Intel® Roadmap Directions 2013

A Resource Guide for CIOs and IT Professionals

Volume 2 ▪ 2013

www.intel.in/directions

Windows* 8 Tablets with Intel Inside®

Compatible. Portable. Unstoppable.

Intel continues in its efforts to innovate by constantly enhancing the performance of its desktop, mobile and server platforms, and enabling advanced capabilities and features for new form factors as seen in this Intel® Roadmap Directions - Volume 2, 2013.

This volume turns the spotlight on tablets based on Intel® processors running Windows* 8. Discover how powerful, portable tablets based on Intel® architecture and Windows 8 provide amazing capabilities for both consumer and business use.

Also featured in this edition of the Roadmap is the Intel® Xeon® processor E5-4600 product family that provides a density- and cost-optimized 4-socket processor solution to extend the value of the Intel® Xeon® processor E5 family to 4-socket servers. Additionally, this volume also focuses on 3rd generation Intel® Core™ processors that come with great advantages for all your business needs.

As always, Intel Roadmap Directions will be a valuable source of tangible technology updates, news and resources to help drive your business ahead in a dynamic and highly competitive market.

All your content. More seamless than ever. Get the best Windows* 8 experience when you choose a tablet with Intel Inside®.

Intel® platforms for tablets deliver the Windows* 8 advantage

The development of Microsoft* Windows* 8 and Intel® platforms for tablets represents the latest achievement in a decade long history of collaborative co-engineering. Together, the two companies have carefully tuned their products to deliver an unmatched user experience.

Tablets based on Intel® processors running Windows 8 have far more extensive capabilities for both consumer and business use than the competing tablets in the market.

Run applications and other software you depend on, without compromise

Select from an unparalleled ecosystem of more than four million applications that run on Windows based devices powered by Intel. Intel platforms support the varying demands of these applications, enabling an excellent user experience for different workload sizes. For example, users of processor-intensive software such as Adobe Photoshop* and Adobe Director*, and high-end games should opt for tablets based on Intel® Core™ vPro™ processors or Intel® Core™ processors, while those with more modest needs, such as social media, watching YouTube* videos, and casual games, should go for Intel® Atom™ processor-based tablets.

Mapping task requirements to the right Intel platform-based tablet

Based on whether a user wants a tablet for personal use, for work, or both, they can choose the Intel processor that best meets their specific needs. Both platforms deliver a compelling Windows* 8 user experience with great responsiveness and seamless downloads, support the applications users depend on, and operate smoothly on corporate networks.

For users with rigorous performance requirements for tasks such as demanding productivity applications and content creation, and for those who have advanced security needs, Intel Core vPro processors or Intel Core processors are typically the right choice. Because Intel Atom processors are optimized for portability and long battery life, they may be preferred by users who place a premium on mobility and whose typical tablet use includes light productivity applications and content consumption.

Task requirements mapped to Intel® platforms for tablets

	Intel® Core™ vPro™ Processors and Intel® Core™ Processors	Intel® Atom™ Processors
	Demanding Tasks (Best Suited to Intel® Core™ vPro™ Processors and Intel® Core™ Processors)	**Light Tasks** (Well Supported by Intel® Atom™ Processors)
Productivity and Communications	▪ Client-side enterprise apps ▪ Ad hoc business intelligence reporting	▪ Email, blogging, and social media ▪ Cloud based enterprise apps for Atom
Multimedia	▪ Media development (for example, creating Flash* animations) ▪ Video editing	▪ Media consumption (for example, watching videos) ▪ Photo editing
Gaming	▪ Mainstream PC games (for example, Guild Wars* 2 and Diablo* III)	▪ Casual online games (for example, Angry Birds* and Cut the Rope*)

Select the best tablet to match your needs

Intel® architecture-based tablets have emerged as a flexible choice for either consumer or business use, and they are equally well suited to a combination of the two. Intel architecture-based tablets help deliver the full potential of the Windows* 8 experience. This combination of hardware and OS offers brilliant and immersive user experiences with beautiful visuals, great responsiveness, and seamless downloads.

With support for the entire software ecosystem built for Windows, these devices offer extraordinary performance, battery life, responsiveness, and security. The fundamental distinctions between the two hardware platforms are as follows:

- **Tablets based on Intel® Core™ vPro™ and Intel® Core™ processors** are optimized for performance and security. They are well suited to content consumption and creation. In addition, Intel® Core™ vPro™ processors deliver security and manageability advantages for business users.
- **Tablets based on Intel® Atom™ processors** are optimized for portability and long battery life. They are better suited for content consumption than creation.

