Sun 公司酷线程 UltraSPARC T1 Sun Fire 服务器最新发展介绍

姓名

职务

Sun Microsystems, China

议程

- Sun 公司如何以最新的处理器创新与系统设计解决客户面临的 IT 难题
- 酷线程 CoolThreads 技术介绍
- SWaP 指标的意义
- Sun Fire T1000/T2000 服务器
- 成功案例
- 最新发展介绍

Sun 可以帮助您 ...

通过以下因素充分发挥数据中心的作用

- 最高性能
- 最高能源、冷却和空间效率

... 更低的价格

需求和容量发生冲突 ...

- 需求
- 用户
- 服务
- 访问

- 功率
- 成本
- 空间
- 热量

... 而您的
数据中心
进退维谷！

Sun 的服务器策略

为将来十年构建最好的 64 位服务器

- 创造全新和开放的行业标准，提高性能，降低能耗，缩小空间，降低成本
- 在 CPU 、系统和软件等级方面创新
- 通过充分利用研发实现效率最大化
- 整合服务和系统
- 利用 Solaris 二进制兼容提供保证

AMD 64 Opteron

ULTRASPARC

树立全新行业标准

世界领先的性能和能源效率

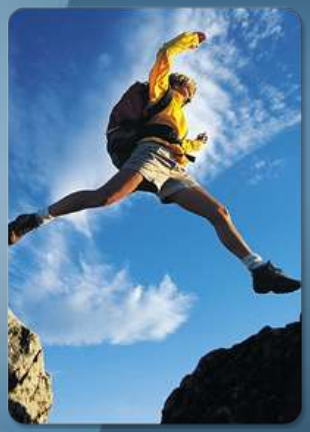
Sun Fire™ x64 服务器

Sun Fire V490-E25K 服务器
Netra™ 服务器

Sun Fire 酷线程 ™ 服务器

在整个产品线中保证 Solaris 的兼容性

改变服务器的竞争形态



超群的性能
实现性能的全面领先

50 多个世界领先的测试指标

x64: 最高可达 1.7 倍于 Xeon 服务器，是同级别服务器中最快的

CoolThreads: 5 倍于竞争对手

UltraSPARC IV+: 优于或相同于竞争对手

极具竞争力的价格
低于或相当于竞争对手

x64: 比 Xeon 服务器具有更高的性能价格比

CoolThreads 酷线程：价格是 Xeon 服务器的三分之一

UltraSPARC IV+: 与前一代产品价格相同

购买 Sun 服务器可免费获得 Oracle 数据库

改变服务器的竞争形态

更少占用空间
在更小的空间内实现更大的吞吐量

x64：占用空间只是 Xeon 服务器的四分之一

CoolThreads 酷线程：占用空间只是 Xeon 服务器的四分之一
UltraSPARC IV+：同样的空间占用，性能提升 5 倍

更高的电能使用效率
突破性的服务器电能使用效率指标

新的行业指标体系：
SwaP = 性能 /（空间 x 电能）

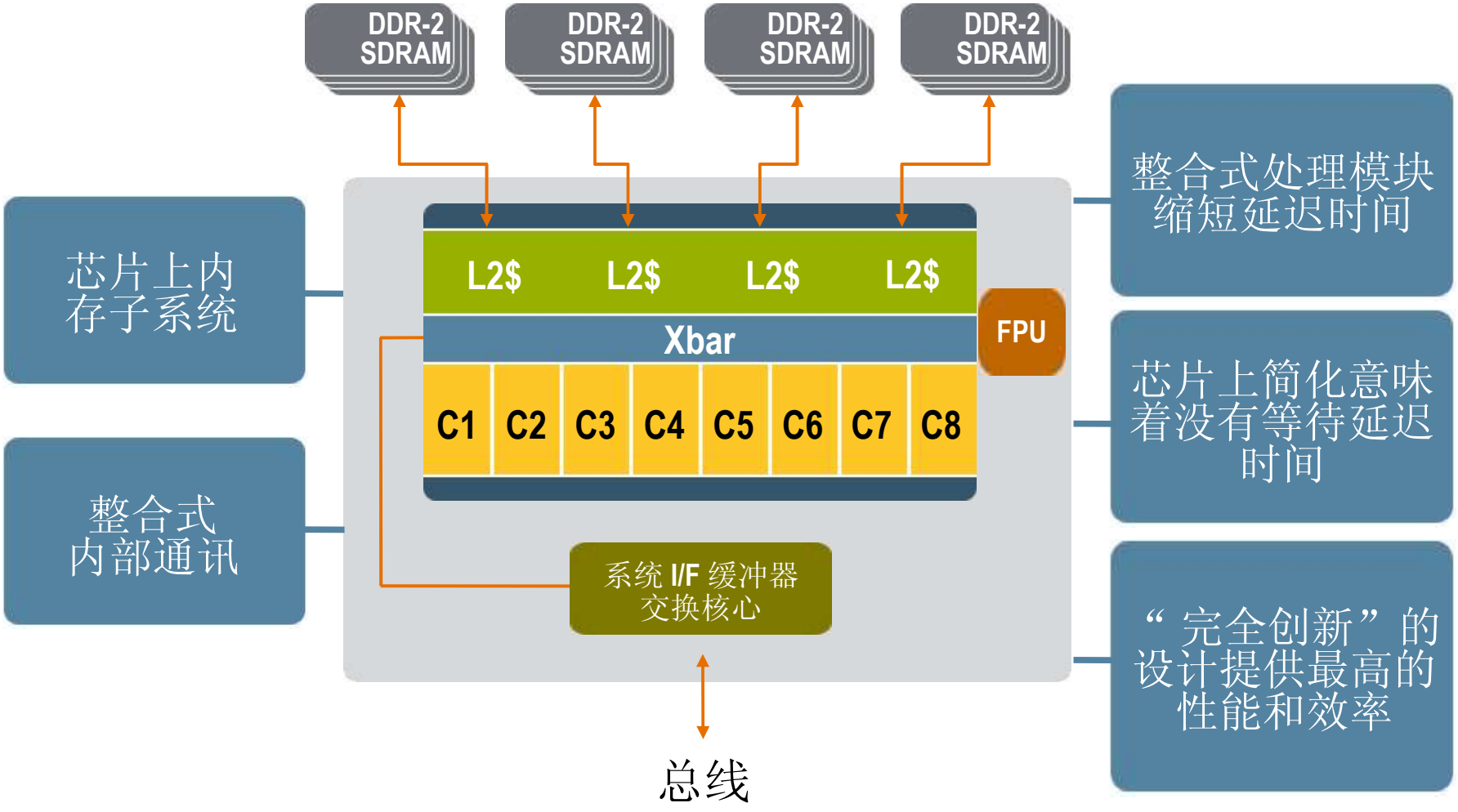
CoolThreads 酷线程：电能消耗是 Xeon 服务器的五分之一
x64：比 Xeon 服务器最高可节省 60% 的电能

实现酷线程 CoolThreads 创新技术的 UltraSPARC T1 芯片

- 一个芯片上有 32 个线程
- 酷线程 (CoolThreads) 是性能、使用空间与能耗的全新标准
- 空间占用少，相当于可以在一个机架上放置 1280 台计算机
- 超过 100 项专利
- 耗电仅相当于一个 70W 的灯泡

为实现高吞吐量性能和效率而设计

最新的 UltraSPARC T1 芯片



全新 Sun Fire 酷线程 CoolThreads 服务器

专为终极网络性能设计的超大容量线程而设计

- 8 内核 T1 芯片，32 线程，9.6 GHz, 72 watts
- SPECjbb2005 世界记录
- “我们的测试表明 *Niagara* 系统的性能是传统系统的四倍，但价格却是传统系统的十分之一。”
  > Paul Sutton, CEO, Kabira
- 100% 二进制兼容
- 起价 $2,995
  (我们没有开玩笑 * 美国定价仅供参考)

性能最快而且是
首个有生态环保特色的服务器

Sun Fire T1000

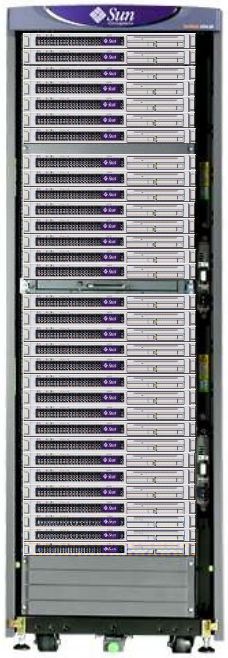
Sun Fire T2000

- 5 倍性能
- 1/5 能耗
- ¼ 空间
- 价格等于或低于行业标准

* 参见披露内容

Sun Fire T1000

网络服务器
身份 / 目录服务器
端口服务器
应用程序整合
索引，搜索
边缘 / 网络节点



- 大型水平扩展
- 极端机架安装密度
  - 1RU 机箱，深 19”
  - 最多 16 GB DDR2 内存
  - 8 个内存插槽
- 简单可靠的设计
  - 1 SATA 3.5” 磁盘驱动器
  - 1 PCI-E 扩展插槽
- 低成本 / 高效率
  - 180 瓦典型功耗
  - 提供无磁盘配置
- 价格 / 性能处于领先地位

Sun Fire T2000

Java 应用程序服务器，企业应用程序服务器（ **ERP** 、 **CRM** ），网络层合并

- 机架安装密度
  - 2RU 机箱，深 24.3”
  - 最多 32 GB DDR-2 内存
  - 16 个内存插槽
- 高可靠性
  - 热插拔磁盘驱动器
  - 冗余热插拔供电和风扇
- 可扩展
  - 3 PCI-E， 2 个 PCI-X 扩展插槽
  - 最多 4 个 SAS 2.5” 磁盘驱动器
  - 4 10/100/1000 Mbps 以太网
  - 4 个 USB 端口
- 低功耗 / 低 TCO
  - 325 瓦典型功耗

SWaP – 服务器的全新标准

空间、功率和性能 (SWaP)

“SWaP 是一种全方位的客观标准，能够以更加全面、现实的方法评估今天的服务器。”

ideas International

CoolThreads 击败友商同类产品

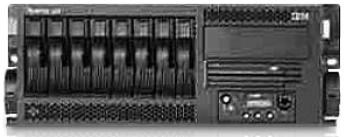
空间、功率和性能 (SWaP)

主要友商产品

Sun Fire T2000 对比

IBM x346
SPECweb2005

IBM p5+ 550
SPECweb2005



HP rx4640 Itanium II
SPECjAppServer2004

性能	3.2 倍	1.8 倍	1.3 倍
功耗	3/4	1/2	1/4
空间	相同	1/2	1/2
SWaP	4.3 倍	8 倍	10.6 倍

为酷线程™服务器最优化的操作系统

- **Solaris 10** 支持数百万线程
- 数据包引擎使用酷线程实现吞吐量最大化
- **CMT** 智能调度程序平衡负载
- 高可用性
  - 可预测的自修复
  - 高级无人值守 **Lights-Out** 管理

