



# Intel® Xeon® Processor 7500 Series

What's new about the Intel® Xeon® Processor 7500 Series (*formerly codenamed Nehalem-EX*)?

- **Up to 8 cores. Up to 16 threads. Up to 24MB shared cache.**  
*Dynamically scalable microarchitecture offers up to 8 cores per socket, 2 threads per core, and 24MB shared cache.*
- **Intel® Scalable Memory Interconnect (SMI) and Scalable Memory Buffers (SMB)**  
*The integrated SMI offers high-speed serial links to the SMBs, which support cost-effective, commodity RDDR3 memory. 2 integrated memory controllers per socket accommodate high-capacity bandwidth, up to 8 DIMMs per memory controller, and 4 DDR Channels.*
- **QuickPath Interconnect (QPI)**  
*QPI delivers dynamically scalable interconnect bandwidth, outstanding memory performance and flexibility, and tightly integrated interconnect reliability, availability, and serviceability (RAS).*
- **Recoverable Machine Check Architecture**  
*The first machine check recovery in Intel Xeon Processor-based systems works in conjunction with firmware and OS to recover or restart processes to continue normal operation.*
- **Intel® Virtualization Technology (Intel VT-x, VT-d, VT-c)**  
*Higher-level VMM Functions, including resource discovery, provisioning, scheduling, and user interface. Processor virtualization, memory virtualization, I/O device virtualization.*
- **Intel® Hyper-Threading Technology and Intel® Turbo Boost Technology**

**Designed for the most demanding applications  
and large-scale consolidations.**

**Scalable Performance, Flexible Virtualization, and Advanced Reliability**

**Expert included.**



# Intel® Xeon® Processor 7500 Series

## Product Specifications

Process	TDP <sup>1</sup>	CPU Number	Frequency	Cores / Threads	Cache	Link Speed	Max Mem Speed <sup>2</sup>	Turbo Boost <sup>3</sup>	HT	
45nm	130W	X7560	2.26 GHz	8 / 16	24MB	6.4 GT/s	1066 MHz	1 / 2 / 3 / 3	Yes	
	130W	X7550	2.0 GHz	8 / 16	18MB	6.4 GT/s	1066 MHz	1 / 2 / 3 / 3	Yes	
	130W	X7542	2.66 GHz	6 / 6	18MB	5.86 GT/s	1066 (978) MHz	0 / 1 / 1 / 1	No	
	105W	E7540	2.0 GHz	6 / 12	18MB	6.4 GT/s	1066 MHz	0 / 1 / 1 / 2	Yes	
	105W	E7530	1.86 GHz	6 / 12	12MB	5.86 GT/s	1066 (978) MHz	0 / 1 / 1 / 2	Yes	
	95W	E7520	1.86 GHz	4 / 8	18MB	4.8 GT/s	800 MHz	N/A	Yes	
	LOW POWER	95W	L7555	1.86 GHz	8 / 16	24MB	5.86 GT/s	1066 (978) MHz	1 / 2 / 4 / 5	Yes
		95W	L7545	1.86 GHz	6 / 12	18MB	5.86 GT/s		0 / 1 / 3 / 5	Yes

<sup>1</sup> TDP is Thermal Design Power

<sup>2</sup> 1066 MHz frequency runs at an effective frequency of 978 MHz when run at 5.86 GT/s Link Speed

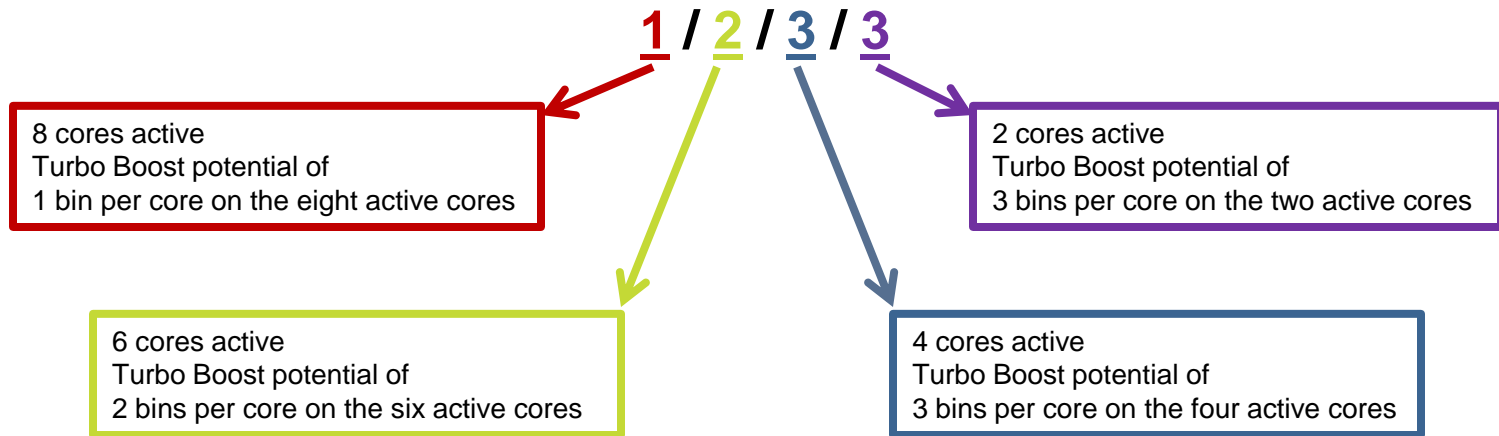
<sup>3</sup> Max Turbo Boost frequency based on number of 133-MHz increments above base frequency (+2 = 0.266 GHz, +3 = 0.400 GHz). See pages 3 and 4 for information about interpreting the Turbo Boost specification.

