

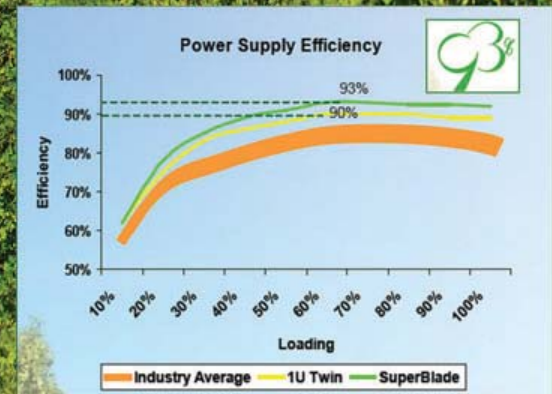
SUPERMICR[®] Green IT



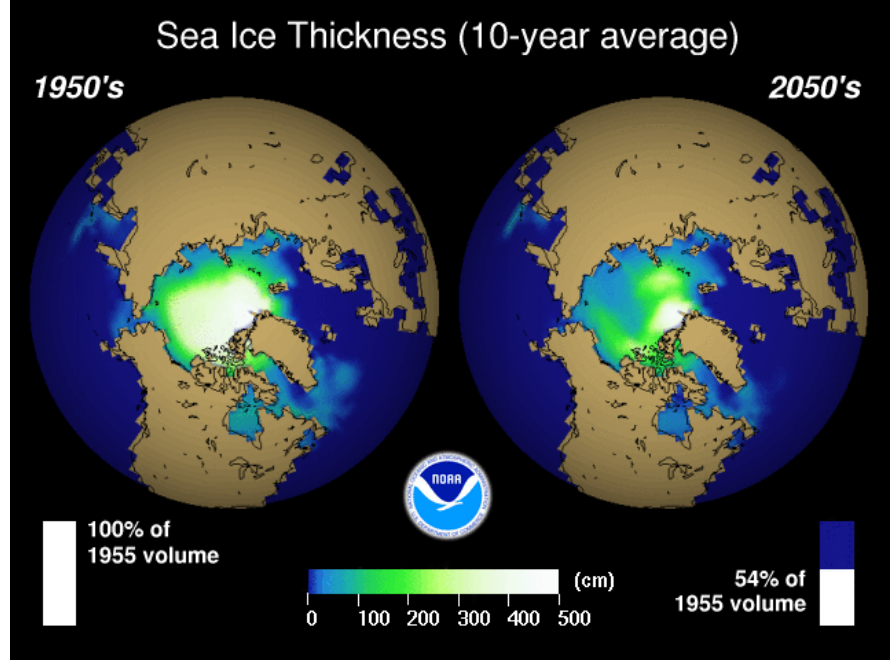
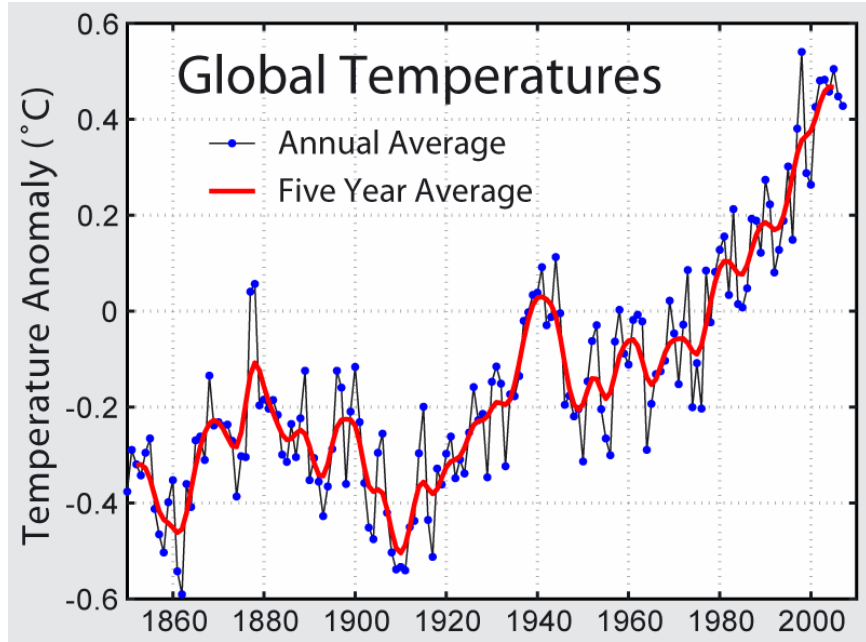
DatacenterBlade™
290GFLOPS/kW, 93% High Efficiency Power



