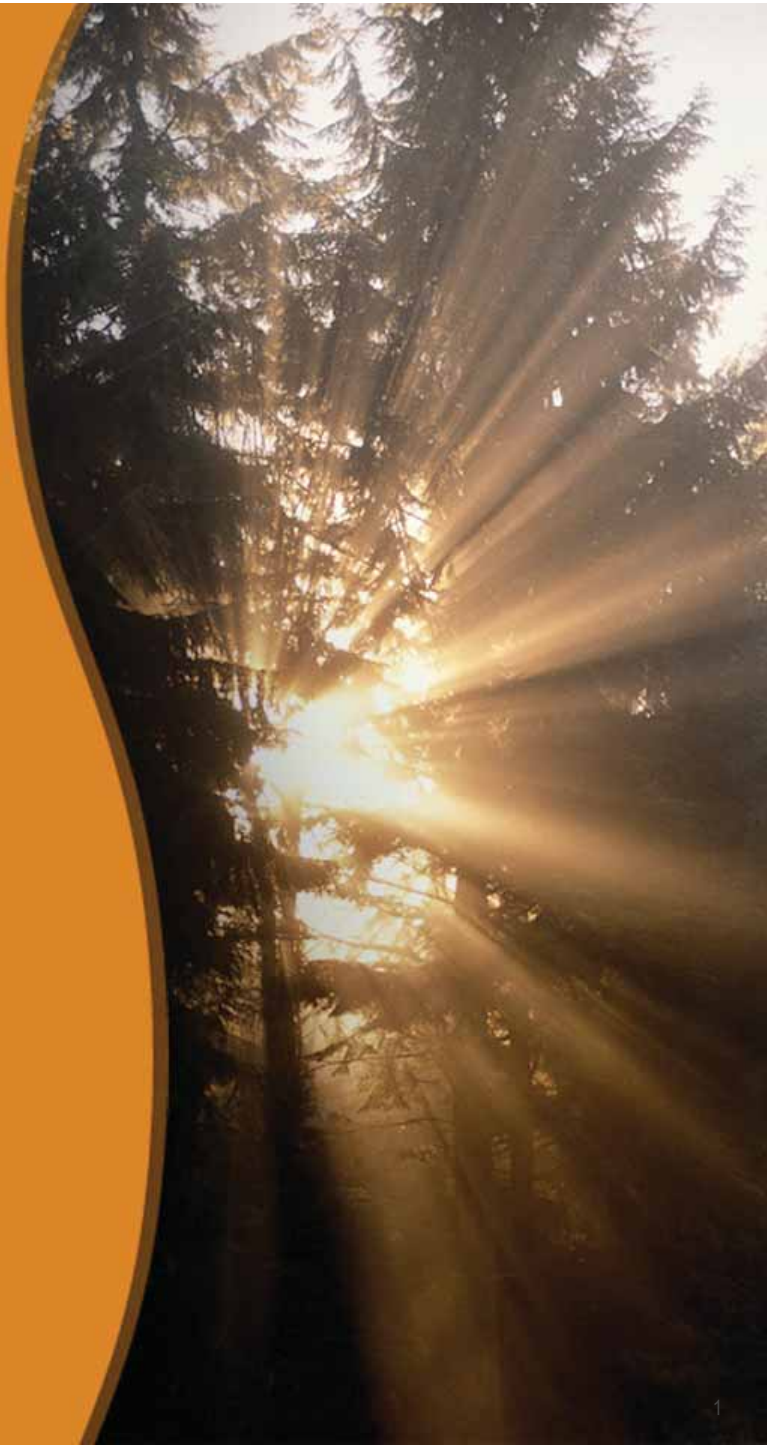




SUN MICROSYSTEMS

Technology for our customers

Luis Martinho
Account Manager



Agenda

- 1. Sun Vision and Mission**
- 2. Sun Systems**
- 3. Sun Storage**
- 4. Sun Software**
- 5. Sun Services**
- 6. Main customers in Portugal**

Agenda

1. Sun Vision and Mission

2. Sun Systems

3. Sun Storage

4. Sun Software

5. Sun Services

6. Main customers in Portugal

Guided By A Singular Vision
**The Network
Is The Computer.**



The Global Power of Sun

Global

- Business Presence in 160 Countries
- Fortune 184
- 34,909 employees*

Innovation

- 14,000+ global patents
- ~\$2 billion annual R&D

Business Strength

- \$13.88 billion annual revenue**
- \$3.3 billion cash & marketable debt securities*

Communities

- 13+ million Solaris licenses
- 6+ million Java developers
- 5.5+ billion Java devices

What Others Are Saying



Sun received three InfoWorld 2008 Technology of the Year

Awards for “Most Innovative Server OS: Sun Solaris 10,” “Best File System: Sun ZFS,” and “Best Storage Server: Sun Fire X4500 (Thumper).”

1/08



Sun was named as one of the “100 Best Corporate Citizens 2008” by Corporate Responsibility Officer magazine.

2/08

Gartner

Gartner rated Sun and “Strong Positive” or “Positive” in 20 of 28 categories in which it measures technology companies

7/08



Sun took eWeek Excellence Awards for its Sun SPARC Enterprise T5120 with eWeek's “top marks as a server platform that will support computing workloads for years to come, without forcing IT pros to compromise on performance.”

6/08



Fortune named Sun one of “America's Most Admired Companies” in 2008 ranking in the top six in the Computers category, ahead of Dell

3/08



Sun took 5 of 11 developer.com “Product of the Year Awards” for Java™ Platform, Standard Edition 6 JDK; NetBeans IDE; NetBeans Mobility Pack; and Glassfish Web Services Interoperability

4/08



Fast Company named Sun as one of the World's 50 Most Innovative Companies

3/08

A Great AND a Good Company

Business Practices

Sharing a high standard of ethics and open practices

Eco Responsibility

Good for the environment, great for your business

Global Citizenship

Innovation and action guide our efforts to eliminate the digital divide

Workplace

Supporting employee-, environmental-, and community-focused initiatives that serve the needs of our employees

Our Vision:

The Network is the Computer

- 1.5+ billion people on the Net today
- 390 gigabytes of data created every second
- 50% new data growth



Everyone and everything participates on the network

What is Driving Infrastructure Demand?

**New Consumers.
New Content.**

**On the
Network...**



**New Devices.
New Services.**

What is Driving Infrastructure Demand?

**New Consumers.
New Content.**

**On the
Network...**

**Drives
Infrastructure
Demand.**



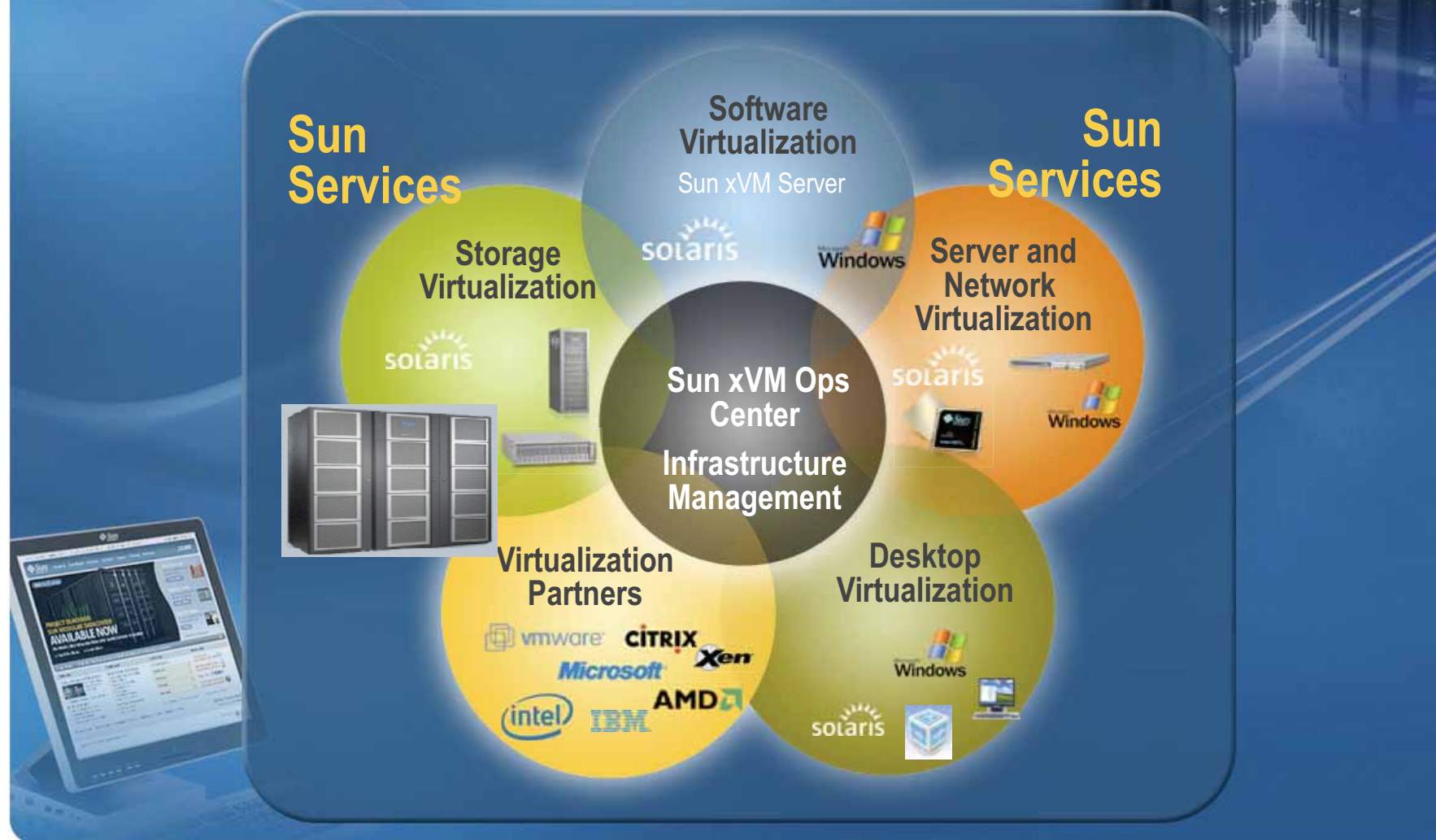
**New Devices.
New Services.**



**Sun Technology
Powers the
Connected World**

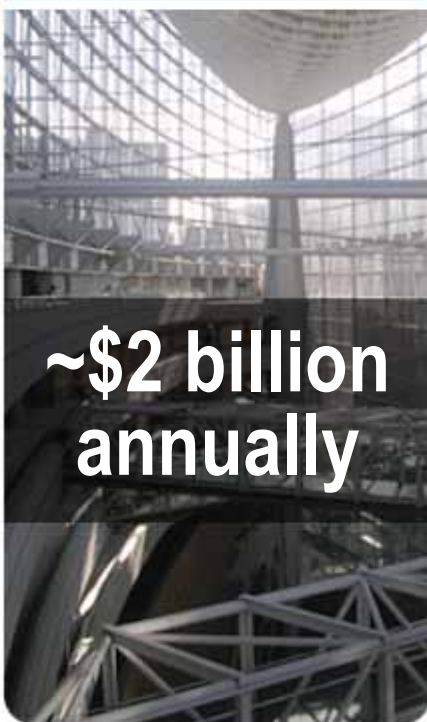
Desktop to Datacenter Virtualization

Unifying Virtualization and Management Across the Infrastructure



Developing the Most Innovative, Essential Products and Services for the Connected World

Invest in R&D
Delivering Innovation



Sharing Technology
Building Open and Free Communities



Delivering the Most
Network Computing Infrastructure Choice



Building Alliances
to Broaden Solutions



Essential Technology for the Connected World

Comprehensive Portfolio Delivering Customer Choice

Developer Environment		
Database/Storage Platform		
Application Infrastructure		
Virtualization	<p style="text-align: center;">xVM</p>	
Operating System		
Systems Servers Storage Networking		
Microprocessor		

Technology and Added Value Service

**Sun
Technology
and Services**

SPARC 64

Servers
Software

Open Network Computing Infrastructure

Services
Storage

Managed Services
Professional Services
Support Services

SunSpectrum™ Support
A higher standard of service

Learning Services
Global Financial Services Operation

STORAGETEK™

Agenda

1. Sun Vision and Mission

2. Sun Systems

3. Sun Storage

4. Sun Software

5. Sun Services

6. Main customers in Portugal

Sun Systems Strategy



- Innovate at all levels of the system
- Excel on performance, energy efficiency, space and cost
- Partner with market leaders
- Integrate software, storage, services, and systems to change the economic equation
- Design and deliver innovative products and services for web scale and virtualization



New UltraSPARC[®] T2 Processor

64 systems on a chip



Designed for Virtualization



Sun Blade™ T6320 server module



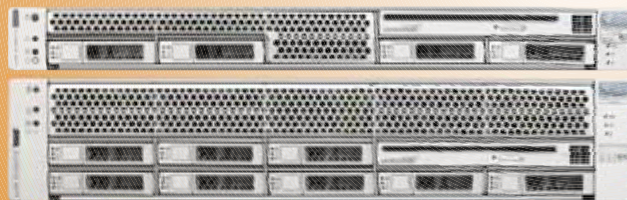
Sun™ SPARC® Enterprise T5120 server

Sun™ SPARC® Enterprise T5220 server

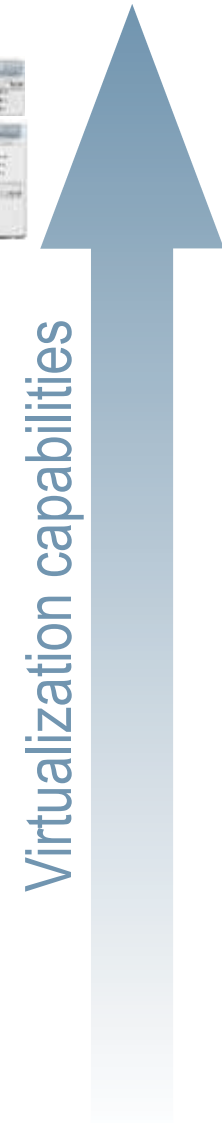
- **Unique features**
- **Wirespeed security**
- **10 GbE**
- **Maximum LDOMs**



- **Common design**
- **Scale and performance**
- **Efficiency (eco, space, density, etc.)**
- **Manageability, serviceability, reliability**
- **Investment protection**



Sun Fire™ X4150 server
Sun Fire™ X4450 server



CY2008 Sun Server Portfolio

Enterprise
SPARC
Servers

sparc64



V490 - E25K



"Thunder"



M4000-M9000



M3000

Volume
SPARC
Servers



T1000
T2000



T6300



T5120
T5220



T6320



T5140
T5240



"Scottsdale"



T5440

ULTRASPARC

UltraSPARC T1

UltraSPARC T2

UltraSPARC T2+

x64
Servers



X2100 M2
X2200 M2
X2250

1 & 2 Socket



X4100 M2
X4200 M2
X4140 / X4150
X4240 / X4250

2 Socket



X6240
X6250



X4440
X4450

4 Socket



X6440
X6450



X4600 M2

8 Socket

Sun Modular Datacenter

Scalability for Optimal Compute Power

"We increased our compute capacity over 30% in a matter of months with Sun MD. Including design, approvals, site prep, install and start-up — it was much faster than the two to five years required to build a satellite center or a major building."



Chuck Boeheim
Assistant Director of Computing
Stanford Linear Accelerator Center

SLAC

<http://www.sun.com/SLACvideo>
<http://today.slac.stanford.edu/feature/2007/blackbox1.asp>
<http://today.slac.stanford.edu/feature/2007/blackbox2.asp>
<http://www.slac.stanford.edu/~boeheim/blackboxsite.html>

