

## 똑똑한 업무환경 구축을 위한 네할렘 기반의 서버



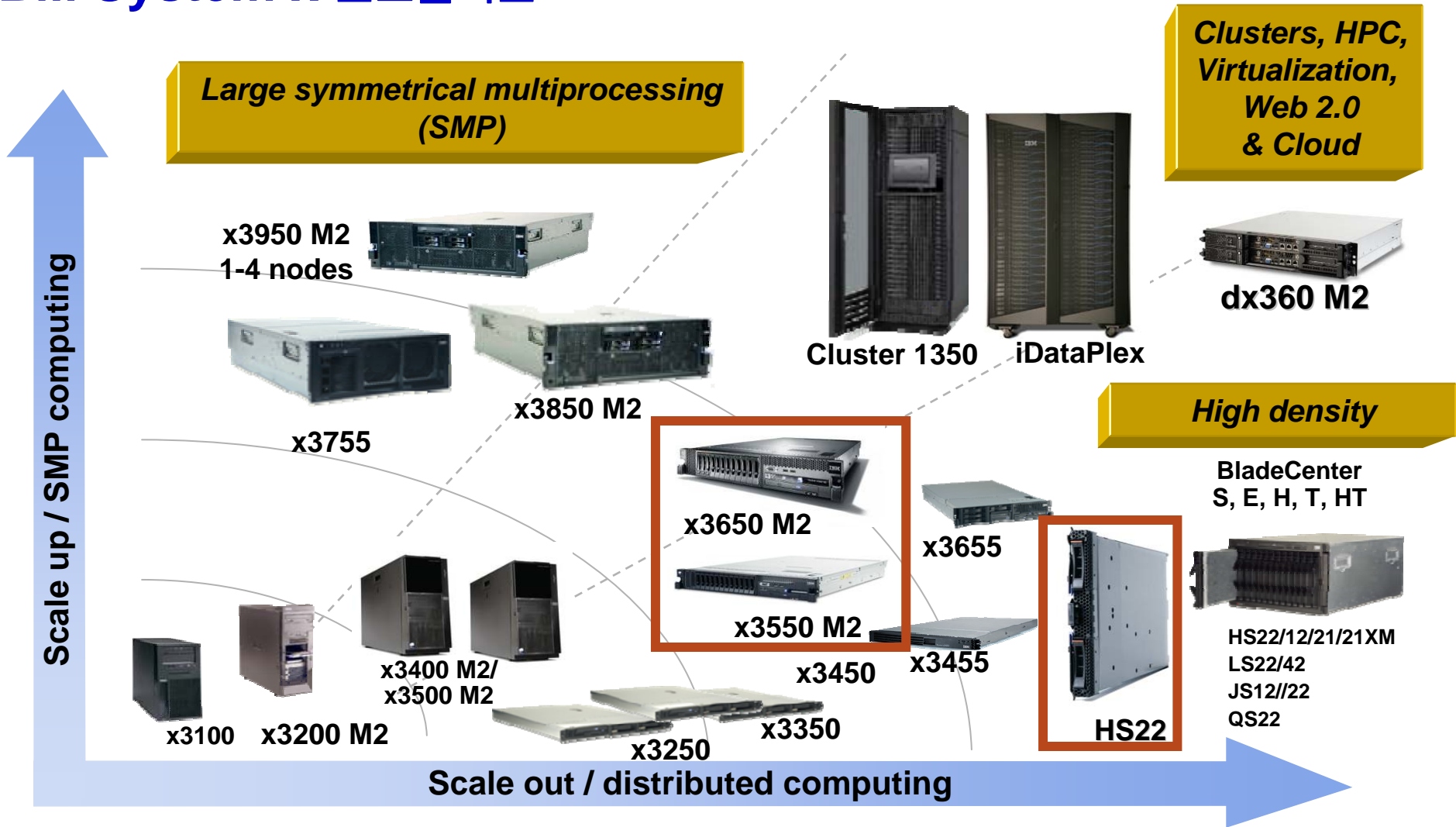
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17 July, 2009