Key differentiators between Intel® platforms for tablets

	Intel® Core™ Processor Family	Intel® Atom™ Processors
	Choose the 3rd Generation Intel® Core™ Processor Family for Performance-Optimized Devices	**Choose the Intel® Atom™ Processor for Portability-Optimized Devices**
Handle Demanding Tasks: Performance	**Best** ▪ Runs demanding productivity apps ▪ Handles demanding workloads requiring complex multi-tasking ▪ Suited to content consumption or creation	**Good** ▪ Runs light productivity apps ▪ Supports multitasking ▪ Features instant-on capability
Protect and Access Sensitive Data: Security	**Best** ▪ Provides advanced hardware-based security built for the enterprise **Better** ▪ Provides built-in, hardware-based security	**Good** ▪ Provides hardware-based security features
Keep on Top of Your Digital World: Responsiveness	**Best** ▪ Automatically wakes from standby periodically to fetch updates ▪ Accelerates hard drive response by caching data on a solid-state drive	**Good** ▪ Fetches updates to social media and email while on standby ▪ Securely communicates with nearby devices[1]
Compute On-the-Go: Portability and Battery Life	**Good** ▪ Enables long-lasting operation between battery charges ▪ Thin and light tablet designs	**Best** ▪ Enables all-day operation with outstanding battery life ▪ Razor-thin and extremely light tablet designs

Looking ahead, tablets based on Intel architecture will create even more delightful experiences for users. As the Intel technology roadmap continues to unfold, we all have a breathtaking future at our fingertips.

Read more at http://www.intel.in/content/www/in/en/tablets/tablets.html

Intel® Xeon® Processor E5-4600 Product Family

The Advantages of 4-Socket Servers

The Intel® Xeon® processor E5-4600 product family provides up to 1.88x greater performance[2] and up to 52 percent 4-year Total Cost of Ownership (TCO) estimated advantage[3] compared to the 2-socket servers based on the Intel® Xeon® processor E5-2600 product family. Data centers looking for ways to improve performance, reduce costs, and make maximum use of floor space now have a clear and compelling choice for new server purchases and refreshes.

One solution, multiple advantages

Based on a new Intel® microarchitecture and Intel's leading-edge 32nm process technology, the Intel® Xeon® processor E5-4600 product family provides a density- and cost-optimized 4-socket processor solution to extend the value of the Intel® Xeon® processor E5 family to 4-socket servers.

Excellent performance scaling

Compared to the Intel® Xeon® processor E5-2600 product family, the Intel® Xeon® processor E5-4600 product family doubles the processors, memory (48 DIMMs supporting up to 1.5 TB), and I/O (160 lanes of PCIe 3.0 based on 40 lanes per socket) for maximum capacity.

Achieve the right balance of performance and price

By using fewer servers to deliver equivalent performance, the Intel Xeon processor E5-4600 product family provides the following TCO advantages:

- Less server hardware to buy
- Reduced infrastructure and utilities costs. Factors reducing these costs include:
  - Fewer servers to power and cool
  - Excellent energy efficient performance
  - Up to 75 percent better density at rack level,[4,5] which saves valuable rack/floor space
- Fewer servers to maintain, which translates into lower maintenance costs
- Fewer operating system (OS) licenses to purchase and maintain

Read more at http://www.intel.in/content/www/in/en/processors/xeon/xeon-processor-5000-sequence.html

3rd Gen Intel® Core™ Processors for Business

The Ideal Choice to Meet Your Business Needs

3rd Gen Intel® Core™ i3 Processor - Reliable and adaptable

Start with the performance of a 3rd generation Intel® Core™ i3 processor-based PC for your business. Take advantage of this new generation processor that delivers incredible performance and effortless multitasking with Intel® Hyper-Threading Technology.[6] Enjoy savings with a suite of built-in visual enhancements – no extra hardware required.[7] With performance to keep pace with your business needs, an Intel® Core™ processor is designed and ready to work with you.

3rd Gen Intel® Core™ i5 Processor - A visibly smarter way to power your business

Step up to the performance of a 3rd generation Intel® Core™ i5 processor-based PC for your business. This new generation processor delivers incredible performance and a burst of speed when needed with Intel® Turbo Boost Technology 2.0.[8] Enjoy savings with a suite of built-in visual enhancements – no extra hardware needed to deliver stunning imagery.[7] Stay productive by avoiding slowdowns as you won't need to wait for your processor to catch up with you. With performance like this, the only thing more amazing than an Intel® Core™ processor is what your employees will do with it.