1UTwin™
2 Nodes in 1U, 90% High Efficiency



Global Warming



The global average air temperature near the Earth's surface rose $0.74 \pm 0.18 \text{ }^\circ\text{C}$ ($1.33 \pm 0.32 \text{ }^\circ\text{F}$) during the hundred year ending in 2005. The Intergovernmental Panel on Climate Change (IPCC) concludes *"most of the observed increase in globally averaged temperatures since the mid-twentieth century is very likely due to the observed increase in greenhouse gas concentrations, such as CO₂"*.

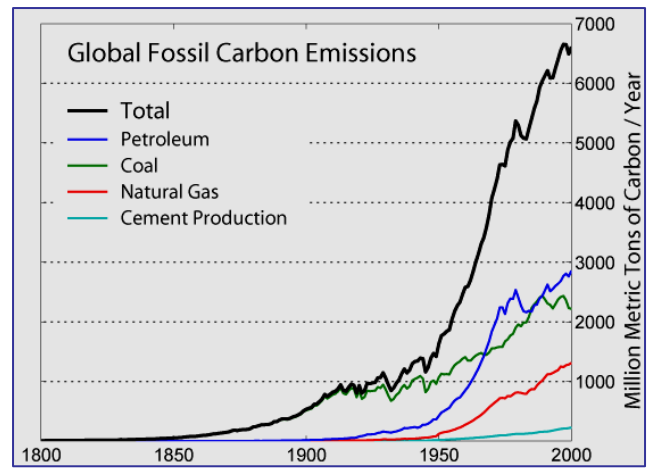
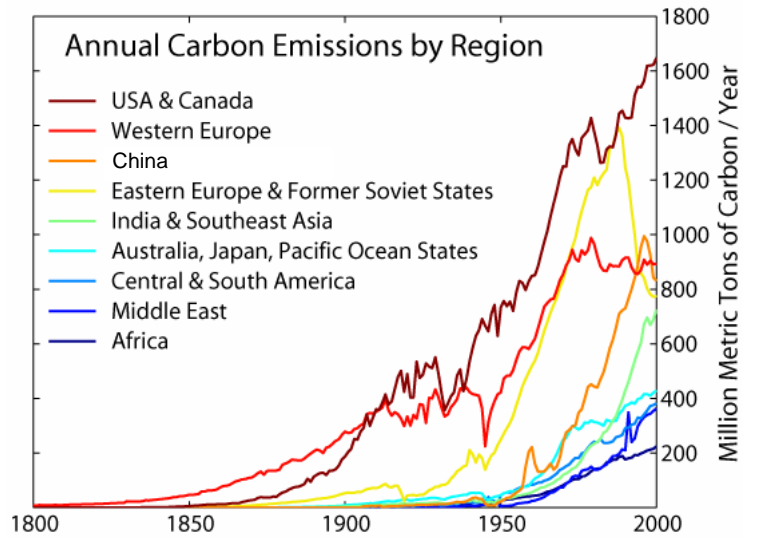
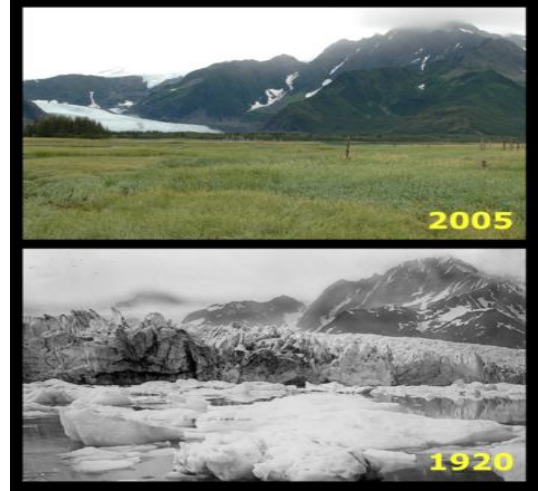


