



**CISCO** Unified Computing System

IT'S NOT JUST  
WHAT WE MAKE

IT'S WHAT WE  
MAKE POSSIBLE



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# Two Found New Firm

MOUNTAIN VIEW — Two  
founders of Fairchild Semicon-

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Innovation

Trust

Secure

Scale

History of great innovations pushing technology forward.

Earned market trust by delivering on promises and recognized as IT leaders.

Stable and secure companies, with large footprint in your IT infrastructure.

Global markets reach, unique engineering expertise, and solid customer support.

Share a common vision of Billions of connected devices.

Combined \$10B R&D Budget / year

## Strong Partnership



# A History Of Collaboration



Ethernet Evolution

Wireless Connectivity



Client Mgmt/Security

Verified For Centrino



Business Class Wireless Suite

802.11n

WiMAX OPA & IOT

Next Gen Datacenter

## Unified Computing System

## Network Admission Control



EtherChannel

InterSwitch Link

## Gigabit Ethernet

## Data Center Ethernet

## FCoE

1995

2000

2005

2009



# Collaboration Across UCS Platform



**Intel brings**

**Cisco delivers**

**Memory**

Xeon with integrated memory controller

Memory extender technology

**Unified Fabric**

DCE compliant 10GbE controller

10GbE Unified fabric solution

**Virtualization**

Xeon 5500 with enhanced VT-c and VTx2 virtualization capabilities

VN-Link solution and Hypervisor bypass (VT-d)