Agenda

1. Sun Vision and Mission

2. Sun Systems

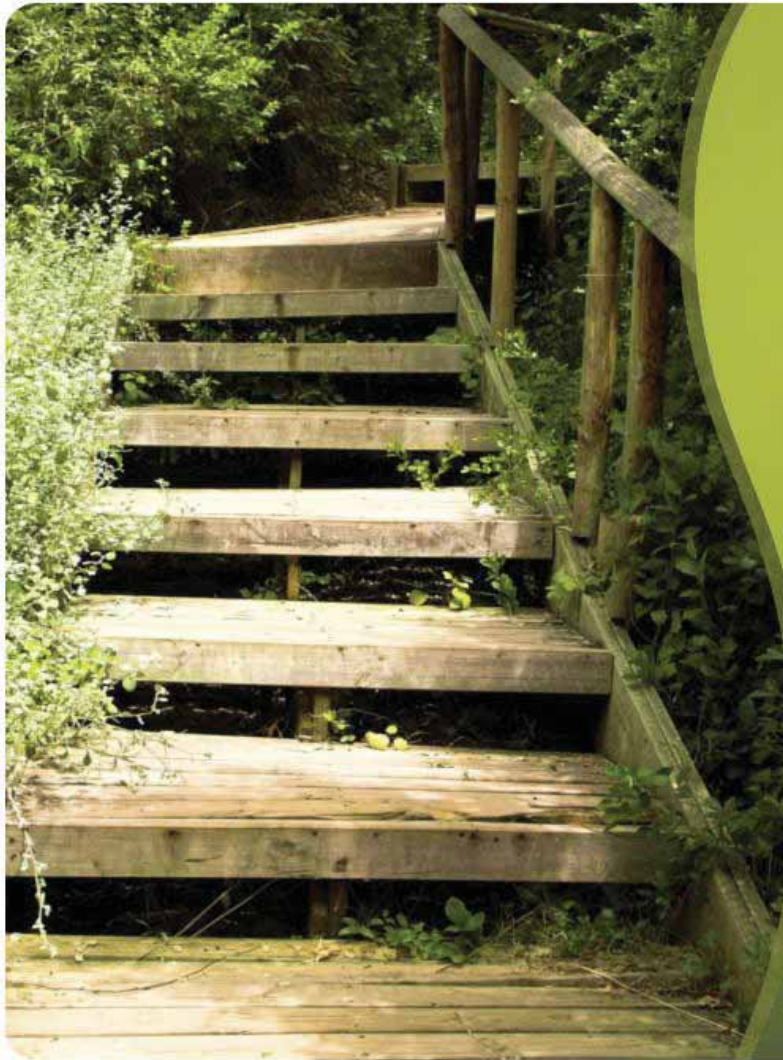
3. **Sun Storage**

4. Sun Software

5. Sun Services

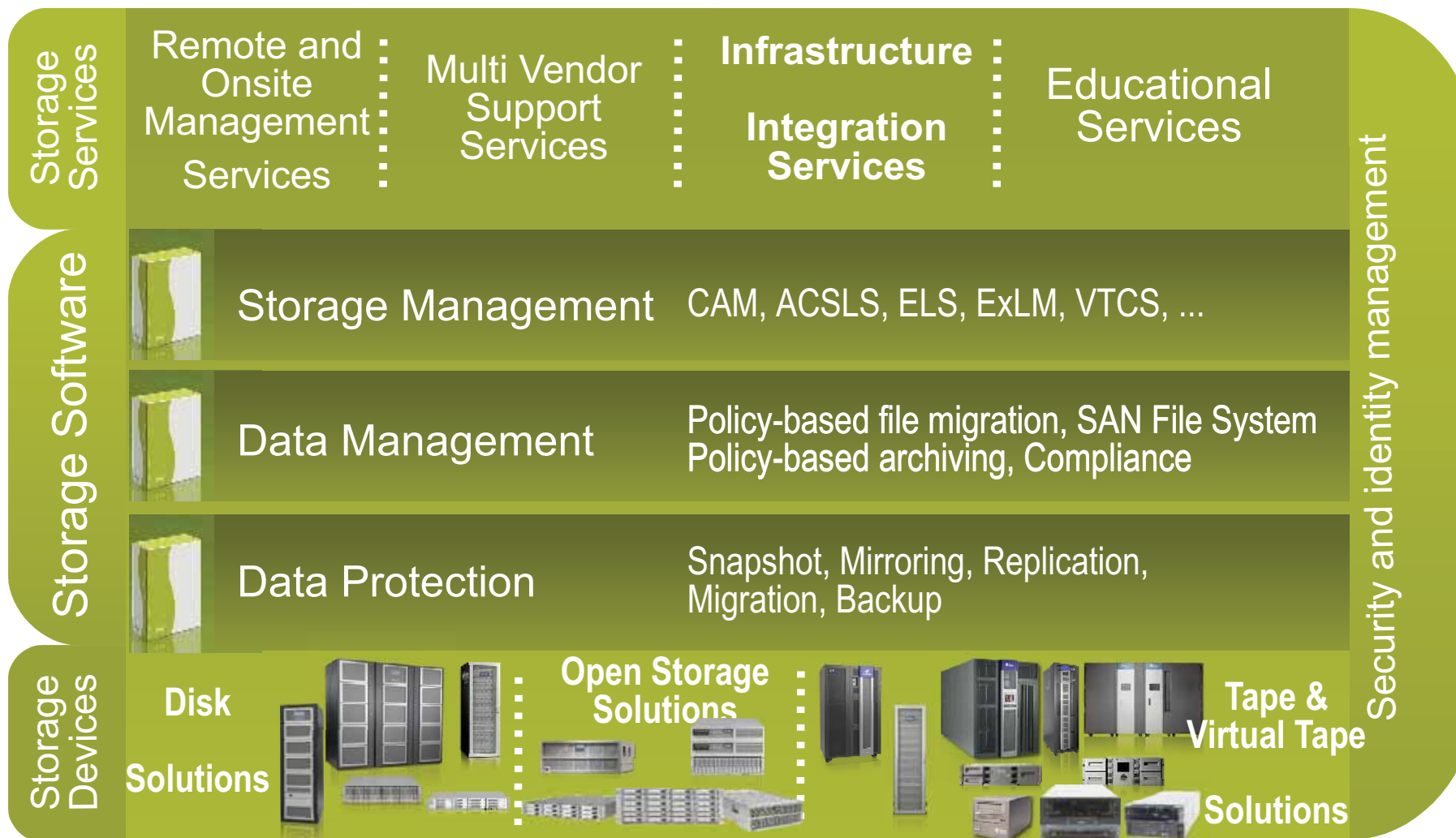
6. Main customers in Portugal

Why Customer Should Refresh Storage



- Reduce Cost, Gain Eco-Efficiencies
- Grow Effortlessly
- Simplify Management
- Minimize Risk
- Preserve Business Investments

Sun Storage Portfolio



Sun's Disk Portfolio

Enterprise Disk



ST 9985V



ST 9990V

Virtualization, Thin provisioning

Modular Disk



ST 2510, 2530, 2540



ST 6140



ST 6540

Storage Expansion

New!

Storage J4000



Disk-Related Software

Device Enablement & Management :
CAM, Availability Suite, ...

File-Systems

ZFS, QFS, Lustre

Storage Server

New!



SunFire X4540

Business Problems Solved by Open Storage

Traditional Storage Solutions Are Not Meeting These Challenges

**More Storage for
Less Budgets**



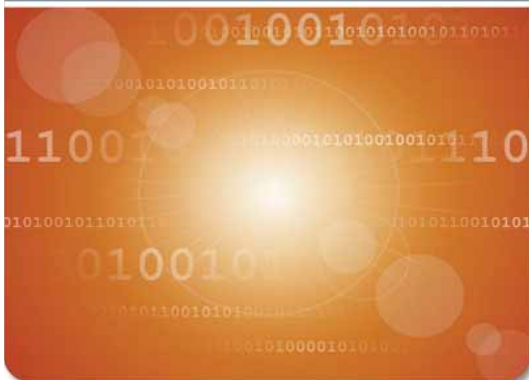
**Security Designed-in,
Not Bolted-on**



**Innovation Without
the Wait and Risks**



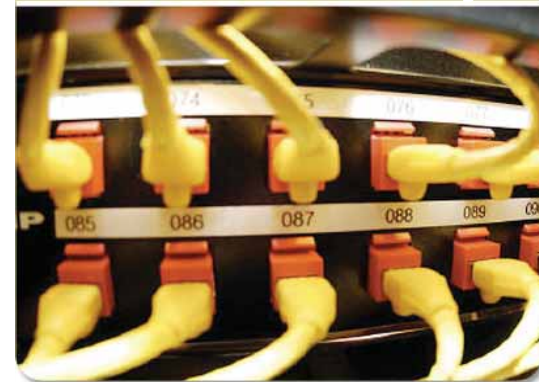
**Quickly Scale as
Your Data Grows**



**Free Yourself from
Vendor Lock-in**



**Less Complexity,
Greater Efficiency**



What Open Storage Means

It Means Economic Value and Scale for You

- **Start with simple building blocks**
- **Use storage building blocks from a wide range of suppliers**
- **Deploy the software you need, not just what you can afford**
- **Connect to virtually anything**
- **Simplify your storage infrastructure**



Products To Get You Started

Open
Storage
Arrays



J4200



J4400



J4500

Open
Storage
Servers



CMT Servers

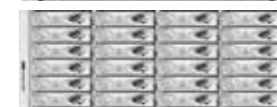


X4240 & X4250



X4540

Future
Open Storage
Appliances




Unified Storage Family

Open
Storage
Flash



Complete Line of Application & Storage Accelerators

Sun's Tape Portfolio

<p>Enterprise Libraries</p>  <p>SL8500</p>	<p>Midrange Libraries</p>  <p>SL3000</p>	<p>Distributed Libraries</p>  <p>SL500</p>	<p>Entry Libraries</p>  <p>SL48 SL24</p>		
<p>Virtual Tape</p>  <p>Virtual Storage Manager 4e/4/5</p>	<p>VTL Plus V2.0</p>  <p>New!</p>  <p>VTL Prime (De-Dup.)</p>	<p>Encryption Key Management</p>  <p>KMS V2.0</p>	<p>STK Brand Tape Media</p> 		
<p>Tape Drives</p>	<p>New!</p>  <p>T10000B</p>	<p>New!</p>  <p>T9840D</p>	 <p>LTO3 & 4</p>	 <p>DAT</p>	
<p>Tape-Related Software</p>  <p>Backup and Recovery</p>			 <p>Device Enablement and Management</p>		 <p>Key Management</p>

Agenda

1. Sun Vision and Mission

2. Sun Systems

3. Sun Storage

4. **Sun Software**

5. Sun Services

6. Main customers in Portugal

Aggressive acquisition strategy



- **Database:** World's most popular open source database – multi-platform, global support, global community
- **Identity:** Sun Role Manager enforces company security controls by user role and automates access compliance
- **Virtualization:** Sun xVM Virtual desktop runs multiple operating systems side-by-side for developing applications more quickly

Professional Open Source

Open Source

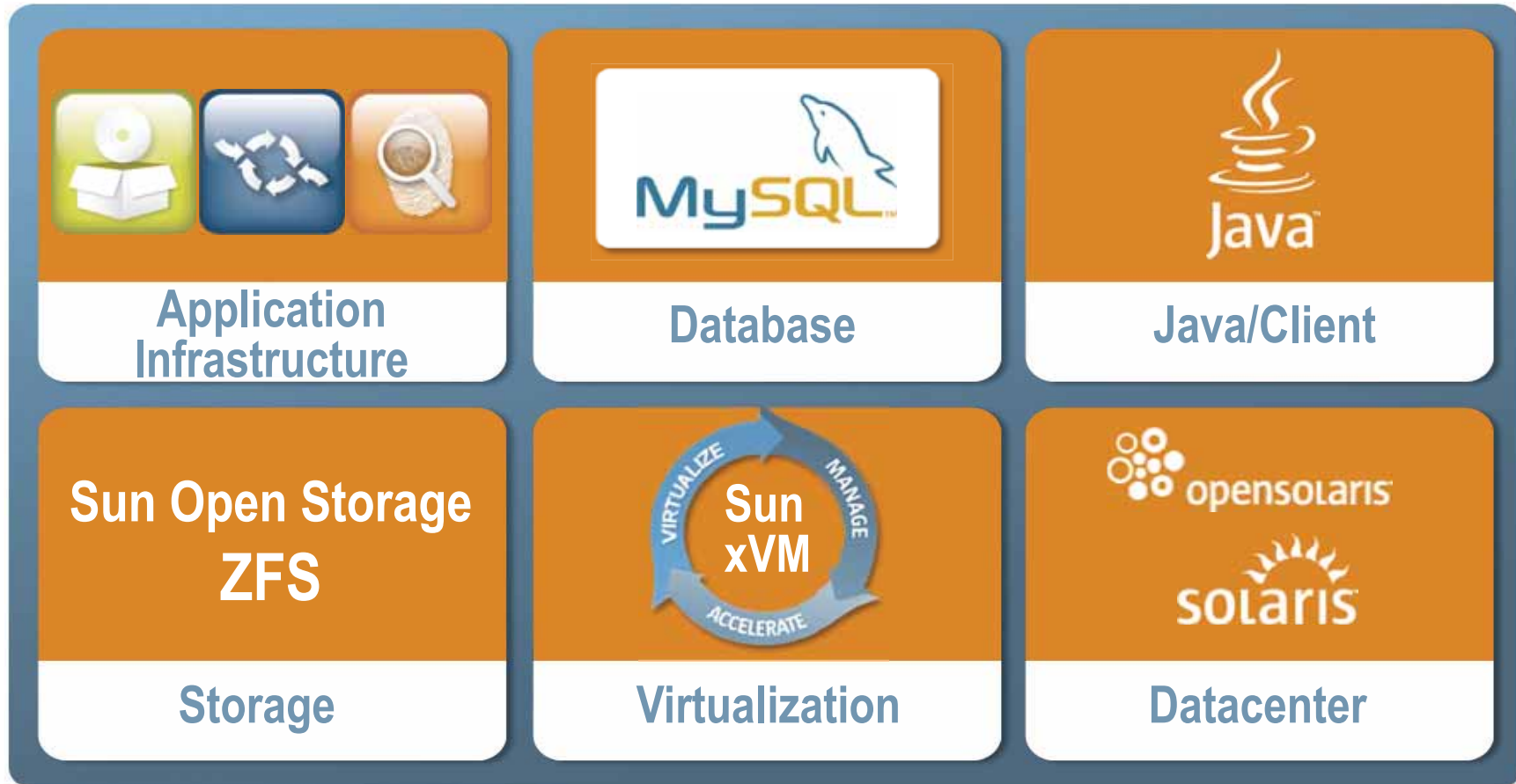
- Source code
- Core binary product
- Basic training
- Security support
- Developer programs

What We Sell

- Subscriptions
 - > Deployment software
 - > Global Technical Support
 - > Patches and Updates
 - > Knowledge Base
 - > Training
 - > Indemnification
- Servers, Storage and Services

Sun Software Portfolio

Multi-Platform and Open



Developer Tools and Programs

Professional Services (PS), Sun Learning Services (SLS), Support

Sun Application Platform



- **Build**
 - > Build and integrate composite applications for increasing information visibility and making smarter business decisions
- **Secure**
 - > Manage, protect, store, verify and share user identity information
- **Deploy**
 - > Reliable, fast, and more cost-effective application

Sun Application Platform



- **Build**
 - > Build and integrate composite applications for increasing information visibility and making smarter business decisions
- **Secure**
 - > Manage, protect, store, verify and share user identity information
- **Deploy**
 - > Reliable, fast, and more cost-effective application

Build: App Integration and SOA

- Sun's SOA platform lowers TCO and introduces business flexibility for:
 - > 1) Integrating customer data
 - > 2) Mergers & acquisitions
 - > 3) Application consolidation
- Leverages legacy application functionality as re-usable services and combines with newly created services to rapidly address new business objectives
- Transparency into future releases with open source code base
- Rated LEADER by Gartner and Forrester



Sun ESB Suite

- Enterprise Service Bus platform
- Integration and process management
- Open source and pluggable



Java CAPS

- Comprehensive composite application platform suite
- Combines ESB with MDM Suite
- Open source and pluggable

“Sun's Java CAPS product is a rising star in the company's software portfolio”

Gartner: 23 April 2007 Paul McGuckin, Daryl Plummer, Jess Thompson

Secure: Identity and Compliance

- Identity Management solves acute business needs:
 - > Enterprise security
 - > Regulatory compliance and risk management
 - > Operational efficiencies
- Addresses risk and compliance pain points:
 - > Automates access certification and re-certification process
 - > Improves internal audit operational efficiencies
- Rated the LEADER by Gartner and Forrester



Role Manager

- Role Engineering
- Access Certification



Identity Manager

- Automated Provisioning
- Identity Auditing



Federated Access Manager

- Web SSO
- Federation



Compliance Manager

- Preventative/Detective Control
- End-2-End – Detection and Reporting

Deploy: Application Containers

- 4.5 Million Downloads in last year
- Dozens of external committers
- Over 7,000 members
- Extensive partner eco-system
- Simple-Reliable-Low Cost
- SpecJApp Server record holder
- Features
 - > JavaEE 5 / AJAX / Ruby / PHP
 - > Integrated LAMP stack
 - > Metro - .NET Interoperability
 - > Sailfin – SIP Support



- GlassFish Enterprise Server**
- Java EE App Server
 - Highly scalable and reliable



- Sun Web Stack**
- Automated Provisioning
 - Identity Auditing



- GlassFish Communications Server**
- SIP Teleco Support
 - Built with Ericsson



- Mobile Enterprise Platform**
- Mobile Application Sync
 - Rich Mobile Applications

Fastest Growing Web Platform

Sun xVM portfolio

Open Virtualization from Desktop to Datacenter



**Sun xVM
VirtualBox**
Open developer
virtualization
platform



**Sun xVM
Server**
Enterprise-class
hypervisor



**Sun xVM
OpsCenter**
Manage
heterogeneous
data centers



**Sun xVM
VDI**
Only VDI with
choice: Windows,
Solaris and Linux
delivered securely

Desktop to datacenter virtualization

SUN xVM VIRTUALBOX	SUN xVM SERVER	SUN xVM OPS CENTER
<ul style="list-style-type: none">• Developer desktop virtualization platform• Enables desktop or laptop PCs running Windows, Linux, Mac or Solaris to run multiple operating systems side-by-side• Ease of switching between platforms	<ul style="list-style-type: none">• Hypervisor family inherits scalability, availability, manageability, observability and security from Solaris• Consolidates Windows, Linux, and Solaris	<ul style="list-style-type: none">• Datacenter automation• Physical and virtual resource management• Manage thousands of hardware and software entities

Sun xVM Server

- Open and Interoperable
 - > Windows, Linux and Solaris
 - > Import/Export VMware and Microsoft VMs
 - > openxvm.org community
- Enterprise-class scalability
 - > ZFS, network virtualization
- Available and reliable
 - > Predictive Self Healing
- Datacenter-grade security



Foundation for the Dynamic Datacenter

Sun xVM Ops Center

- Manage physical and virtual datacenter
- Provision from firmware to hypervisor, operating system, and application
- Automatic patching
- Compliance reporting



Virtualizing the desktop - Sun xVM VDI

Your Desktop Anywhere

My desktop on a PC



My desktop on a Mac



My desktop on a Sun Ray client



As you move between devices,
your desktop follows you

Agenda

1. Sun Vision and Mission

2. Sun Systems

3. Sun Storage

4. Sun Software

5. **Sun Services**

6. Main customers in Portugal

The Overall Sun Services Portfolio

Infrastructure Services for the Customer Life Cycle



Understanding and Serving Our Customers

Sun Offers Flexible, Yet Holistic Solutions for Your IT Sourcing Needs

Business Drivers	Benefits of Sun Managed Services
<p>Optimize IT Infrastructure <i>To stay focused on strategic initiatives</i></p>	<ul style="list-style-type: none">• Use predictive management techniques• Ebay: “They (Sun Managed Services) keep the infrastructure running smoothly so we can be thinking about the next big thing.”
<p>Maintain IT Service Continuity <i>To maximize system availability</i></p>	<ul style="list-style-type: none">• 24x7 continuous management of your operations all year round• Minimize outages & reduce the threat of financial loss• Vodafone España: Achieve 99.9% system availability
<p>Retain Control of IT Infrastructure <i>To support heterogeneous environment</i></p>	<ul style="list-style-type: none">• Choose selective sourcing rather than outsourcing• Hire Sun to manage only what you want managed• National Grid Wireless: Built trust and confidence with senior management

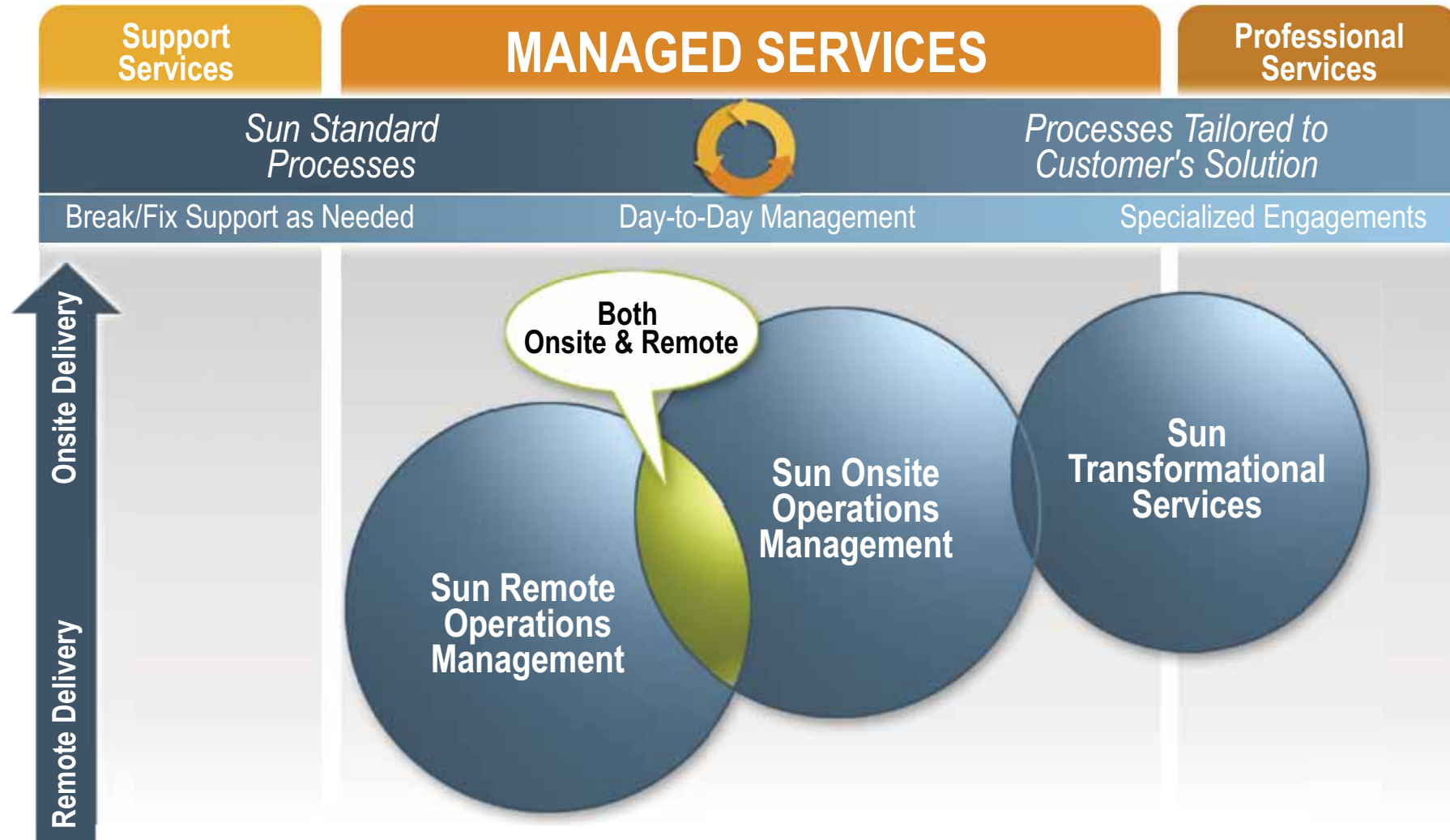
Understanding and Serving Our Customers

Additional Business Drivers that Sun Addresses . . .