> Solaris 容器系统分区 Containers 提供更高利用率

> 不需要再汇编

连续的二进制兼容性

过去 20 年性能提升了 > 1000 倍

10 年二进制兼容性

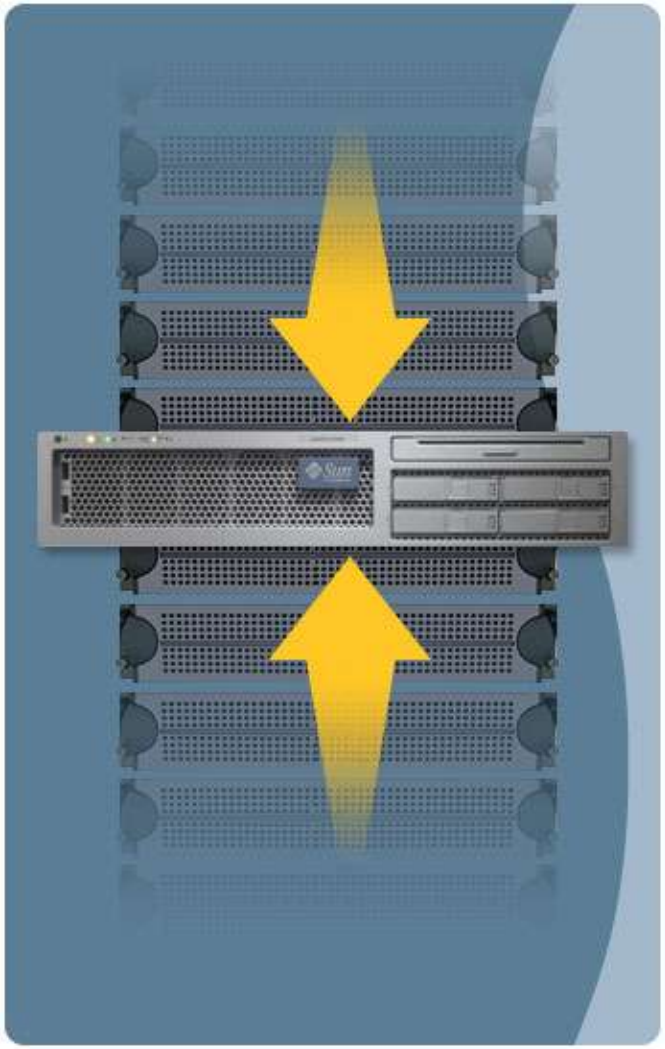
20 年系统兼容性

… 以及 Solaris 应用程序兼容性担保！

酷线程服务器整合

Sun Fire T2000

- 服务器的数量最多可缩减到十分之一
- 电能消耗成本减半！
- 容量提高 5 倍或更多
- 增加更多应用程序、更丰富的服务 / 内容



网络层整合计划

- 将网络和应用程序层整合到 Sun Fire 酷线程服务器

客户

- International Paper/CGI-AMS/Solectron

新浪网 sina.com

全球最大的华人门户网站

性能、客户体验与总体成本

12 台 Sun Fire™ T1000 服务器为一亿八千万新浪邮件用户提供高性能目录服务，性能比以前使用的 x86 服务器提高达五倍以上。“ Sun 公司所提供的解决方案，在强化服务扩展性、改善客户体验的同时，可以显著降低 IT 投资的总体成本。”

新浪公司 *CTO* 李嵩波

Fiducia IT AG 为什么选择 Sun

领先的银行业系统集成商

能源效率

“... 我们无法相信 32 线程服务器如此之小 ... 借助 Sun Fire™ T2000 服务器，我们将能够以 4:1 的比率更换当前的服务器，同时将我们的性能翻倍。而且 ... 看起来我们可以将自己的电能消耗从 5.2 削减到 0.35 kw/ 小时，就是 14 倍。真是不可思议！”

Matthias Schorer， 首席架构师
Fiducia IT AG

Strato AG

世界上第 3 大网络主机提供商

性能、能源效率、占用空间

挑战

- 托管超过 2 百万个域
- 每天数十亿次点击
  - 每个月的网络通讯量超过一千兆字节
- 面对严峻的数据中心冷却问题
- 无法扩展数据中心占地面积

解决方案

- Sun Fire T2000 服务器

优势

- 尽管一台 POP3 服务器可处理之前系统 2 倍的请求，但仍然有超过 90% 的 CPU 闲置
- 有望削减功耗和冷却成本

EDS

我们的客户认为 **T2000** 最棒

成本、性能、能耗效率

“Sun Fire T2000 服务器的成本、吞吐量性能和能耗节约让我们欣喜若狂。正如您想象的那样，减少我们数据中心的功耗至关重要。在我们的最初测试过程中，我们体验到服务器功耗减少了 50% 。在每单位功耗应用吞吐量中，T2000 服务器提供了我们迫切需要的优势。”

Larry Lorzon， CIO， EDS

某服务供应商的网络数据中心

2,000 Xeon 处理器		406 Niagara 处理器	
			
Xeon/Windows/Websphere		酷线程 /Solaris	
2 处理器 Xeon 系统	1,000 套系统	酷线程 8 核心系统	406 套系统
瓦特 / 系统	.585 kW	瓦特 / 系统	.180 kW
费用 /kw/ 月	$125	费用 /kw/ 月	$125.00
有用寿命	36 个月	有用寿命	36 个月
整个三年运营成本	$2.63M	整个三年运营成本	$0.33M

酷线程服务器以 *9* 倍性能 / 瓦特
提供 *6* 倍性能

三年运营费用节省 **230** 万美元
服务器数量减少 **60%**

引入完全保护计划

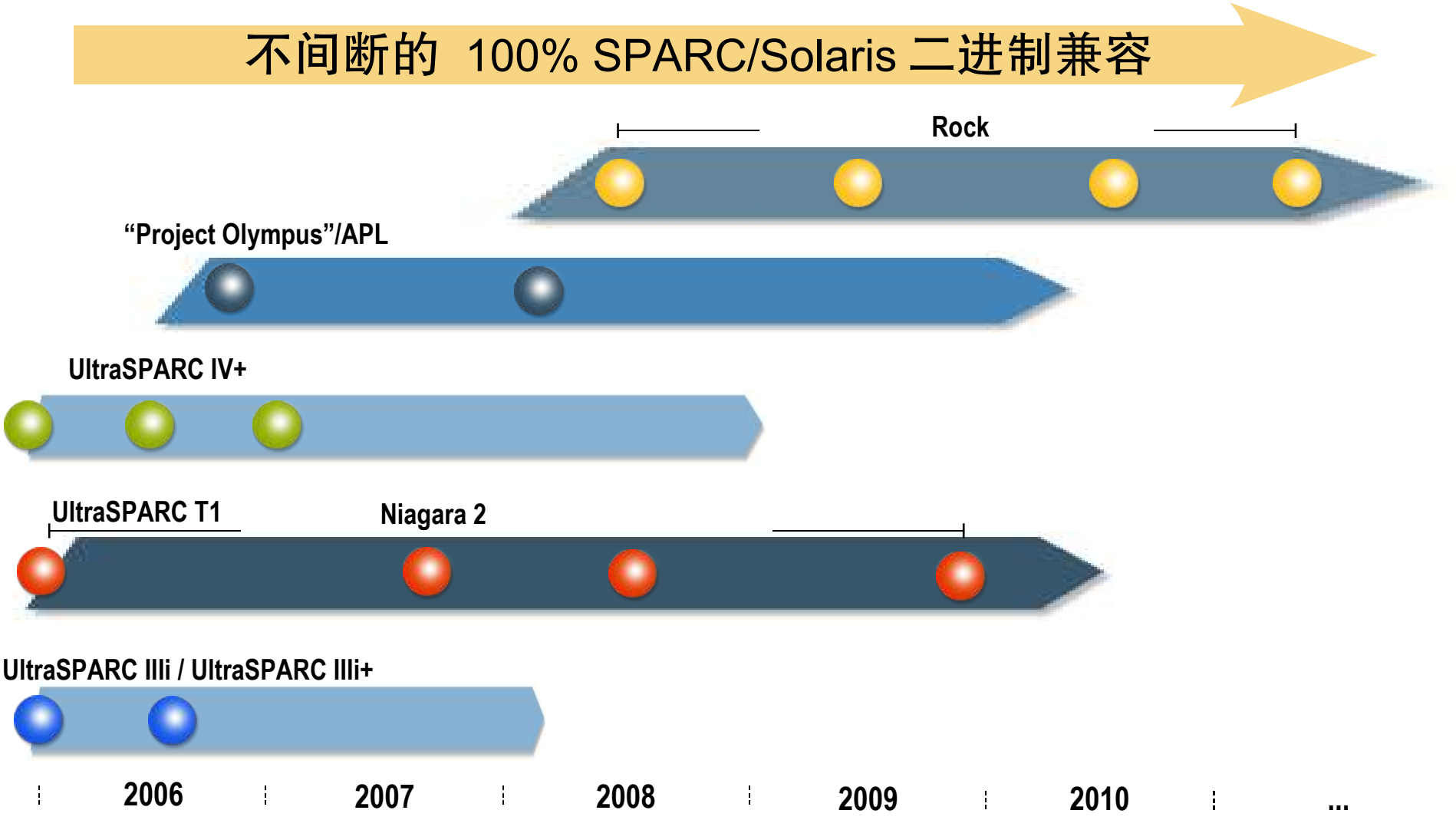
- 系统就绪计划：服务器、操作系统和 3 年整合化硬件和 Solaris 支持
- 企业就绪计划：系统就绪计划的所有内容 + 安装
- 降低服务器价格！
- 提高系统可用性，创建 IT 效率
- 减少预算风险，从资产中提炼更多价值

- 超越损坏 / 修复范围
- 无与伦比的选择
- 没有暗含的成本

Sun 全新 UltraSPARC IV+ 服务器系列

- 速度是 IBM P5+ 的三倍
- 性能测试再创世界记录：
  - TPC-H 10000GB
  - TPC-H SF3000
  - Manugistics
  - Lotus Domino Notes
- 100% 兼容于 Solaris OS 已装系统
  (为什么 Itanium 需要一百亿美元投资？)
- 我们现在处于整个创新周期的起点

SPARC 芯片路线图



Note: Roadmap reflects estimated system delivery dates

OpenSPARC: 处理器设计的开放新选择

- Sun 的开源 SPARC 倡议（ OpenSPARC ） 其目的是公开 UltraSPARC T1 设计点的源码文件
  - 发布日期 :2006 年 3 月
  - 2006 年一季度公开细节
- 首批源码文件包括：
  - 以 Verilog 表现的设计源码
  - 一个确认套件与仿真模型
  - ISA 规格文件 (UltraSPARC Architecture 2005)
  - 一个 Solaris 编程范例

www.OpenSPARC.net

开源 SPARC 网站

开源 SPARC 的酷工具包 CoolTools

- Sun Studio 11 编译器和工具
  - Dprofile – data space profiling 剖析
  - Cool Threads 编程
    - 自动并行化的 C, C++, Fortran 编译器
    - OpenMP – MPJava 平台的并行编程 API
- MediaLib 媒体流的编程库
  - 媒体流应用的编程库 – 视频、音频与数字处理等
  - 为 UltraSPARC T1 优化的性能
- 系统调优工具
  - CoolThread 选择工具

Sun 与 Oracle 通力合作

ORACLE® Sun microsystems

- 我们双方的 Java 协议续签 10 年
- Oracle 支持 NetBeans Integrated Developer Environment (IDE) 以加速 Java 的跨平台开发
- Oracle 选择 Solaris 10 作为首选 64 位开发和部署平台
- 多内核的全新 **Oracle** 许可价格优势
- 一旦购买 US IV & IV+ 服务器的第一年维护支持，将免费取得 Oracle 数据库许可证

Sun 的行业标准服务器优势

最佳性能

改善生产力、产品开发和服务水平

最高能源效率

节约能源和冷却成本，同时不会影响性能

易于管理、维修

节约 IT 员工和维护成本，降低复杂性

最佳可靠性、可用性

避免系统崩溃、停机、不必要的服务中断；提高服务水平

操作系统选择

x64 服务器的多操作系统，跨产品线的世界级 Solaris

最完整、扩展性最强的产品线

以具有成本效益的方式不间断增长，并提供投资保护

更高利用率

更充分地利用 IT 资产

最佳安全性

更好地管理风险、减少威胁和漏洞，保护数据

Sun 的方法提供

更多选择

更多创新

更多价值

借助 Sun 的方法，您可以获得

- 合作伙伴
- 行业标准服务器
- 操作系统
- 基础设施交付模式
- 可互操作组件
- 灵活简单的定价和业务模式

借助 Sun 的方法，您可以获得

- CoolThreads 酷线程，多线程技术
- UltraSPARC IV+ 巨大的吞吐能力
- Java 技术
- Solaris – 600 项创新、 Dtrace 、 Container
- 互联服务
- 所有产品中均确保安全性
- 生态环保
- 行业标准创新
- 集成、优化
- 专注于构建开放技术的社区

借助 Sun 的方法，您可以获得

- 更低的系统支持成本
- 让您的系统事半功倍
- 节约数百万电能和冷却成本
- 免费、开放访问取得世界级软件和操作系统
- 可重复和可靠的最佳实施方案
- 零障碍退出

用酷线程 CoolThreads™ 改写未来

Sun Fire T1000 和 T2000

- 5 倍性能
- 1/5 能耗
- ¼ 空间
- 价格等于或低于行业标准

* 参见披露

Sun microsystems

谢谢！

NETRA ATCA SERVER

Delivering Choice, Innovation and Value in an Integrated System Design

Kirk Mosher
Netra Systems Group
Sun Microsystems, Inc.