3rd Gen Intel® Core™ i7 Processor - Performance big enough for your business

Get top-of-the-line performance with a 3rd generation Intel® Core™ i7 processor-based PC for your business. Discover effortless multitasking with Intel® Hyper-Threading Technology and enjoy a burst of speed when needed with Intel® Turbo Boost Technology 2.0.[6,8] With a suite of built-in visual enhancements and Intel® Advanced Encryption Standard-New Instructions to help encrypt your data, you can increase your employees' productivity with confidence.[7,9,10] With responsive performance and incredible processing speed, an Intel® Core™ processor is the natural choice to power your business PCs.

Read more at http://www.intel.in/content/www/in/en/processors/core/core-processor-family.html

Desktop Roadmap Guidance

This latest Intel® architecture building block roadmap update¤ is intended to provide you with recommendations for your Desktop deployments.

Desktop Segment	Processor	Chipset	Processor No.	Clock Speed	Cache	FSB / QPI◊
Enthusiast Desktop	Intel® Core™ i7 Processor	Intel® C206/C216/X79 Chipset	Intel® Core™ i7 Processor 3000 Sequence	Up to 3.50 GHz	Up to 15 MB L3 Cache	N/A
Enterprise Managed Desktop	Intel® Core™ i5 Processor with vPro™ Technology	Intel® Q77 Chipset	Intel® Core™ i5 Processor 3000 Sequence	Up to 3.40 GHz	6 MB L3 Cache	N/A
Advanced Desktop	Intel® Core™ i3 Processor	Intel® 6 or 7 Series Chipset	Intel® Core™ i3 Processor 3000 Sequence	Up to 3.40 GHz	3 MB L3 Cache	N/A
Evolving Desktop	Intel® Pentium® Processor	Intel® 6 Series Express Chipset	Intel® Pentium® Processor G2000 Sequence	Up to 3.20 GHz	3 MB L3 Cache	N/A
Basic Desktop	Intel® Celeron® Processor	Intel® 6 Series Express Chipset	Intel® Celeron® Processor G1600 Sequence	Up to 2.70 GHz	2 MB L3 Cache	N/A
Entry Level Desktop	Intel® Atom™ Processor	Intel® NM10 Chipset	Intel® Atom™ Processor D2000 Sequence	Up to 1.86 GHz	Up to 1 MB	N/A

¤ Please refer to Desktop Reference Tables for getting the exact SKU information.

N/A - Not Applicable

Mobile Roadmap Guidance

This latest Intel® architecture building block roadmap update¤ is intended to provide you with recommendations for your Mobile deployments.

Mobile Segment	Processor	Chipset	Processor No.	Clock Speed	Cache	FSB	Wireless Solution
Portable Workstation	Intel® Core™ i7 Processor	Mobile Intel® 7 Series Chipset	i7-3700QM / i7-3800QM / i7-3900XM Series	Up to 3.00 GHz Base Freq.	Up to 8 MB L3 Cache	N/A	Intel® Centrino® 6000 Series (802.11 a/g/n)
Performance Notebook	Intel® Core™ i7 Processor with vPro™ Technology	Mobile Intel® QM77 Chipset	i7-3520M / i7-3740QM Processor	Up to 2.90 GHz Base Freq.	Up to 6 MB L3 Cache	N/A	Intel® Centrino® 6000 Series (802.11 a/g/n)
Mainstream Notebook	Intel® Core™ i5 Processor	Mobile Intel® 7 Series Chipset	i5-3300M Sequence	Up to 2.80 GHz Base Freq.	3 MB L3 Cache	N/A	Intel® Centrino® 6000 Series (802.11 a/g/n)
Ultrabook™	Intel® Core™ i5 / Core™ i7 Processor	Mobile Intel® 7 Series Chipset	i5-3437U, i7-3687U	Up to 2.10 GHz Base Freq.	Up to 4 MB L3 Cache	N/A	Intel® WiFi Link 6000 Series (802.11 a/g/n)
Small Form Factor (Less than 1.5KG Weight)	Intel® Core™ i5 / Core™ i7 Processor	Mobile Intel® 6 Series Chipset	i5-2557M, i7-2607M / i7-2609M Sequences	Up to 2.30 GHz Base Freq.	Up to 4 MB L3 Cache	N/A	Intel® WiFi Link 6000 Series (802.11 a/g/n)
Value Notebook	Intel® Celeron® Processor	Mobile Intel® 6 Series Chipset	B1000 Series Dual-Core Processor	Up to 2.10 GHz Base Freq.	2 MB L3 Cache	N/A	Intel® WiFi Link (802.11 b/g)
Netbook	Intel® Atom™ Processor	NM10	N2000 Processor Sequence	Up to 1.86 GHz Base Freq.	Up to 1 MB L2	N/A	Intel® WiFi Link (802.11 b/g)

¤ Please refer to Mobile Reference Tables for getting the exact SKU information.