**Power Management**

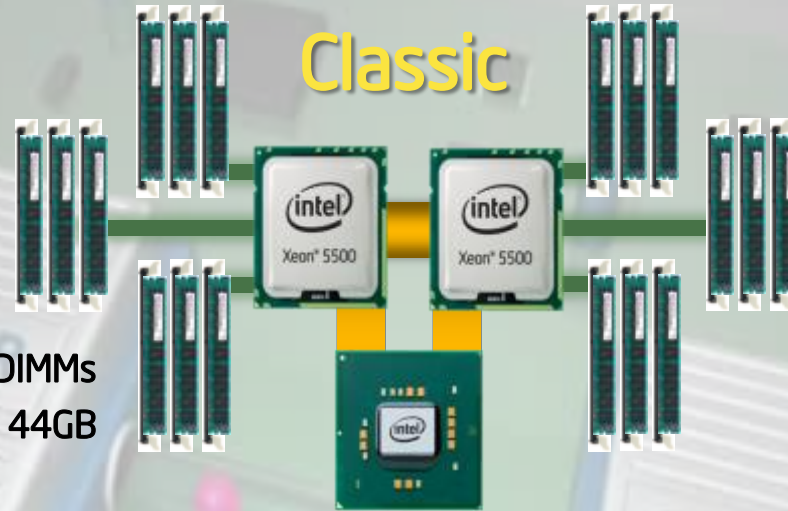
Xeon 5500 with 5x low power states

Innovative chassis and system level power management



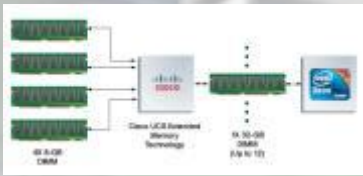
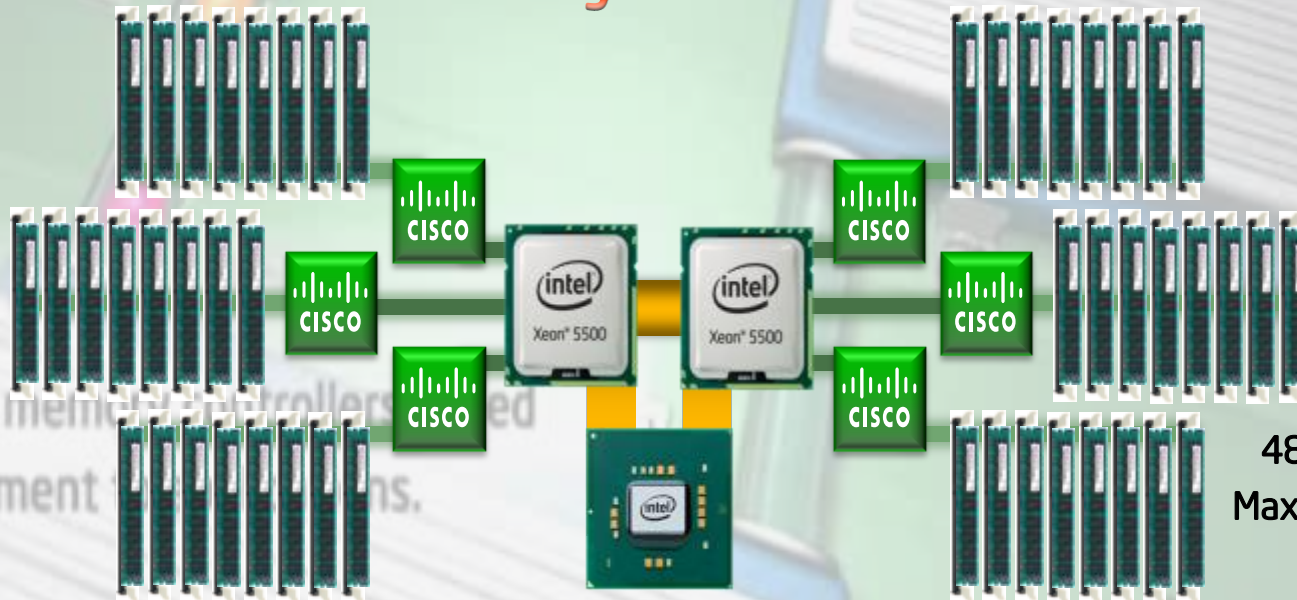
# Classic