Agenda

- Sun Leadership in Telecom Market
- The Netra Difference
- Netra ATCA Blade Server Family
- Best Choice, Innovation and Value
- Your Trusted Partner
- Summary

Sun Leadership in Telecom Market

Sun's Largest Vertical Market

Proven Market Leadership

- 35% market share in telecom data servers[1]
- 41% market share in carrier grade servers[1]
- 48% market share for VoIP application servers[2]
- All ten of the largest NEPs worldwide use Netra
- 48 out of the 50 largest service providers use Sun

Leading Provider of Platforms and Software

- Broadest line of carrier grade rack and blade servers
- Choice of UltraSPARC and Opteron in ATCA blade server
- Carrier-Grade Solaris™OS – battle-tested, proven reliability
- More than 1m Java™ Enterprise Systems users

Driving Java Standards for Telecom

- J2ME widely adopted – 1B+ Java-based handsets in use!
- JAIN-SLEE for network-based services development
- OSS/J for Java-based OSS component integration

[1]InStat/MDR Report - Dec 2004
[2]Frost and Sullivan Report – Nov 2004

Today's Networks Are Built on Sun

Leading NEPs Partner With Sun

Industry Leading 3rd Party Partners

The Netra Difference

Rock Solid, Carrier Grade

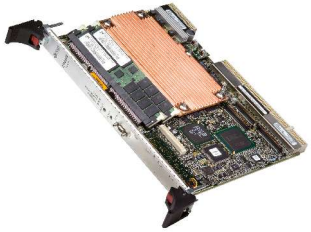
- Broadest carrier-grade family
- Proven 5x9s+ reliability
- Proven carrier-grade OS
- Rugged NEBS L3 certified
- Short <20” deep form factor
- Telecom management/alarms
- Guaranteed compatible
- Extended product lifecycle

Netra CT900

Netra 1280

Netra CT410/810

Netra 440



Netra CP Blades

Netra 240

Netra 210

Sun starts with standards and innovates from there

Sun Starts with Standards

- Open standards maximize choice, interoperability and value
- Active contributor to PICMG, SAF and DMTF standards
- Delivering standards-based blade products since 1998
- Supported by best-of-breed, standards-compliant, telecom ISV/IHV partner community

... And Innovates from There

- Integrated system design
- Redundant, PICMG-compliant ATCA server and components
- Choice of compute blades and carrier grade operating systems
- Common, SAF-compliant HA and blade management software
- Pre-tested, NEBS L3 certified

Sun's integrated system design makes the system greater than just the sum of the parts

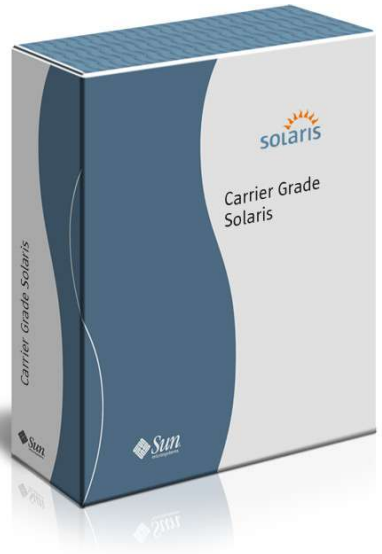
Netra ATCA Blade Server Family

Server

Netra CT900
ATCA Blade Server

Blades

Netra CP3010 SPARC
Netra CP3020 Opteron



Software

Carrier Grade Solaris
MontaVista Linux CGE
Netra High Availability Suite
Netra Blade Management Suite

Netra CT900 ATCA Blade Server

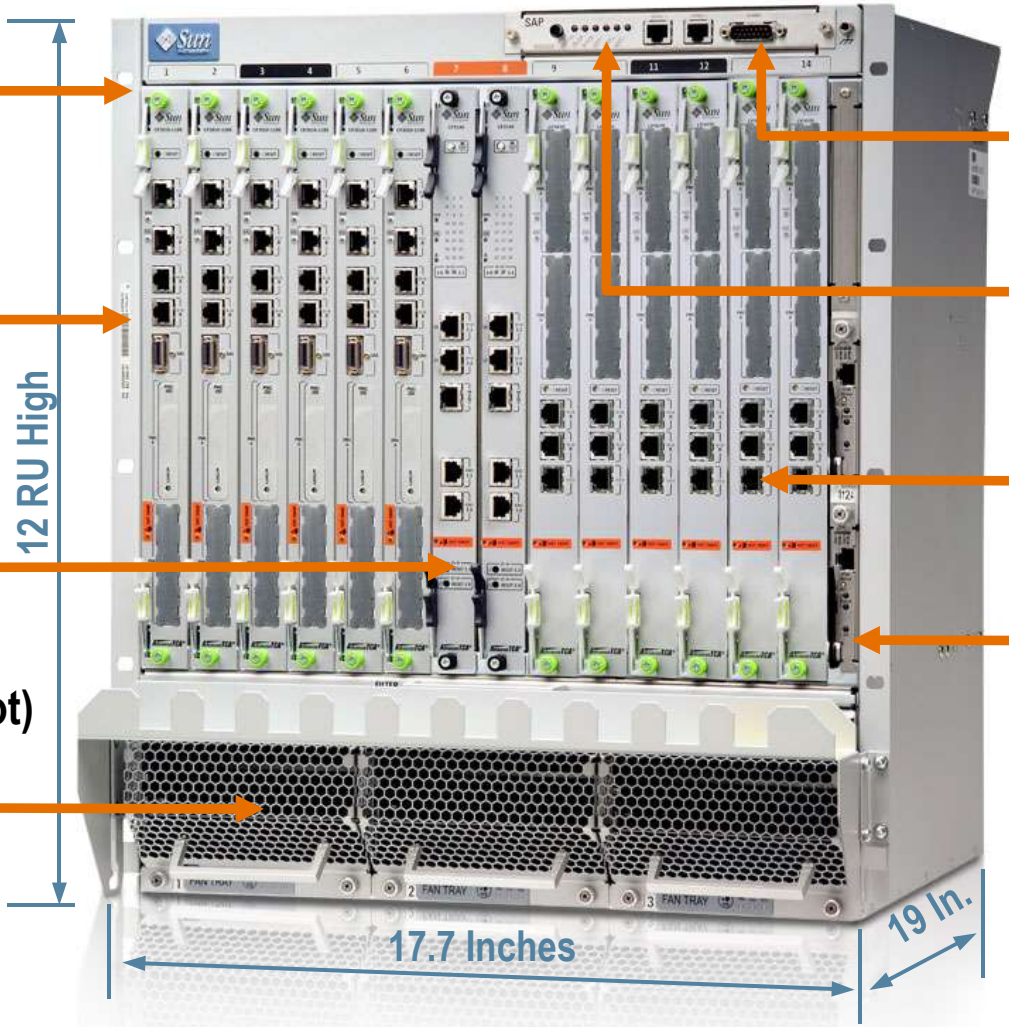
New!

12U/14 Slot
ATCA Server
(PICMG 3.0/3.1)

NEBS L3 Certified
ETSI Compliant
RoHS Compliant

Dual Hot-Swap
Gigabit Ethernet
Switch Blades
(4 Channels per Slot)

Redundant,
Hot-Swap Fan and
Power Modules



Management
and Alarm Ports

Front LED
Status Panel

Front and
Rear Access

Dual, Hot-Swap
Shelf Managers

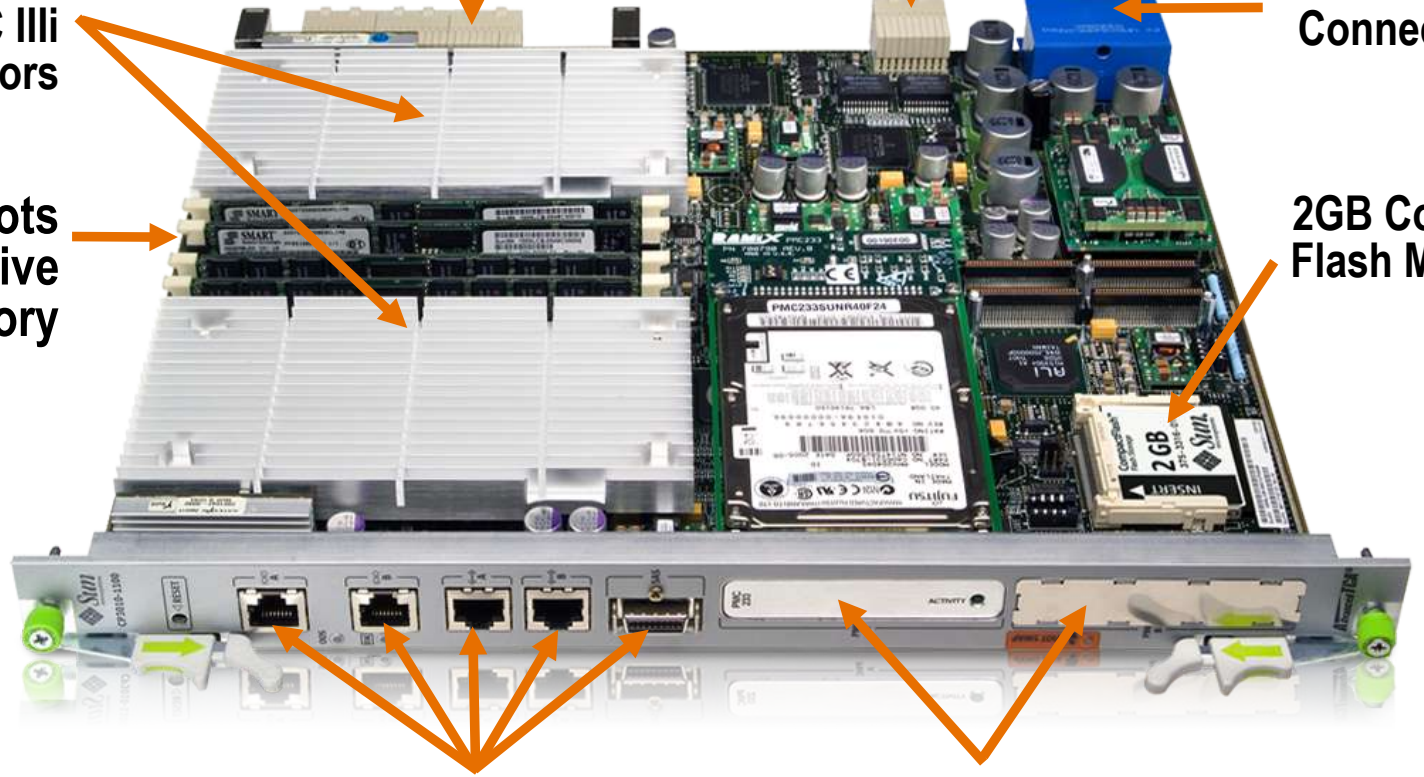
Netra ATCA: Best Choice

Choice of Processor and Carrier-Grade Operating Systems

- Dual-processor UltraSPARC IIIi or Dual-core Opteron blades
  - > UltraSPARC T1 by end of 2006
- Carrier Grade Solaris 9 and 10 or MontaVista Linux 3.1 OSs
- Feature-rich, “server on a blade” design
- “Mix and match” compute blades and OSs in the same server

