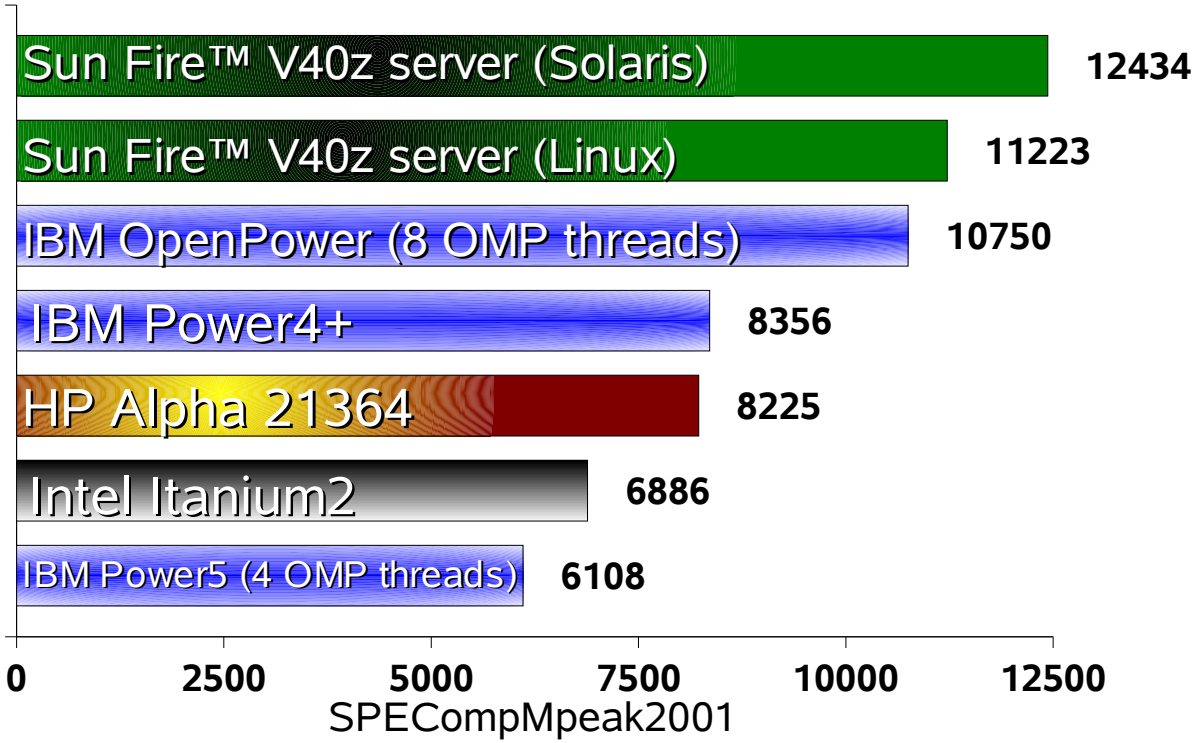
World Record SPECweb®99_SSL Result

- Outperformes all Xeon, Itanium and Power5-based systems by up to 39%
- Does not resort to the use of specialized encryption cards



SPEC OMP2001 World Record Result

- Sun Fire V40z server sets new high mark by posting best results in a 4 thread category