Business Drivers	Benefits of Sun Managed Services
<p>Reduce Security Risks <i>To minimize business impacts</i></p>	<ul style="list-style-type: none">• Meet regulatory and compliance requirements• Protect entire IT environment from security breaches and leaks using Sun's ITIL-compliant framework• Chicago Public Schools: Improved security and firewall protection
<p>Address Staff Shortfalls <i>To extend capabilities without hiring extra staff</i></p>	<ul style="list-style-type: none">• Extend staff and fill gaps with skilled Sun resources• Shorten learning curves with knowledge transfer from Sun when bringing operations back in-house• Coventry Building Society: Saved 100 staff hours
<p>Manage IT Infrastructure Costs <i>To reduce operating expenses</i></p>	<ul style="list-style-type: none">• Reduce annual operating costs by hundreds of thousands of dollars• Lower engineering and integration costs• Callidus Software: Passed 50% cost savings to customers through subscription services

Sun Managed Services - A Closer Look

Understanding the Fundamentals of Our Offering



Sun Remote Operations Management

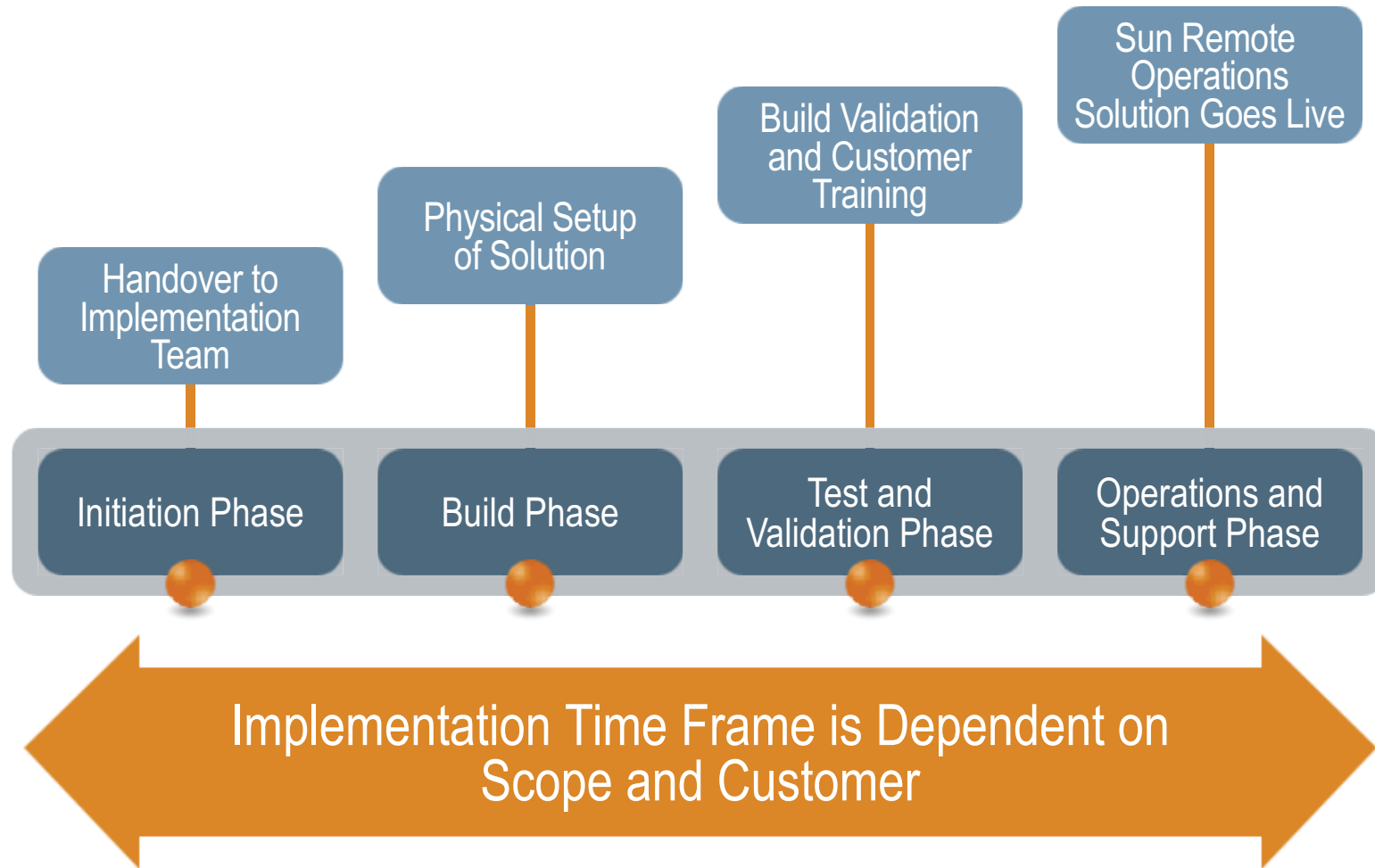
Remote 24x365 Monitoring and Management of Any Platform

- Adaptable solutions customized for your business requirements
- Services extend to all areas of IT, such as the Operating System, Servers, Storage, Network, Database, Applications, and much more
- ITIL-based best practices
- Assigned account managers and engineers
- Operational efficiency ensures fast implementation and response time



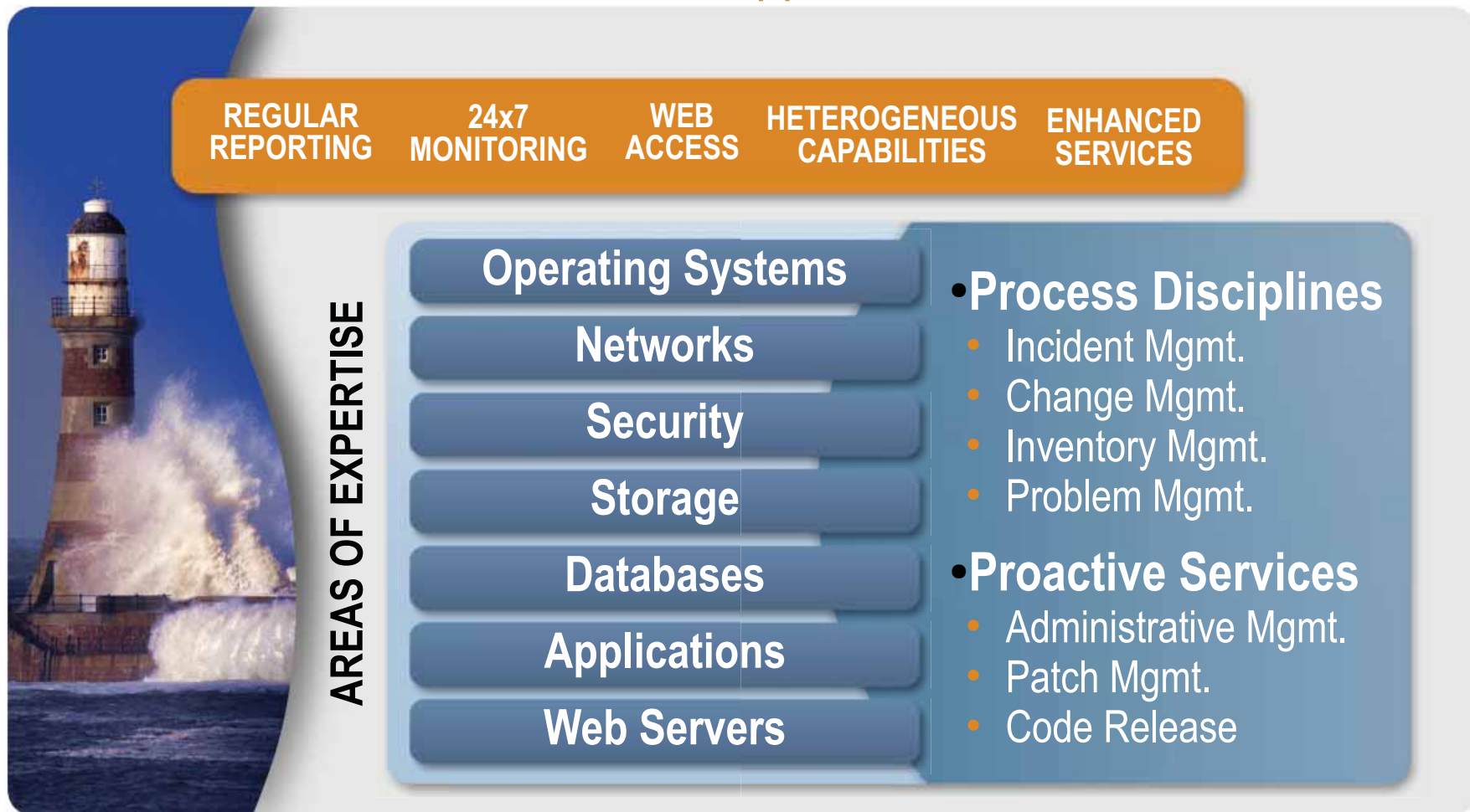
Remote operations management services deliver **predictive, adaptable, cost-effective** solutions to improve operational efficiency in **heterogeneous** IT environments

Remote Implementation Phases



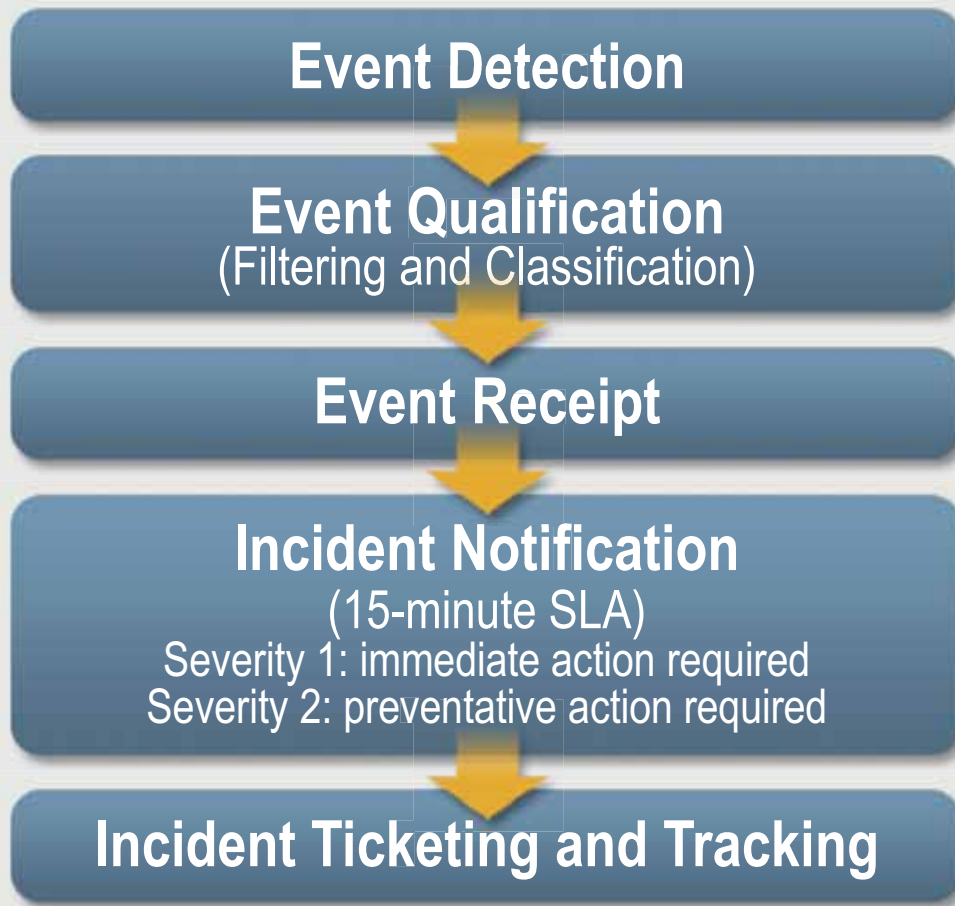
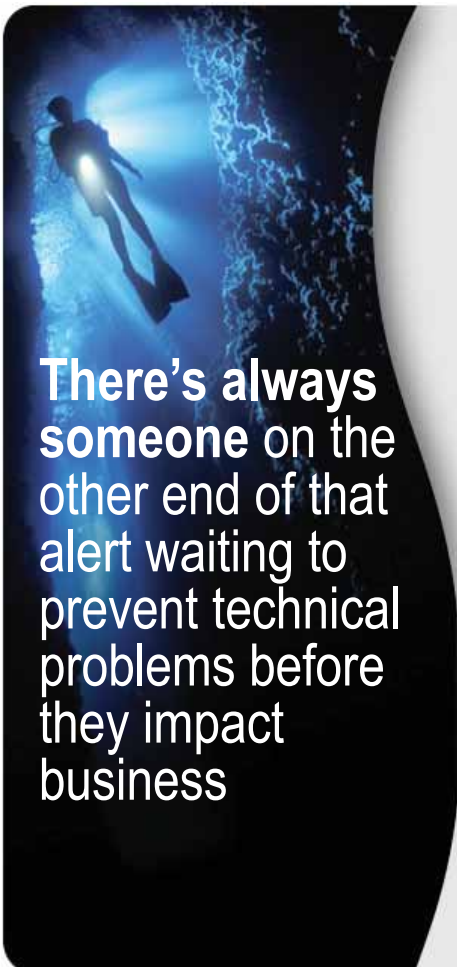
Comprehensive Expertise

ITIL Framework with a Predictive Approach to Service



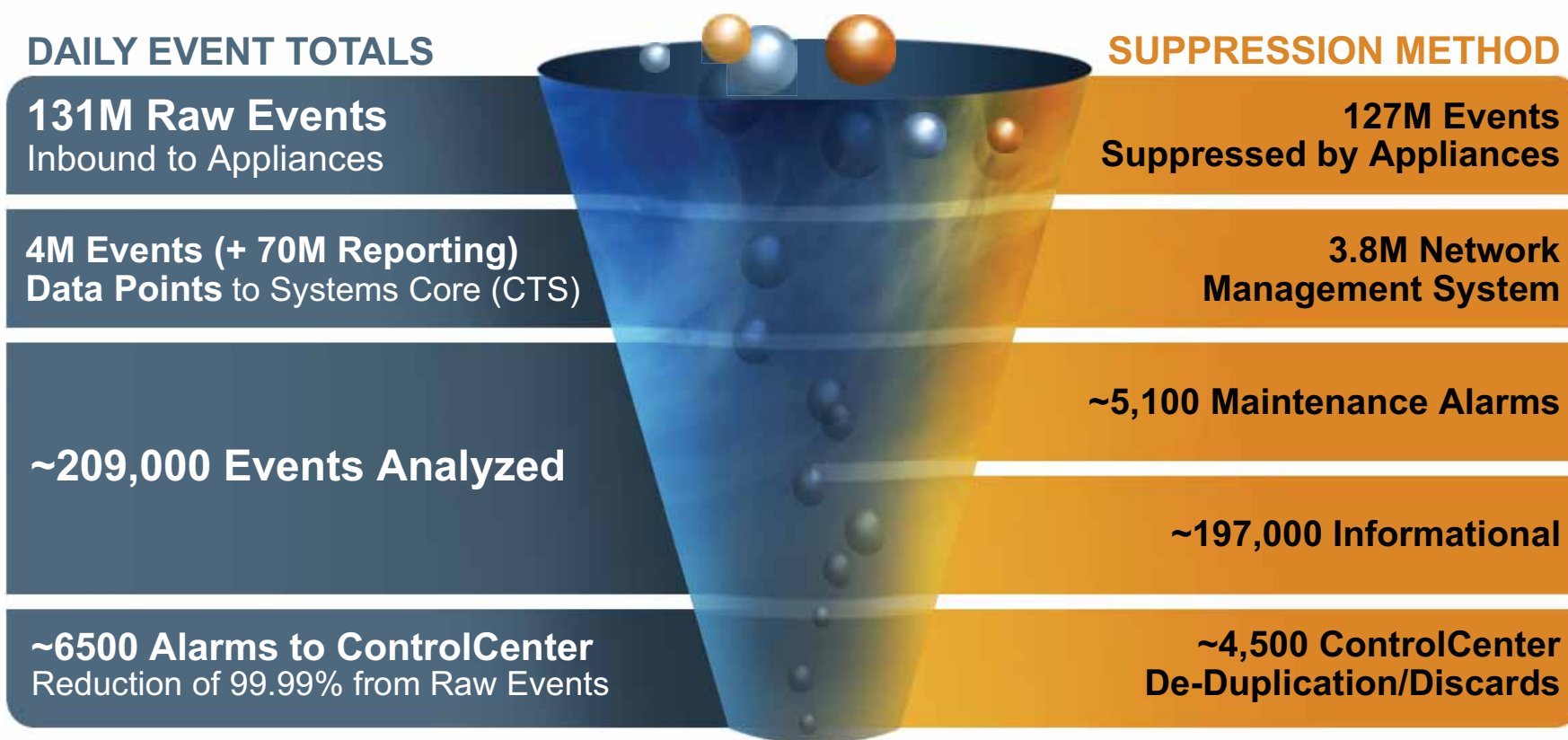
Monitoring Capabilities: Baseline Service

Our People Make the Difference



Monitoring Capabilities: The Sun Advantage

Sun's Method of Filtering and Prioritizing Events Reduces "the Noise" by 99%



~2000 Ticketed Events

(of which ~670 are correlated to existing incidents)

Ticketed Events represent ~30% of Actionable Alarms

PLEASE NOTE: Data points provided reflect average daily totals based on system information from July-August, 2008.