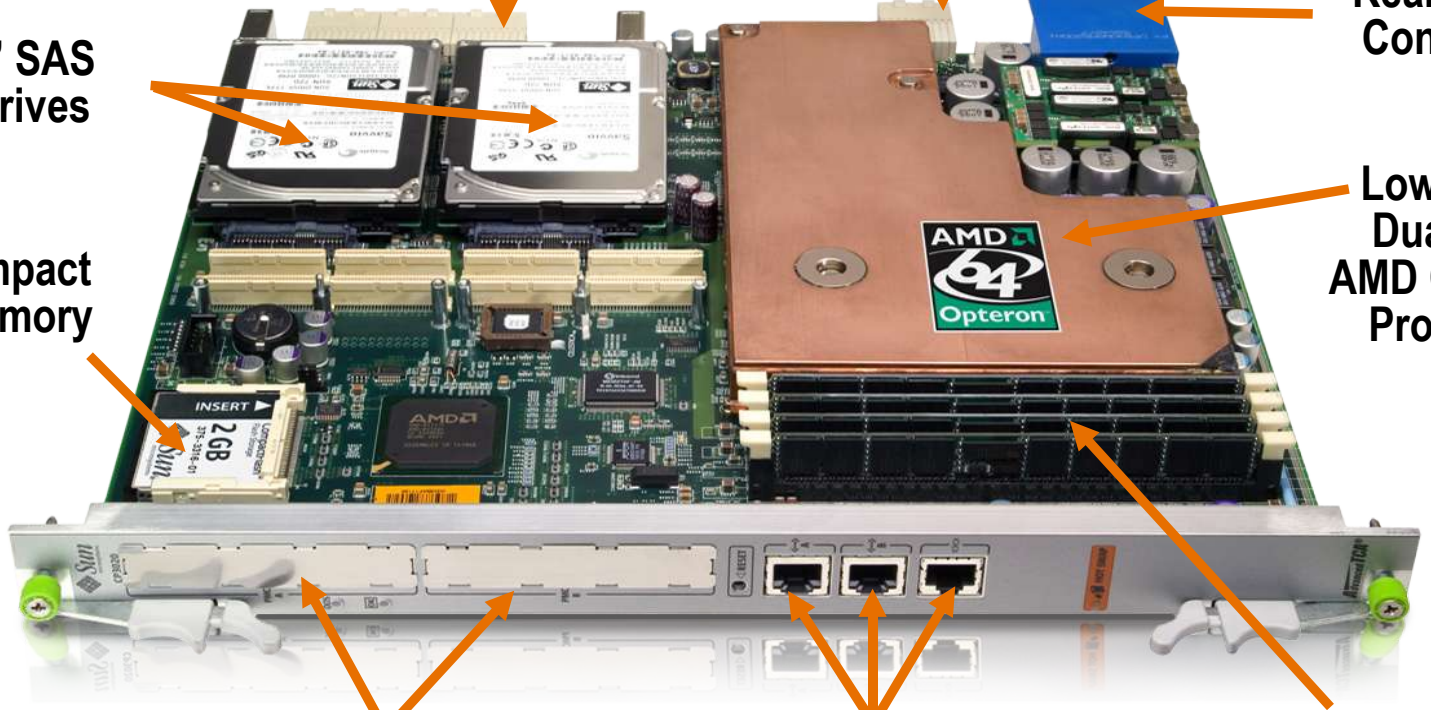
Industry's First UltraSPARC ATCA Blade

New!



Industry's First Opteron ATCA Blade

New!



Choice of Carrier Grade OS

solaris™

- Solaris 9 and 10
- Most widely deployed carrier grade OS
- Proven reliability
- Guaranteed compatibility
- UltraSPARC and Opteron
- Free and open source

- MontaVista Linux CGE 3.1
- Leading carrier grade Linux OS
- Optimized Opteron release
- Licenses available from Sun or MontaVista
- Supported by Sun

The Leading Carrier-Grade OS

solaris™

- Fault-Isolating Containers
- Predictive Self-Healing
- Dynamic Tracing - DTrace
- Secure Execution - IPv6
- Solaris Enterprise System

Solaris 10
eWeek Lab's
Top Product of 2005

- 57 World Records
- Thousands of Applications
- Guaranteed Compatibility
- HP, IBM, Sun, Dell, Fujitsu

Netra ATCA: Best Innovation

Industry's Fastest, Densest, and Most Reliable ATCA Blade Server

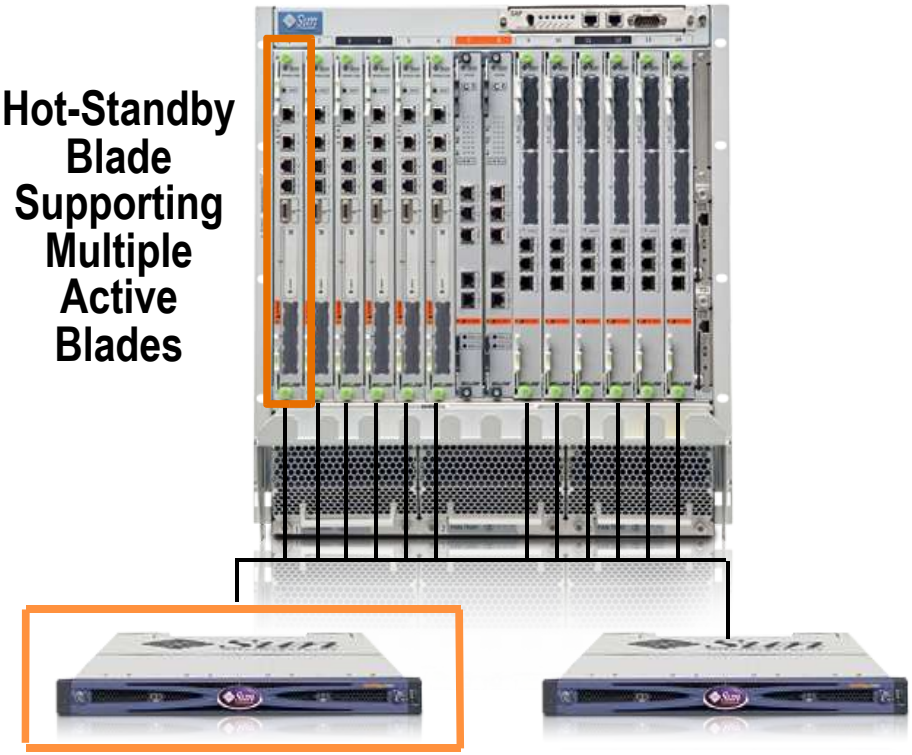
- Fastest: Outperforms Intel-based 2.8GHz Xeon blades by up to 10%
- Densest: Saves up to 10-inches of space per rack, delivering up to 30% better compute density
- Most Reliable: Designed for six 9s reliability, just seconds of downtime per year

ULTRASPARC solaris

AMD 64 Opteron

Netra High Availability Suite 3.0

New!



- Higher service availability
- Cost-effective N+1 design
- Ultra-fast switchover
- Automatic fault diagnosis
- Up to 64 node clusters
- SAF and CGTP compliant

ULTRASPARC AMD 64 Opteron solaris

Netra Blade Management Suite

New!

- Integrated element management architecture
- SAF and PICMG compliant
- Built-in fault “cause” diagnosis
- Up to 40% less development
- Interoperable with SAF-compliant 3rd party hardware and software

Netra ATCA: Best Value

Delivering Better Telecom Solutions Faster and for Less

- Higher service availability
- Greater capacity in less space
- Faster time to market
- Reduced cost of development
- Lower total cost of operations

ULTRASPARC

solaris

AMD 64 Opteron

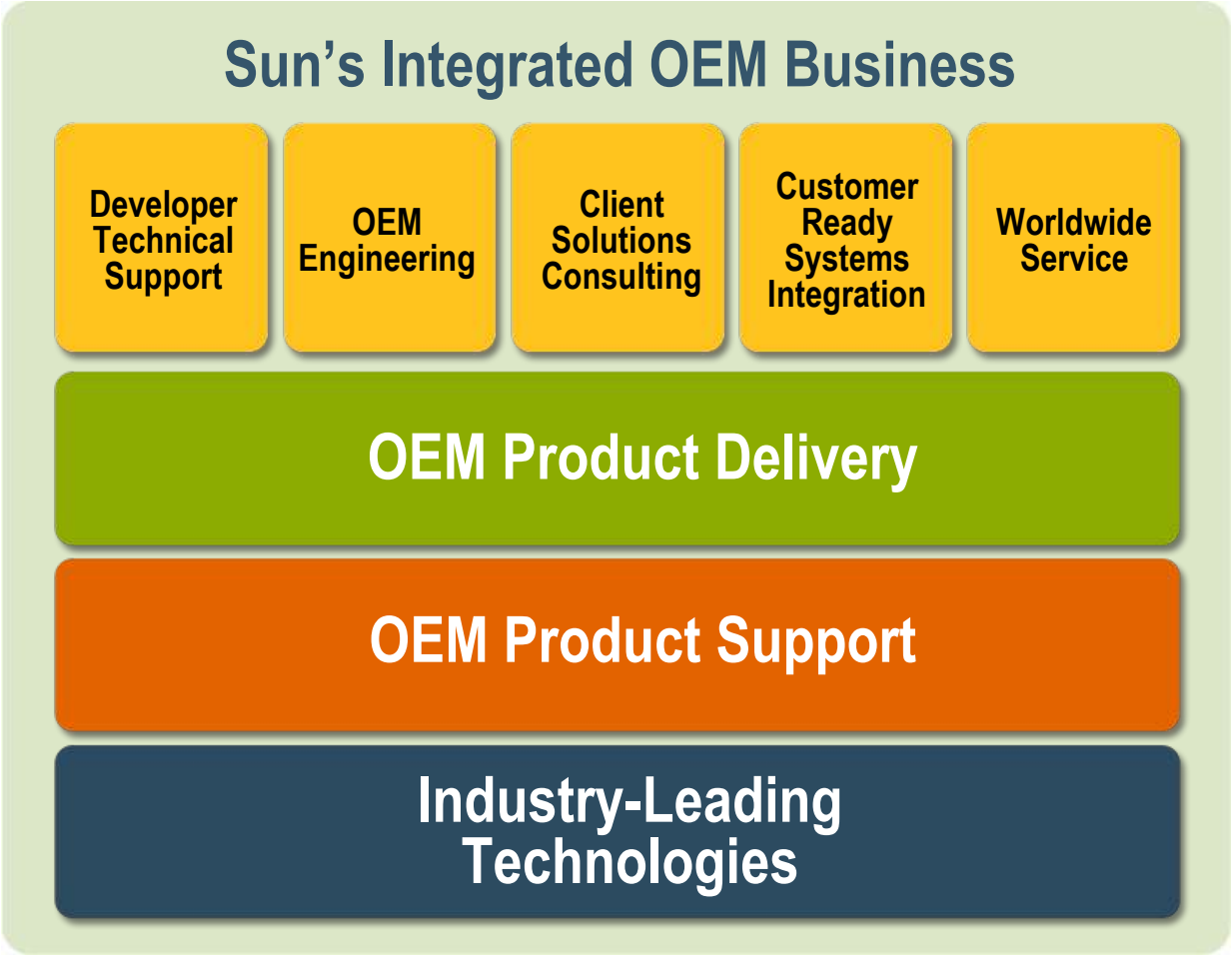
Success requires more than just great technology.

Sun's OEM Business Strategy

Sun's Integrated OEM Business

Because Success Requires *More* Than Just Great Technology

Sun combines industry-leading technologies with dedicated sales, support and services that OEMs need to succeed.



OEM Product Support

Guaranteed Lifecycle Management and Support for OEM Customers

- Extended Product Lifecycle Commitment
- Advanced Product Change Notification
- Longer EOL Product Transition Periods
- Extended Product Roadmap Horizon
- Post-EOL Extended Availability and Spares Program
- Early Developer Access and Product Loaner Programs
- OEM Engineering and Program Management Support
- Online Access to OEM Resources

Summary

- Sun starts with standards and innovates from there
- Netra ATCA blade server is the industry's fastest, densest and most reliable, open standards-based blade server
- Netra ATCA blade server provides the industry's best choice, innovation and value in an integrated system design
- Netra ATCA blade server delivers higher service availability, greater capacity, faster time to market, reduced cost of development and lower total cost of operations
- Sun is your trusted partner, delivering industry-leading technologies with the sales, support and services that OEMs need to succeed

For More Information

- Visit www.sun.com/atca
  - Launch Video
  - 3D Product Fly-Through Demo
  - Product Datasheets
  - Overview Brochure
  - Technical Architecture White Paper
  - Management & Availability White Paper
  - Netra High Availability White Paper
  - ISV/IHV Partner Community
  - Press Releases & Media Coverage

Netra Blade Servers

Netra Blade Family

Open Standard, Carrier Grade Blade Platforms

Type	Netra Server		Netra Blades
CPCI/ CPSB 2.0/2.16		Netra CT410/810		CP2140 (USIIi) CP2160 (USIIi) CP2300 (USIIi) CP2500 (USIIIi+)
ATCA 3.0/3.1		Netra CT900		CP3010 (USIIIi) CP3020 (Opteron) UltraSPARC T1*

* Scheduled for release by the end of 2006

Netra CT900 ATCA Server

Highly Reliable, High Density ATCA Blade Server

High Density Blade Server

- 12U High/19” Wide Chassis
- 14 Total Slots, 12 Node Slots

Standards Based

- PICMG 3.0/3.1, Dual Star Extended
- NEBS L3 Certified, ETSI Compliant
- RoHS/WEEE Compliant