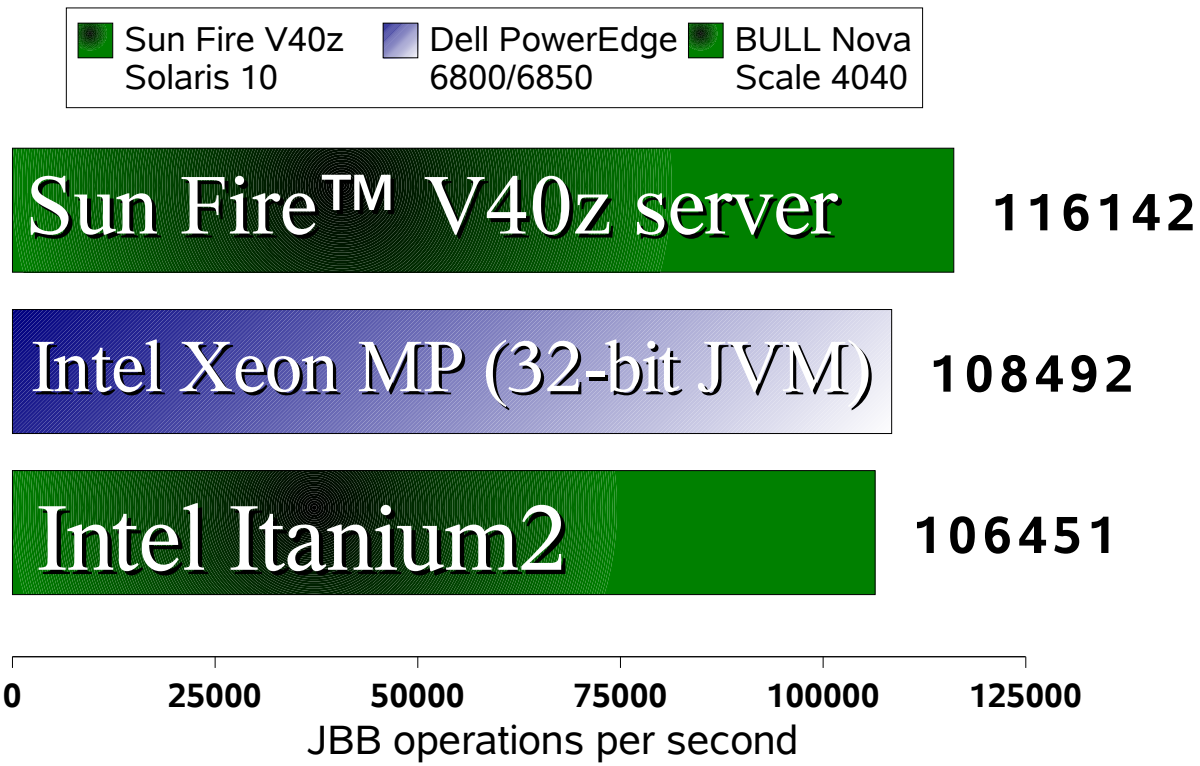


- ✔ Sun Studio 10 and Solaris 10 OS duo gives 11% performance boost on the same hardware vs Linux
- ✔ Better than Power5-based IBM eServer OpenPower 710 server by more than 32% using half the number of parallel OpenMP threads
- ✔ More than twice the performance of Power5-based IBM eServer p5 510
- ✔ Tops the Performance of HP AlphaServer GS1280, a 4x1.3 GHz Alpha 21364 based platform, by 50%

SPEC and the benchmark name SPEComp are registered trademarks of the Standard Performance Evaluation Corporation. Competitive benchmark results stated above reflect data published on www.spec.org as of 4/7/05. For the latest SPECweb99_SSL benchmark results, visit http://www.spec.org/omp/results/ The Sun Fire V40z server (4xAMD Opteron Model 852, Solaris 10, Sun Studio 10 compiler): SPECompM2001 - 12,434 (4 cores, 4 chips, 4 threads). The Sun Fire V40z server (4xAMD Opteron Model 852, SLES 9, PathScale compiler): SPECompM2001 - 11,223 (4 cores, 4 chips, 4 threads). The IBM eServer OpenPower 710 (2x1.65 GHz POWER5, Linux): SPECompM2001 -- 10,750 (4 cores, 2 chips, 8 threads. The IBM eServer pSeries 655 (4x1.7 GHz Power4+, AIX): SPECompM2001 -- 8356 (4 cores, 4 chips, 4 threads). The HP AlphaServer GS1280 7/1300 (4xAlpha 21364 , Tru64 UNIX): SPECompM2001 - 8225 (4 cores, 4 chips, 4 threads). The HP server rx7620 (4x1.5 GHz Itanium2, HPUX): SPECompM2001 - 6886 (4 cores, 4 chips, 4 threads).The IBM eServer p5 510 (1x1.65 GHz POWER5, AIX): SPECompM2001 -- 6108 (2 cores, 1 chip, 4 threads).