18 DIMMs  
Max 144GB



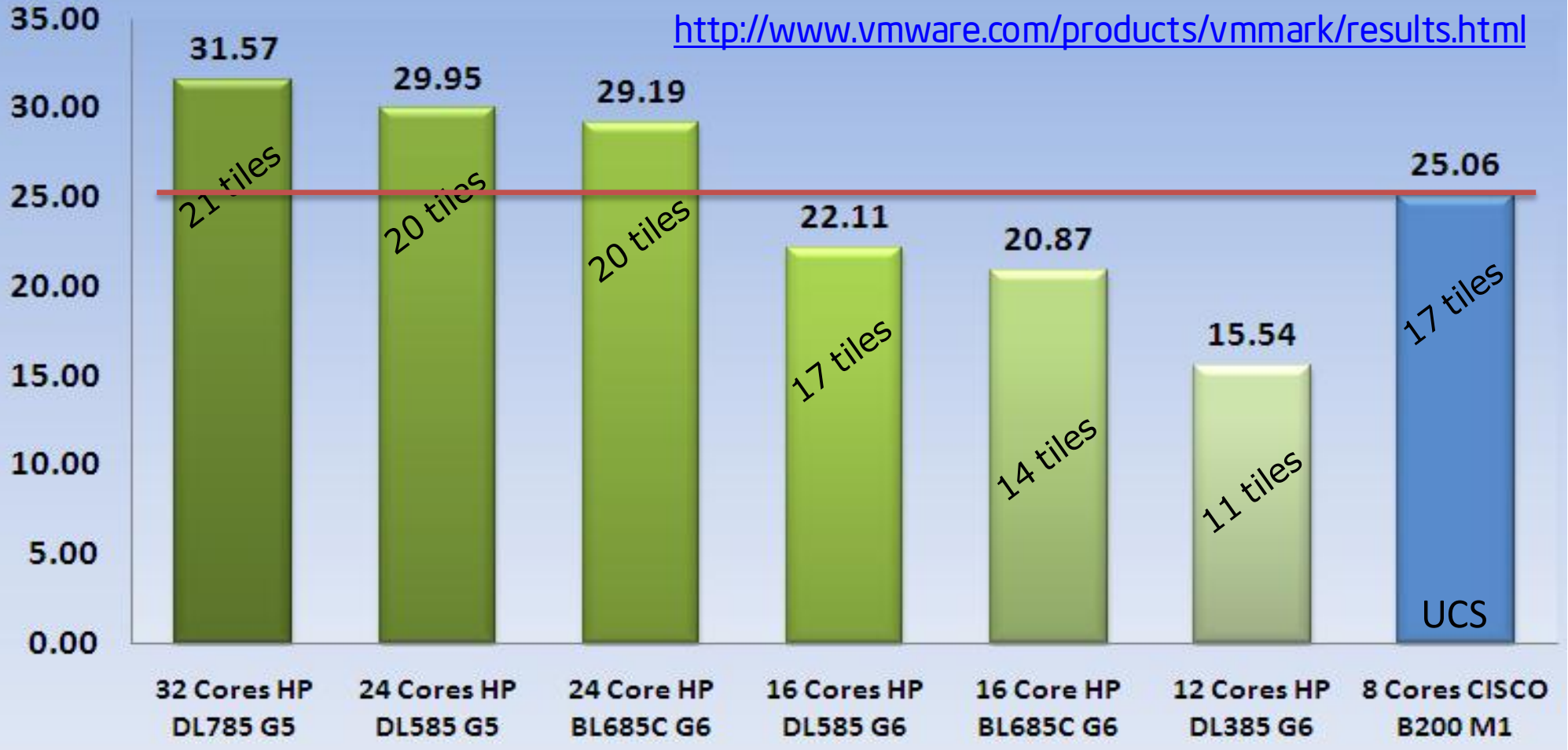
# Cisco UCS With Memory Extension

48 DIMMs  
Max 384GB



# VMMARK V1.1.1 VMWARE ESX V4.0

<http://www.vmware.com/products/vmmark/results.html>



# 32nm Investment **\$7 BILLION** Over 2 Years



D1D Oregon



D1C Oregon



Fab 32 Arizona



Fab 11X New Mexico



# Intel® Xeon® 5500 Processor

45/32 nm Hi-K Multi-Core Processor

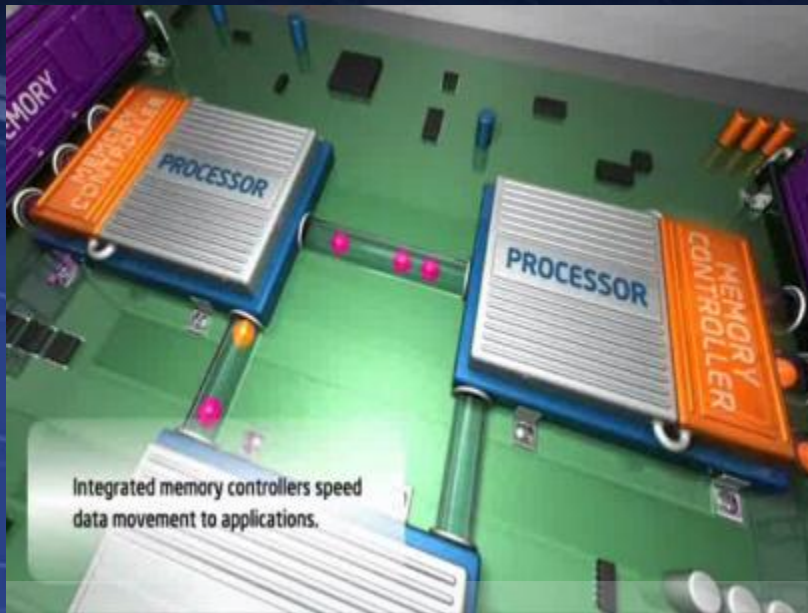


- Intelligent Performance
- Adaptable Energy Efficiency
- Flexible Virtualization

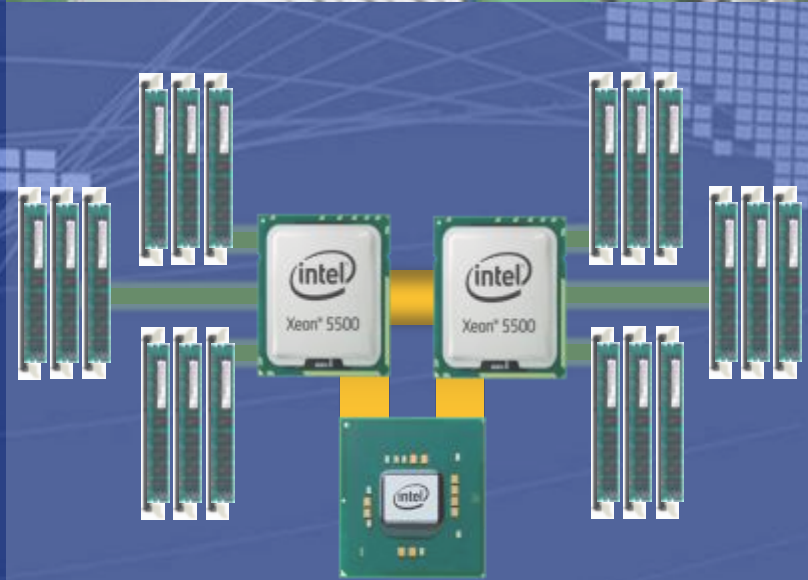
*A New Generation of Intelligent Server Processors*