Highly Flexible – Choice of CPU/OS

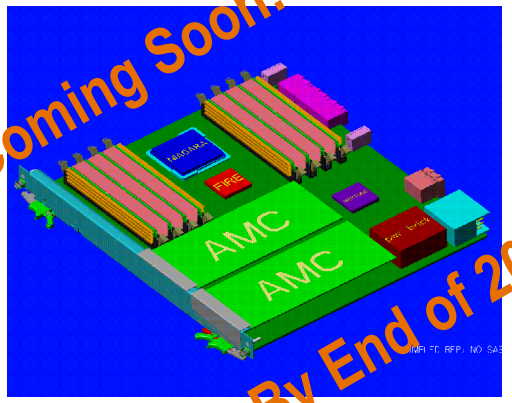
- Hot Swap, Dual CPU/Core UltraSPARC and Opteron Blades
- Solaris and MontaVista Linux OS

Highly Reliable and Manageable

- Dual Hot Swap GBE Switch Blades
- Dual Hot Swap Shelf Managers
- Redundant Fans and Power Modules
- Front and Rear Access
- Netra High Availability Suite
- Netra Blade Management Suite

Netra ATCA Blades

Choice of Compute Blades and Carrier Grade Operating Systems



CP3010 SPARC	CP3020 Opteron	UltraSPARC T1
▪ 2-Way UltraSPARC IIIi ▪ Up to 8GB Memory ▪ 2 PMC Slots ▪ Carrier-Grade Solaris 9 & 10	▪ 2-Core Opteron x64 ▪ Up to 8GB Memory ▪ 2 PMC Slots ▪ Carrier-Grade Solaris 10, & MontaVista Linux CGE	▪ 8-core UltraSPARC T1 ▪ Up to 16GB Memory ▪ 1 AMC Slot ▪ Carrier-Grade Solaris 10

Netra CP3010 SPARC ATCA Blade

Highly Reliable, Feature-Rich, 2-Way UltraSPARC IIIi ATCA Blade

ULTRASPARC solaris Java

Feature-Rich Design

- Dual 1.1GHz USIIIi CPUs
- Up to 8GB Memory – 4 DDR1 Slots
- 2GB Compact Flash Memory
- 2 PMC Slots – 1 for Optional HDD
- 2.5” 40GB SATA PMC Drive Option
- Dual Fast Ethernet Mgmt Ports
- Dual Serial Console Ports
- Front and Rear SAS Ports
- Front & Rear Access
- Dual Base & Extended Fabric

Carrier Grade OS & Management

- Solaris 9 & 10 OS
- Processor Management Services
- Dual IMPI Interfaces

Standards-Based

- NEBS L3 Certified, ETSI Compliant
- PICMG 3.0, SAF HPI Compliant
- RoHS/WEEE Compliant

Netra CP3020 Opteron ATCA Blade

High Performance, Feature-Rich, Dual-Core Opteron ATCA Blade

Feature-Rich Design

- Single or Dual-Core AMD Opteron
- Up to 8GB Memory – 4 DDR1 Slots
- 2GB Compact Flash Memory
- 2 PMC Slots
- 2x2.5” 40GB SAS Drives
- Dual Fast Ethernet Mgmt Ports
- Single Serial Console Port
- Front & Rear Access
- Dual Base & Extended Fabric

Carrier-Grade OS & Management

- Solaris 10 & MontaVista Linux CGE
- Processor Management Services
- Dual IMPI Interfaces

Standards-Based

- NEBS L3 Certified, ETSI Compliant
- PICMG 3.0, SAF HPI Compliant
- RoHS/WEEE Compliant

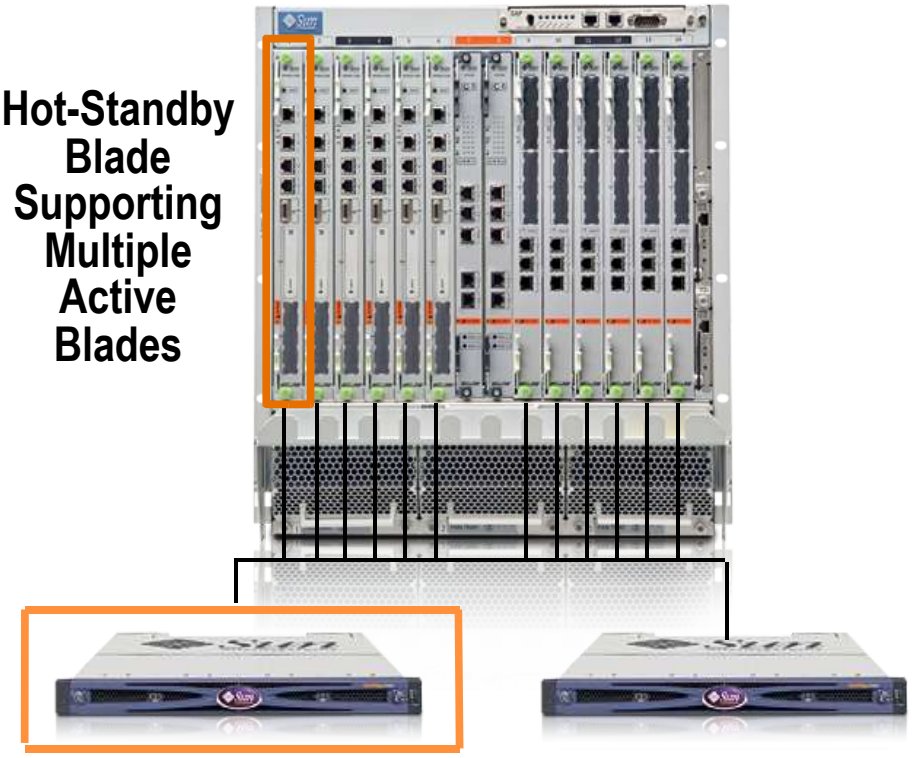
Designed for 6x9s Reliability

- Redundant, Hot-Swap Components
  - Base & dual star extended fabric backplane with redundant, hot-swappable compute blades, Gigabit Ethernet switch blades, shelf managers, fan trays and power entry modules
- Carrier-Grade Operating System
  - Fault-isolating containers, predictive self-healing, live OS upgrades, IPv6 security
- Netra High Availability Suite
  - Cost-effective, SAF-compliant, N+1 ultra-fast switchover software for up to 64-blade cluster
- Netra Blade Management Suite
  - SAF-compliant, element management software with built-in fault “cause” diagnostics

Just Seconds of Downtime Per Year

Netra High Availability Suite 3.0

Blade-Optimized HA Switchover and Fault "Cause" Diagnosis Suite

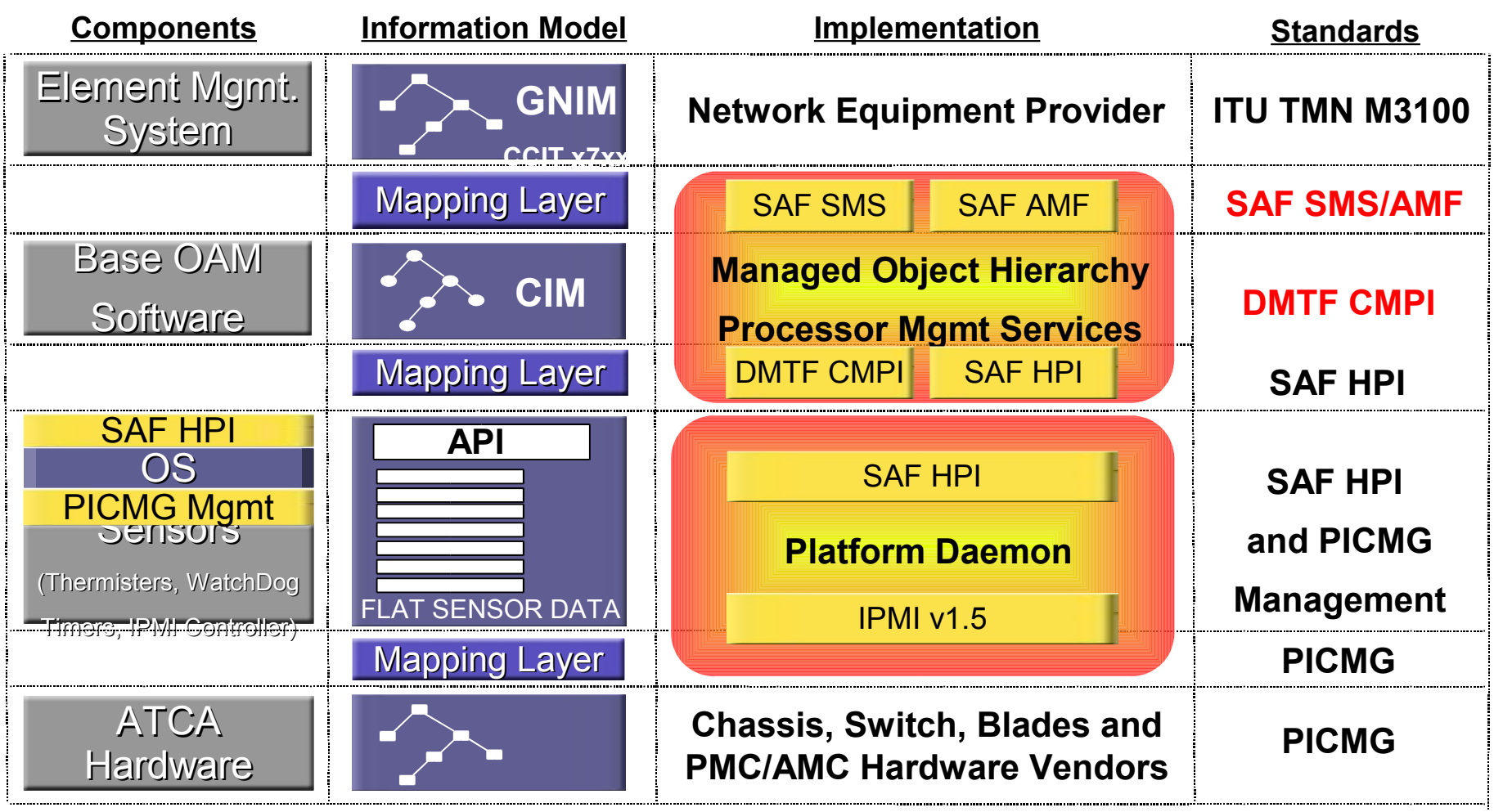


High-availability for blades

- Cost-effective N+1 Cluster
- Ultra-fast Switchover Service
- Up to 64 Blade Cluster
- Cluster Membership Monitor
- Cluster Software Provisioning
- Redundant File/Boot Servers
- Automatic Fault Diagnosis
- Automatic Blade Restart
- CG Transport Protocol (CGTP)
- SAF-AIS Compliant
- Solaris 8, 9 &10 OS
- MontaVista Linux CGE 3.1 OS

Netra Blade Management Suite

SAF-Compliant Element Management Architecture



RED = Specification and/or Implementation In Progress

For more information
www.sun.com/atca

Exceeding Expectations for Industry Standard: The Sun x64 Factor

Speaker Name
Title

Demand and Capacity Are Colliding...

- Demand
- Users
- Services
- Access

- Power
- Costs
- Space
- Heat

...and your
data center is
right in the middle!