Management Capabilities: Robust Options

Frees up IT Staff to Focus on More Strategic Tasks



A Wide-Range of Management Services

Problem Management / Resolution of Incidents

Planning and Support for Change Controls

Proactive and Administrative Tasks

Track Inventory of IT Systems

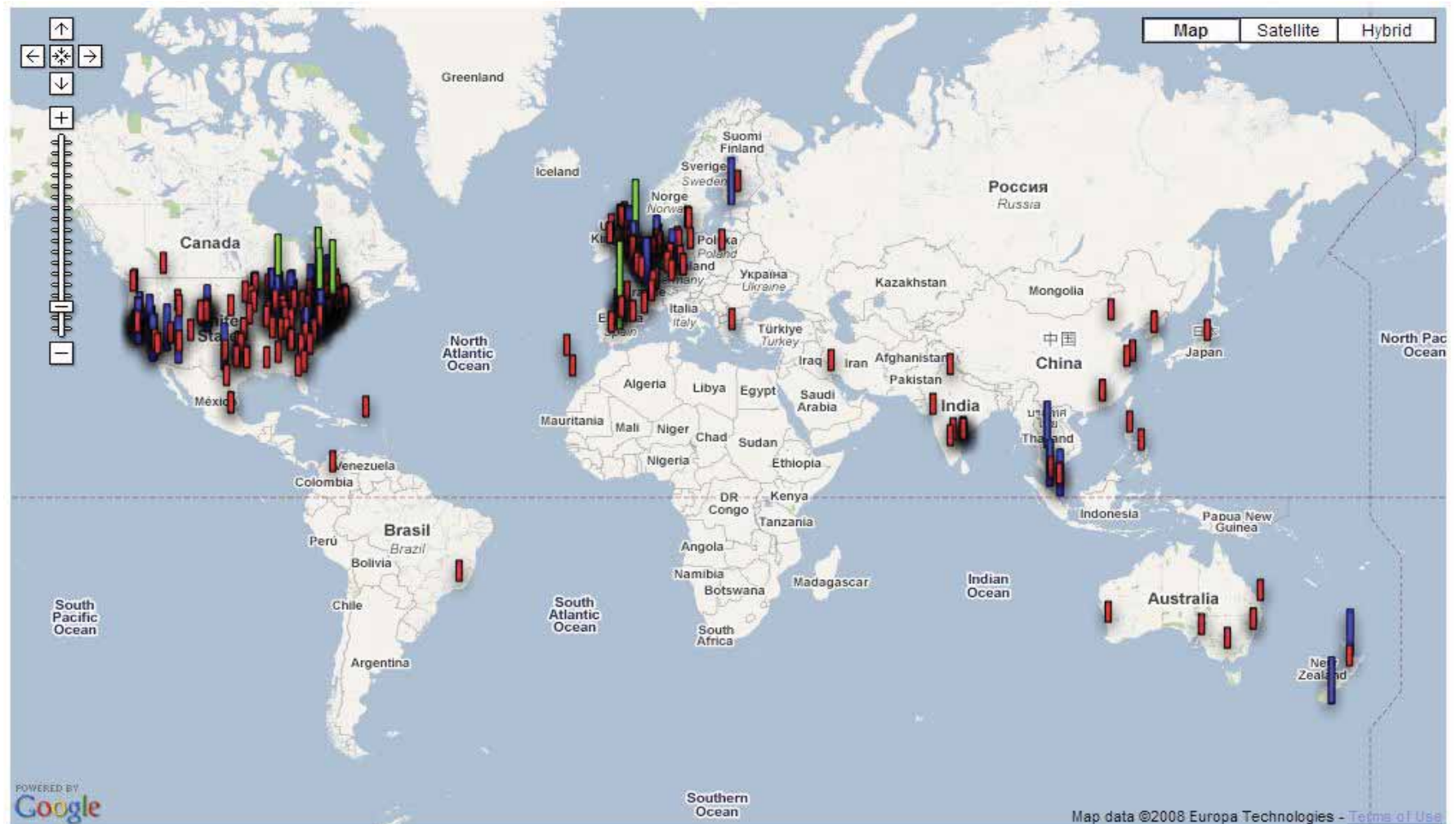
Management of Third-party Vendors

Performance and Availability Reporting

Specialized Areas of Expertise

Sun's Global Reach

When we say anytime, anywhere . . . we really mean it.



Did You Know Sun Supports 400+ Technologies?

AREAS OF SUN EXPERTISE

SAMPLE SUPPORTED TECHNOLOGIES

Operating Systems



Networking



Security



Storage



Databases



Applications



Web Servers



Org Certifications



- ISO 27001 Security Certified in Americas, Europe, & Asia
- ITIL Certified Staff

Agenda

1. Sun Vision and Mission
2. Sun Systems
3. Sun Storage
4. Sun Software
5. Sun Services
6. **Main customers in Portugal**

Main Customers in Portugal

Comunicações



Sector Público



Sector Financeiro



Utilities e Recursos Naturais



Media e Transportes



Saúde e Educação

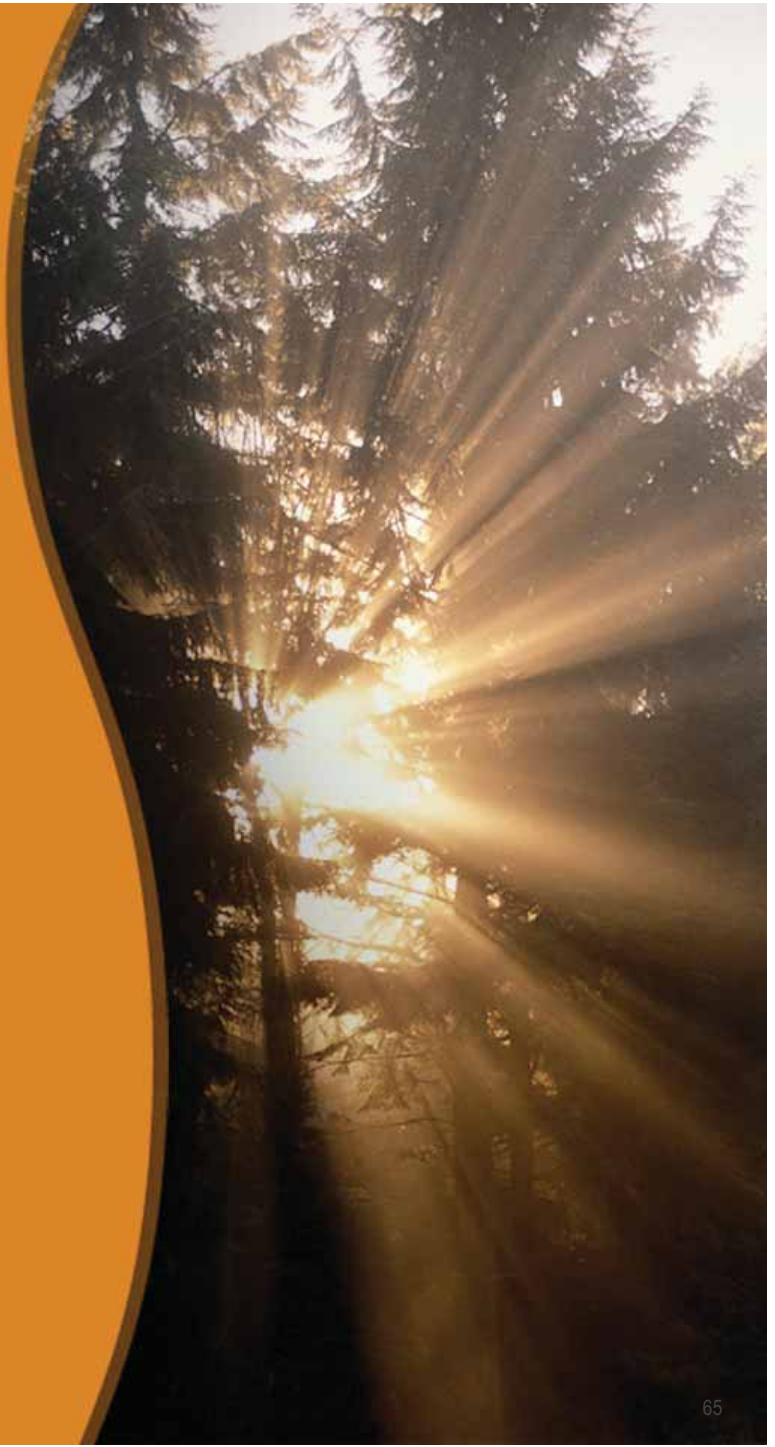




Thank you!

Luis Martinho

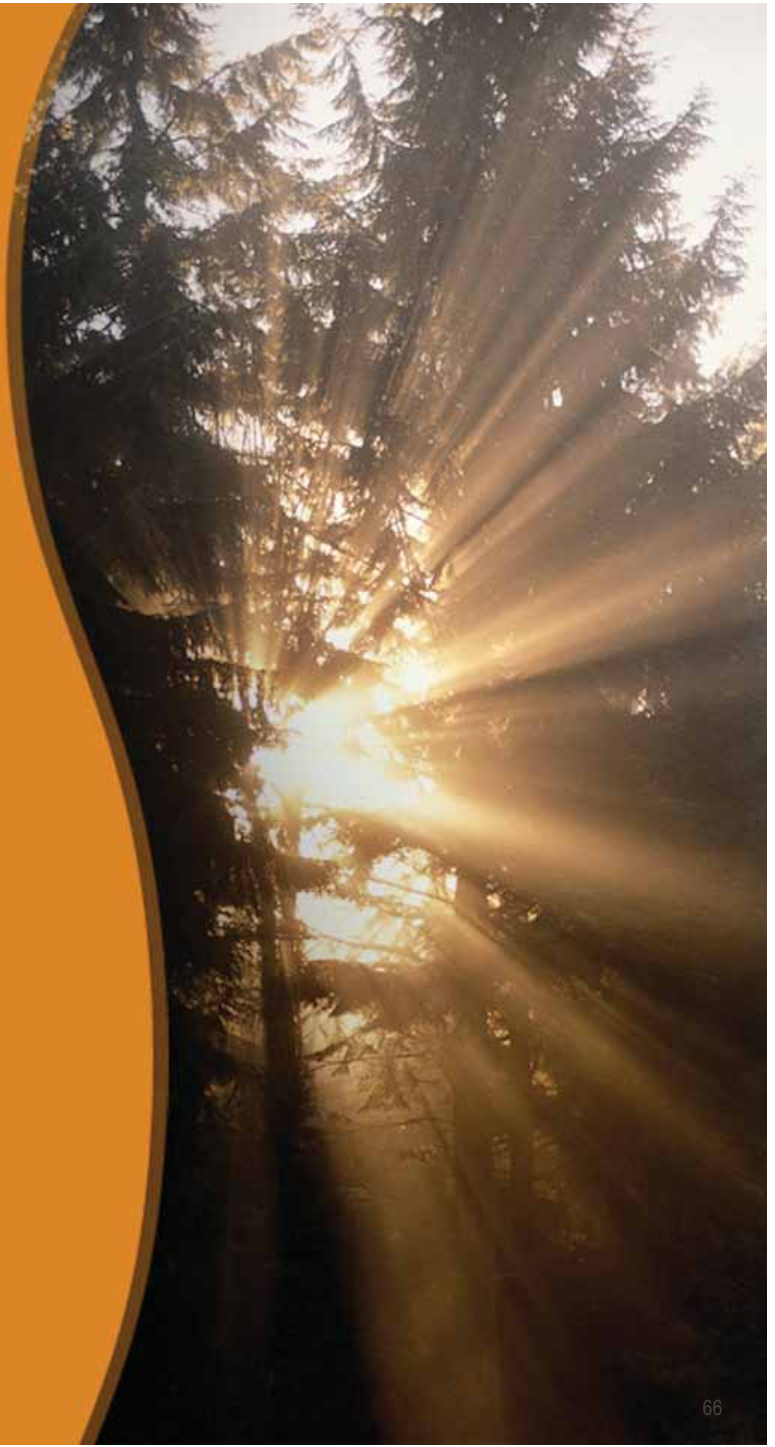
Luis.Martinho@Sun.COM





Appendix

Some Sun Value Propositions



Sun IT Value Propositions

Click on icon to access value proposition



Industrialization and Best Practices



Technical Normalized Basis



Security



Provisioning



Infrastructure Virtualization



Desktop Virtualization



Web 2.0



Open Source



High Performance Computing



Disaster Recovery



Business Application Infrastructure



Data Protection



Identity Management



Archiving



Services Oriented Architecture



Business Continuity



Computers Rooms Optimization



Eco Datacenter



x86



CMT

Industrialization and Best Practices

Value Proposition



CUSTOMER REFERENCE

100% of the new projects apply Best Practices

Objective : Improve the quality of service by decreasing significantly the number of incidents.

Solution : Identify the different incidents in production, elaborate statistics, deduct the causes and engage suited action plans so it doesn't reoccur.

Customer Benefit : Optimal management of incidents. Establish standards based on experience feedbacks and apply it in the implementation of all the new projects.

OMCM



KEY PERFORMANCE INDICATORS

- Number of incidents treated per day
- Time to repair
- Number of changes
- Nature of change
- Mean time for the change
- Infrastructure maturity level
- Unavailability mean time



TECHNOLOGY / METHODOLOGY

- 360° sight of Staff, IT Processes and Products
- Best Practices ITIL, COBIT, Sun i-Runbook (Best Practices Sun and Customer)
- 100 consultants certified ITIL Service Manager, +500 certified ITIL Foundation in the world
- Services Optimized DataCenter (SODC)
- DataCenter Reference Implementation (DCRI)
- Methodologies : Prince2, Six Sigma, Operation Management Capabilities Model (OMCM)

SERVICES

- Industrialization and Best Practices Workshop
- Sun Operations Capabilities Assessment
- Sun Learning Services



Standardized Technical Basis

Value Proposition



CUSTOMER REFERENCE

40% of technical components reusable

Objective : Evolution of the Sun/Solaris European platform by improving industrialization level. Define Solaris 10 common technical basis standardized to the whole Sun environment.

Solution : System components (Solaris 10, Sun Cluster, VxFS, VxVM), Software Components (ERP, scheduler), Master of deployment. Implementation within 3 months.

Customer Benefit : Cost reduction, global consistency servers population, productivity gains to reuse standard components.



KEY PERFORMANCE INDICATORS

- Number of OS
- Number of OS releases
- Number of administration software
- Open Source components ratio
- Change frequency
- Total Cost of Ownership



TECHNOLOGY / METHODOLOGY

- 64 bits multi-cores processors : SPARC, CMT, AMD, INTEL
- Sun StorageTek SAN, NAS, VTL
- Hybrid Data Server Sun Fire x4500 capacitive storage to 48TB
- x64 Server eight-processors quadri-cores
- SPARC Server 64 processors
- Sun Blades 8000, 6000
- Solaris 10 for free with support subscription
- Solaris Binary Compatibility
- Solaris 10 on platforms (Sun, IBM, HP)
- Multi OS : Solaris, Linux, Windows, VMWare

SERVICES

- Standardized Technical Basis Workshop
- Product Deployment Services
- Sun Learning Services

- Open Source strategy (OpenSolaris, GlassF



Security Value Proposition





CUSTOMER REFERENCE

Users lifecycle processes automation and implementation conformity

Objective : Users habilitations management and tools implementation for conformity rules respect.

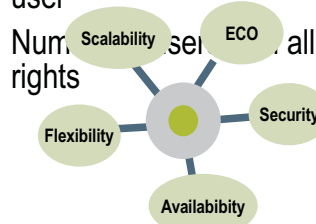
Solution : Sun Java System Identity Manager and Sun Java System Identity Auditor, AD, LDAP, SAP, RACF, DB2 adapters.

Customer Benefit : Sun solution suited to the iterative implementation of users lifecycle processes management, processes and audit reports. The progressivity allows faster its.

KEY PERFORMANCE INDICATORS

- Propagation time for new user
- Number of exemptions
- Number of applications integrating the SSO
- Number of notifications per user
- Number of propagation anomalies per year
- Number of password per user
- Num. all rights



- SERVICES**
- Security Workshop
 - Product Deployment Services
 - Security Services
 - Sun Learning Services
 - Sun Managed Services
 - Sun Support Services
 - Sun Global Financial Services Operation

- TECHNOLOGY / METHODOLOGY**
- Solaris Security
 - > Digital Certificates Everywhere
 - > IP Filter Firewall
 - > Secure Execution
 - > User Rights and Process Rights Management
 - > Cryptographic Infrastructure
 - > Secure by Default Networking
 - Solaris Trusted Extensions
 - > Evaluation Assurance Level 4 (EAL4+)
 - > Adds labeled security
 - > Multi-level networking and printing
 - > Multi-level GUI
 - > Leverages existing privilege model
 - > Uses Solaris Containers
 - > Runs all Solaris applications
 - > High level of certification
 - Solaris Minimization
 - Sun Secure Global Desktop Software
 - Sun Java System Identity Management Suite
 - JavaCard Architecture
 - Encryption for Archive Data
 - Key Ma



Provisioning Value Proposition



CUSTOMER REFERENCE

Reduction by 50% of deployment costs

Objective : Deploy and update Weblogic and Oracle services.

Solution : Web Logic and Oracle environment with Unix or Windows environments.

Customer Benefit : 95% elimination of manual interventions in deployment processes. Unified process and central console for different technologies deployments. Consistent and error-free backup process. 50% reduction implementation and costs for new applications and support.



KEY PERFORMANCE INDICATORS

- Time to deploy a new service
- Time to Update
- Number of services deployed per year
- Number of OS deployed per year
- Number of applications deployed per year
- Administration ratio for a deployment



TECHNOLOGY / METHODOLOGY

- Sun xVM Ops Center (Global management solution for hardware and software)
 - > Patches deployment
 - > OS Provisioning and Monitoring
 - > Register, Discovery, Inventory
 - > Unified management of xVM Server and Solaris Containers
- N1 Service Provisioning System (Application Provisioning)
- N1 Advanced Architecture for SAP (SAP landscapes provisioning)
- Quickly operational
- Structure the deployments
- Accelerate production launch
- Operations reliability
- Guarantee the know-how

SERVICES

- Provisioning Workshop
- Product Deployment Services
- Sun Learning Services
- Sun Support Services
- Sun Global Financial Services Operation





Infrastructure Virtualization Value Proposition

CUSTOMER REFERENCE

26% reduction servers number

Objective : 130 Sun servers consolidation (mainly Web Tier) by withdrawing the oldest models. 60 servers eligible for consolidation/virtualization.