Carbon Dioxide Emissions & Global Warming

McCarty Glacier - Alaska



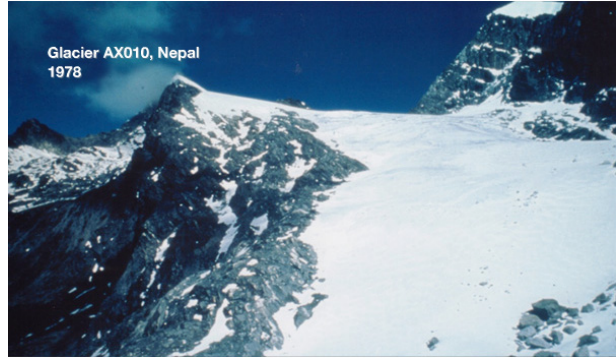
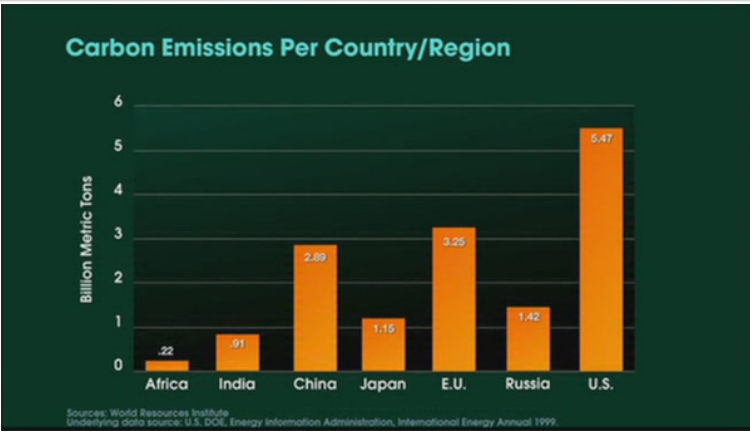
Pedersen Glacier



Global Warming is related to Carbon Dioxide Emissions



Global Warming Effects - Asia



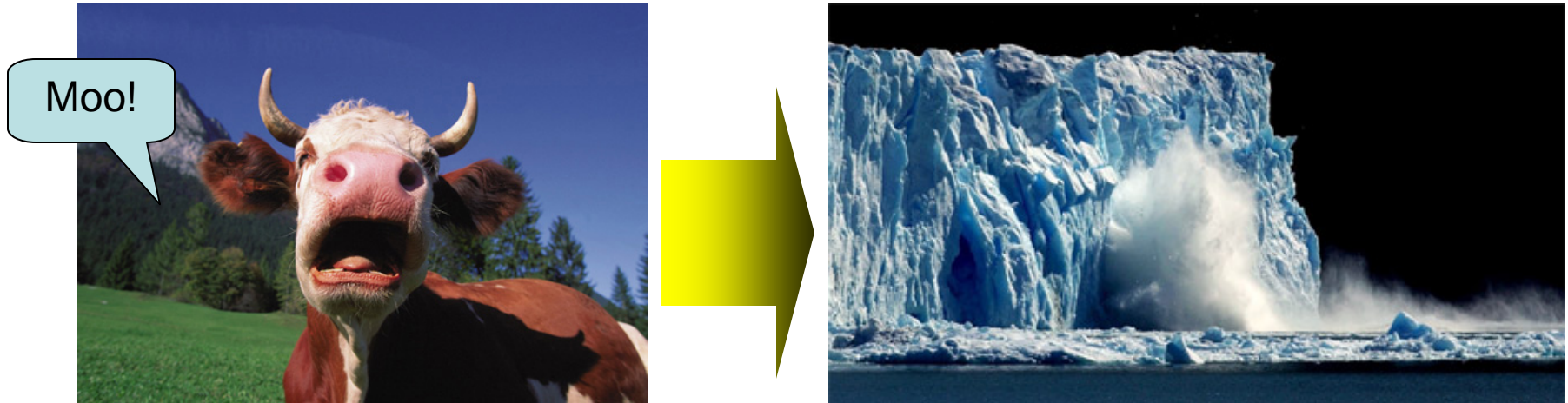
Scientists' renders of Taiwan and Shanghai when Arctic glaciers melt

Environmentalists warn that the melting of glaciers in the **Himalayas** could spell disaster for millions of people living in the region.