Sun Fire Systems for Every Application

Delivering Real-World Application Performance

Scale Up

- Large databases
- Enterprise apps—CRM, ERP, SCM
- Data warehousing, business intelligence
- Server consolidation/ migration
- Mainframe rehosting

Scale Out

- Web services, mail, messaging, security, firewall
- Applications server,database, ERP, CRM
- HPC, Compute Grid solutions
- Network-facing, I/O intensive
- Load balancing, business logic
- Distributed databases
- Server consolidation

Our Server Family Goal

Be the Preferred Partner For All Your Server Needs

Deliver innovation on a commodity platform for enterprise computing in multi-OS environments

AMD 64 Opteron

Lead the revolution of multithreaded computing for extreme performance

ULTRASPARC

Best Performing, *Broadest* Line of Servers in the Industry

Market-Defining Products

Sun Fire™ x64 Servers

Industry's fastest, highly energy-efficient, and reliable servers

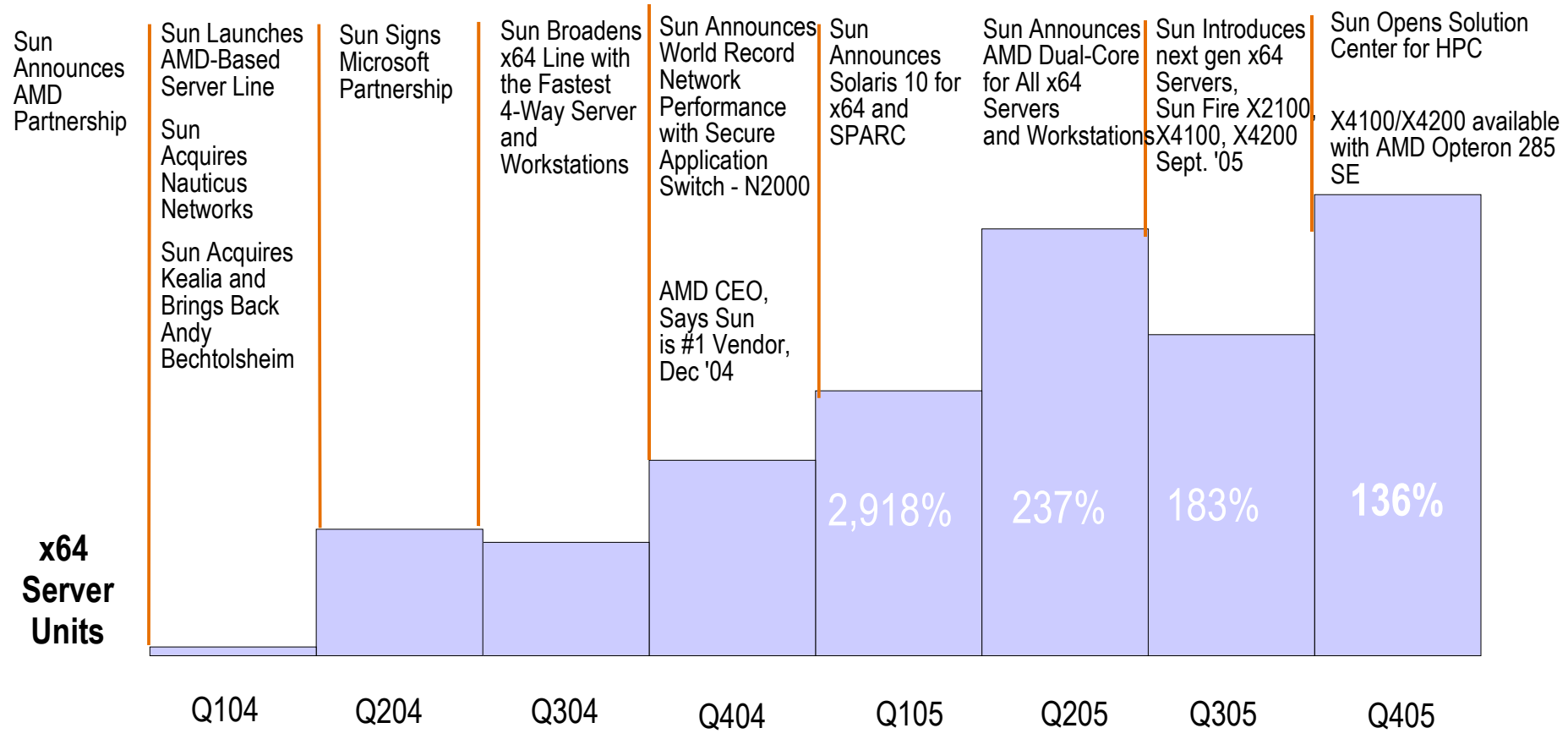
Sun Fire Enterprise Servers

Industry's best high-performing, reliable, scalable UNIX servers for mission-critical computing

Sun Fire CoolThreads™ Servers

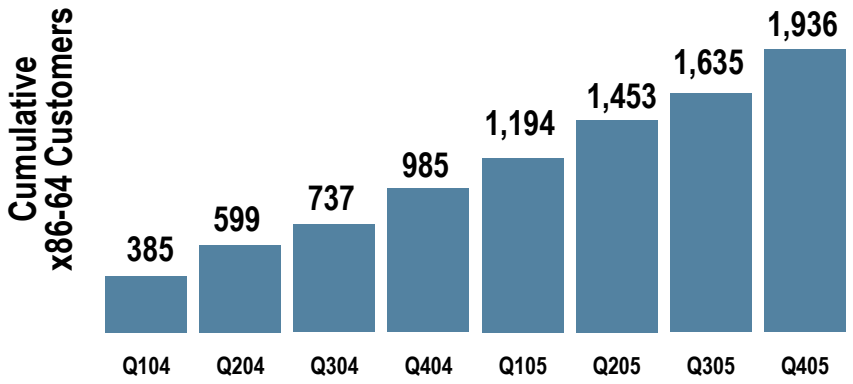
Industry's most power and cooling-efficient servers ever, with best performance per watt

Sun's x64 Milestones

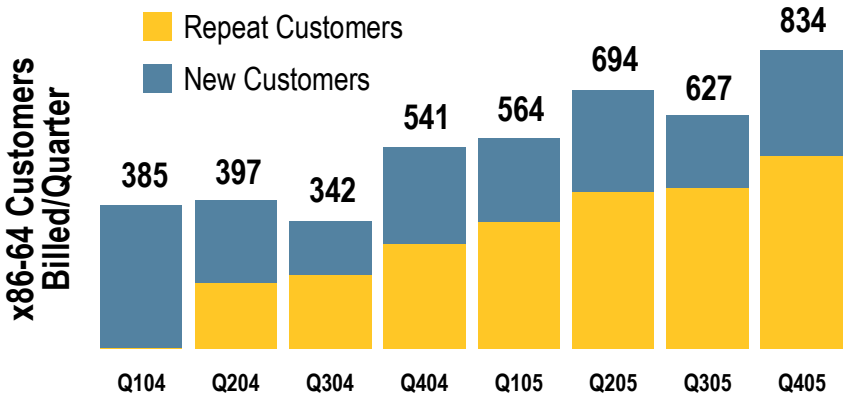


Sun's x64 Momentum

22% Average Enterprise Customer Growth/Quarter



62% Repeat Business



Based on Sun Fiscal Calendar, July –June

Sun x64: A Higher Standard for Industry Standard

Best Performance

Improve productivity, product development, and service levels

Cost and Energy Efficiency

Save power and cooling costs, without compromising performance

Ease of Deployment

Save time, money;
Increase your business agility

Enterprise-class Reliability, Security

Avoid system crashes, downtime, unwanted service interruptions; increase service levels

Simplified Management

Save IT staff and maintenance costs, cut complexity

Increased Utilization

Get more from your IT assets

Innovative Sun Design

All Sun system design uses industry-standard components

Most Complete, Most Scalable Product Line

Grow cost-effectively, without disruption and with investment protection

Best Performance

- 1.5X the performance of Xeon servers
- Faster Opteron Servers
- Solaris 10 OS optimized for Sun x64 can boost application performance by 300%!*
- Dual-core and single-core AMD Opteron processors options, with DirectConnect Architecture

Improved Employee Productivity
Less Space and Power Required

* Based Dynamic Tracing (DTrace) optimization with specific customer instances, results may vary.

Simply The Fastest

Over 70 Performance World Records ... And Counting

Workload/App Type	Sun Fire Server	The Competition
Manufacturing (MCAE)	Sun Fire X2100 Workstation	16 processor cluster beats HP by 48%
Electronic Design (CAD/CAM)	Sun Ultra 20 Workstation	Beat HP xw9300 workstation by 76% in SPEC APC SolidWorks
Java Apps Serving	Sun Fire X4100, X4200	Sun holds the best 4-core and 2-core results; Beats Dell by 35%
Integer Throughput	Sun Ultra 40 Workstation	Beats all 2 socket x86 systems by 10%

* world record data validated 02/06

Cost and Energy Efficiency

Sun Fire X4100 vs.
single core Xeon-based systems

Dell

HP

IBM

1½ times
the Horsepower!

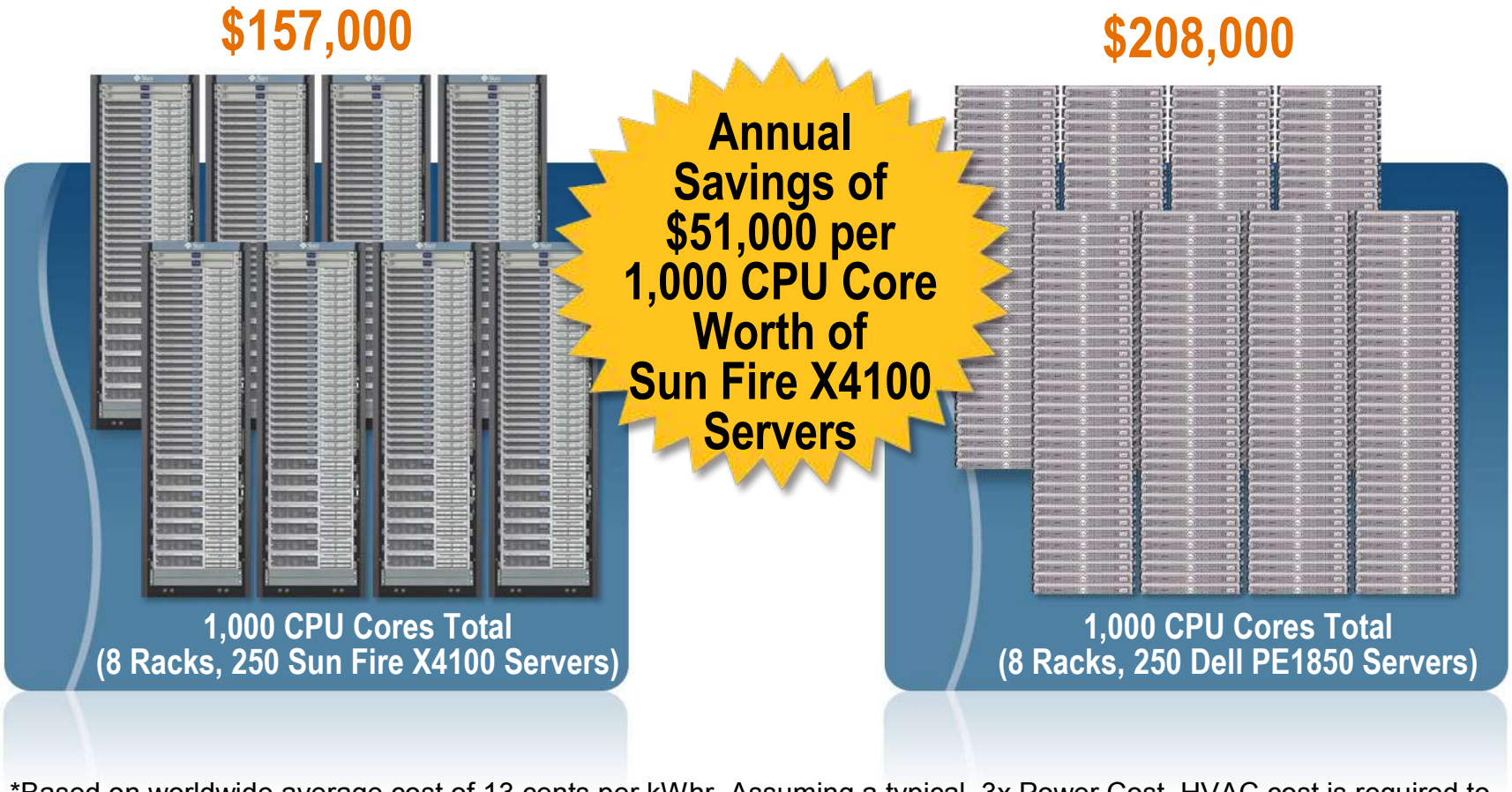
Less than 1/2
the Power Use!

1/4 the Size!

1/2 the Cost!

Sun x64 Saves Energy Costs

Total Annual Cost per Year/1,000 CPU Core Compute Farm*
when Considering Total Power Consumption and HVAC



*Based on worldwide average cost of 13 cents per kWhr. Assuming a typical .3x Power Cost, HVAC cost is required to remove the heat generated by these systems.