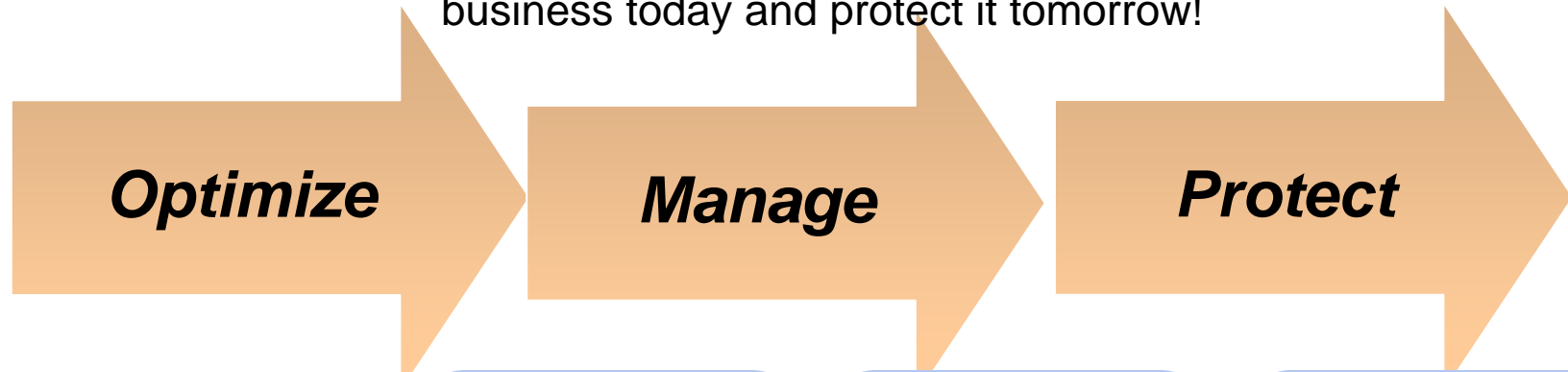
# IBM System x 포트폴리오



# Xtended Design Architecture

## **X** xtended Design Architecture for Business Advantage

- IBM System X with XDA provides customers the confidence to optimize their business today and protect it tomorrow!



<u>Performance</u>	<u>Availability</u>	<u>Manageability</u>	<u>Flexibility</u>
<ul style="list-style-type: none"><li>▪ Qual Core</li><li>▪ FBD Memory</li><li>▪ TOE</li><li>▪ Virtualization</li></ul>	<ul style="list-style-type: none"><li>▪ Ready RAID</li><li>▪ RAID &amp; HA Standard</li><li>▪ CV Cooling</li></ul>	<ul style="list-style-type: none"><li>▪ IBM Active EnergyManager</li><li>▪ iMM</li><li>▪ KVM</li></ul>	<ul style="list-style-type: none"><li>▪ eXtended I/O<ul style="list-style-type: none"><li>▪ Express, HTX</li></ul></li><li>▪ Scalable Design</li><li>▪ Stable Platform</li></ul>





# Nehalem Overview

## KEY FEATURES

**Greater Instruction per clock and improved cache hierarchy**

**Simultaneous Multi-Threading**

**Dynamic Resource Scaling**

*Any unneeded cores automatically put into sleep mode; remaining operating cores get access to ALL cache, bandwidth and power/thermal budgets*

**Turbo Mode**

*CPU operates at higher-than-stated frequency when operating below power and thermal design points*

## IT BENEFITS

**Faster Processing / core**

**More Threads / core**

**Lower power consumption during periods of low utilization**

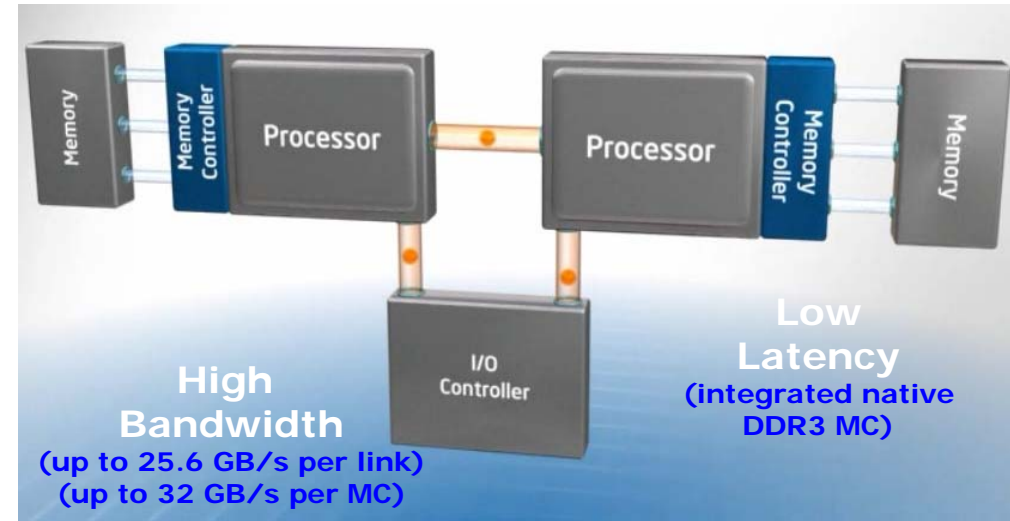
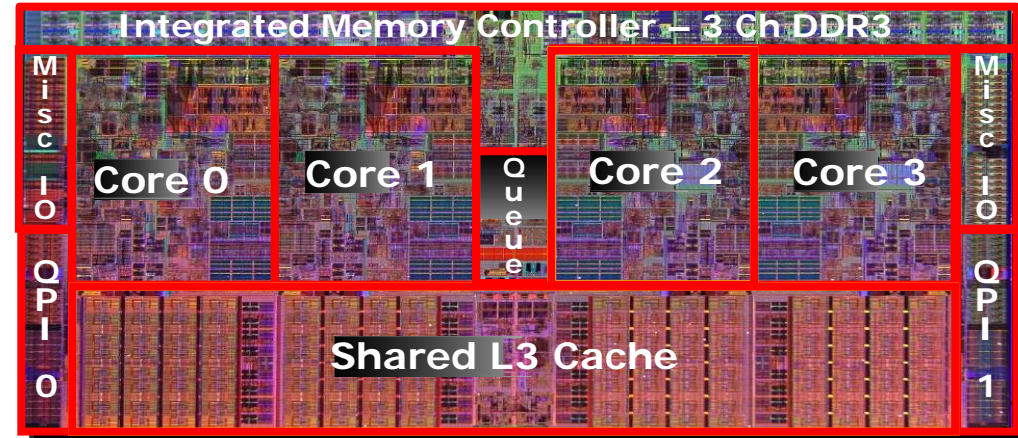
**Additional Processing boost during peak demand periods**