Swelling glacial lakes would increase the risk of catastrophic flooding. In the long term, the glaciers could disappear altogether, causing several rivers to shrink and threatening the survival of those who depend on them.

Global Warming Contributed by... Cows?

- **MYTH:** The world's 1.5 billion cattle are responsible for 18 per cent of the greenhouse gases that cause global warming, more than cars, planes and all other forms of transport put together.

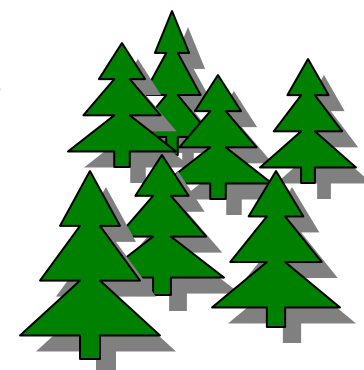
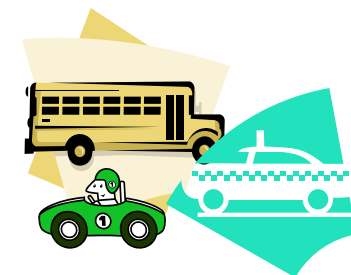
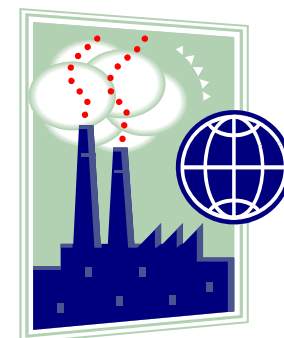


- **FACT:** Burning fuel to produce fertilizer to grow feed, to produce meat and to transport it - and clearing vegetation for grazing - produces 9% of all emissions of CO₂.
- Cow's wind and manure emit more than 20lbs. of methane and 100 other polluting gases per year
- Ranching is the major driver of deforestation worldwide, and overgrazing is turning a fifth of all pastures and ranges into desert.
- The average American diet – all the various energy inputs and livestock emissions involved in its production pump an **extra 1.5 tons of CO₂ yearly.**
- **CONCLUSION:** Eat less steak!

Source: Food and Agriculture Organization of the United Nations (FAO) – Dec. 2006

Environmental Impact of Energy Savings

- A *watt-hour* is the electrical energy expended by a one-watt load drawing power for one hour. A *kilowatt hour* (kWh) is a thousand watt-hours.
- Carbon dioxide (**CO₂**) emissions generated by fossil-fueled electricity are measured as **Lbs CO₂ /kWh**. One kilowatt hour of electricity causes carbon dioxide emissions of **1.43 pounds**.
- A car on the road contributes **11,560 Lbs (~ 5.2 Tons)** of CO₂ per year.
- Trees absorb carbon dioxide. The EPA estimates that reducing CO₂ emissions by **7,333 pounds** need an equivalent to the contribution provided by **an acre of trees**.
- In the modern world, each person emit on average **5 Tons** of CO₂ per year; a computer server could cause similar amount due to consuming fossil-fueled electricity, which requires planting **24 trees each year** to offset the emission.



Source: Energy Information Agency & Environment Protection Agency

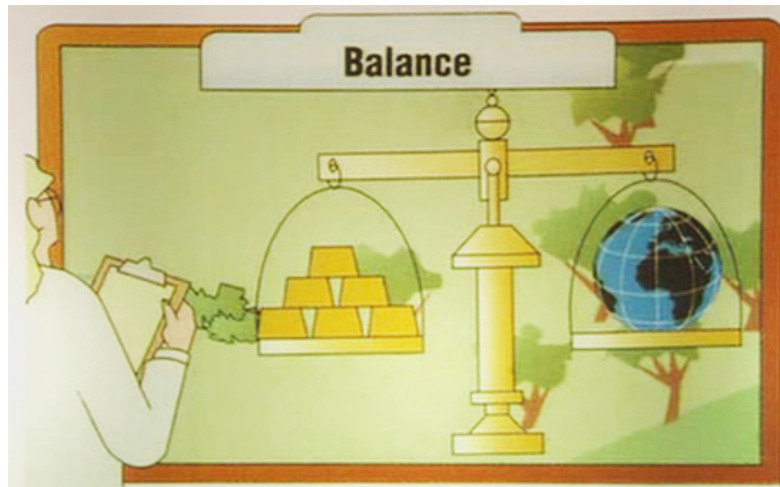


Social Responsibility

Human Activity Causes Climate Change

Concerns:

- The global average surface **temperature has already risen by approximately 0.7°C** over the past century
- It's projected to increase another $2\text{-}5^{\circ}\text{C}$ by 2100 and cause up to **4 meters in rising sea levels**
- Global temperatures are now rising at three times the rate of increases in the early 1900s.
- 90% certainty that human activity is causing climate change.