N/A - Not Applicable

Server Roadmap Guidance

This latest Intel® architecture building block roadmap update¤ is intended to provide you with recommendations for your Server deployment.

Server Segment	Processor	Clock Speed	Cache	FSB / QPI[Φ]
High End Mission Critical	Intel® Itanium® Processor 9500 Series	Up to 2.53 GHz	Up to 32 MB L3 Cache	6.4 GT/sec QPI
Mainstream Mission Critical	Intel® Xeon® Processor E7-4800 / 8800 Series	Up to 2.67 GHz	Up to 30 MB L3 Cache	6.4 GT/sec QPI
High Density 4-skt Server	Intel® Xeon® Processor E5-4600 Series	Up to 2.90 GHz	Up to 20 MB L3 Cache	Up to 8 GT/sec QPI
Performance DP Server	Intel® Xeon® Processor E5-2600 Series	Up to 2.90 GHz	Up to 20 MB L3 Cache	Up to 8 GT/sec QPI
Mainstream DP Server	Intel® Xeon® Processor E5-2600 Series	Up to 2.90 GHz	Up to 15 MB L3 Cache	Up to 8 GT/sec QPI
Entry DP Server	Intel® Xeon® Processor E5-2400 Series	Up to 2.40 GHz	Up to 20 MB L3 Cache	Up to 8 GT/sec QPI
UP Server (1-skt)	Intel® Xeon® Processor E3-1200v2 Series	Up to 3.60 GHz	Up to 8 MB L3 Cache	N/A

¤ Please refer to Server Reference Tables for getting the exact SKU information.

N/A - Not Applicable

Intel® Xeon® Based Workstation Roadmap Guidance

This latest Intel® architecture building block roadmap update¤ is intended to provide you with recommendations for your Workstation deployment.

Workstation Segment	Processor	Clock Speed	Cache	FSB / QPI[Φ]
Performance DP Workstation	Intel® Xeon® Processor E5-2600 Series	Up to 3.10 GHz	Up to 20 MB L3 Cache	Up to 8 GT/sec QPI
Mainstream DP Workstation	Intel® Xeon® Processor E5-2600 Series	Up to 2.50 GHz	Up to 15 MB L3 Cache	Up to 7.2 GT/sec QPI
Entry DP Workstation	Intel® Xeon® Processor E5-2600 Series	Up to 2.40 GHz	Up to 10 MB L3 Cache	Up to 6.4 GT/sec QPI
Performance UP Workstation	Intel® Xeon® Processor E5-1600 Series	Up to 3.60 GHz	Up to 15 MB L3 Cache	N/A
Entry UP Workstation (1-skt)	Intel® Xeon® Processor E3-1200v2 Series	Up to 3.50 GHz	Up to 8 MB L3 Cache	N/A

¤ Please refer to Server Reference Tables for getting the exact SKU information.

N/A - Not Applicable

~ Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

Φ Intel® QuickPath Interconnect (Intel® QPI) unleashes the parallel processing performance of next-generation Intel® 45nm microarchitectures.