**FASTER cores ... MORE cores/threads ... DYNAMICALLY ADAPTABLE**

Source: Intel. All future products, computer systems, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice.

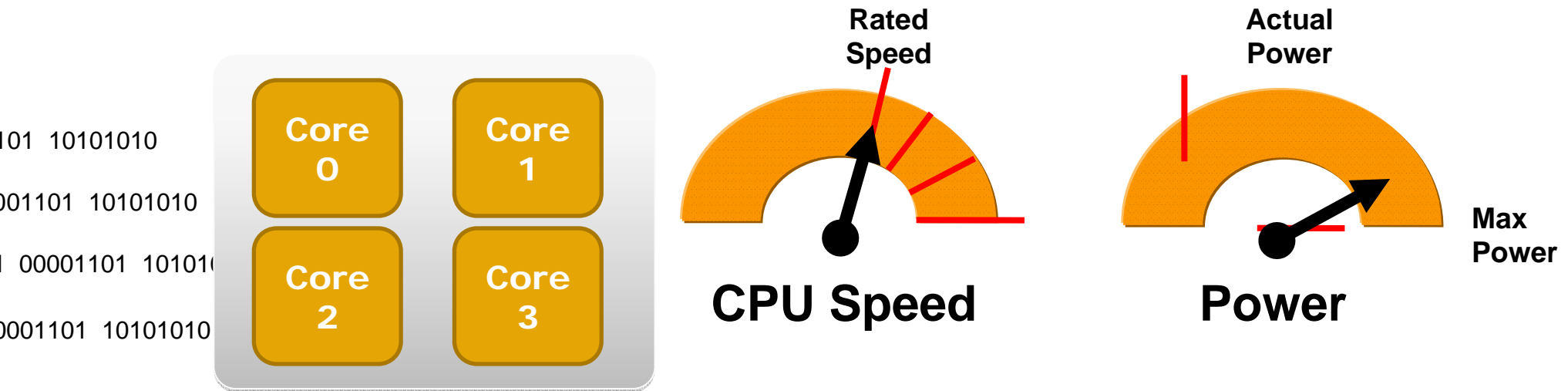
# Intel® Xeon® Processor 5500 Series(codename Nehalem-EP)

- **Micro-architecture enhancements**
- **Integrated Memory Controller**
  - 3 DDR3 channels per socket
  - Memory Bandwidth & Capacity scales with # of CPUs
  - Very *low memory latency*
- **2 Intel® QuickPath point-to-point Interconnect**
  - High Speed link between CPUs & IO Hub
- **Single die quad core**
- **Shared 8MB L3 cache**
- **Return of SMT (hyperthreading)**
  - 8 logical cores per CPU, 16 total in O/S
- **High core frequencies (upto 2.93GHz for server)**
- **Significant (>2x) improvement in SpecFP and STREAM (>3x) benchmarks)**
- **Dynamic Speed Technology (aka Turbo Mode)**
- **Nehalem Virtualization Features**
  - Reduced latency for VM transitions
  - Reduced # of VM transitions with Extended Page Table (EPT)
- **Energy Efficiency Enhancements**
  - Integrated Power Gates minimize Idle Power
  - Manages active power by automatically optimizing operating voltage