# Intel® Xeon® Technologies



- Adaptable Energy Efficiency
  - Intel® Turbo Boost Technology
- Intelligent Performance
  - Integrated Memory Controller
  - Intel® Hyper Threading
  - Intel® QuickPath Interconnect
- Flexible Virtualization 2<sup>nd</sup> Gen
  - VT-d
  - VT-c

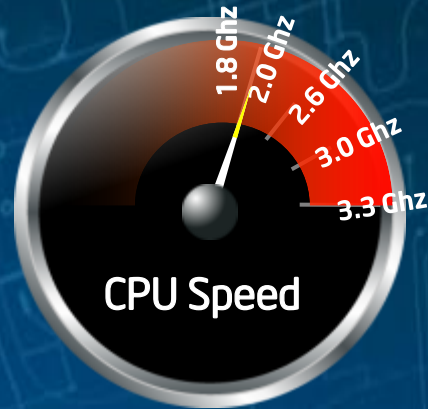


# Intel® Turbo-Boost Technology

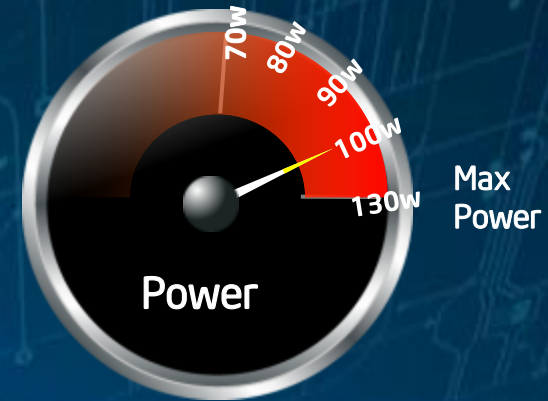
Xeon®



Rated Speed



Operating Power



CPUs typically operate at a fixed max frequency regardless of the workload

For the most demanding workloads, the CPU operates closer to its power limitations