4-way 64-bit Record on SPEC JBB2000

- Sun Fire V40z server leads the pack with x64 stack
  - Benchmark emulates wholesale order processing



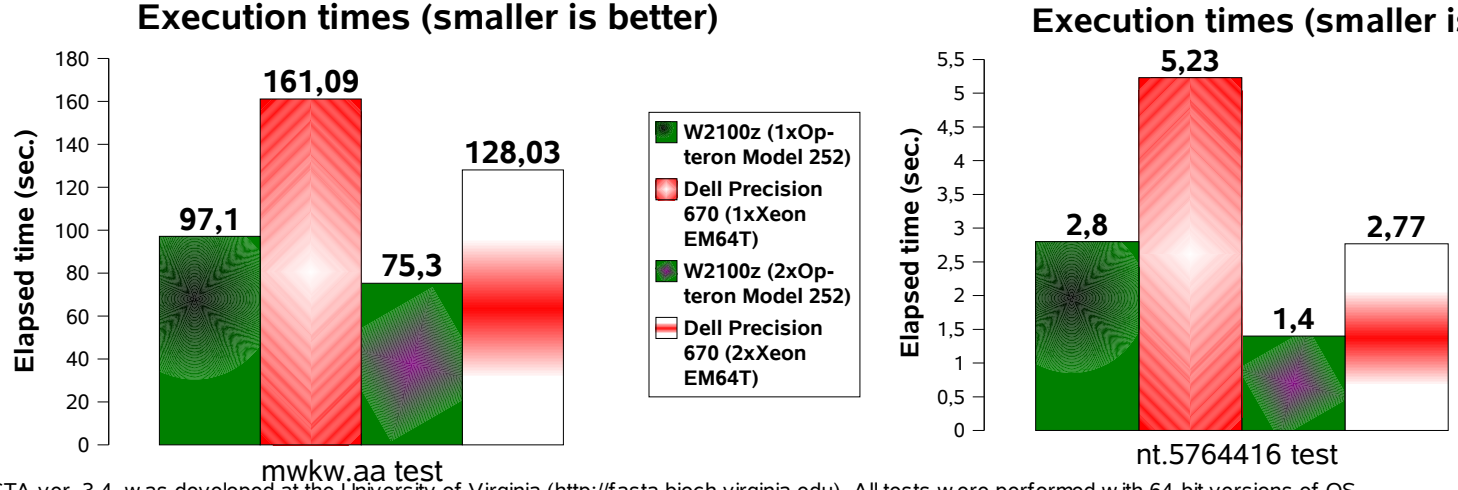
64-bit Platform
\+ 64-bit Solaris OS
\+ 64-bit Java VM
= **Performance Advantage**

- ✔ Beats than Dell PowerEdge 6800/6850 server, a 4x3.66 GHz Intel Xeon MP-based EM64T platform, by 7%
- ✔ Solaris beats Windows with 32- or 64-bit JVMs

SPEC and the benchmark name SPECjbb are registered trademarks of the Standard Performance Evaluation Corporation. Competitive benchmark results stated above reflect data published on www.spec.org as of 04/12/05. For the latest SPECjbb benchmark results, visit http://www.spec.org/jbb2000/results/. 4-way and 4 CPU systems have four cores. 64-bit systems have 64-bit capable implementation of the operating system and Java Virtual Machine. Sun Fire V40z server (4x AMD Opteron Model 852, Solaris 10): 116142 JBBops/s. Dell PowerEdge6800/6850 server (4x3.66GHz Intel Xeon MP, Windows Server 2003): 108,492 JBBops/s. Bull NovaScale 4040 server (4x1.5 GHz Intel Itanium2, Windows Server 2003): 106,451 JBBops/s.

World Record Performance on Bioinformatics workloads: FASTA

- Provides sequence similarity searching against nucleotide and protein databases. Compares one protein or DNA sequence to another, or to a protein DB or a DNA library
- Sun Java™ Workstation W2100z, running Solaris 10, showcases 2x scalabily, beating Dell Precision Workstation