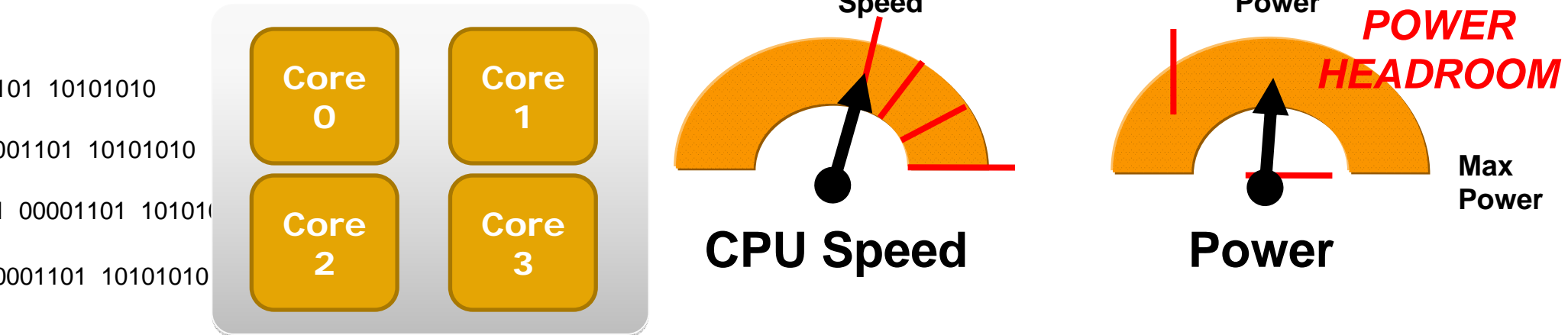
QPI: Intel® QuickPath Interconnect (Intel® QPI)

## Intel Nehalem EP Turbo Mode Overview



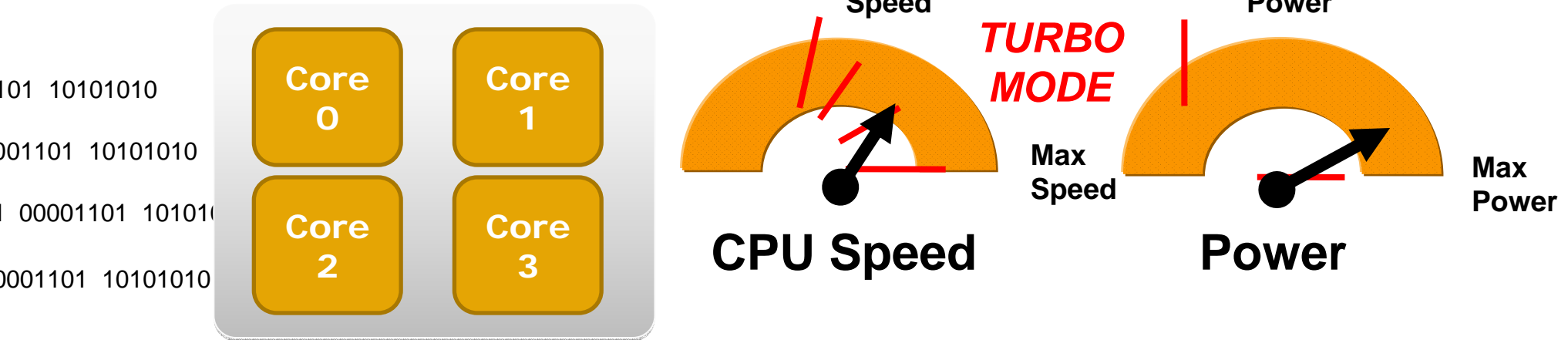
- CPUs typically operate at a fixed max frequency regardless of the workload
- For the most demanding workloads, the CPU operates closer to its max power limit

## Intel Nehalem EP Turbo Mode Overview



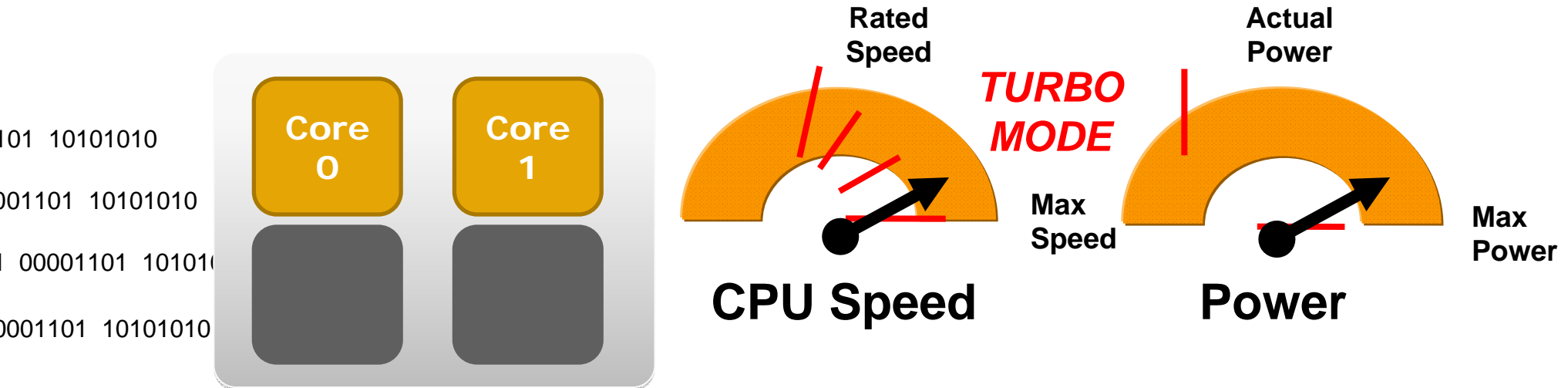
- However, most applications allow the CPU to operate below max power
- Power headroom may also be available if cores are idle