Solution : New systems based on Sun Fire T2000 /CMT for the Web Tier, Sun Fire V490, V890 for databases and Sun Fire x4200 /x64 for calculation. Solaris 10.

Customer Benefit : 26% reduction servers number – 53% reduction models number – 32% reduction rack units number – Processing



KEY PERFORMANCE INDICATORS

- Virtualized applications ratio
- SwaP ratio
- Use rate of equipment environment
- Return On Investment
- Number of virtual machines
- Availability ratio



SERVICES

- Virtualization Workshop
- Product Deployment Services
- Consolidation and Migration Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- TCO/ROI Tool : Sun Value Platform
- Servers, storage and desktop virtualization
- Dynamic System Domains
- Solaris Containers
- VMWare, Microsoft Virtual Server
- Sun xVM Infrastructure
 - > Sun xVM Server (LDom, Xen)
 - > Sun xVM Ops Center : Unified management of xVM Server and Solaris Containers
- Solaris Cluster and Geo Cluster Edition
- Sun StorageTek 99xxV
- Sun Virtual Tape Library
- Solaris ZFS
- Sun Modular Datacenter S20 : Datacenter virtualization
- Sun Virtual Desktop Infrastructure Softwa
- Virtual (ization)



Desktop Virtualization Value Proposition



CUSTOMER REFERENCE

30% growth productivity

Objective : Deploy a call centre with controlled and reduced costs offering a high service quality level.

Solution : Ultra Thin Sun Ray, Sun Ray Server Software, Computer Telephony Integration (CTI Genesys).

Customer Benefit : 30% improvement of tele-operators productivity . Answering time of support reduced from 23s to 3s. Noise, heat and energy consumption reduction in call center.



KEY PERFORMANCE INDICATORS

- Number of virtual terminals
- Number of virtual machines deployed per year
- Decibels decrease ratio in the call center
- Productivity improvement ratio
- Temperature decrease ratio in the call center



SERVICES

- Desktop Virtualization Workshop
- Product Deployment Services
- Sun Learning Services
- Sun Support Services
- Sun Managed Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- Sun Virtual Desktop Infrastructure Software
- Sun Ray workstation (thin client)
- Sun Desktop Software
Sun Ray Server Software (terminals steering, session mobility, centralised administration)
- Sun Secure Global Desktop Software (Secured Remote Access, Access Control)
- Open Office (office automation Solaris and Windows)
- Sun Java Desktop System (Solaris, Linux, Windows)
- NameFinder (organization chart, calendar)
- Sun Virtual Desktop Access Kit for VMWare (Lifecycle control of VM Windows XP, Assign ment of the VM)
- Virtual (Virtualization)



Web 2.0 Value Proposition



Reducing Impact on Environment and Optimization for Meteoric Growth

CUSTOMER REFERENCE

Objective : Grew 2 Billions to 4 Billions impression pages per week in same physical data center space

Solution : T1000 and T2000, Solaris 10, Storage and Services replacing Dell/Linux servers.

Customer Benefit : Reduce power and cooling expenses. Minimized impact on environment in line with green principles.



KEY PERFORMANCE INDICATORS

- Number of Open Source components
- Electrical consumption
- Costs saving
- SwaP ratio
- Number of web concurrent users
- Time to Repair
- Return on Investment
- Total Cost of Ownership



SERVICES

- Web 2.0 Workshop
- Java Enterprise Server Services
- Startup Essentials Program
- Product Deployment Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- 64 bits processors CMT, Multi-thread, Multi-core, Less Power, Space, Cooling
- Hybrid server Sun Fire x4500
- Data protection
- Sun Blade Server on AMD, Intel, UltraSparc T1, multi-OS : Solaris 10, Windows, Linux
- Sun Java Enterprise Software Infrastructure (Glassfish, Portal, Web, Proxy, Identity...)
- Virtualization: Sun xVM Infrastructure (LDom, Xen)
- Sun Virtual Desktop Infrastructure Software
- Open Source free : SAMP, NetBeans, GlassFish, OpenSSO, OpenOffice, MySQL, OpenPortal, OpenESB, VirtualBox

- Java C Platform
- Sun R (consumption)



Open Source Value Proposition



CUSTOMER REFERENCE

Freedom, Objective Control and Choice

Objective : Disaster Recovery Plan site. Components standardization. Solutions Control.

Solution : Open Source for Cyrus Messenger, MySQL and Postgres database, Web and Java, Debian O.S., Nagios supervisor.

Customer Benefit : Independence, Scalability, Objectives control and Choice of the solutions.



KEY PERFORMANCE INDICATORS

- Number of Open Source projects
- Number of Open Source components
- Number of contributors
- Economies made by the OpenSource choice
- Freedom of choice
- Service quality
- Open standards



SERVICES

- Open Source Workshop
- Product Deployment Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- Sun Implication in the communities
- Languages : Java, Ruby, Python...
- Open Source Free : Source code, Binary product, Simple Training, Security help
- Open Source Paying : Subscription, Support, Services, Training, Indemnification
- Open Storage (Open Source Software with Industry Standard Hardware)
- Open Source Software: OpenJDK, OpenSolaris, NetBeans, GlassFish, Grid Engine, OpenSSO, OpenFM, OpenOffice, OpenDS, OpenPortal, OpenESB, OpenSparc, VirtualBox
- Java is Everywhere
- MySQL is a Strategic Step
- OpenOffice is the Desktop reference
- LAMP : Linux, Apache, MySQL, PHP
- SAMP: Solaris, Apache, MySQL, PHP



High Performance Computing Value Proposition



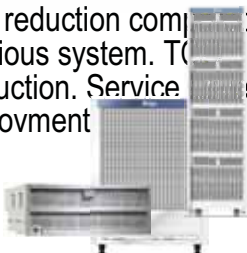
CUSTOMER REFERENCE

The Most Powerful HPC system : 500 Tflops

Objective : Mathematic calculations models applied to oil tanks, astrophysics, chemistry, seismology, aerospace, bio informatics and new technology.

Solution : Sun HPC system of 500 TeraFlops. 82 Sun Ultra-Dense Blade Platforms on Opteron, 2 Sun Ultra-Dense switches, 72 Sun Fire x4500 servers, 100 TB RAM, 1.7 PB disks.

Customer Benefit : Calculation time reduction compared to the previous system. TCO Reduction. Service improvement



KEY PERFORMANCE INDICATORS

- Mean calculation time
- Number of Gflops
- Number of Watts per flop
- Availability Ratio
- Number of processors
- Number of calculation hours per year
- Number of scheduled maintenance days



TECHNOLOGY / METHODOLOGY

- Solution Benchmark Centers
- AMD, INTEL, CMT Processors
- Multi OS : Linux, Solaris, Windows
- High Performance network Gigabit, 10G or Infiniband. Reduction of cabling with switch Magnum
- Sun Constellation System
 - > Sun Blade 6048 Modular System
 - > Sun Datacenter Switch 3456
- Sun StorageTek 5800
- High Performance Storage (Lustre, pNFS, Sun Fire x4500 48TB, SAM-FS Archiving)
- Sun Studio 12 (For Free)
- Sun Grid Engine (Open Source)
- Sun HPC Cluster Tools (OpenMPI)

SERVICES

- High Performance Computing Workshop
- Product Deployment Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation



Disaster Recovery Value Proposition



CUSTOMER REFERENCE

System Availability at 99,999%

Objective : Ensure service continuity for 500,000 clients even in case of total failure of one of the 2 remote sites (200 km distance). RPO at Day-1.

Solution : Local cluster (active/passive) and asynchronous data replication on Sun StorageTek 9990 with TrueCopy on IP.

Customer Benefit : 40% reduction on billing cycle, measured 99.999% availability, disaster recovery objectives achieved through simulation.



KEY PERFORMANCE INDICATORS

- Recovery Point Objective (RPO)
- Recovery Time Objective (RTO)
- Full Recovery Time Objective (FRT0)
- Data quality ratio after incident



SERVICES

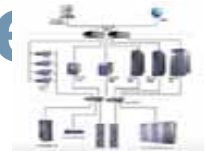
- Disaster Recovery Plan Workshop
- Product Deployment Services
- Data Management Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- Service Level Agreement based solution
- Solaris ZFS
- Tape Virtualization with Specific DR Testing
 - > Virtual Storage Manager (VSM)
 - > Virtual Tape library (VTL)
- Clustering
 - > Solaris Cluster
 - > Solaris Cluster Geographic Edition
- Synchronous / Asynchronous Replication
 - > ST9000 (TrueCopy, ShadowImage, Copy-on-Write)
 - > ST6000 (Remote Volume Mirroring, Snapshot)
- Data Movement Software
 - > Sun StorageTek SAM-FS, SAM-OES



Business Application Infrastructure Value Proposition



CUSTOMER REFERENCE

A SAP production platform for 200 concurrent users

Objective : Production SAP/BW information system for decision-making reporting . The solution should reduce the current maintenance costs.

Solution: Production SAP/BI .0 Unicode environment, Oracle 10g, Solaris 10. Configuration : 4 CPU AMD Opteron @2,6Ghz / 32 GB RAM / 480 GB of data.

Customer Benefit : A full x64 platform with reduced acquisition and maintenance costs for 200 concurrent users.



KEY PERFORMANCE INDICATORS

- Response time for one transaction
- Number of concurrent users
- Data flow integration time
- Availability ratio
- Mean time to repair
- Number of applications modules for the solution
- Total Cost of Ownership
- Return On Investment



SERVICES

- Architecture Design Workshop
- Product Deployment Services
- Sun Learning Services
- Sun Support Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- Architecture based on projects experiences, benchmarks (TPC-H, SAPS...)
- Architectures made to face changes and functional evolutions
- Alliances with SAP, ORACLE, SAS...
- MySQL Database
- Infrastructure BI Accelerator (Alliance SAP, Sun, Intel, SuSE)
- N1 Advanced Architecture for SAP (Landscapes SAP Provisioning)
- Oracle RAC optimized on Sun platform
- Walldorf SAP skills center
- SAP NetWeaver optimized on Sun
- +2000 BI customers in the world
- Sun VIP Support with SAP, Oracle, SAS



Data Protection

Value Proposition



Ensure Data Protection and Availability for Large Bank Datacenter

CUSTOMER REFERENCE

Objective : Data protection for several consolidated banking institutions in compliance with regulatory constraints on data protection.

Solution : Sun StorageTek tape libraries and virtualization on 2 remote sites with systematic backup set replication.

Customer Benefit : Guaranteed data protection according to safety rules at minimal cost (OpEx and CapEx).



KEY PERFORMANCE INDICATORS

- Data existence
- Data availability ratio
- Data retention duration
- Data restore duration
- Data encryption
- Recovery Point Objective (RPO)



TECHNOLOGY / METHODOLOGY

- Tape Automation
 - > SL8500, SL3000, SL500, SL24 / SL48
 - > T10K, T9840D, LTO
- Tape Virtualization
 - > Virtual Tape Library
- Synchronous / Asynchronous Replication
 - > ST9000 (TrueCopy, ShadowImage, Copy-on-Write)
 - > ST6000 (Remote Volume Mirroring, Snapshot)
- Open Storage (Open Source Software with Industry Standard Hardware)
 - Data Copy Services
 - > Storage Archive Manager (SAM-FS)
 - > Backup Applications

SERVICES

- Data Protection Workshop
- Product Deployment Services
- Data Management Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation



Identity Management Value Proposition



CUSTOMER REFERENCE

Users lifecycle processes automation and implementation conformity

Objective : Users habilitations management and tools implementation for conformity rules respect.

Solution : Sun Java System Identity Manager and Sun Java System Identity Auditor, AD, LDAP, SAP, RACF, DB2 adapters.

Customer Benefit : Sun solution suited to the iterative implementation of users lifecycle processes management, processes and audit reports. The progressivity allows faster ROI and results.



KEY PERFORMANCE INDICATORS

- Propagation time for new user
- Number of exemptions
- Number of applications integrating the SSO
- Number of notifications per user
- Number of propagation anomalies per year
- Number of password per user



TECHNOLOGY / METHODOLOGY

- Sun Java Enterprise System License per employee/year
- Sun Java System Identity Management Suite
 - > Sun Java System Directory Server first LDAP server in the world.
 - > Sun Java System Access Manager, Controle access, SSO...
 - > Sun Java System Identity Manager First solution user provisioning
 - > Sun Java System Identity Auditor : audit rules, security and legal policy...
 - > Sun Java System Federation Manager : Deploy solutions of identity federation between partners sites

SERVICES

- Identity Management Workshop
- Product Deployment Services
- Identity Management Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

- O.S : S RedHa



Windows,

Archiving Value Proposition



ROI on 3 years with 1,6 M€ saving in Telco Company

Objective : Archive production data (scores, payment, billing) on monthly basis and make it available while decreasing storage costs.

Solution : Sun StorageTek disks and tapes. Critical data on fast disks (15k RPM FC), frequently accessed data on mid-range disk (10k RPM FC), and low value data on SATA disk or tapes.

Customer Benefit : Return On Investment on 3 years with 1,6M€ saving.



CUSTOMER REFERENCE

KEY PERFORMANCE INDICATORS

- Conservation duration of archived data
- Resource consumption per service
- Media number on which the data have transited during its lifecycle
- Return On Investment
- Mean time archived data research
- Guarantee of data Integrity throughout



TECHNOLOGY / METHODOLOGY

- Tape Automation
 - > SL8500, SL3000, SL500, SL24/SL48...
 - > T10K, T9840D, LTO
- Best in class Data Movement Software
 - > Sun StorageTek SAM-FS, SAM-QFS
- Third-party Archiving Software
 - > Symantec Enterprise Vault
 - > Commvault Simpana Archive for Microsoft Exchange Systems
- Fixe-based Storage Offering
 - > NAS

SERVICES

- Archiving Workshop
- Product Deployment Services
- Data Management Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation





Services Oriented Architecture Value Proposition

A 60% reduction of industrialization time

Objective : Segment and qualify its customers according to their family situation and their products portfolio in order to improve customer loyalty.

Solution : norms and standards definition ,objets and interactions definition.

Customer Benefit :
Performance, scalability, maintainability.
High security and auditability level. Shift from product centric mode to customer centric mode.
Customer repository with a progression of 60 000 customer/year.



CUSTOMER REFERENCE

KEY PERFORMANCE INDICATORS

- Time to make a new service available
- Cost of inter-services cross charges
- Applications ratio participating to the SOA
- Response time
- Quality of service
- Data repository quality



TECHNOLOGY / METHODOLOGY

- Pragmatic et incrémentale. Alignement Business/IT
- Capitalize and integrate the existant
- Integration (ESB, JBI)
- Processes management (BPMN, BPEL, BAM)
- Business To Business (B2B)
- Unique sight of customer (MDM)
- Business standards support : SWIFT Ready Gold, ACORD, RosettaNet, PharmaML
- Very strong opening on the standards (XML, WSDL, SOAP, UDDI)
- Interoperability JAVA / .Net
- Java Composite Application Platform Suite License per employee/year

SERVICES

- Services Oriented Architecture Workshop
- Product Deployment Services
- Services Oriented Architecture
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation



Business Continuity Value Proposition



Ensure Data Protection and Availability for Large Bank Datacenter

CUSTOMER REFERENCE

Objective : Data protection for several consolidated banking institutions in compliance with regulatory constraints on data protection.

Solution : Sun StorageTek tape libraries and virtualization on 2 remote sites with systematic backup set replication.

Customer Benefit : Guaranteed data protection according to safety rules at minimal cost (OpEx and CapEx).



KEY PERFORMANCE INDICATORS

- Recovery Point Objective (RPO)
- Recovery Time Objective (RTO)
- Full Recovery Time Objective (FRTO)
- Data availability ratio
- Hardware availability ratio
- Data restore duration



SERVICES

- Business Continuity Workshop
- Product Deployment Services
- Data Management Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- Service Level Agreement based Solution
- Infrastructure virtualization: xVM, Virtual Tape Library
- Solaris ZFS
- Archiving: ST 5xxx, C2MS, Symantec, Arcsys
- Clustering: Solaris Cluster, Solaris Cluster Geographic Edition
- Synchronous / Asynchronous Replication
 - > ST9000(TrueCopy, ShadowImage, Copy-on-Write)
 - > ST6000 (Remote Volume Mirroring, Snapshot)
- Data Copy Services
 - > SAM-FS, SAM-QFS, Backup Applications

- Sun Java System Identity Manag
- Solaris ons



Computers Rooms Optimization Value Proposition



CUSTOMER REFERENCE

An environment protected and available 24/7

Objective : Redefine architecture with Disaster Recovery Plan. Applications, office automation, authentication, supervision and exploitation are considered

Solution : LAN : network equipment, cabling, labeling, Vlan definition, Firewall, virtualization.
(300 network links deployed)
WAN : network equipment, cabling, contract with a service provider.
SAN : equipment, cabling, plan (zoning, carve up...), 120 Ethernet fibers.

Customer Benefit : Datacenter security and 24/2



KEY PERFORMANCE INDICATORS

- Servers consolidation ratio
- Storage consolidation ratio
- SwaP ratio
- Number of hot points in room
- Electric consumption ratio
- Square feet reduction ratio
- Return On Investment



TECHNOLOGY / METHODOLOGY

- Investment Protection Program (IPP)
- TCO/ROI Tool : Sun Value Platform
- Infrastructure Consolidation (Racks, Blades, Sun Modular Datacenter S20, Storage SAN, NAS, VTL)
- Third Products (cooling, inverters...)
- Metrology tool kit (TeamQuest...)
- Cabling and Labeling
- System Management tool kit (Sun Management Center...)
- Eco-Responsability (Electric Consumption, RoHS, WEEE Recycling...)

SERVICES

- Computer Rooms Optimization Workshop
- Product Deployment Services
- Audit Computer Rooms
- Sun Moves
- Sun Support Services
- Sun Global Financial Services Operation



Eco Datacenter Value Proposition

Over 60% reduction in overall power load

Objective: Reduce costs and energy consumption of the datacenters. Refresh older server and storage for improved availability, performance and capacity.

Solution: 152 datacenters (202,000 square feet) to 14 new high density, next-generation datacenters (76,000 square feet) at Sun's Santa Clara, California campus.

Customer Benefit: More than \$9 million USD cost avoidance in new datacenter investment. 88% reduction in server and storage space footprint. Over 60% reduction in overall power load. Over 450% improvement in server compute performance. 244% increase in storage capacity.