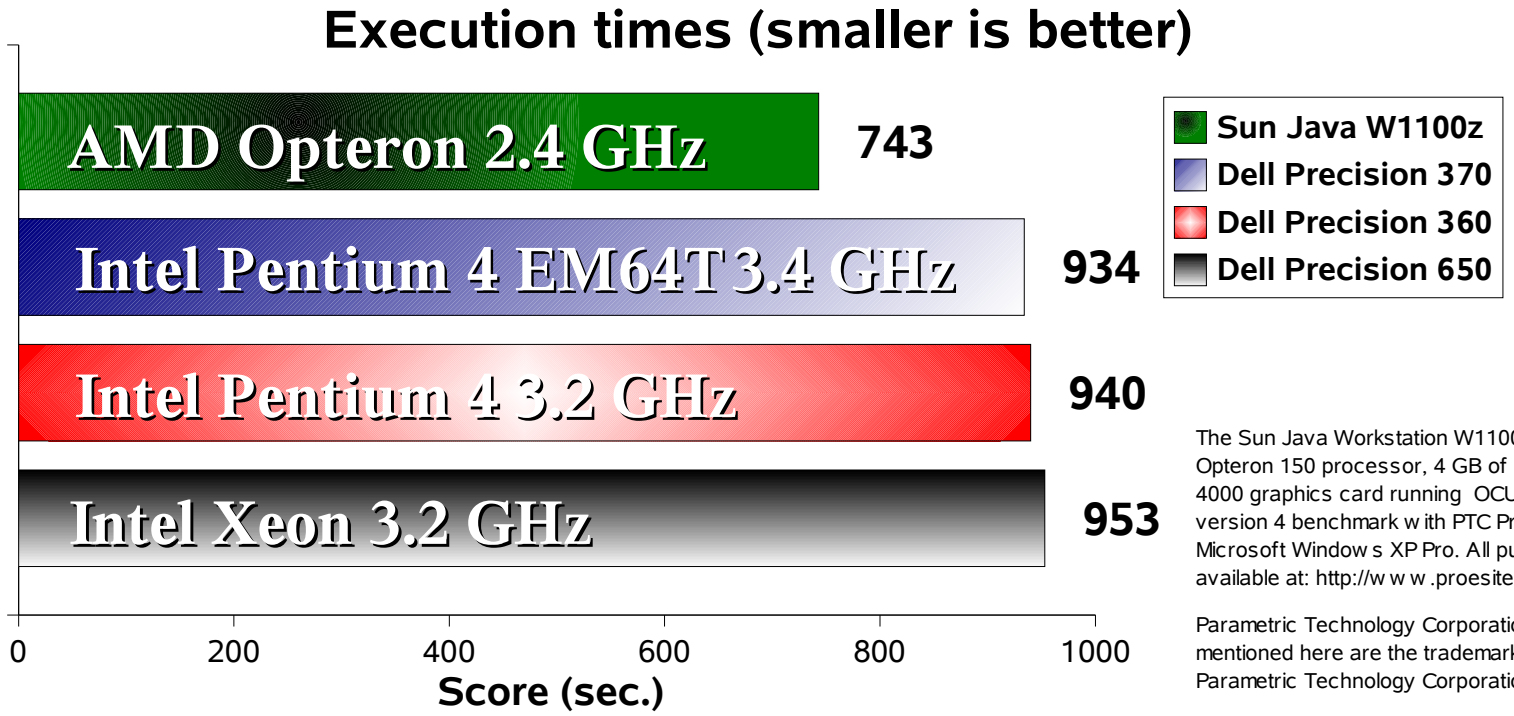
Solaris beats Linux

FASTA ver. 3.4 was developed at the University of Virginia (http://fasta.bioch.virginia.edu). All tests were performed with 64-bit versions of OS.

The Sun Java™ Workstation W2100z – AMD Opteron Model 252, 4 GB RAM, Solaris 10. Dell Precision 670 workstation – Intel Xeon 3.6GHz with EM64T,4 GB RAM, RHEL 3.0 Update 2

New World Record on OCUS Benchmark v4 for PTC Pro/ENGINEER Wildfire 2.0

- Sun's workstation legacy pays off big in MCAD benchmark
- Sun Java™ Workstation W1100z and Sun Java™ Workstation W1100z eclipse all other published results as of 4/1/05



The Sun Java Workstation W1100z equipped w ith single AMD Opteron 150 processor, 4 GB of memory, nVidia Quadro FX 4000 graphics card running OCUS (Olaf Corten's Utilities) version 4 benchmark w ith PTC Pro/ENGINEER Wildfire 2.0 on Microsoft Window s XP Pro. All published benchmark results available at: http://w w w .proesite.com/cgi-bin/ocusb4.cgi

Erwarten Sie mehr von Sun

Wir liefern extreme Performance

- Führende Benchmark-Ergebnisse

Wahlmöglichkeiten für Hardware, Betriebssystem und Applikationen mit den passenden Ökosystemen für die beste Lösung

- Beste Wahl für Ihr Budget und Ihre Lösungs-Anforderungen

Technologie und Expertise für den Sprung ins nächste Zeitalter

- Vertrauen Sie dem 64-Bit Marktführer

best “Open Systems Days”
Unterföhring, den 20. April 2005

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Sun microsystems