# Intel Nehalem EP Turbo Mode Overview



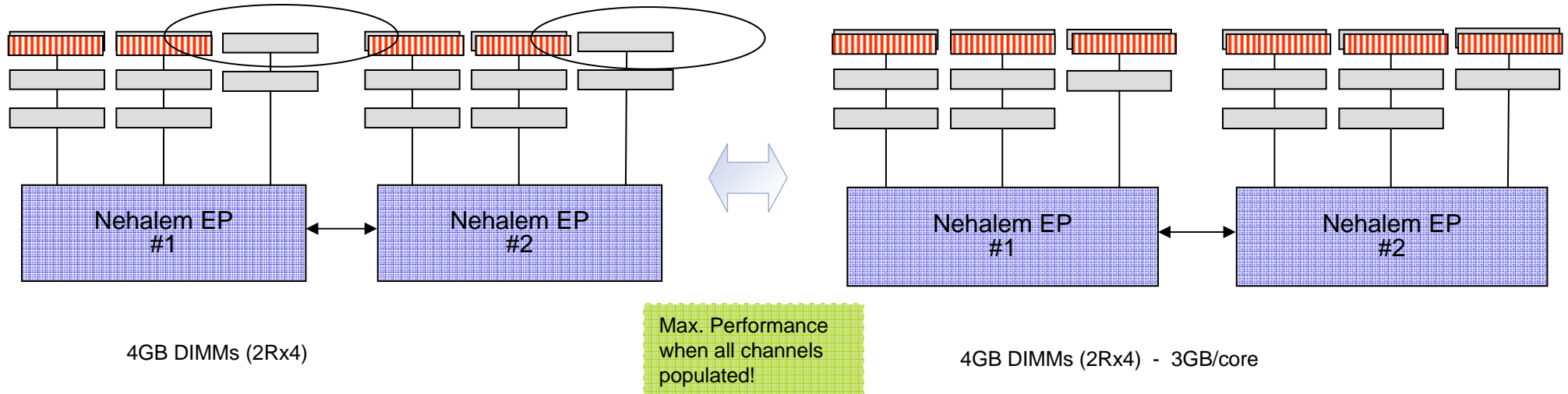
- Turbo Mode speeds up the CPU to utilize any available power headroom

## Intel Nehalem EP Turbo Mode Overview



- Turbo Mode speeds up the CPU to utilize any available power headroom
- With fewer cores active and more headroom, the CPU can reach even higher frequencies

# Memory Diagram





# IBM Intel High Volume Portfolio - The Innovation Continues!

*Rack and tower servers ready for any IT challenge*

**IBM x3200**  
Reliable entry server (1 socket)

**IBM x3400 M2:**  
Value enterprise server (2 socket)

**IBM x3500 M2:**  
Business critical "all in one" server (2 socket)

**IBM x3650 M2:**  
Flagship business critical expandable server (2 socket)

**IBM x3550M2 :**  
Business critical compact application server (2 socket)

**IBM HS22 :**  
Blade Server (2 socket)

**IBM x3350:**  
High availability infrastructure server (1 socket)

**IBM x3250:**  
Entry infrastructure server (1 socket)

## Server solutions designed to meet today's complex challenges

- Leadership energy efficient design
- Significantly reduced total cost of ownership resulting from IBM management tools
- IBM's trusted leadership, global reach, service and support

# System x3650M2 > Product Attributes

## Microprocessor

- Intel Nehalem EP Processor with QPI technology
- Intel Tylersburg DP (36-D) chipset
- Dual socket, quad core

## Memory

- DDR-3 R-DIMMs
- 16 DIMM sockets (up to 96GB)
- 2GB, 4GB, 8GB ‘registered’ DIMMs
- On line spare & memory mirroring

## Storage

- 8 - 2.5” Hot Swap SAS/SATA Drives; plus optional x 4 – no tape supported if 4 optional drives deployed
- SSD - 32GB supported (option)