Expert included.



# Intel® Xeon® Processor 7500 Series

## Interpreting the Turbo Boost Specification



- This example is based on the Intel Xeon processor 7560: 8 cores, 2.26 GHz, with a Turbo Boost specification of 1 / 2 / 3 / 3. **Note: Each Turbo Boost increment applies to 2 cores at a time for the Xeon 7500 series.**
- When thermal headroom exists or a core is idle, Turbo Boost increases the base frequency of the cores.
- The frequency increases take place in increments ( “bins” ) of 133 MHz (.133 GHz).
- The first number corresponds to the boost potential of 1 bin per core when all eight cores are active. The second number refers to the boost potential of 2 bins per core when six cores are active. The third number refers the boost potential of 3 bins per core when four cores are active. The fourth number refers to the boost potential of 3 bins per core when two cores are active.

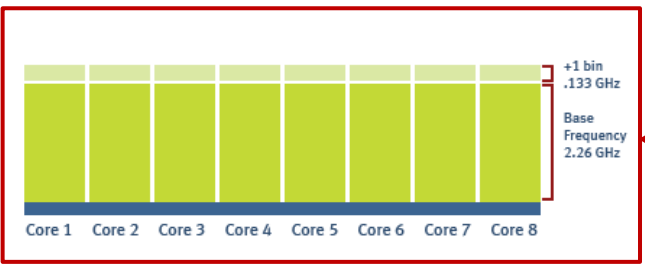


# Intel® Xeon® Processor 7500 Series

## Interpreting the Turbo Boost Specification

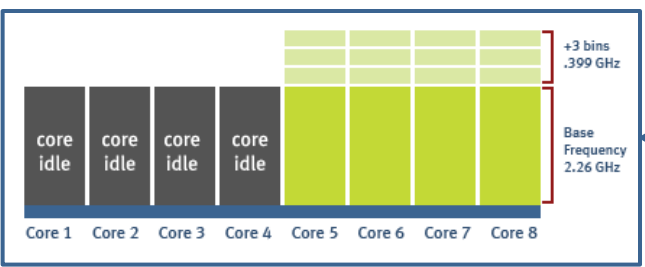
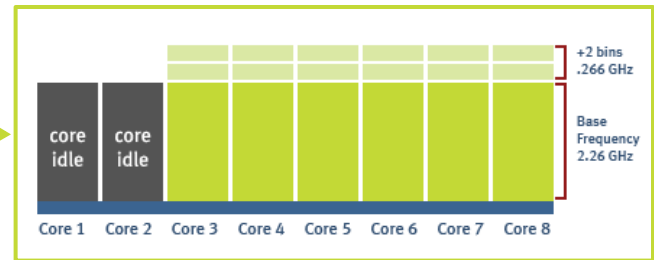
1 / 2 / 3 / 3

Base Frequency: 2.26 GHz  
Incremental Increase: .133 GHz



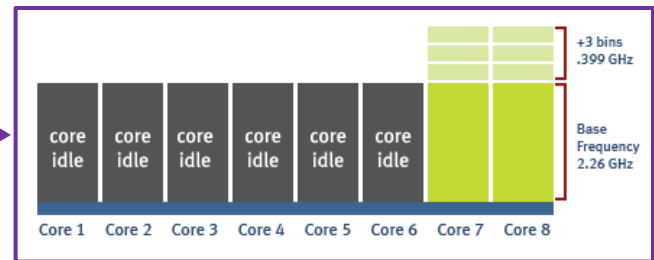
**In Use:** 8 cores  
**Turbo Boost:** 1 bin  
**Boosted Frequency:** 2.4 GHz