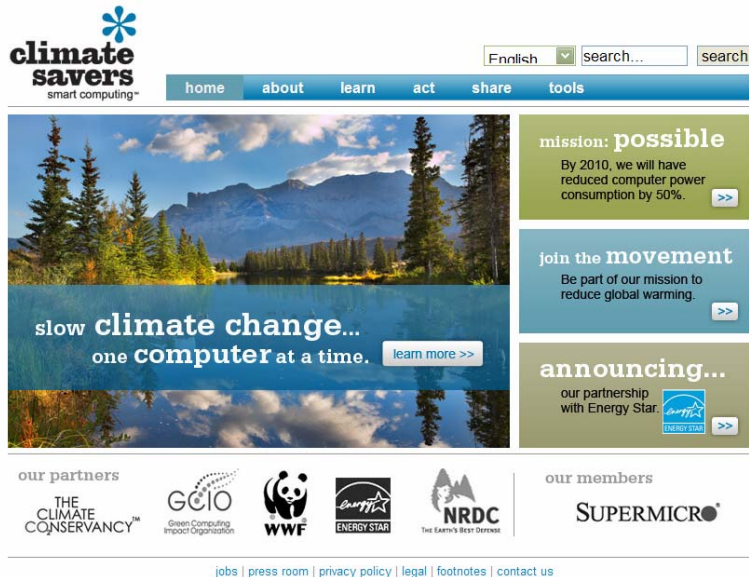


Thinning ice puts polar bears in danger

Social Responsibility

Contributing Efforts

- Producing earth-friendly, high-performance server building block solutions that save energy and money.
- Partaking in efforts using technology to save the GREEN, and planting trees (Global Warming demo park initiative)
- Encouraging other tech companies to be proactive by reducing CO₂ and other greenhouse gas emissions to sustainable levels – through CSCI participation
- AS APAC Chair, Supermicro strongly committed to the Climate Saver Computing Initiative (CSCI) mission of **reducing computer power consumption by 50% by 2010** and urges both consumers and suppliers to join the green mission and reduce global warming.



<http://www.climatesaverscomputing.org/>



Using Technology to Reduce IT Power Requirements

- Worldwide servers have consumed about **123 billion** kilowatt-hours (kWh) in 2006, and worldwide datacenters electricity cost is about **\$7.2 billion** in electricity costs.*
 - ❖ **123 Billion kWh = 176 Billion Lbs CO₂**
= ~ 80 Million Tons of CO₂
- *Existing technologies and strategies could reduce typical server energy use by **25%** (~20 Million Tons of CO₂), such as increasing power efficiency or reduce power consumption. Even greater energy savings are possible with advanced technologies.*



We Keep IT Green™



SuperBlade™ Solutions

OfficeBlade™
(50dB or lower)
Optimized for office environments
and personal supercomputing

DatacenterBlade™
14 Blades Ideal For
Datacenter and HPC

93% Power Efficiency
For improved TCO and
earth-friendly computing

Source: 2007 IDG, based on a study from LLNL and Stanford Univ.



IT TCO & Going Green Starts with Design

TCO (Total Cost of Ownership) is not only the initial cost of the acquisition of the product (s), but also all the expenses related to it (energy, management, maintenance, space, etc.) during the 3-4 years of its lifecycle.