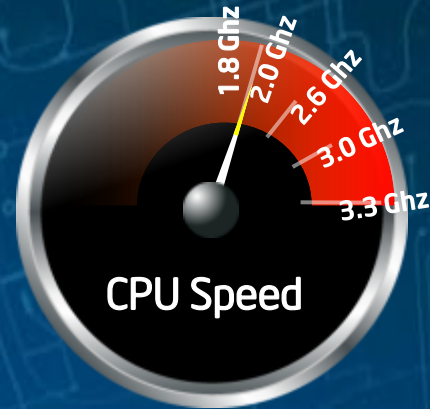


# Intel® Turbo-Boost Technology

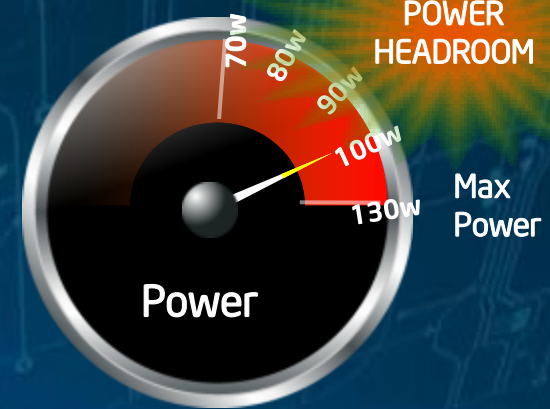
Xeon®



Rated Speed



Operating Power



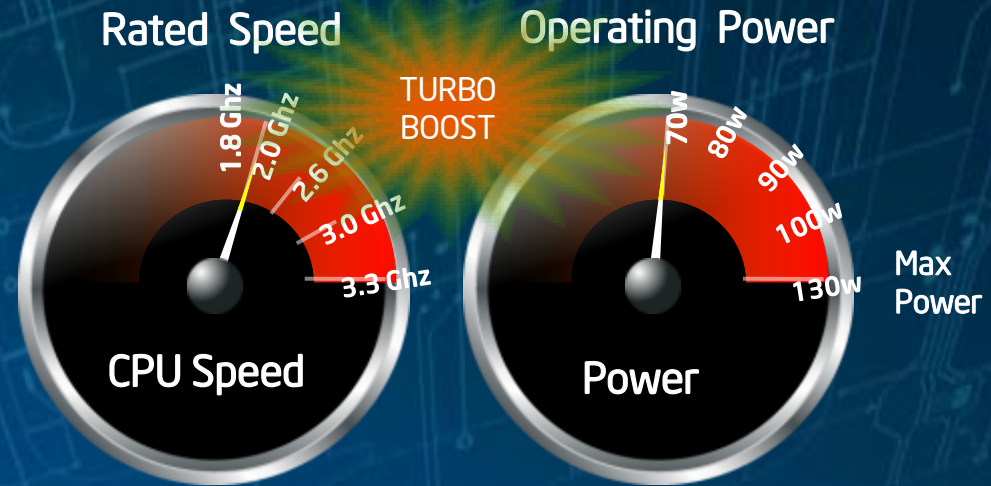
However, most applications allow the CPU to operate below maximum power

Power headroom may also be available if cores are in idle mode



# Intel® Turbo-Boost Technology

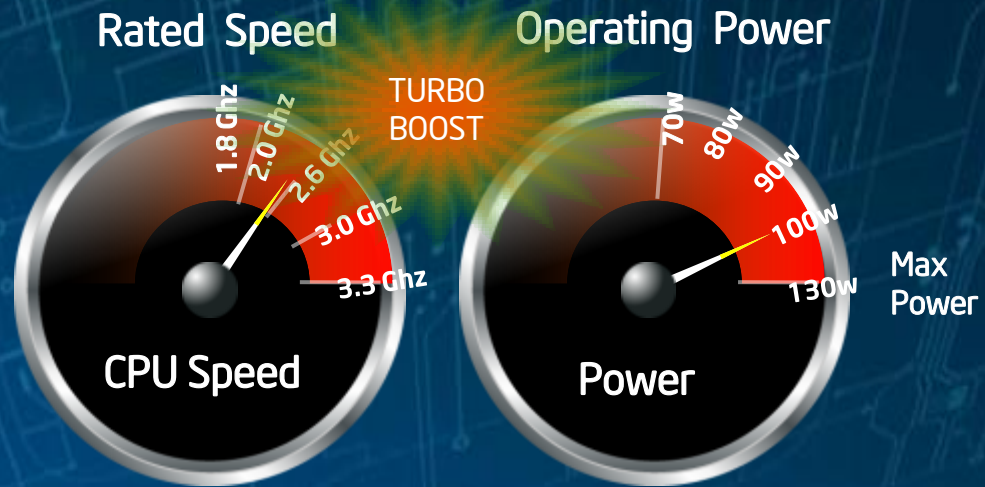
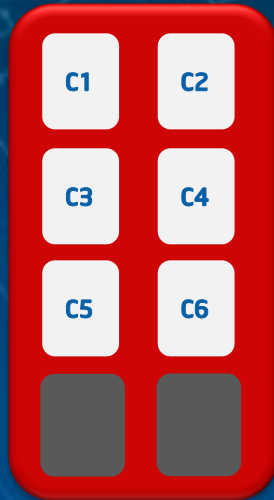
Xeon®



Turbo Boost speeds up the CPU to utilize any available power headroom

# Intel® Turbo-Boost Technology

Xeon®



Turbo Boost speeds up the CPU to utilize any available power headroom

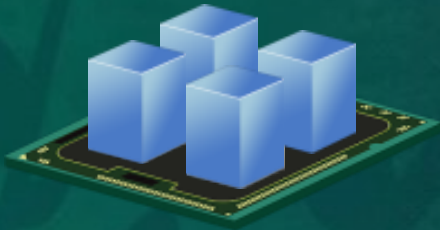
With fewer cores active and more headroom, the CPU can reach even higher frequencies