## Expansion Slots

- 4 PCI-E (4 x8)
  - 2 x8 - Full length, full height
  - 1 x8 - Half length, full height
  - 1 x8 - Low Profile
- 4 x8 are convertible to 2 x16 via optional risers (1 x8 FH, FL + 1 x8 LP in Connector 1; 1 x8 FH, FL + 1 x8 FH, ½ L in Connector 3)
- Also, PCI-X via optional riser

## Integrated Functions

- Two 10/100/1000 Mbit Ethernet ports (std)
  - Plus 2 optional
- USB ports – pre-boot and normal use, also for KB/Mouse
  - 2 rear (USB2.0)
  - 2 front (USB2.0)
- Video (one front & one rear)
- SAS – RAID 0/1 std, RAID 5 optional

## RAS/Service

- iMM (Integrated Mgmt. Module) with Virtual Media Key for ‘remote presence’
- TPM (Trusted Platform Module) 1.2
- IPMI 2.0
- IBM Director
- Server Guide
- Light path diag.
- UEFI (Unified Extensible Firmware Interface)

## Media

- 1 DVD CD-RW Combo (std)
- No Legacy Floppy
- DDS5 and GoVault internal tape options supported

## Packaging

- 2U Package, 28” deep
- Rack mounted with slides

## Power

- Redundant HS Power - 675W (1 + 1 power)
  - IBM Director Active Energy Manager v3.1
  - >92% AC/DC Conversion Efficiency
  - Energy Star v4.0 compliant

## Cooling

- Hot Swap redundant fans

## Software

- On board connector for virtualization included; optional embedded hypervisor
- See NOS Plan