The bottom line is:

1. Save money through intelligent design for your server systems with energy and environmental preservation in mind.
2. Create cost-effective and green solutions that save power without sacrificing performance

Key Points to Improve TCO and ROI

- ✓ Energy Saving Computing Components
- ✓ High Efficiency Power Systems
- ✓ Optimized Computing Density
- ✓ Management / Maintenance



Reducing Power Consumption

● Energy Saving Computing Components:

- ❖ Low Voltage CPU
- ❖ High Efficiency MB Designs - Utilizing High Efficiency VRM and components
- ❖ Energy-saving HDDs, memory, components and subsystems
- ❖ Optimized air channel and cooling architectures
- ❖ Power-saving BIOS, drivers and OS

● High Efficiency Power Systems:

- ❖ Since the summer of '06, Supermicro started to improve most of our power supplies to high efficiency, with ratings over 85%
- ❖ Today, our SuperBlade™ power supplies have been tested to achieve up to 93% power efficiency
- ❖ We are continuing to research new technology to achieve even higher efficiency power

● Advantages

- ❖ Above points represent big savings in the monthly bill over the product lifecycle (up to hundreds of dollars per server and thousands for each blade enclosure)
- ❖ Increasing computing density per square feet in datacenter
- ❖ Big reductions on CO₂ emissions... **Keep IT Green™!!!**



93% Power Efficiency
For improved TCO and earth-friendly computing



The Best Green Datacenter Blade

- **7U rack-optimized enclosure**

- ❖ 10 blades or 14 blades per enclosure
- ❖ 60 or 84 blades per 42U rack



14-blade

- **Wide range of processor support – at all speeds**

- ❖ 2-way / 4-Way quad-core processor blades

- **Hot-swap and redundant modules**

- ❖ Server blades, Switches, CMM, and power supplies



10-blade

- **Chassis management with IPMI 2.0 functionality**

- ❖ KVM-over-IP, IPMI-over-LAN, remote Virtual Media, remote power control, etc.

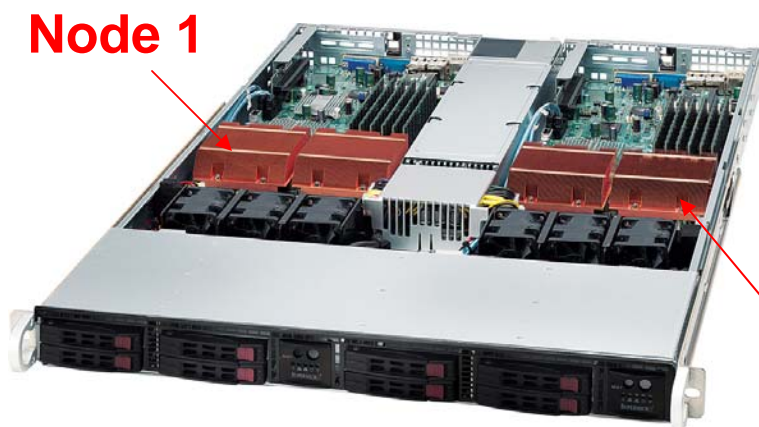
- **Networking**

- ❖ GbE switch, 10GbE switch, 4x DDR InfiniBand switch

- **290 GFLOPS/kW with 93% high efficiency power units**

The Best Green Rackmount Server - 1U Twin™

- **2 computing nodes in 1U, up to 16 processing cores**
- Save IT real estate costs with double the computing density
- Utilize shared chassis and power architecture to reduce management cost and increase efficiency
- Standard 1U formfactor fits in standard rack with front-to-back airflow
- Cutting-edge connectivity options: 10GbE, InfiniBand or Dual Gigabit Ethernet,
- Efficient storage options: 4x 2.5" or 2x 3.5" hot-swap SATA/SAS HD
- Optimize for HPC cluster, datacenter, data farm and other high-availability applications
- 240 GFLOPS/kW with 90% high efficiency power unit