CUSTOMER REFERENCE



KEY PERFORMANCE INDICATORS

- Servers consolidation ratio
- Storage consolidation ratio
- SwaP ratio
- Electric consumption ratio
- Square feet reduction ratio
- Return On Investment



SERVICES

- Eco Datacenter Workshop
- Datacenter Eco Assessment
- Product Deployment Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

TECHNOLOGY / METHODOLOGY

- TCO/ROI Tool : Sun Value Platform
- 64 bits processors multi-cores multi-threads (CMT)
- Sun StorageTek 6540 Disk Array
- Sun StorageTek SL8500 Tape Library
- Infrastructure consolidation (Racks, Blades, Sun Modular Datacenter S20...)
- Virtualization (Solaris Containers, Sun xVM Infrastructure, Dynamic System Reconfiguration, SAN, VTL, Sun Ray 2)
- Electrical consumption and space reduction
- Restriction on the use of certain Hazardous Substances (RoHS)
- Waste Electrical and Electronic Equipment (WEEE) recycling
- The own Sun's experience on his Datacenter of Santa Clara (USA)



x86

Value Proposition



Decrease Latency and Increase Bandwidth for processing

Objective : A bank wishes the best infrastructure at the best price for analysis, storage, data integration, complex calculations and performance to treat the exponential flow of the market operations orders.

Solution : IT infrastructure with 10 servers x4600M2 with Sybase, 12 servers x4100M2 with Oracle RAC, 12 servers x4150 for Reuters flows and 6 servers x2200M2 "Run Rate"

Customer Benefit : Decrease Latency and Increase Bandwidth for processing



CUSTOMER REFERENCE

KEY PERFORMANCE INDICATORS

- SwaP Ratio
- Use Ratio
- Calorific Dissipation Ratio
- Space Footprint Reduction Ratio
- Return On Investment
- Availability Ratio
- Total Cost of Ownership
- Time to Provision



TECHNOLOGY / METHODOLOGY

- Multi-OS 64 bits : Solaris, Windows, Linux, VMWare
- Servers and Workstations
- AMD and Intel Processors
- Sun xVM Infrastructure Xen server and Ops Center for management
- Provisioning N1 System Manager
- Sun Blade 6000: Blade server Intel, AMD Quad-core and Blade storage
- Sun Blade 8000: Blade server AMD, Intel Quad-core
- Sun Fire x4600 M2 octo-processors AMD Quad-core
- Sun Fire x4440 unequal performance and density on x86 market
- Sun Fire x4500 Hybrid Server with 48TB SATA disks storage
- Obstruction, consumption, calorific dissipation and space reduction
- Administration (MOS, ILOM or Tier Products)

SERVICES

- Virtualization Workshop
- Product Deployment Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation



CMT

Value Proposition



300 servers consolidated in 25 CMT servers

Objective : Datacenter cost reduction and servers refresh by integrating new technologies.

Solution : 25 Sun Fire T1000 with multithreads CMT processors technology

Customer Benefit : Replace 300 old servers by 25 Sun Fire T1000. Datacenter high capacity and performance with CMT processor. Costs reduction.

CUSTOMER REFERENCE



KEY PERFORMANCE INDICATORS

- SwaP Ratio
- Use Ratio
- Calorific Dissipation Ratio
- Space Footprint Reduction Ratio
- Return On Investment
- Total Cost of Ownership
- Time to Repair



TECHNOLOGY / METHODOLOGY

- Product of the year 2007
- Solaris Multi-OS 64 bits for consolidation
- CMT Processors UltraSparc T2 with 2 sockets - 8 cores - 64 threads
- Virtualization with Ldom and Solaris Containers
- Sun xVM Infrastructure LDom and Ops Center for management
- Provisioning N1 System Manager
- Sun Server T5xxx (Niagara 2)
- Sun Blade 6000: Blades CMT and storage
- Best for Java Application Server Platform
- Many World Records (SPECjAppServer2004 Dual-node, Single-socket SPECjbb2005 Result, Single Socket Lotus Domino iNotes, SPECweb2005, Database Tier SPECjAppServer2004 Dual Node...)

SERVICES

- Virtualization Workshop
- Product Deployment Services
- Sun Learning Services
- Sun Managed Services
- Sun Support Services
- Sun Global Financial Services Operation

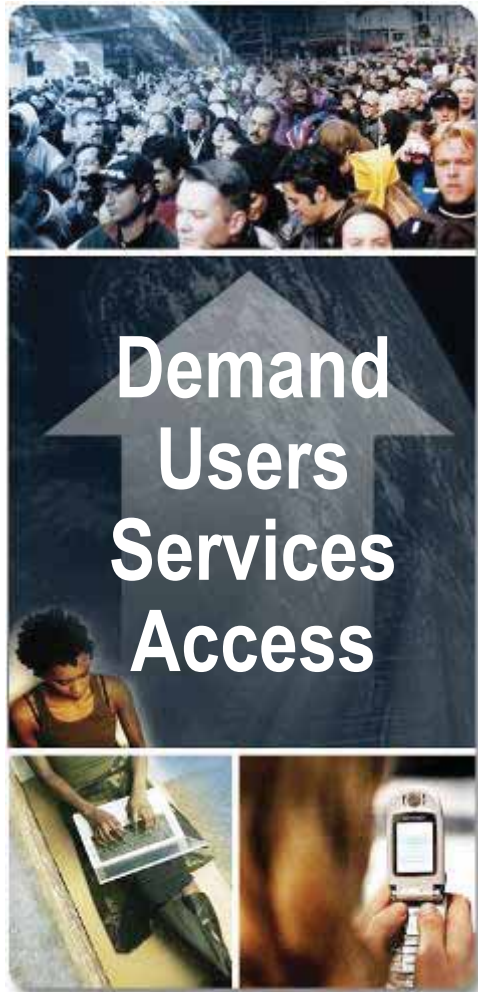
- Consumable reduction
- Calorific dissipation



Sun Modular Datacenter



Growing Demand, Shrinking Resources



“By 2008, 50 percent of current data centers will have insufficient power and cooling capacity to meet the demands of high-density equipment”*

— Gartner

“Energy bills traditionally have accounted for less than 10% of an overall IT budget but soon could account for more than half”

— Gartner



*Source: <http://www.gartner.com/it/page.jsp?id=499090>

Solving Customer Problems

Rapid delivery of new data center capacity

Lower energy consumption and reduced CO₂ emissions



Incremental capacity added when needed

Flexibility to locate and use IT resources where needed

Higher density capability for the latest IT equipment

Sun Modular Datacenter

The World's First Virtualized Datacenter

Virtualize the datacenter into a modular, self-contained unit to radically improve time to deployment; increase flexibility and mobility; and enable higher-density and more efficient computing



Sun Modular Datacenter *Momentum*

- Project Blackbox concept announced October 2006
 - > Project Blackbox tour circles globe - twice!
- Sun MD **S20** released January 2008
 - > Double digit shipments world-wide in the first 12 months
 - Sun MD success breeds imitators
- Sun MD **D20** released August 2008

Uptime
Institute™

2008 Winner
Green IT Award

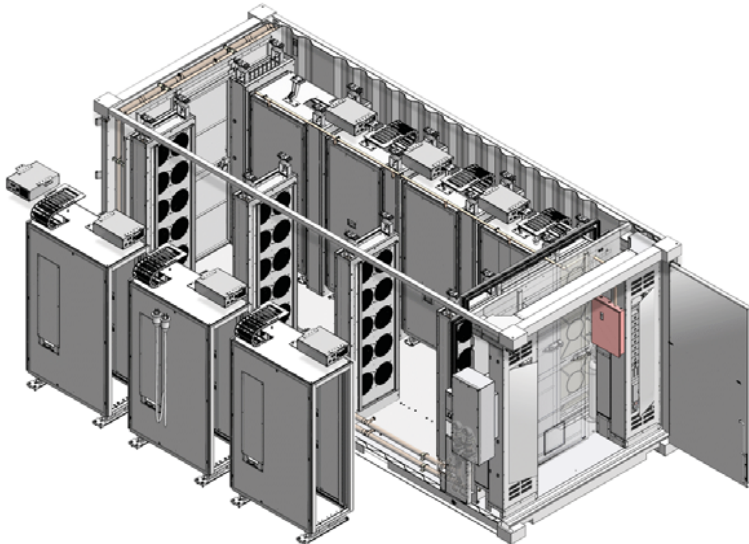


Sun has successfully created and leads the market for modular

Introducing Sun Modular Datacenter D20

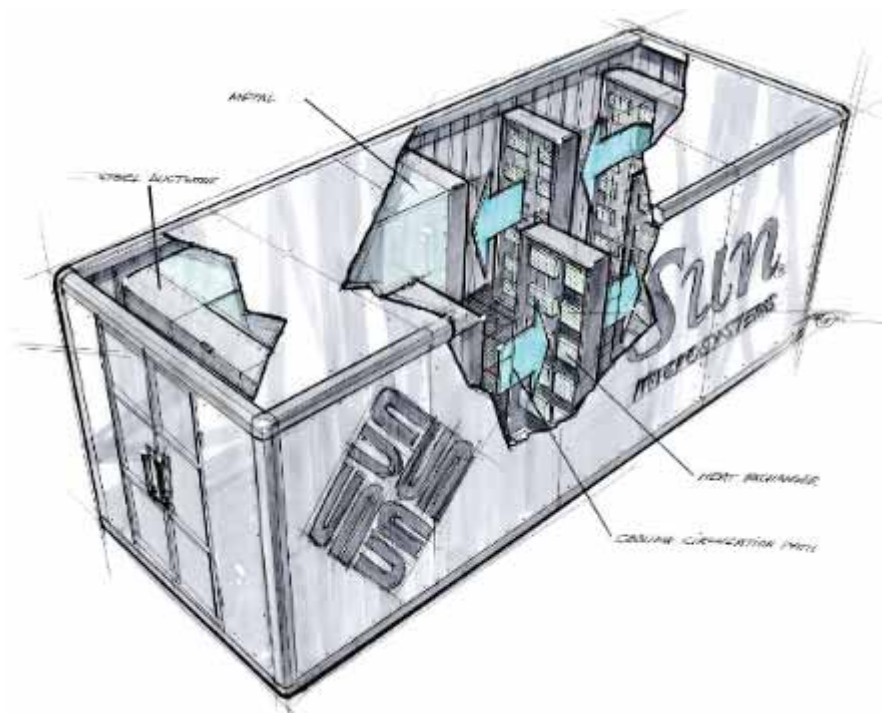
The Latest Edition to the Sun MD Family

- Sun MD D20 – a new configuration with deeper racks for expanded compatibility with Sun and 3rd party business critical equipment
 - Sun SPARC Enterprise™ M4000 and M5000 servers, Sun StorageTek™ SL500 Modular Library, Sun StorageTek SL24 Tape Autoloader, Sun StorageTek SL48 Tape Library, and the Sun StorageTek 9985V System.



What is the Sun Modular Datacenter?

A high-density, energy efficient, datacenter configured in an enhanced 20' x 8' shipping container for ease and speed of deployment

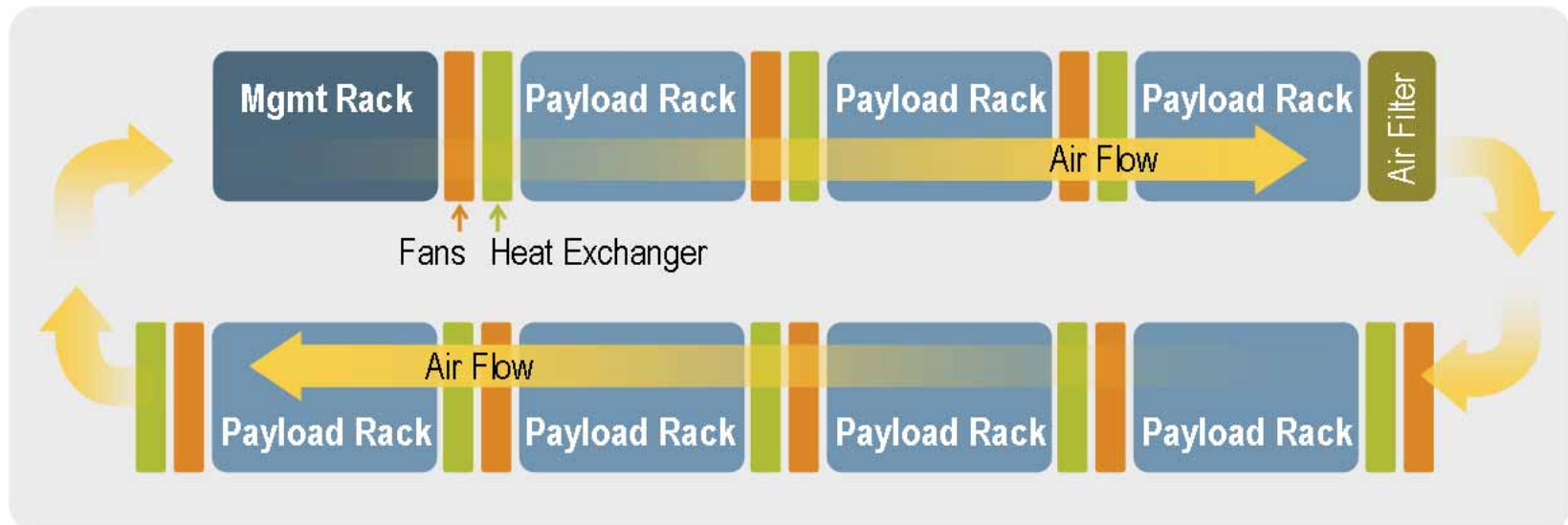


- Integrated, high-efficiency power and cooling up to 25kW per rack!
- Holds up to 1120 CPUs or 3 *petabytes* of disk
- Customizable payload
 - > Sun and 3rd party gear compatible
- Global deployment capabilities with Sun Services

Extreme Efficiency

Innovation in action

- Unique, closed-loop water cooling system
 - > Self-contained, closed-loop air circulation system results in **far less area** to cool – *no hot aisles!*
 - > Water can carry as much as 3,500 times more heat than air in the same volume



Enhanced Mobility & Durability

Datacenter Where *You* Need IT



ISO 20' enhanced steel shipping container, rated >2X max expected weight load

Suitable for indoor and outdoor deployment
-29°C to 54°C (-20°F to 130°F) operating range

Rack helical shock mounts rated to 9-G (vertical plane)



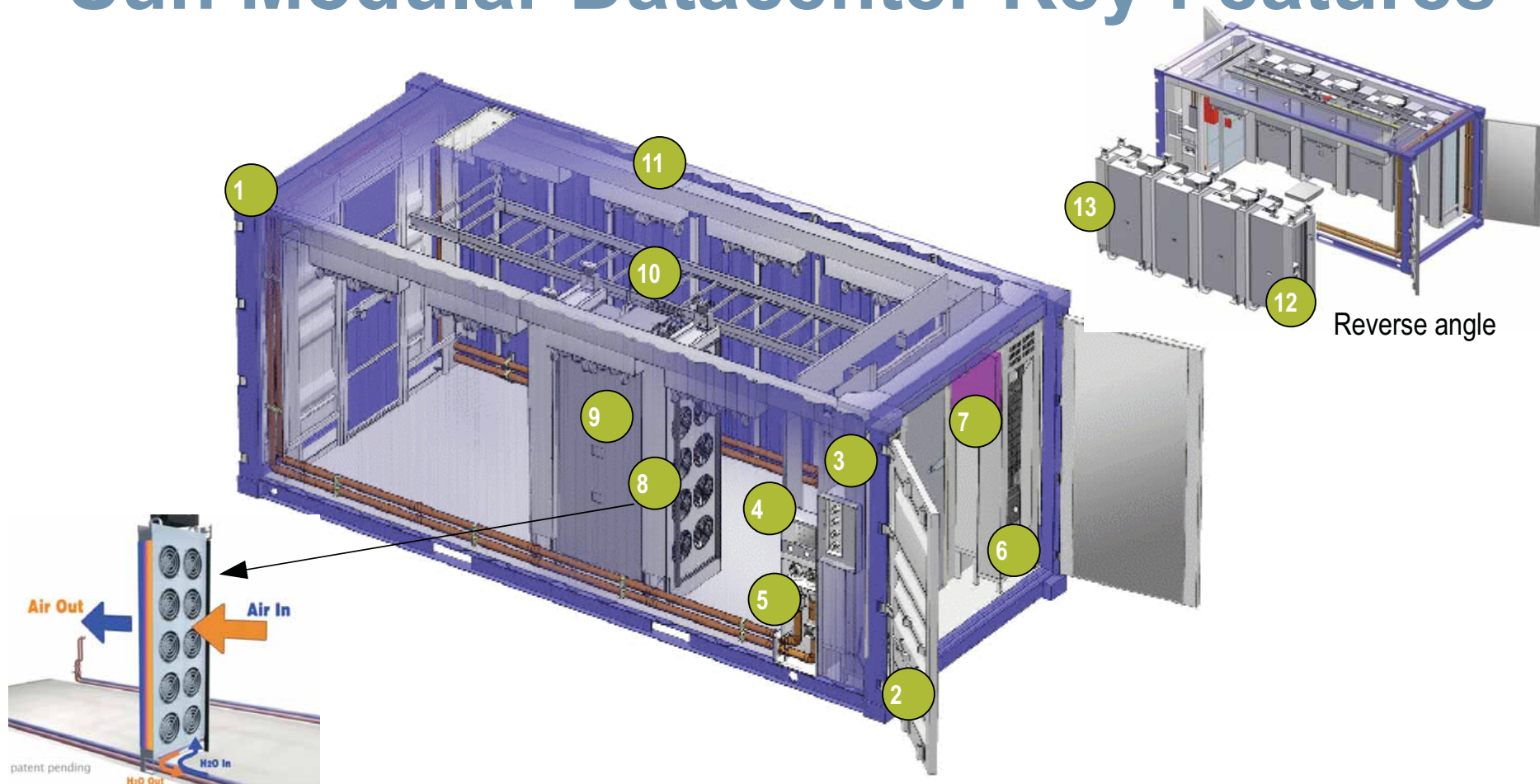
HEX with flexible coolant supply lines



Tested for durability

- > NEMA 3R standard for weather resistance
- > IP 44 certified for particulates & moisture
- > Earthquake tested to 6.7 Richter scale

Sun Modular Datacenter Key Features



- 1** ISO-standard, externally welded, insulated steel alloy 20' x 8' x 8.5' shipping container.
- 2** Full-perimeter rubber door seals and an integrated gutter system.
- 3** External power connection—one per side. Can be configured with low or high voltage power sources.

- 4** Network connection panel – one per side. Can be configured with RJ-45 and/or LC (fiber) connectors, or with an 18-cable pass-through.
- 5** Chilled water input and output with 2" NPT female fittings (one cold inlet and one warm return). One pair of fittings per side.

- 6** Power distribution panels for two independent internal power grids.
- 7** Smoke- and fire-suppression control box with integrated gas-based fire suppression system.
- 8** Water-cooled heat exchanger with ten fans and a dedicated fan controller. One heat exchanger for each equipment rack.