**Blue** items are new or enhanced attributes vs. x3650

## Nehalem 탑재 System x 서버 특징점 3가지

1



92% AC/DC Conversion Efficiency



## Nehalem 탑재 System x 서버 특징점 3가지

2



시스템 구성 변경 시 F1키를 누를 필요 없음



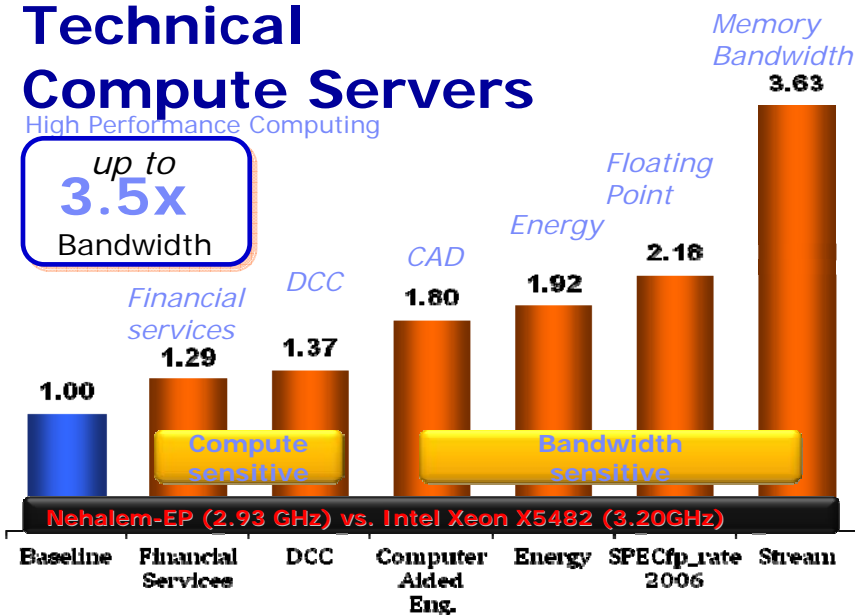
# Nehalem 탑재 System x 서버 특징점 3가지

# 3

## Technical Compute Servers

High Performance Computing

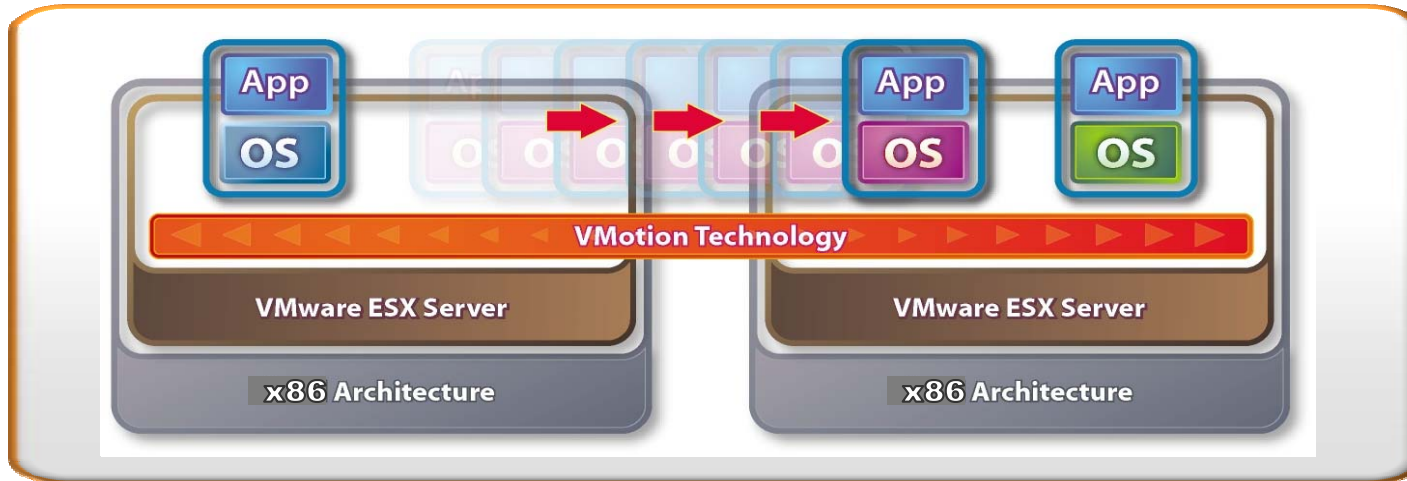
up to **3.5x**  
Bandwidth



기존 Xeon 5400 Series보다 최소 1.3배에서 최대 3.6배까지 성능향상!!

## System x 가상화 이점

운영중인 가상머신을 중단 없이 다른 물리적 시스템으로 이동하는 기술



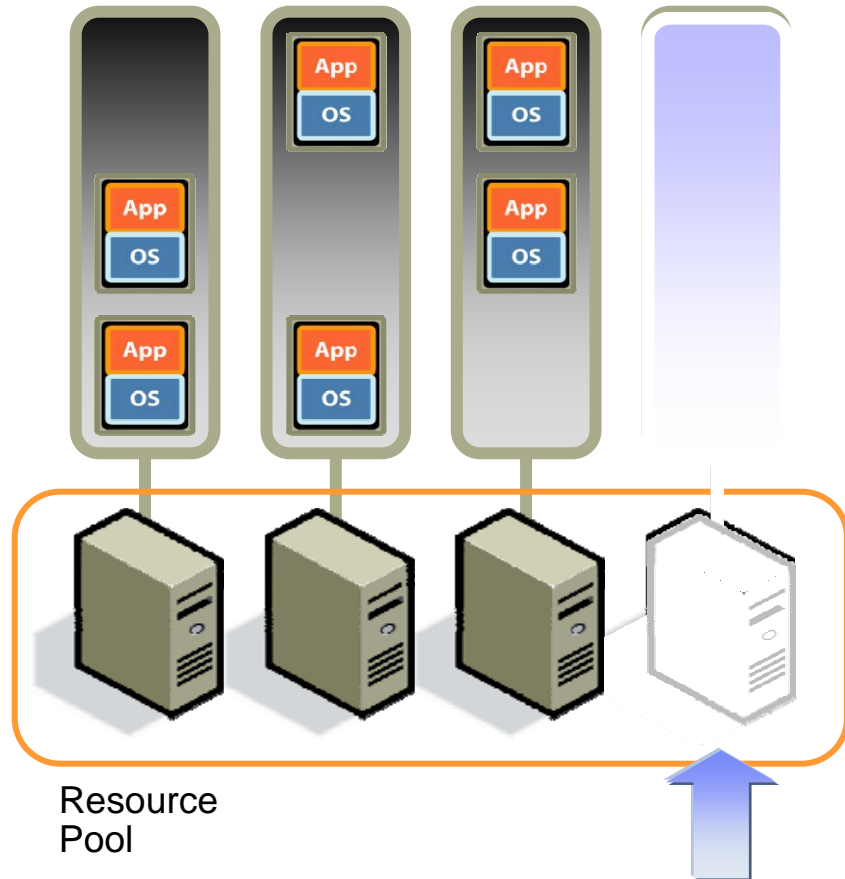
### > 주요 기능

- 가상 머신의 라이브 마이그레이션 지원

### > 주요 혜택

- 시스템 업그레이드 또는 패치 등의 계획된 다운타임 시 활용
- 가상서버 이동 시, 완벽한 트랜잭션 무 결성 보장
- 다양한 스토리지 지원 : Fibre Channel, iSCSI, SAN, NAS

## System x 가상화 이점



하드웨어 유지보수 완료

### > 주요 기능

- 계획된 다운타임 극복
  - 시스템 BIOS 및 Driver Patch 및 Upgrade
  - 시스템 부품 교체 및 Upgrade

### > 주요 혜택

- Hardware 추가/제거에 따른 별도의 운영 스케줄링 제거
- 비즈니스 연속성 보장

# 획기적인 상면/전력 비용 감소

## Scale Up형 통합

As 1차 통합대상 서버 중 40대 서버를 Scale Up 형태의 통합방안으로 선정하였으며, 상면공간이 Rack 4개에서 0.5개로(88%) 획기적으로 감소합니다.