Ease of Deployment

- Simpler installation with Sun Customer Ready Systems
  - > Reduce initial installation issues by up to 80%
  - > "The racks practically came off the truck running – the entire 8-rack cluster up within 2 days." INEEL Chief IT Architect
- Faster grid deployments – up to 90%
  - > Sun built a 10 Teraflop cluster with Sun Grid Rack Systems in a matter of weeks – not months
- IT expertise from Sun Client Solutions for optimizing Sun products and technologies

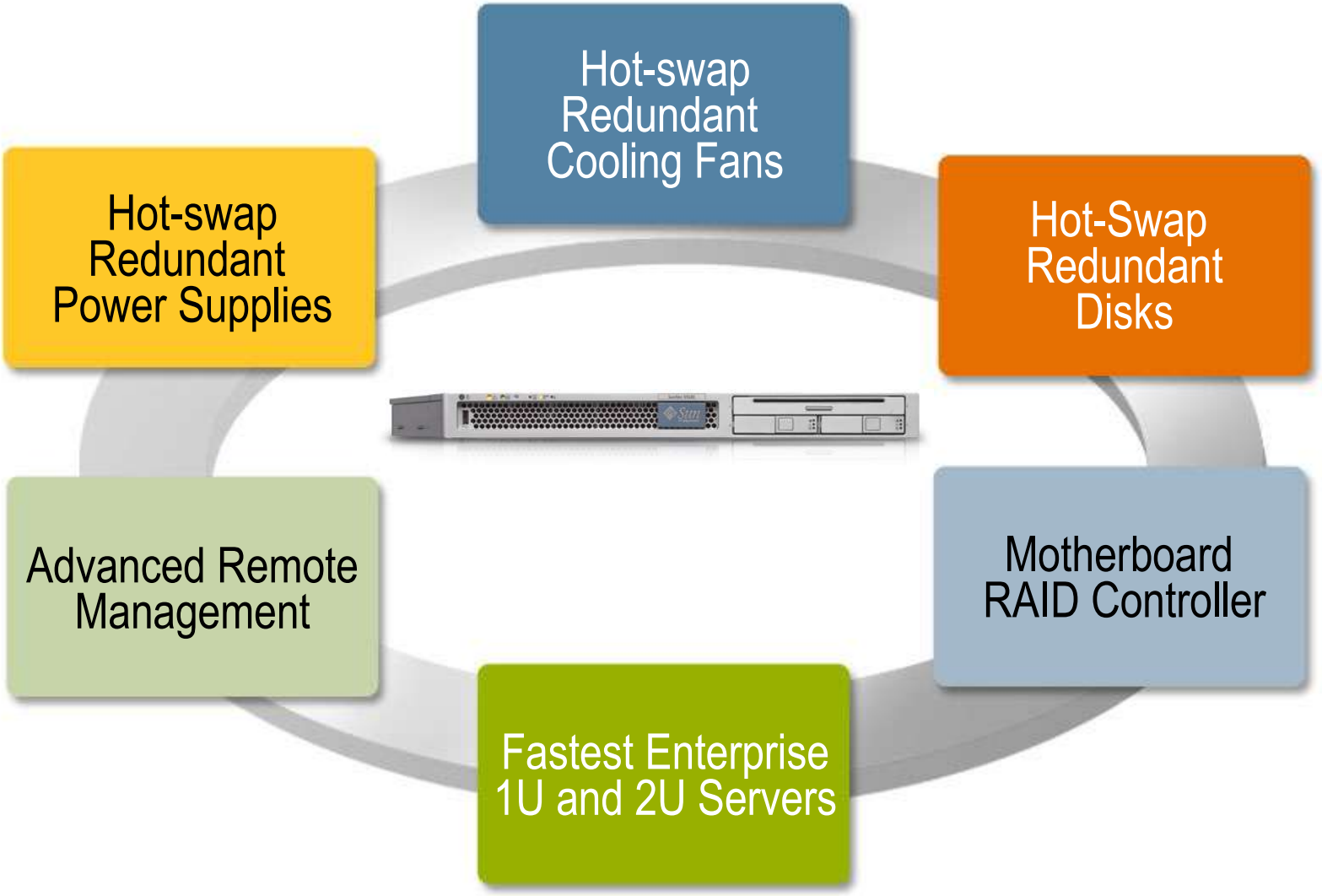
Faster Deployments

Enterprise-Class Systems

- Highly availabe servers with intelligent fault lighting
- Easier to service with redundant and hot-swappable components
- Sun Secure Application Switch – N Series for extra security
- Best built-in security with Solaris
  - > Process rights management
  - > Integrated firewall

Helps Reduce IT Support Costs

Enterprise-Class Systems



Simplified Management

- Manage pools of resources as a system – not as individual components
  - > Built in lights-out capability
  - > Powerful aggregated management with Sun N1 System Manager
- Manage components with a comprehensive set of remote management tools
  - > Zero touch control

Save IT Support Costs, Improve Service Levels

Simplified Management

Sun's Built-in Management Features and Functionality

	$0 Extra	$349 Extra	
AMD Opteron Systems	**Sun**	**HP**	**IBM**
Full remote CD/DVD/Floppy		Extra $$	None on AMD
Full remote KVM		Extra $$	None on AMD
IPMI 2.0 Management			None
SNMP V2c, V3			None on AMD
DMTF 'SMASH' standard CLI			None
Secure Management with HTTPS			None on AMD
Role-Baed Access with LDAP			None on AMD

IBM = eServer 325/326, BMC, no RSA option available

HP = iLO Standard or Advanced Pack

Simplified Management

Sun N1 System Manager

Lower Total Costs

Simplify Administration

Reduce System Downtime

Increased Utilization

- Consolidate, pool and share compute resources in a grid for utilization rates of up to 80%* with virtualization
- Complete virtualization offerings for driving up utilization rates
  - > Solaris virtual servers — SolarisTM 10 Containers and Dynamic System Domains
  - > Multi-OS virtual servers — VMware or Xen
  - > Networking — Sun Secure Application Switch

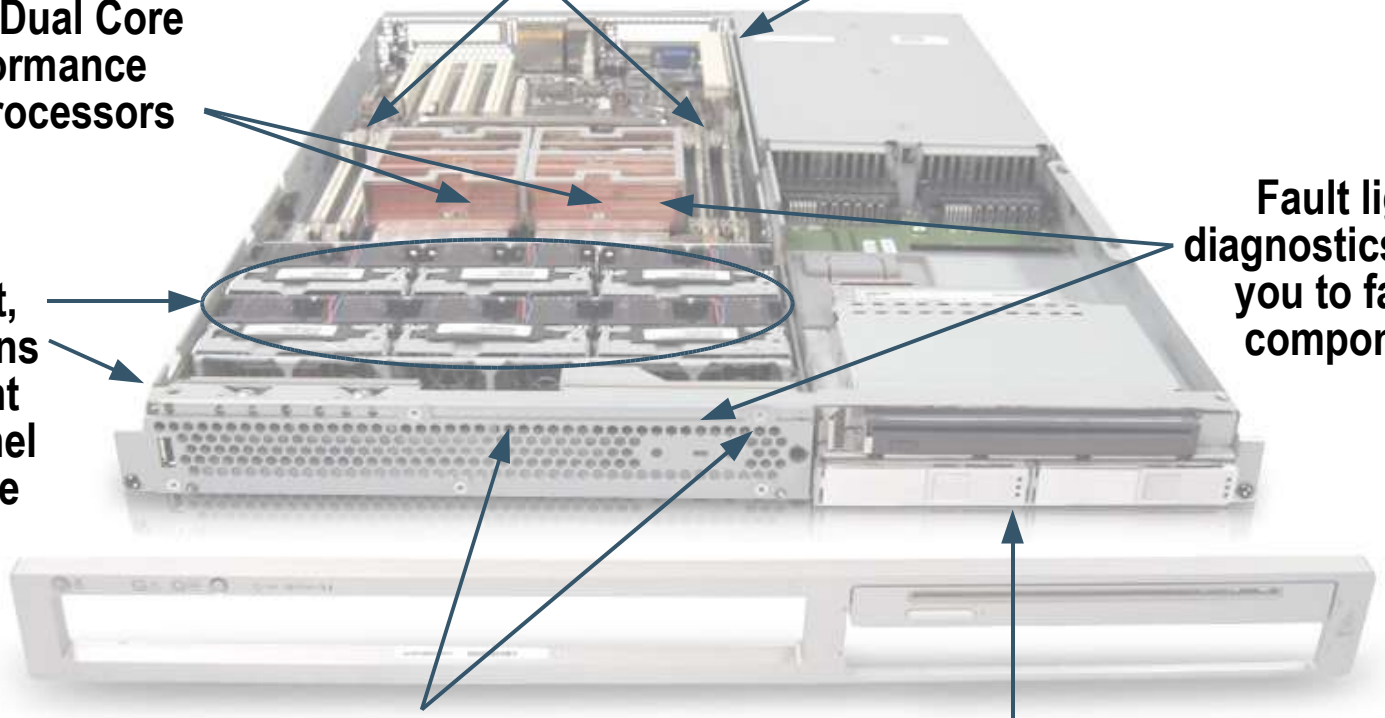
Get More from IT Assets

Innovative Sun Design, Industry Standard Components

- 100% Industry Standard
  - > Run Solaris OS, Linux, and Windows
  - > Strong partnerships with AMD, Microsoft
- Sun designed components working together
  - > Servers
  - > Application Switches
  - > Software
- Backed by Sun's proven expertise in deploying distributed, grid environments

Investment Protection, Cost Savings

Innovative Sun Design



4 DIMM slots per socket for Maximum Performance

Integrated mgmt with remote console, KVM included as standard

Highest Performance Single and Dual Core Full Performance Opteron Processors

Fault light diagnostics guide you to failed component

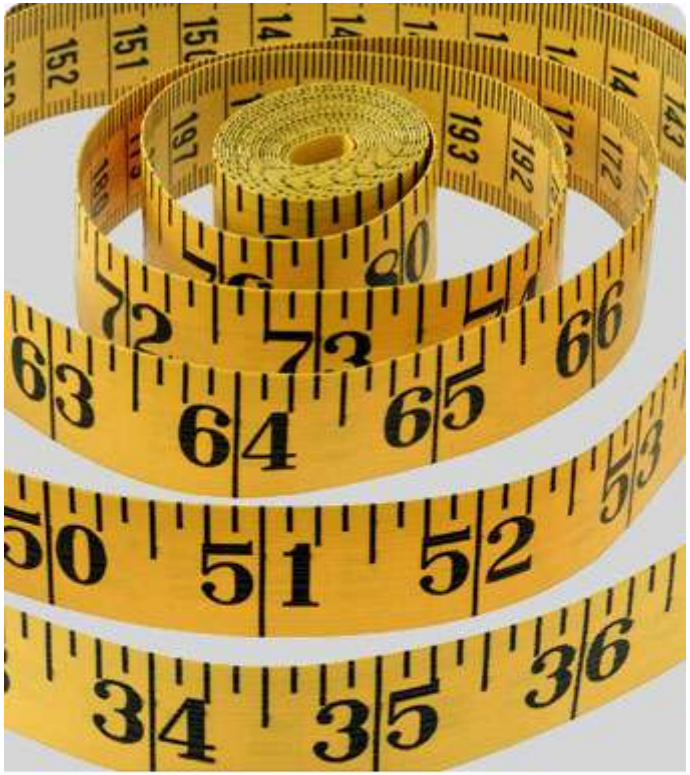
Redundant, hot-plug fans under front access panel for feasible in-rack servicing

Large opening for good airflow and air divider for separate cooling zones

Hot-plug RAID Drives SAS for Performance

Complete, Scalable Product Line

- Near linear scale
  with Solaris OS on x64
  - > Up to 16-way servers
  - > Tested up to 256 CPUs
- Hardware systems designed for distributed, grid computing environment
- Add incremental compute power as you grow



Grow Your Infrastructure Cost-Effectively, without Disruption

Complete, Scalable Product Line

New Rack Servers

Sun Fire x2100

Sun Fire x4100

Sun Fire x4200

Future Galaxy Systems 16 way

X64 Rack Servers

V20z Single/Dual Core

V40z Single/Dual Core

X64 Workstations

W1100z

W2100z

Sun Ultra™ 20 Workstation

Sun Secure Application Switches

N1000

N2100

Your Choice of Operating Systems

Unbeatable Combination: Sun Fire™ Servers and Solaris™ 10 OS

Extreme Performance
Dynamic Tracing

Optimal Utilization
Solaris Containers

Virtually Unparalleled Security
Process Rights Management
Solaris Cryptographic Infrastructure