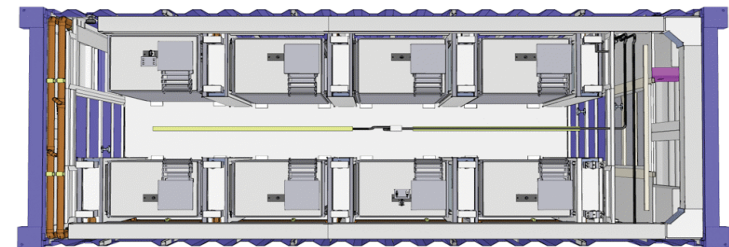
- 9** Eight industry-standard 40RU 19" equipment racks with integrated shock-absorption coils.
- 10** Overhead cable tray and eight articulating cable management arms.
- 11** Wire raceways and rack power receptacles providing dual grid power feeds to each rack.
- 12** Sun MD Network and Control management rack.
- 13** In-line air filter bank.

Sun MD Product Line Overview

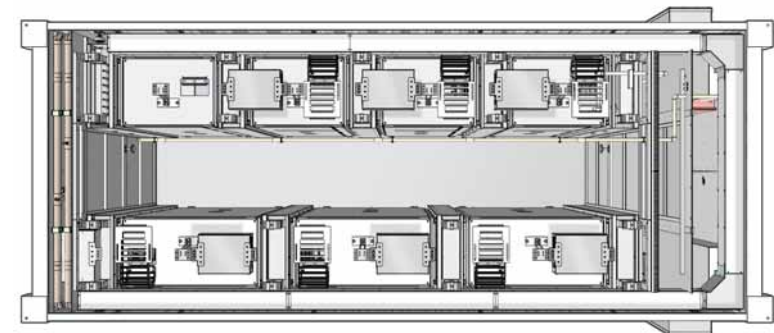
- Sun Modular Datacenter **S20**
 - > 8 x 40 RU racks
 - All 8 racks with 781mm usable depth
 - > 305 available RU

- Sun Modular Datacenter **D20**
 - > 7 x 40 RU racks
 - 3 racks with 1150mm usable depth
 - 4 racks with 781mm usable depth
 - > 265 available RU

Top View Sun MD S20



Top View Sun MD D20



Standards Based Platform



- Virtually any application can be deployed in a Sun MD
- Any compatible Sun and 3rd party equipment allowed
 - > Must conform to rack specs to be “compatible”
 - All racks 48.26 cm (19”) wide
 - S20 depth: 78.1 cm (30.75”) all racks
 - D20 depth: 78.1 cm (30.75”) racks 1 - 4
115.0 cm (45.25”) racks 3 - 7
 - Front to back cooling

– For a complete list of Sun supported products, visit: <http://www.sun.com/products/sunmd/s>

Components of a Sun MD Installation

- One or more Sun MDs
- Appropriate installation site
- Electric power source (possibly redundant)
 - > Commercial power, standby generator, etc.
- Chilled water source (possibly redundant)
 - > Facility supplied or stand-alone chiller
- Network connections
- Physical security (when needed)
- Service Vestibule (when needed)
- Payload



Sun Modular Datacenter Advantages



- Rapid deployment
- Game changing economics
- Global mobility
- High-density computing
- Eco value

Rapid Deployment

Deployable in 1/10th the time[®]
vs. typical datacenter

- Modular, self-contained, pre-integrated solution enables faster deployments
 - > Standardized form-factor in an enhanced 20' cargo container
 - > Leverages existing global infrastructure via road, ship, or air
 - > Containerized power, and chilled water solution also available



When You Can't Afford to Wait

Sun Modular Datacenter

"We increased our compute capacity over 30% in a matter of months with Sun MD. Including design, approvals, site prep, install and start-up — it was much faster than the two to five years required to build a satellite center or a major building."



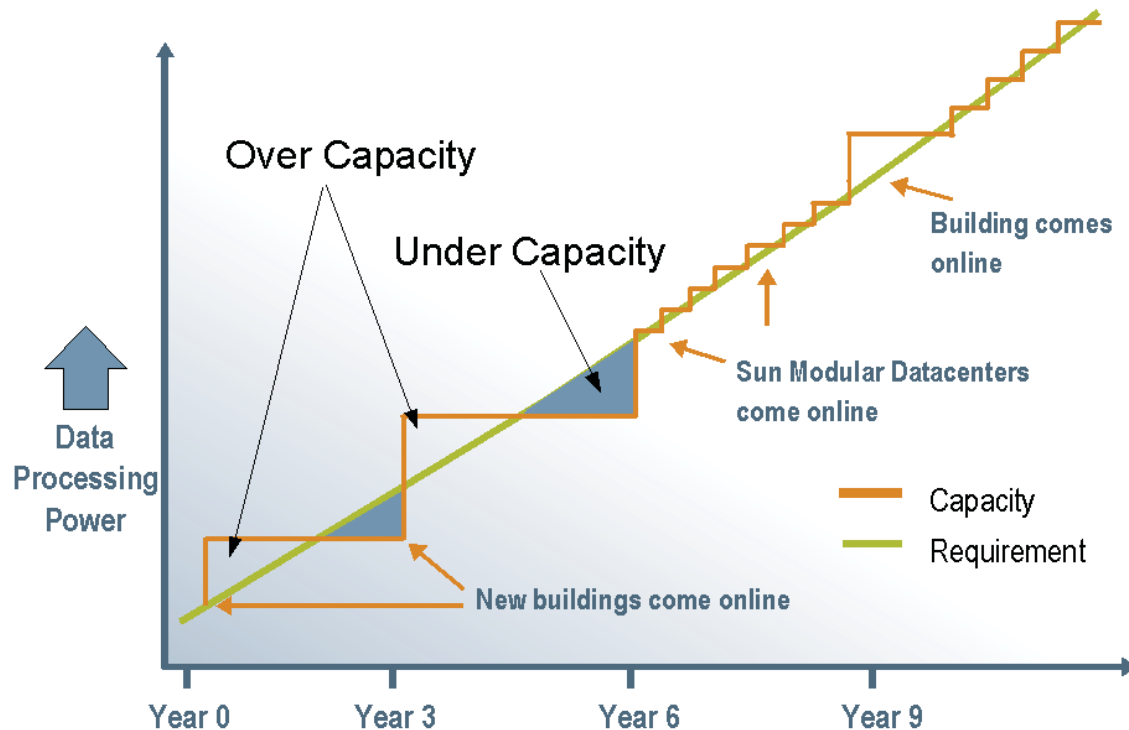
Chuck Boeheim
Assistant Director of Computing
Stanford Linear Accelerator Center

SLAC

<http://www.sun.com/SLACvideo>
<http://today.slac.stanford.edu/feature/2007/blackbox1.asp>
<http://today.slac.stanford.edu/feature/2007/blackbox2.asp>
<http://www.slac.stanford.edu/~boeheim/blackboxsite.html>

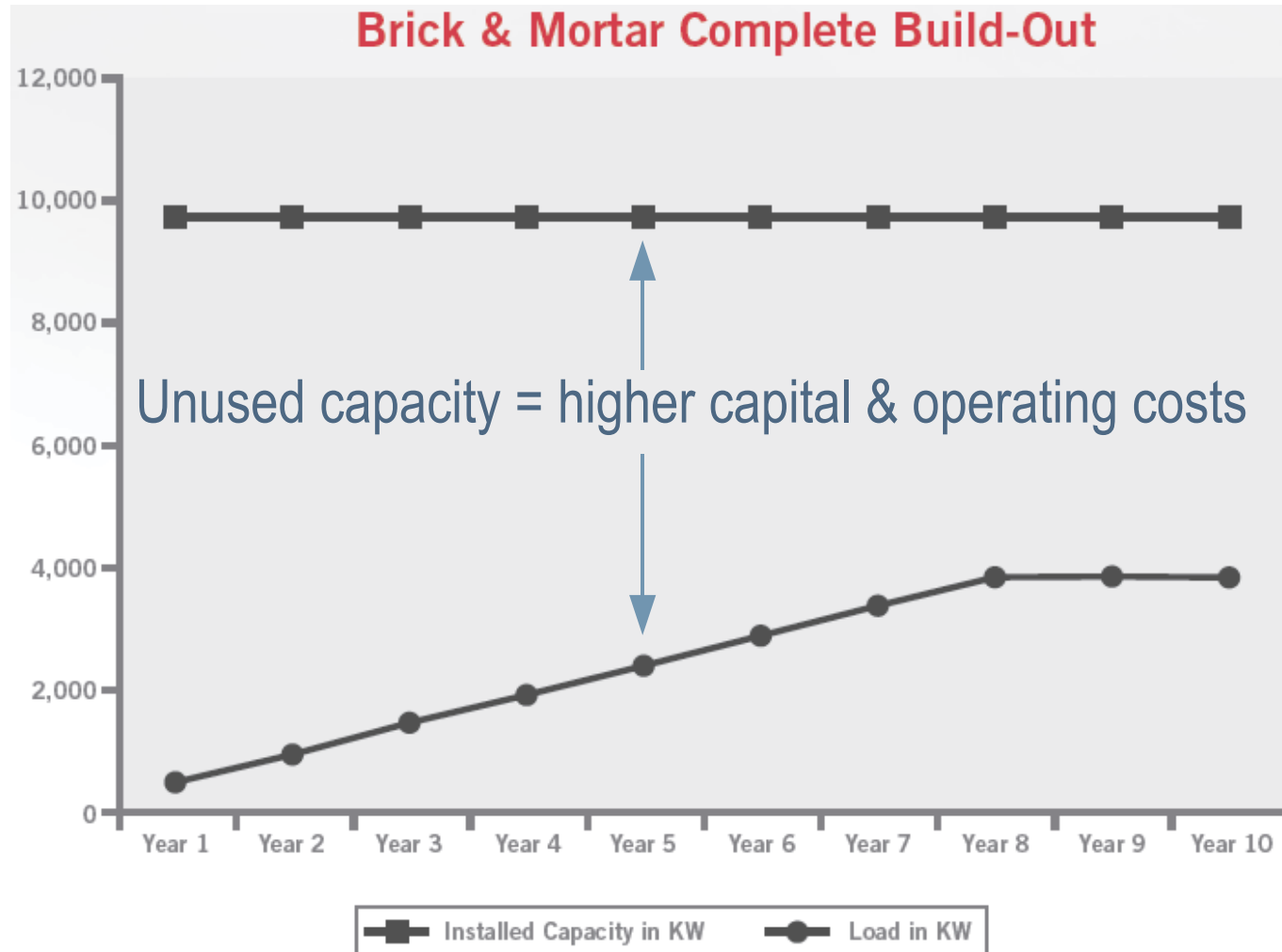
Game Changing Economics

A better way to buy datacenter capacity



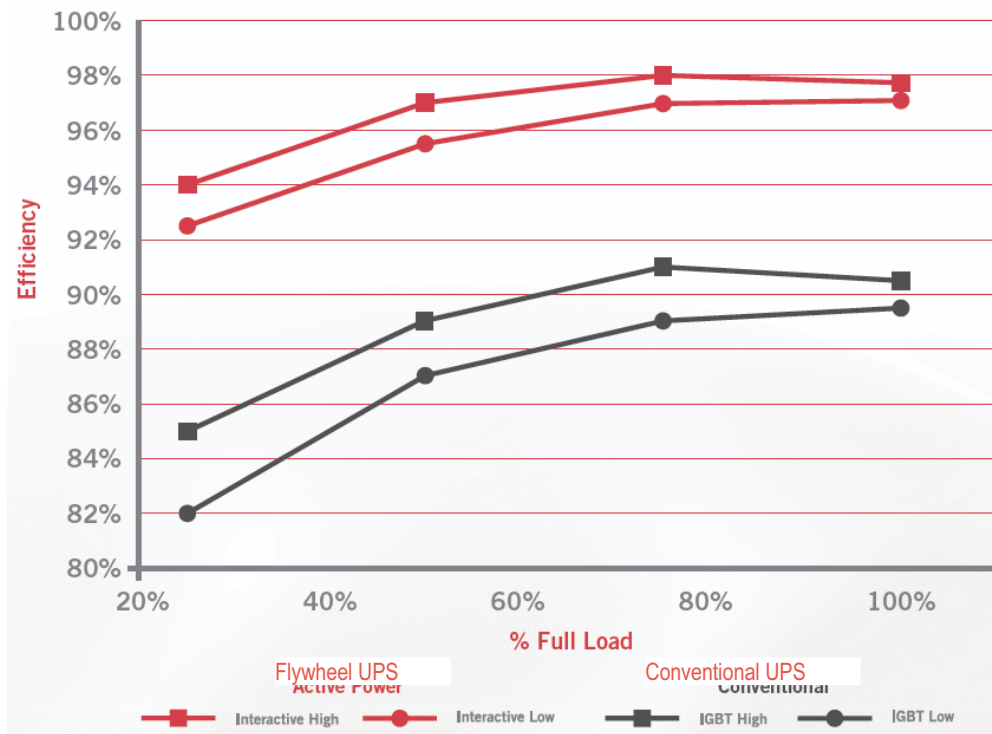
- Expansion at a fraction of the cost of a new datacenter
 - > Increase capacity when you need it, in the amount you need, instead of all at once
 - > Can delay new building investments
 - > Free up capital for other uses

Cost of Over-Capacity



Efficiency Costs

- Unused infrastructure costs money to initially deploy
- Unused infrastructure anticipated for expansion consumes electricity
- Unused infrastructure is run at a much lower efficiency



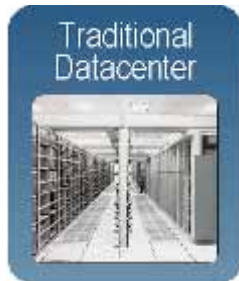
- 100kW load @ 92% efficiency consumes 70,080kWh / year
- 30kW load @ 80% efficiency consumes 52,560kWh / year

Capacity When You Need It

> \$2 million savings!

Incremental investment saves money

- Reduce the cost of capacity by deploying over time when you need it
 - > Invest rather than expense



Starting Capital	\$5,000,000
Expense	-\$5,000,000
Interest	\$0
End Capital	\$0

Example: 5 year growth forecast of 1MW capacity at 200kW per year

- Traditional datacenter will cost \$5M now
- Deploy Sun MDs over 5 years and save over \$2 million!



Starting Capital	\$5,000,000	\$4,501,700	\$3,958,553	\$3,366,523	\$2,721,210
Expense	-\$870,000	-\$870,000	-\$870,000	-\$870,000	-\$870,000
Interest	\$371,700	\$326,853	\$277,970	\$224,687	\$166,609
End Capital	\$4,501,700	\$3,958,553	\$3,366,523	\$2,721,210	\$2,017,819
	Year 1	Year 2	Year 3	Year 4	Year 5



Faster ROI with Sun MD

- Accelerate “time to revenue” and repurpose
 - > Customers are deploying the Sun MD as an “instant” data center to accelerate business start-up
 - e.g. Installing the Sun MD while the manufacturing plant is being built to enable immediate start up of production and operations management systems
 - Following business start-up, cus
 - Redeploy to another startup
 - Disaster recovery & back-up
 - Test and development platform
 - The possibilities are endless!



What Customers Are Saying

Sun Modular Datacenter

“The Sun Modular Datacenter S20 is a great solution for us -- cost effective and easy-to deploy. Using the Sun Modular Datacenter, we'll be able to offer IT services in a semi-finished factory and start seeing ROI almost immediately.”

Marnix Maes
Director of IT
Hansen Transmissions



Escalating Datacenter Costs

- New data center costs over **\$15 per W** cost for *new* 20,000 ft², 2MW capacity, 100W ft²
 - > \$30 million to \$60 million
 - > Incremental data center expansion running over \$10 per W of capacity

	20,000 ft ² Computer Room	6,000 – 20,000 ft ² 2MW Power/Cooling MEP	Total
Tier I	\$8.3 million	\$23 million	\$31.3 million
Tier II	\$8.3 million	\$25 million	\$33.3 million
Tier III	\$8.3 million	\$46 million	\$54.3 million
Tier IV	\$8.3 million	\$50 million	\$58.3 million

Source: Uptime Institute. Includes \$2.3 million for computer room build-out with racks, PDUs, labor, etc.