**In Use:** 6 cores  
**Turbo Boost:** 2 bins  
**Boosted Frequency:** 2.5 GHz



**In Use:** 4 cores  
**Turbo Boost:** 3 bins  
**Boosted Frequency:** 2.7 GHz

**In Use:** 2 cores  
**Turbo Boost:** 3 bins  
**Boosted Frequency:** 2.7 GHz

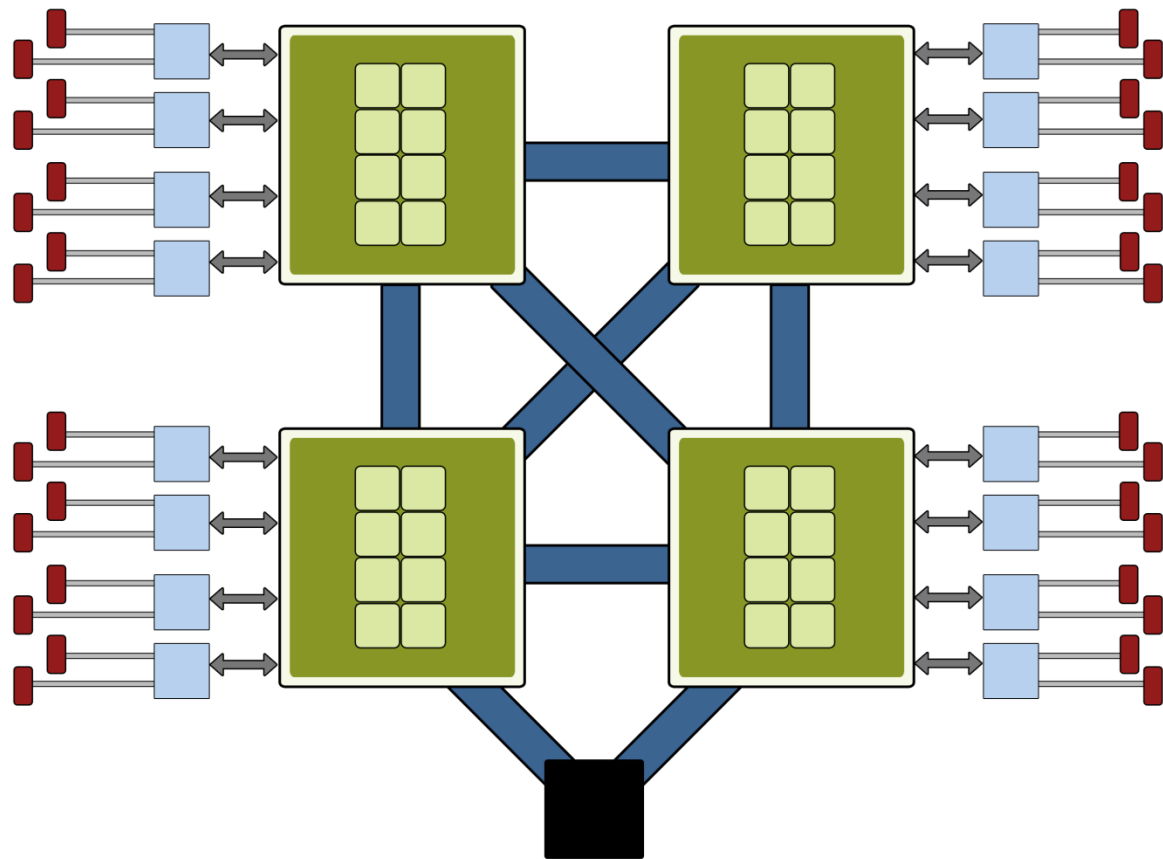


Expert included.



# Intel® Xeon® Processor 7500 Series

## Processor Block Diagram for 4P Mainboards



- Cores
- DDR3 DIMMs
- SMI Links
- 7500 I/O Hub
- Scalable Memory Interconnects
- QPI Links
- DDR3 Links

Expert included.



# Intel® Xeon® Processor 7500 Series

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## Rackmount Servers with Intel® Xeon® Processor 7500 Series

- [Rackform iServ R413](#)
- [Rackform iServ R422](#)

Expert included.



# Intel® Xeon® Processor 7500 / 6500 Series

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Contact Silicon Mechanics

For answers regarding processor selection, memory matching, or other questions you may have, contact one of the Experts at Silicon Mechanics:

Email: [sales@siliconmechanics.com](mailto:sales@siliconmechanics.com)

Toll Free: 866.352.1173

[www.siliconmechanics.com](http://www.siliconmechanics.com)

Expert included.