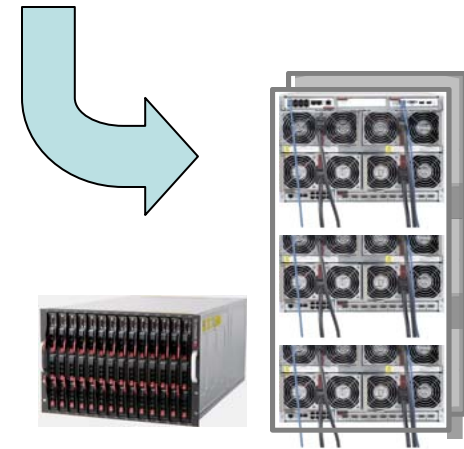
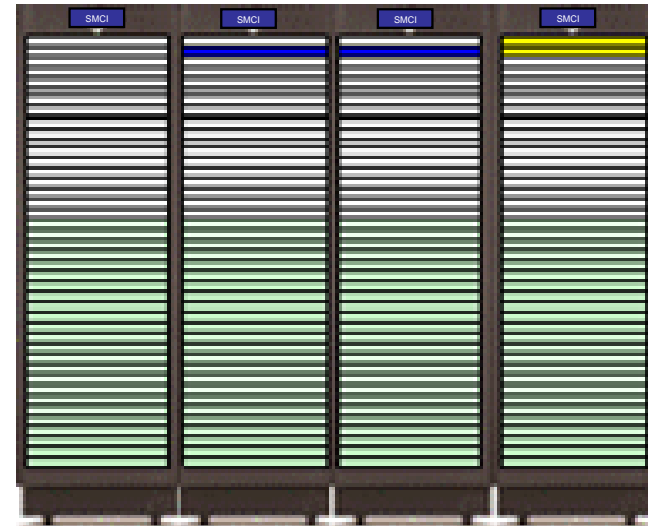


1U Twin™ system
contains two
independent symmetric
motherboards!!!



Maximizing Computing Density and Rack Space

- With the extreme density in your configurations, you get one immediate advantage: less rack space needed, reducing real estate costs!
- 42U rack rental fee per month: \$1000 (including floor space, facility and power; not including network bandwidth)
- How does Supermicro contribute to customer's rack savings?
 - ❖ SuperBlade™: Saves over 50% in space footprint and reduces over 90% in cables in comparison to 1U servers
 - ❖ 1U Twin™: 2 nodes in 1U, double computing node density
 - ❖ MP Configurations in 1U & 2U: Not available from most competitions, typical configuration in 4U or 5U
 - ❖ Tower solutions: 4U rack-mountable adding versatility
 - ❖ Mini 1U products: Small form-factor allowing shallow rack depth



Improving Management & Maintenance

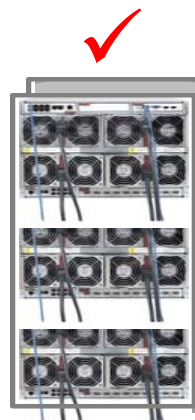
- **SuperBlade™: significantly minimize IT issues with advanced system consolidation and compact design:**

- ❖ Ease of Installation: one blade system vs. 10/14 different rack chassis
- ❖ Advanced management (CMM) for easy IT maintenance and support
- ❖ Less cabling saves cost and improves airflow
- ❖ Share common chassis architecture
- ❖ Hot-swappable components

- **Advantages:**

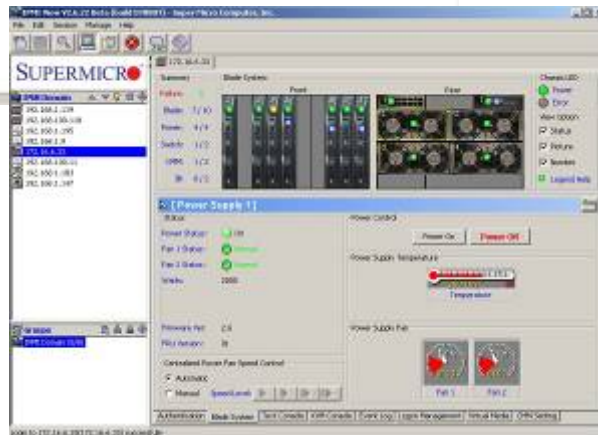
- ❖ Less IT resources needed
- ❖ Maintenance cost reduction
- ❖ Indirect cost savings

- Parts replacement
- Upgradeability



Monitoring & Controlling Remotely

Web Browser



IPMIView

CMM module



- Remote manage anytime, anywhere
 - ❖ server blades, power supplies, cooling fans, and networking switches
 - ❖ Energy optimization
- IPMI 2.0 functionalities & more
 - ❖ KVM-over-IP, IPMI-over-LAN
 - ❖ Virtual media-over-IP (virtual USB floppy/CD, and drive redirection)



Award Winning SuperBlade™

SUPERMICRO® **CRNtech**

SuperBlade™ Beats IBM and Dell Solutions!!