# Intel® Turbo Boost Technology

## Intelligent Performance & Energy Efficiency



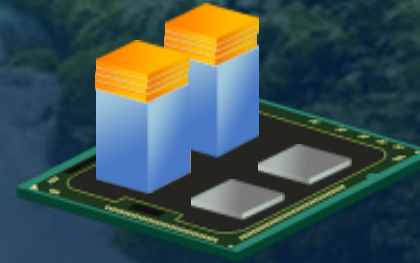
### Intel® XEON Processor, 2Ghz



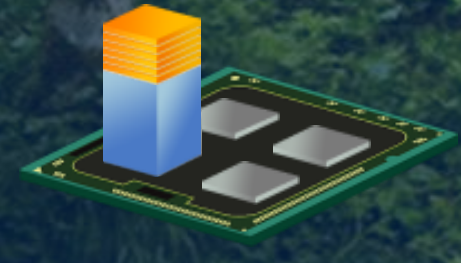
ALL Workloads



Highly Threaded  
Workload < TDP  
2.26Ghz for all 4 Cores



Lightly-Threaded Workload  
< TDP 3.06Ghz for 2  
active Cores



Single-Threaded  
Workload < TDP  
3.20Ghz for 1 active  
Core

## ***Nehalem Architecture Featuring Intel Turbo Boost Technology<sup>3</sup> Enables A Dynamically Scaled Performance Boost***

Intel® Turbo Boost Technology<sup>3</sup> Monitor is a Microsoft\* Windows (32 & 64 bit) gadget that displays turbo frequency changes in the sidebar.

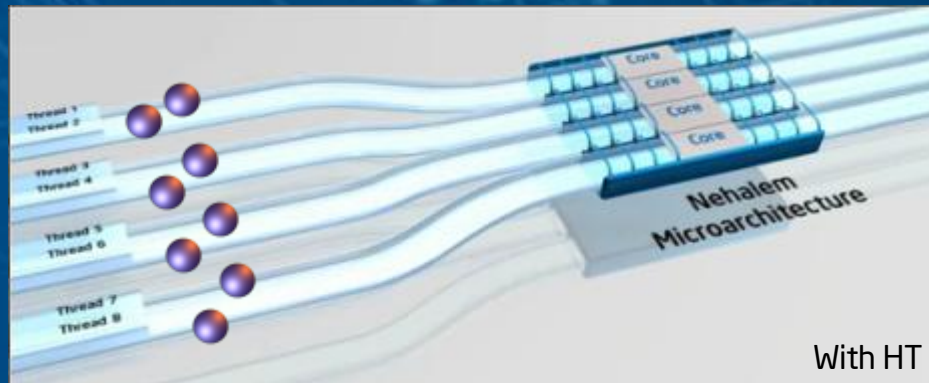
Lead Free Halogen Free Intel product.



# Intel® Hyper-Threading Technology For Better Multitasking

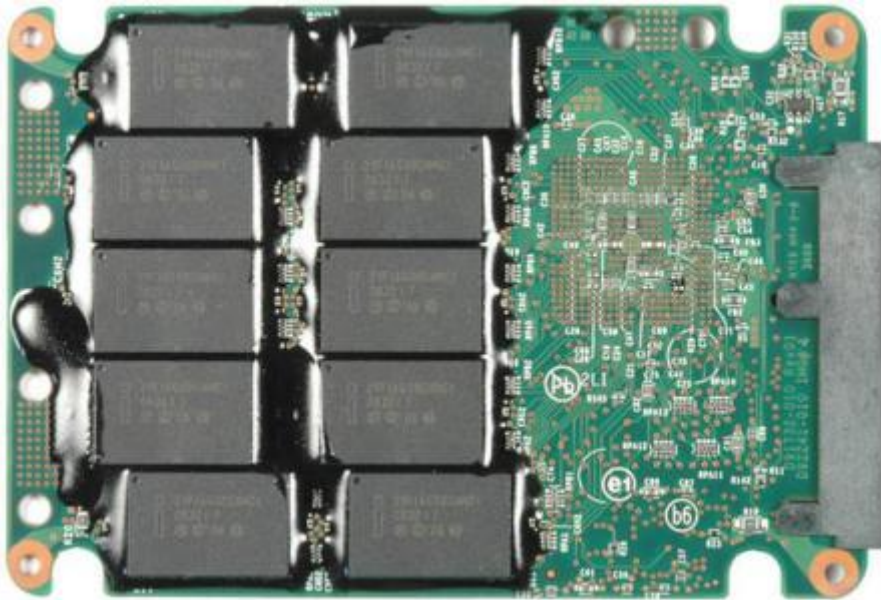


*2 thread engines per core, enabling 8-way processing in 4-core systems. It means that a quad-core processor could run up to eight threads simultaneously*