Relentless Availability
Predictive Self Healing

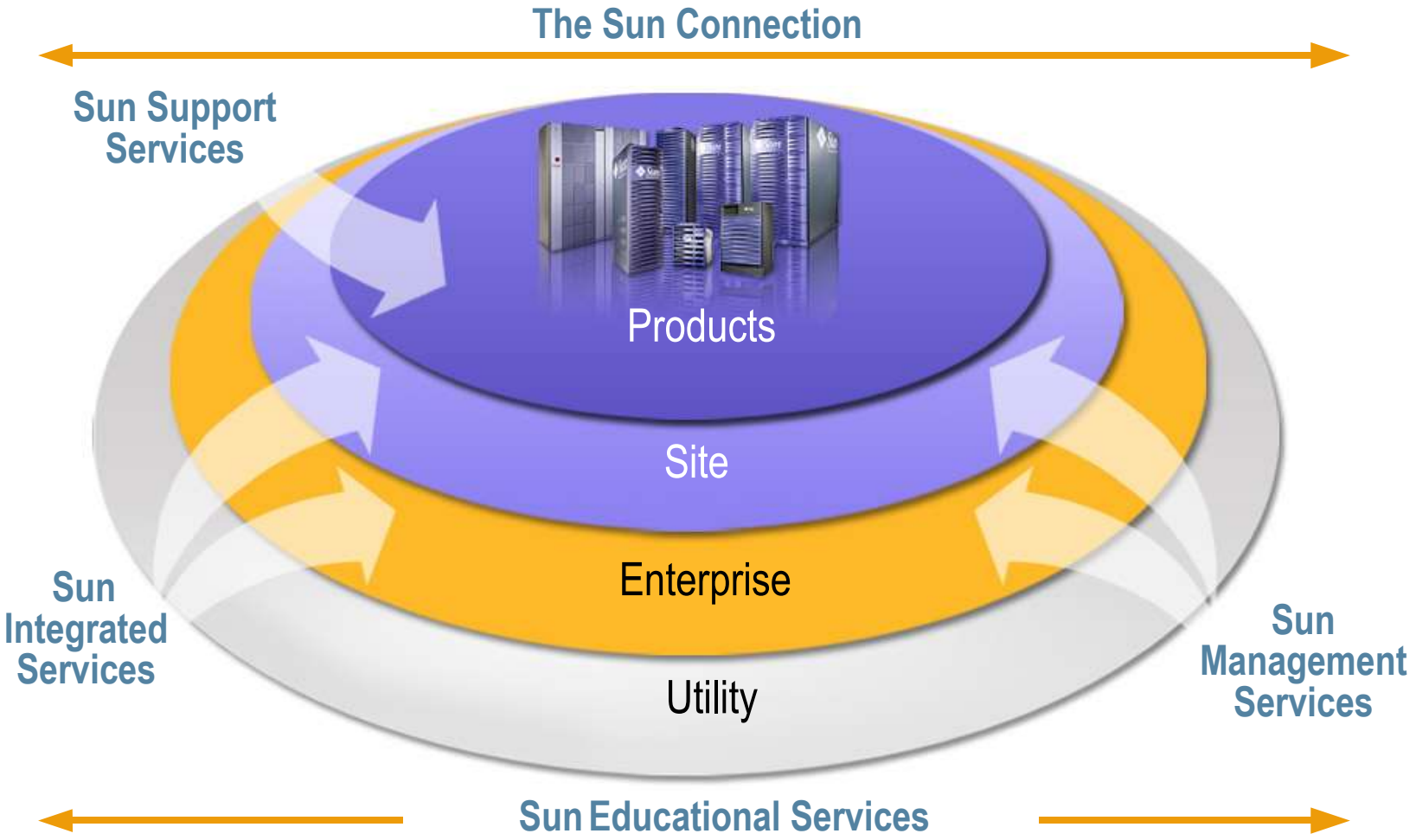
Platform Choice
Optimized for SPARC®, Opteron

Sun Partner Advantage Program

The Best ISVs and More than 20,000 Partners Work with Sun

Services to Implement, Support and Optimize the Data Center

Sun Pioneers IT Simplification While Offering Customer Choice



Choices for World-Class Heterogeneous Support

Updated!

Sun Service Plans

- SunSpectrum Service Plans
- Sun Hardware Service Plan
- Sun Software Service Plans
- Sun System Service Plan for Windows Operating System

Upgraded Phone and Online Support Access

H/W and S/W Service Coverage

Avaialable Support for Solaris OS, Windows and Linux

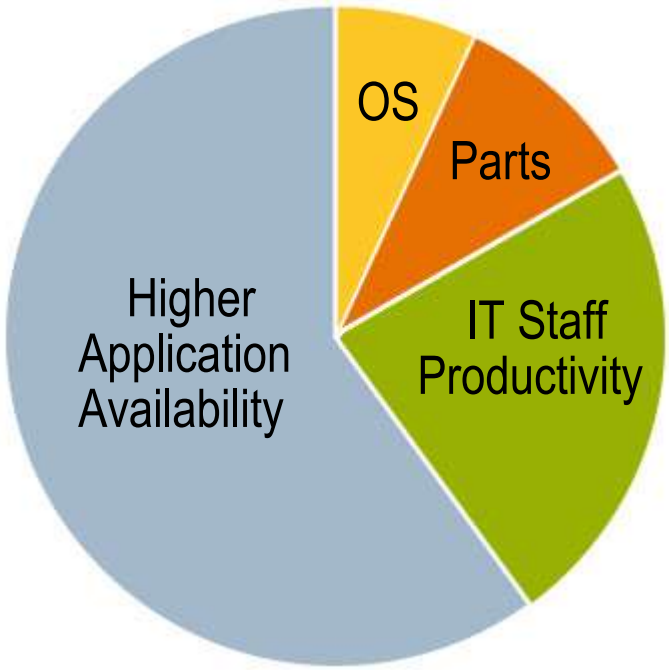
Sun Education Services

Pick Your Plan, Simplify Your Setup, Sharpen Your Skills

Quantified Business Value

SunSpectrum Service Plans

- 2005 Forrester Research:
  Total Economic Impact (TEI)
  - > Global interviews w/SunSpectrum plan customers
  - > Customers varied in industry, company size and type/# of Sun systems
  - > Analysis based on cost, benefit, flexibility and risk
- Key Findings
  - > 110% ROI (break-even < 1 yr)
  - > $1.5M business benefit in 3 yrs
  - > Higher application availability
  - > Significant operational savings



Value Drivers

Download the study at sun.com/service/support/sunspectrum

More Choice, Value and Innovation

Management

Services

Sun Managed Services
SunSpectrum™
Sun Preventive Services

Sun Educational Services
Sun Connection

Java Enterprise System

Availability Suite
Application Platform Suite
Web Infrastructure Suite

Identity Management Suite
Integration Suite
Comms Suite

Java
Sun Microsystems

Data Management

StorageTek™

Operating System

Microsoft Windows
redhat.
opensolaris
solaris
suse

Servers, Desktops

AMD 64 Opteron
ULTRASPARC

Partners

Developers

There's Savings in the Entire System*

$624,965	$1,551,253	$1,311,547
		
Sun *(1 Rack)*	HP *(Multiple Racks)*	IBM *(Multiple Racks)*
Sun Java System Application Server Standard Edition	**BEA WebLogic Server**	**IBM WebSphere Application Server**
Solaris 10 OS and 3-Year Standard Support	**Red Hat AS, 3-Year Standard Support**	**SUSE Linux ES 3-Year Standard Support**
32 Sun Fire X4100	**32 HP DL580 G3**	**32 IBM x366**

* versus single-core Xeon-based systems

Tokyo Institute of Technology

The Tokyo Institute of Technology (TITECH) TSUBAME cluster is Japan's *fastest* supercomputer .

As one of the world's leading technical institutes, they have created Japan's largest supercomputer based on Sun Fire x64 servers with 10,480 AMD Opteron processor cores - totaling more than 50 trillion floating point operations per second.

eBay.com bolstered its search environment for better performance and energy-efficiency

"With 168 million users worldwide, we rely on Sun to provide a technology infrastructure that can scale by the minute to meet the needs of our growing community

James Barrese, vice president, Systems Development, eBay

Faster risk analysis, 30% less heat

New Energy uses Sun Fire x64 servers and Solaris 10 to create a compute grid for faster Monte Carlo analysis, while generating 30% less heat than competing alternatives.

REUTERS
KNOW. NOW.

Solaris 10 on x64 systems boosts performance for algorithmic trading

"... Solaris 10, including containers for consolidation will allow our mutual customers to attain lower latency and a lower total cost of ownership over previous versions of Solaris and other platforms. Future generations of Reuters Market Data Systems will support both Sun's SPARC and X64 platforms."

Michael Parlapiano, executive vice president, Information Management solutions, Reuters

Sun Fire x64 servers & Solaris 10 and storage help monitor network traffic patterns

Sun solution enables BT to set new policies on applications and subscriber usage, increases flexibility for new services

Low latencies, enormous throughput, low energy use, and minimal cooling.

The deployment of Sun Fire x64 servers for shared hosting Webfarm gives Strato the right TCP-stack power with very low latencies and enormous throughput, low energy use, and minimal cooling.

"We look to Sun as one of our key partners when augmenting our HPCC environment.

USC's supercomputing environment includes more than 1,600 nodes, so ease of management is crucial to us. With Sun Fire X4200 servers, we're seeing just that. Furthermore, thanks to the dual-core CPUs from AMD, we can double our computation power without increasing the system footprint and power consumption, which increases the overall performance of our HPCC cluster. Reducing power consumption is a critical factor in the HPCC model, so introducing these Sun ... nodes has helped us advance our model."

Michael Pearce
USC's deputy CIO

Sun Fire x64 and SPARC servers for revenue transaction processing

Overture uses hundreds of Sun Fire V20z servers for a global deployment to support ongoing organic growth and SPARC servers for back-end revenue processing.

ciena.

Improved test & design ability by a factor of 4, while using same about of power as previous solution.

"In almost every head-to-head test we conducted, the Sun Fire V20z servers based on the AMD Opteron processor with Direct Connect Architecture proved faster than the comparable systems we evaluated."

Steven Rennick, Lead Network Systems Engineer,
Ciena Corporation.

SLAC

Over 1.5 Teraflops of compute performance

"Our selection of Sun x64 systems for our newest data-analysis cluster is a further step in our continuing efforts to achieve reliability and fully functional lights out management (LOM). This approach allows us to stop focusing on the datacenter floor and focus more on the services we deploy."

Richard Mount, Director of SLAC computing services

"[Previously] the data would take up to three years of compute time. Now we can conduct those experiments with perhaps two weeks of compute time."

"People using the Sun Grid Rack System for design work have access to a hundred times more compute power than they had previously...There were experiments we wouldn't have previously attempted because processing the data would take up to three years of compute time. Now we can conduct those experiments with perhaps two weeks of compute time."

Dr. Peter Jacobs,
Senior Lecturer in Engineering

“Our decision to select Sun systems was driven by the sheer performance of its Sun Fire servers ... and its competitive pricing.”

“Our collaboration with Sun enables us to develop cutting-edge animation technologies and has boosted our ability to succeed in this market. Our decision to select Sun systems was driven by the sheer performance of its Sun Fire servers powered with both AMD Opteron and SPARC processors, and its competitive pricing.”

Daniel Diaz De La Iglesia,
System Analyst, Dygra Films

Demand More From x64

□ Performance	Evaluate meaningful benchmarks for your workload and business; how well is Sun's competition performing?
□ Energy Efficiency	How much could you save in a year with lower power, cooling costs?
□ Manageability	How many servers is your staff managing today?
□ Reliability, Availability	How critical is reducing server downtime to your business?
□ Utilization	What % of your server capacity are you using today?
□ Faster, Easier Deployments	Would speeding deployment of IT projects give your business better agility?
□ Complete, Scalable Line	How easy is it to add server capacity as your business and IT needs grow?

Call To Action

Ways to Get Started

- Sun Upgrade Advantage Program and special promotions available
- Sun Solution Centers
- Talk with Sun experts on consolidation, migration, HPC, Web services
- Learn more about Sun software, data management, services

VISIT
www.sun.com/x64