Scorecard
1 Super Micro OfficeBlade

Features
 ★★★★★
Ease of Deployment
 ★★★★★
Management
 ★★★★★
Ease Of Use
 ★★★★★
Price/Performance
 ★★★★★
Profit Potential
 ★★★★★

Our group of reviewers wound up agreeing that Super Micro provided the best value based on a combination of all the factors we deemed relevant.

- Total system power consumption with 4 blades is only 406 watts – nicely energy-efficient
- The browser-based management console is very intuitive
- Configuring the unit via the console also is simple.

"... we liked the Super Micro the BEST!"

By CRN Test Center Staff
 12:00 AM EDT Mon. May. 19, 2008
 From the May 19, 2008 issue of CRN
<http://www.crn.com/hardware/207800358>



"...we liked Super Micro the Best!"



The Best Green Data Center Solution Award
BladeSystems Insight '08



93% Blade Power Supply Efficiency Savings Over Industry Standard 1U Server

Power Efficiency Gain %		Watts Saved	kW-Hr Saved per Year	1-Year Savings per Node	Years	Nodes	3-Year Savings
80%	0%	0	0	\$ 0	3	10	\$ -
85%	5%	23.5	204.5	\$ 32.5			\$ 975
88%	8%	37.6	327.2	\$ 52			\$ 1560
90%	10%	47	409	\$ 65			\$ 1950
93%	13%	61.1	531.7	\$ 84.5			\$ 2535

* Assumption: ~450W per node, \$0.16 per kW-hr

10 blades save > \$2.5K in 3 years
 When combined with High efficiency MB, Memory, Air flow, and low Voltage CPU; the savings can be more than \$6000



93% Power Efficiency
 For improved TCO and earth-friendly computing



With Cost Savings from Management, Maintenance and Space Reduction; the SMC Blade TCO Savings are Substantial

kW per hour = \$0.16

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10 blades save > \$2.5K in 3 years
 When with High efficiency MB, Memory, Air flow, and low Voltage CPU the saving can be even up to >\$6000

Total Saving = \$6000 + \$3000 + \$2000 = \$11,000
 Almost 50% of the initial Hardware investment saved



Technology Summary

- ❖ Energy savings – 93% power supply efficiency, energy-efficient motherboard and optimized thermal & cooling system design
- ❖ Best performance/watt (290 GFlops/kW)*
- ❖ High computing density saves real estate cost
- ❖ The quietest blade server system < 50dB OfficeBlade™
- ❖ Application-optimized for Enterprises, Datacenter, HPC, Office computing, and Personal Supercomputer



93% Power Efficiency
For improved TCO and
earth-friendly computing



* DatacenterBlade™ - Based on Linpack performance number measured w/ power meters



Conclusion

- **Global Warming Concern is REAL and CRITICAL. Using high-efficiency technology to reducing carbon footprint is our primary mission.**
- **Technology Going Green = Saving on TCO**
 - ❖ energy-saving computing components & system design
 - ❖ high-efficiency power systems
 - ❖ optimized computing density
 - ❖ effective management and maintenance
- **Using high-efficiency Supermicro solutions can save Millions of US dollars per Datacenter while reducing CO₂ emissions.**
 - ❖ Supermicro has been shipping high efficiency server solutions since 2006
 - ❖ At 93% power efficiency and power saving components, users can save up to \$6000 per blade enclosure in 3 years



Our Missions

- Using one Supermicro high-efficiency server will save up to **3 more trees*** and additional **\$100** on electricity per year when compared with an industry standard server
- If the whole server market** adapts Supermicro's high-efficiency solutions, the world can save up to **1,000,000** acres of forest or 400 million trees per year.
- Supermicro people work with happy mind everyday knowing
 - ❖ We help customers to save money
 - ❖ We grow our business strongly
 - ❖ We contribute to the health of our mother Earth and help solve global warming problem



* Average 28 trees per acre in USA – US Dept. of Forestry
** 8 million total server units shipped in 2007 according to IDC



SUPERMICR[®]

Let's Keep IT Green with High Efficiency Computing Solutions



DatacenterBlade™
290GFLOPS/kW, 93% High Efficiency Power



1UTwin™
2 Nodes in 1U, 90% High Efficiency