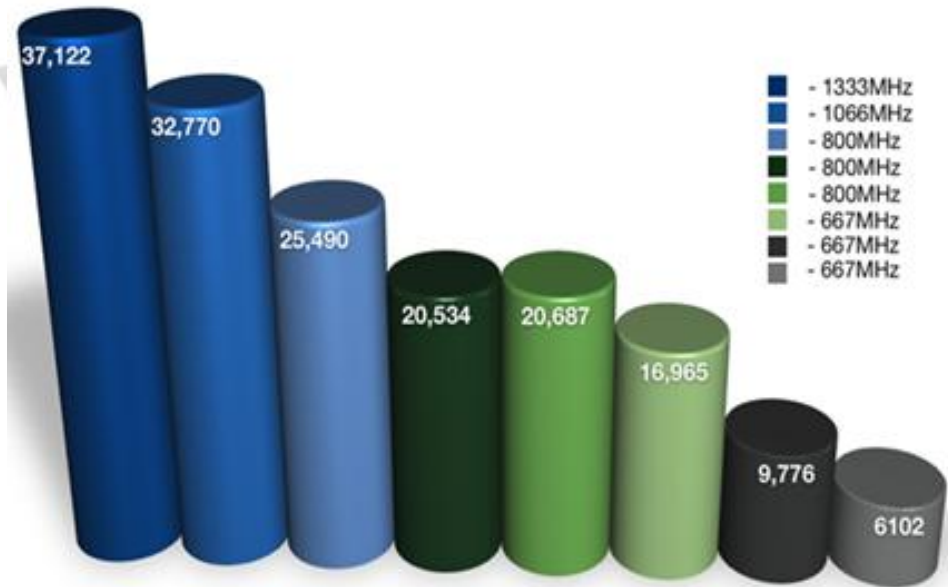


How many threads can my CPU run simultaneously ?

# Intel® NAND Technology



Stream Memory Bandwidth MB/s (Triad)



Performance  
Reliability  
Silent Operation  
Power efficiency  
Form factor Flexibility



SSD

10GBE

Bridging the gap between 1GbE and Infiniband®





### Intel® Turbo Boost Technology

Increases performance by increasing processor frequency and enabling faster speeds when conditions allow

Normal	4C Turbo	<4C Turbo
<p>Core 0 Core 1 Core 2 Core 3</p> <p>All cores operate at rated frequency</p>	<p>Core 0 Core 1 Core 2 Core 3</p> <p>All cores operate at higher frequency</p>	<p>Core 0 Core 1</p> <p>Fewer cores may operate at even higher frequencies</p>

**Higher performance on demand**

25.6 GB/SEC IQPI

18 Dimms  
DDR3  
3 channel

PCI Express-2  
I/O Controller

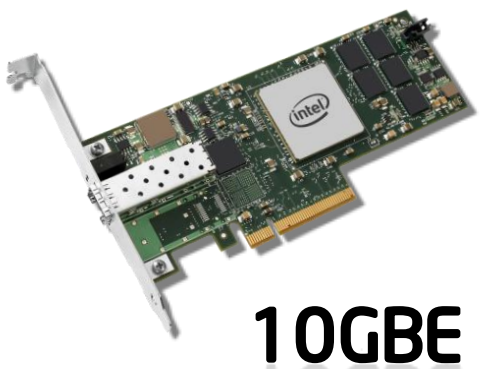
Tylersburg HUB

### Intel® Hyper-Threading Technology, SMT

Increases performance for threaded applications delivering greater throughput and responsiveness

Nehalem Microarchitecture

**Higher performance for threaded workloads**



**10GBE**



**SSD**



DDR1 → 2.5V B/W 3.2GB/S 400MHZ	DDR2 → 1.8V B/W 6.4GB/S 800MHZ	DDR3 → 1.5V 12.8GB/S 1600MHZ	LV-DDR3 1.35V 8.5GB/S 1066MHZ
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# Intel® + UCS is your Cloud Foundation



+

Intelligent DC Resources Utilization  
Intelligent Cloud Solution  
Efficient Power Consumption/Cooling  
Eco Friendly and Space Efficient  
Less Complexity and Management

Ad Hoc

Structured

UCS



# Thank You