As-Is Rack 현황 (Total : 4EA)

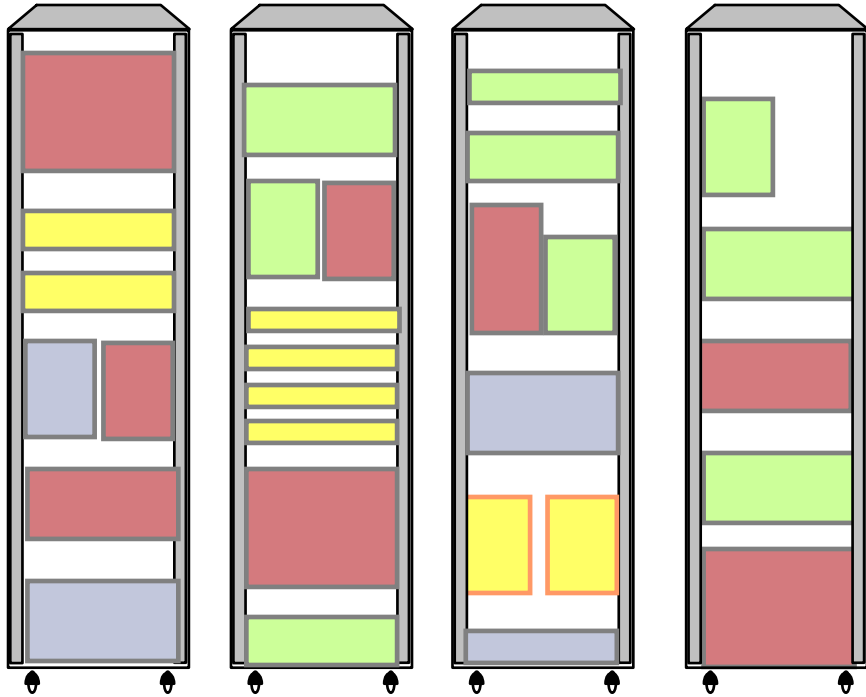
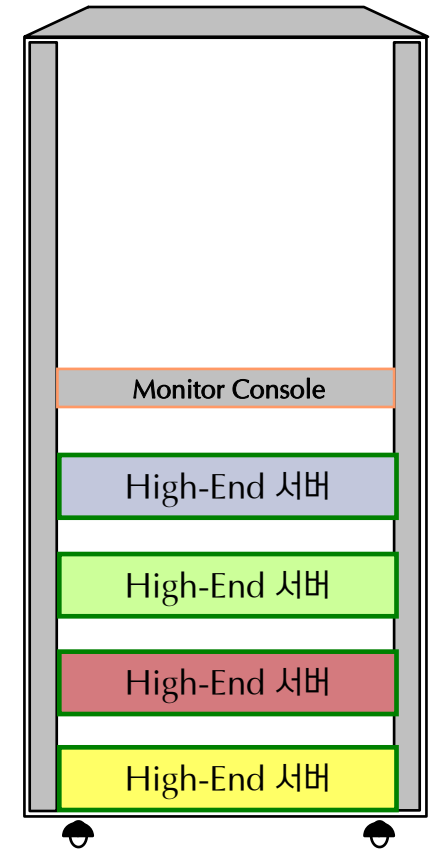


Illustration Only

- 4EA
- 8EA
- 8EA
- 8EA

Rack 4개 -> 0.5개  
통합 전/후  
상면공간 비교

To-Be Rack 구성 방안 (Total : 0.5EA)

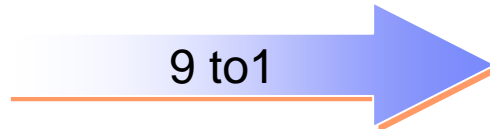


# 가상화에 최적화된 **System x** 네할렘 기반서버

## Smart Energy Design and 9:1 Consolidation Ratio

Customers can lower energy costs \$100 per server per year and maintain workload levels with significantly fewer of the new IBM x3650M2 servers

**2005**  
9 x346 Servers  
Single-Core proc.



**2009**  
1 x3650M2 Server  
Quad-Core proc.



- ✓ Up to 50% lower annual energy costs<sup>(1)</sup>
- ✓ 8.8x more performance per server<sup>(2)</sup>
- ✓ 89% Floor Space Reduction

## Q & A