Sun MD Cost Advantage

- ~ \$6.75 per W of capacity with Sun MD
 - > Lower cost than both new and incremental capacity options with dramatically lower footprint
 - > Leverage containerized 'Total Infrastructure Solution'
 - Includes chiller, UPS, standby power generation, and installation

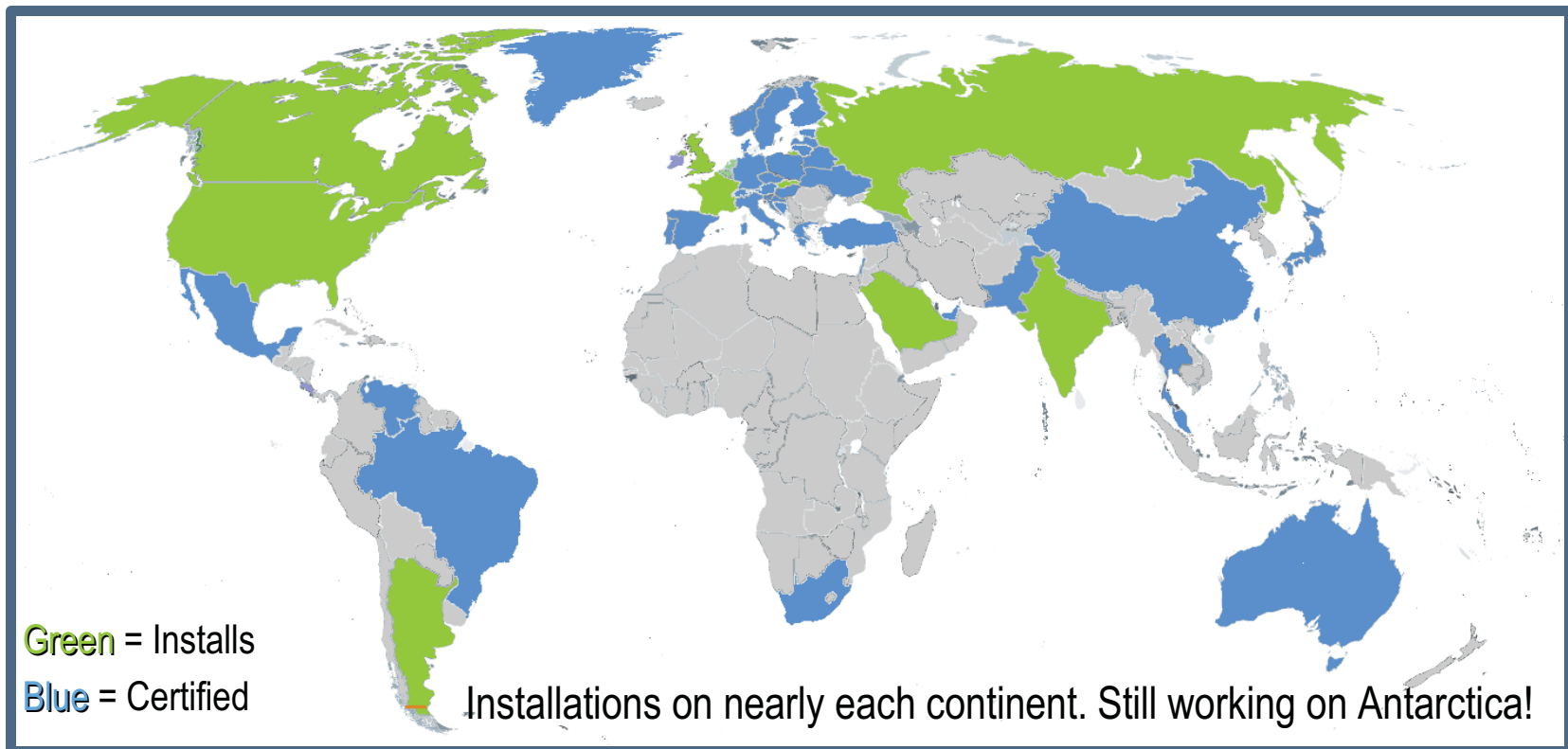
High Density Solution	5,000 ft² 11 Sun Mds	10,000 ft² 2MW Power/Cooling MEP	Total
Sun MD 200kW	\$4 million	\$9.5 million	\$13.5 million

Medium Density Solution	9,500 ft² 21 Sun Mds	10,000 ft² 2MW Power/Cooling MEP	Total
Sun MD 100kW	\$7.5 million	\$9.5 million	\$17 million

Sun Modular Datacenter

The Only *Global* Datacenter

- Certified for regulatory compliance, safety, and fire suppression in over 50 countries

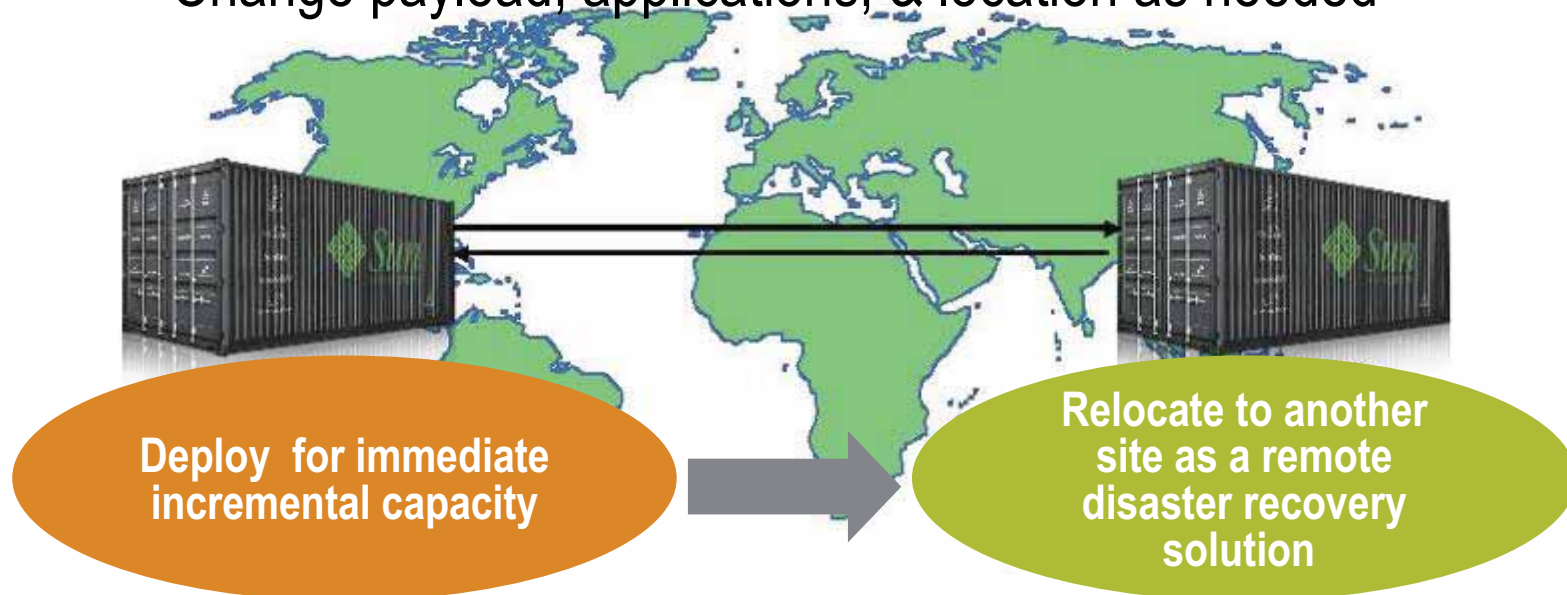


* Some countries do not require certification and will leverage existing certifications.

Mobility Enables Flexibility

Freedom of choice

- Transport where ever needed – world wide
 - > Perfect for emerging markets
- Customers can redeploy and move Sun MD to meet changing business needs and opportunities
 - Change payload, applications, & location as needed



- Regulations (meets or exceeds the following requirements)

> Safety

The Leader in Certification & Compliance

- UL 60950-1 (ETL classification marking)
 - UL 50, Ed. 11 (NEMA 3R equivalent levels)
 - Russia GOST R
 - CB Scheme with national differences
 - CAN/CSA C22.2 No. 60950-1
 - EN 60950-1
 - CENELEC EN 60529 (IP-44 levels)
- > RFI/EMC
- EN 55022 (Sun MD and payload)
 - VCCI (Sun MD and payload)
 - AS/NZS 3548 (Sun MD and payload)
 - Korea MIC (Sun MD and payload)
 - Russia GOST R (Sun MD and payload)
 - CFR47, Part 15, FCC Class A (payload)
 - ICES-003 Class A (payload)
 - CNS-13438 (payload)

- > Immunity
- EN 55024
 - Korea MIC
 - Russia GOST R

- Certifications

- > Safety
- CE Mark, GOST, ETL Classified, CB Report with National Differences
- > EMC
- CE Mark, ITS Technical Construction File, C-Tick, GOST-R, MIC
- > RoHS
- RoHS-compliant (with lead-in solder exemption) for control and management equipment

- Smoke and Fire Suppression certification in over 50 countries world-wide!

High Density Computing

Do more in less space

- 4X higher density in 1/8th the space vs. a typical datacenter
 - > 25kW vs. 6kW per rack
- An ideal platform for blade servers and virtualization solutions

Higher density enables the Sun MD to deliver comparable capacity in a footprint ~8X smaller than a typical datacenter

- 160 sq ft. vs. 1330 sq ft.



Supercomputer in a Box[®]

High Capacity

- 1120 CPUs
 - > 4480 compute cores
 - > Sun Blade 6000 systems with four socket blades
- 17920 compute threads!
 - > Sun Fire T5120 servers
- 3 *petabytes* of disk
 - > Sun Fire X4500 servers (aka Thumper)

High Performance

- >50 Teraflops
 - > 280 Sun Fire X6540 blades with Intel Xeon 7000 series (Tigerton) processors
- >450,000 web operations per second!
 - > 102 Sun Fire T5120 servers
- >100 GB/sec bandwidth
 - > 63 Sun Fire X4500

- Eco Value**
- > 40% lower cooling costs
 - > Using existing chilled water source
 - > Savings independent of IT load!
 - 1,459 metric tons less CO₂
 - PUE as low as 1.3
 - Locate near renewable and/or lower cost sources of energy
 - Smaller footprint has less impact on local environment

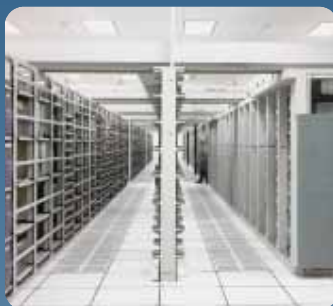


Efficiency by Design

>40% lower cooling costs using existing facilities – save more with higher efficiency chiller



Traditional Datacenter



Sun Modular Datacenter



IT Load

1W

1W

Cooling Load

.65W*

.37W**

> 40% savings!

* Cooling load estimate from Lawrence Berkeley Labs & PG&E Datacenter Efficiency Report June 2005.

**Sun Modular Datacenter cooling load data derived per Sun benchmark testing



Datacenter Challenges

Sun Modular Datacenter

Scenarios

Solutions

Key Markets

key markets and solutions



Augmentation

- Datacenter expansion & consolidation
- Re-purpose & re-deploy
- Disaster recovery



Interim Use

- Datacenter migration
- Temporary datacenters
- Short term projects



Specialized

- Disaster relief
- Gov't / Military
- Oil and gas
- Extensive customization



Large Scale Network Services

- Fast growth
- ASPs
- SPs

Stanford Linear Accelerator Center (SLAC)

Fast capacity for HPC deployment

Key Requirements

- State-of-the-art particle physics research laboratory
- Rapidly increase computing resources to the grid computing infrastructure to support critical particle physics research.
- Overcome datacenter power and cooling system constraints to address a growing number of requests for computing support
- Deliver computing resources in an alternative form factor in less time than the 2 – 5 years estimated to build a new datacenter at the site

Sun Solution

- Sun Modular Datacenter S20
- Sun Fire X2200 M2 servers
- Customer Ready Systems Integration



California, United States

Client Results

- **4X faster deployment** of first system and payload vs. other alternatives (six months from start to finish vs. at least two years for a new building)
- **30% increase in processing power** conveniently located outdoors next to a power substation
- **Purchased second Sun MD and more compute capacity** – Deployed in half the time as the first with Sun MD infrastructure already in place

Hansen Transmissions - India

Mobility Enables Rapid Deployment & Redeployment

Key Requirements

- Leading provider globally of wind-turbine gearboxes
- Rapidly expanding production in new factories in India and China
- Want to install payload before shipment and installation in India
- Need IT services while factory is under construction
- Solution must allow 3rd party equipment

Sun Solution

- Sun Modular Datacenter S20
- Sun Fire T5120 servers
- Sun Fire T5220 servers
- Sun StorageTek 6140 array
- Sun StorageTek 2540 arrays
- Assort. 3rd party gear enabled



Belgium to India

Client Results

- **Rapid deployment** of entire solution from Sun to India – the entire project from concept to delivery executed in less than *four* months
- **Immediate IT capability** - Production Planning and Processing - to manage business development and factory construction in India and **immediate ROI**

Mobile TeleSystems (MTS) - Russia

Rapid Deployments Over Large Geographic Region

Key Requirements

- Largest mobile telephone operator in Russia and CIS.
- Need to support rapid growth and deploy new IT capability outside main office to serve a large geographic region
- Ability to operate outdoors in diverse climate ranges, especially 'Russian winters

Sun Solution

- Sun Modular Datacenter S20
- StorageTek 6540 arrays
- Sun Fire X4600 servers
- Assorted 3rd party gear enabled



Moscow, Russia

Client Results

- **Over 10x reduction** in time to deploy new datacenter capacity
- **Air transport** - From the Sun MD factory in the U.S. to Moscow in less than a week
- **Only 22 days** from Sun MD installation to operation of telco billing solution
- Currently running **outdoors** in Moscow **in all seasons**

Sun MD Configuration Example

High Performance Computing Solution



Quantity	252	1	7	8
RU per	1	15	1	1
Total RU	252	15	7	282
2.5 TFlop performance on Linpack (HPL) with GbE interconnect				

* Additional examples in the appendix



Datacenter Challenges

Sun Modular Datacenter

Scenarios

Solutions

Sun MD Service Solutions



- Sun MD Support Services
 - > Prepare, install, and manage the Sun MD and payload
- Sun Datacenter Efficiency Professional Services
 - > Complete turn-key site prep and deployment solutions with pre-configured or custom end-to-end infrastructure solutions for Sun MD
- Customer Ready Systems (CRS) program
 - > Design, integrate, and test the entire solution before it arrives!

The Sun MD Suite of Services

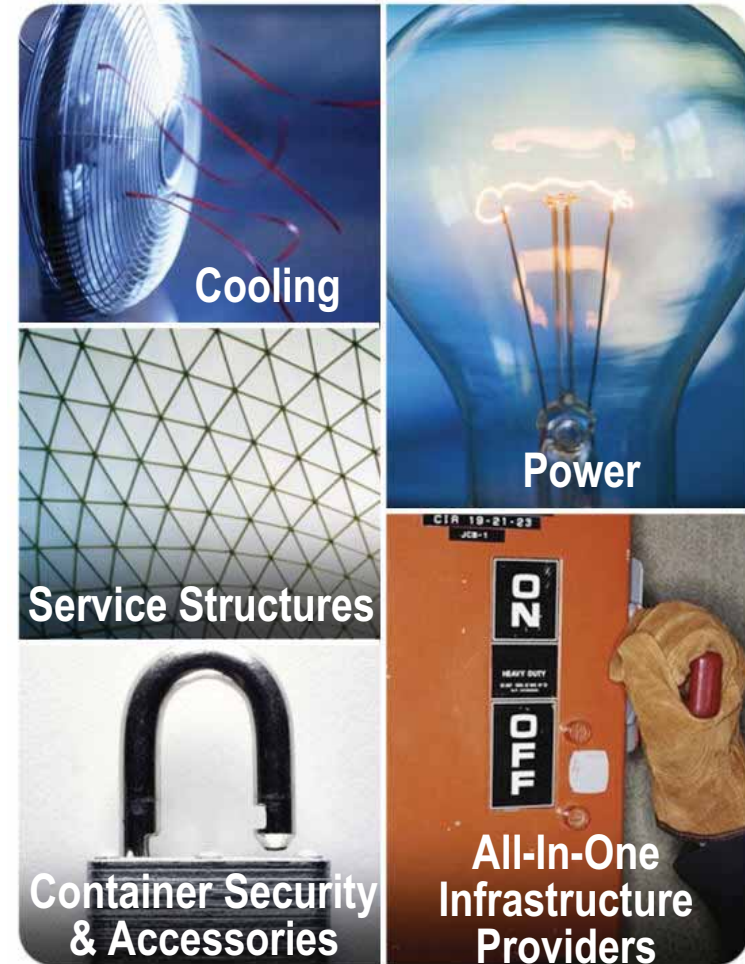
Simplicity from procurement through production



Project Management, Datacenter Services, Training

Infrastructure Solutions

- Customers can deploy infrastructure themselves or leverage Sun solutions:
 - > Community of 3rd party providers to support Sun MD infrastructure needs
 - Chiller vendors; power equipment vendors; service shelters; security, etc.
 - > Individual sub-system providers or “Total Infrastructure Solution”

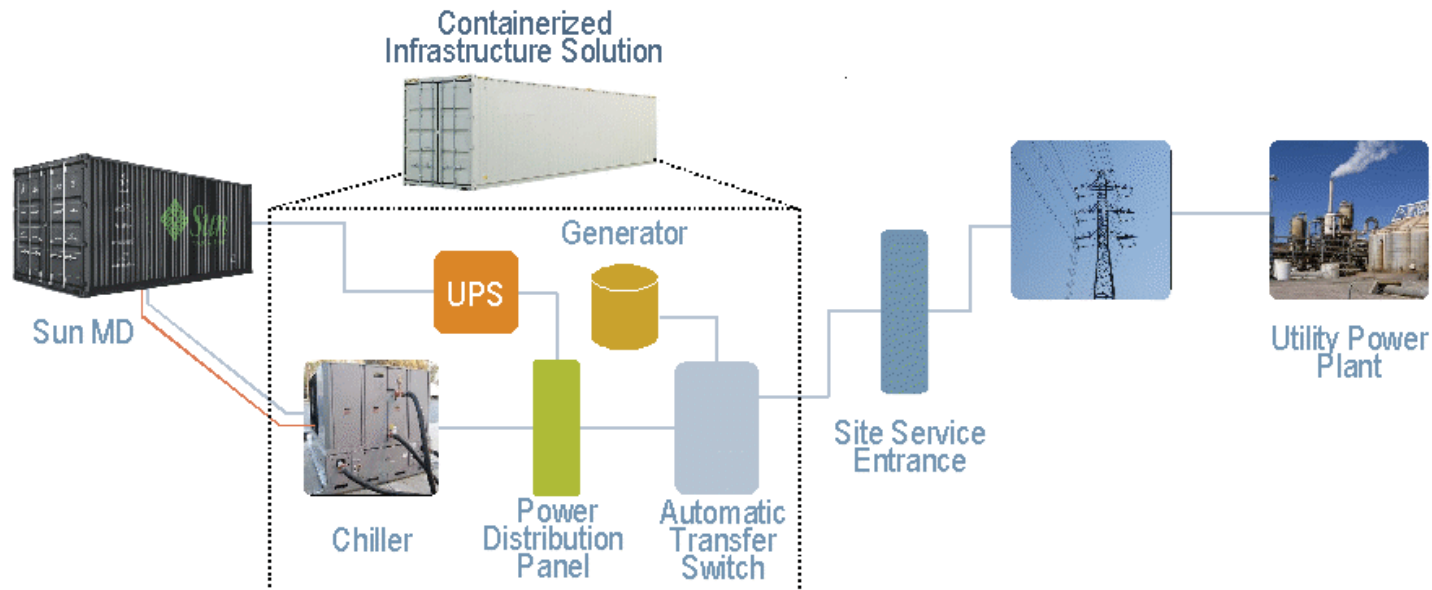


Reference list at: <http://www.sun.com/products/sunmd/s20/providers.jsp>

Sun MD Total Infrastructure Solution

Containerized Chiller, USP, Generator, ATS Solution

- Standard 20' or 40' containerized solutions
 - > Engineering & tested as a system
 - Lowers capital costs & lower on-site labor costs
 - Increases reliability & speeds time deployment
 - > N+1 and custom configs also available



Payload Integration:

Sun Customer Ready Systems (CRS) Program



- Architect, integrate, and test the entire Sun MD and payload at the factory
 - > Reduce risk and speed time to deployment
 - > Includes both Sun and supported 3rd party gear and software
- Turn it on, and it's ready to go!

Financing Solutions

Sun Microsystems Global Financial Services

- Lease the datacenter and equipment with a single, combined payment for both the Sun MD & payload!
 - > Attractive rates and flexible terms from 12 to 60 months
 - > Standard end-of-lease options available, allowing flexibility to renew, return or buyout the entire solution
 - > Structures available that may classify Sun MD as an operating expense
- Available in select countries world-wide
 - > Subject to credit approval and acceptable financing terms

> Please contact your Sun Microsystems Global Financial Services account executive for further details or visit <http://www.sun.com/sales/leasing/index.jsp>

The Possibilities Are Endless

Radically improve time to deployment with the Sun Modular Datacenter

- Take your own interactive tour of the Sun MD
 - > www.sun.com/sunmd - click on the interactive tour icon
- Please contact AskSunMD@sun.com for more information, or ask your local Sales representative
- We look forward to discussing your Sun MD possibilities!