1 Requires near-field communication capability.

2. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. Performance claims sources: Up to 1.88x greater performance gains claim based on performance comparisons using best measured 130W TDP 2- and 4-socket server results on the SPECjbb*2005 benchmark as of 1 March 2012. (Source: TR#1228) Baseline 2-socket populated Intel® C606 Chipset-based customer reference server using two Intel® Xeon® processors E5-2680 (8C, 20M Cache, 2.7GHz, 8.0GT/s Intel QPI), 32GB memory (8x 4GB DDR3-1600 DIMMs), Microsoft Windows Server® 2008R2 Enterprise Edition, Oracle HotSpot® 64-bit Server VM build 20.0-v11 using Java® SE RE 1.6.0 Update 25. Score: 1,418,557 bops. New 4-socket populated Intel® C606 Chipset-based customer reference server with four Intel® Xeon® processors E5-4650 (8C, 20M Cache, 2.7GHz, 8.0GT/s Intel QPI), 128GB memory (16x 8GB DDR3-1600 DIMMs), Microsoft Windows Server® 2008R2 Enterprise Edition, Oracle HotSpot® 64-bit Server VM build 20.0-v11 using Java® SE RE 1.6.0 Update 25. Score: 2,663,768 bops. Up to 3.8x greater performance gains claim based on performance comparisons using best measured 2- and 4-socket server LINPACK MP benchmark results as of 1 March 2012. (Source: TR#1195) Baseline 1.0 – 2-socket server based on Intel Xeon processors X5690 (12M cache, 3.46GHz, 6.4GT/s Intel® QPI), 48GB memory (12x 4GB DDR3-1333). Score: 159.4 GFLOPS. Source: Intel SSG TR#1236. New 4-socket server based on Intel Xeon processor E5-4650 (20M cache, 2.7GHz, 8.0GT/s Intel QPI), 64GB memory (16x 4GB DDR3-1600). Score: 602 GFLOPS. Source: Intel SSG TR#1264.

3. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. Configuration assumptions: System memory 256GB memory configuration for both systems. OS = MS Windows 2008 R2 Enterprise Edition; no additional SW application or licensing costs included 4-Year TCO savings of up to 52% based on Intel estimates by comparing 100 2S Intel® Xeon® processor E5-2609-based servers to 32 4S Intel® Xeon® processor E5-4607-based servers that provide equivalent total server performance using Intel estimates of SPECint*_rate_base2006. The 4-year TCO savings based on: Intel estimate of server acquisition cost of $619,900 (100 servers at $6,199 each) for the 2S vs. $ 347,936 (32 servers at $10,873 each) for the 4S. 68 fewer servers in the data center results in server maintenance savings of $34,000 ($125 per server/year), infrastructure (network, rack/floor space and utility) savings of $88,941 ($327 per server/year) and OS license savings of $271,932 ($999 per server/year).

Desktop table - OEMs and other brands△

OEM	3rd Gen Intel® Core™ i5 and Core™ i7 Processor with vPro™ Technology based Desktops	3rd Gen Intel® Core™ i3/ i5/ i7 Processor based Desktops	Intel® Pentium® Processor based Desktops	All-in-One PCs
acer	Veriton* M200-Q77	Veriton M200-H61, Veriton M200-Q77, Veriton M200-B75	Veriton M200-H61 (G2020, G2120, G2130)	Veriton M200-H61 (G645, Core i3, Core i5)
DELL	Optiplex* 7010, 9010, 9010 AIO	Optiplex 3010, 7010, 9010, 9010 AIO, Vostro 470, 270, 270s	Optiplex 3010, 7010, 9010, 9010 AIO	Optiplex 9010 AIO
FUJITSU		ESPRIMO* E400 E85+, P510 E85+, P710 E90+, P910 0-Watt, Q510, P705 E85+		
HCL	Infiniti* M/L A400 Pro/ Tru - vPro based Desktops	Infiniti M/L A380 Pro/Tru, Infiniti M/L A390 Pro/Tru, Infiniti M/L A400 Pro/Tru	Infiniti M/L A380 Pro/Tru, Infiniti M/L A390 Pro/Tru, Infiniti M/L A400 Pro/Tru	Infiniti M/L A380 Pro/Tru - AIO (Intel 2nd Gen / 3rd Gen 18.5"), Infiniti M/L A410 Pro/Tru-AIO (Intel 2nd/3rd Gen 21.5")
hp	Elite* 8300	Pro* 3330, 4300, 6300, Elite 8300	Pro 3330, 4300, 6300, Elite 8300	Pro 4300, 6300, Elite 8300
lenovo	Thinkcentre*- M92P on Q77 chipset, M92z on Q77 chipset, Tiny on Q67 chipset	Thinkcentre M82 with Q75 chipset, M92p with Q77, Tiny on Q77chipset, M92z with Q67 chipset	M72e, Tiny with H61, M72z with H61, M62z with H61	M92Z, M72z, M62z
WIPRO	WSG 72105, WIV 72105	WSG 68105, WIV 68105, WSG 68B55, WIV 68B55, WSG 68E55, WIV 68E55, WSG 68C55, WIV 68C55, WSG 71255, WIV 71255, WSG 72305, WIV 72305	WSG 68105, WIV 68105, WSG 68B55, WIV 68B55, WSG 68E55, WIV 68E55, WSG 68C55, WIV 68C55, WSG 71255, WIV 71255, WSG 72305, WIV 72305, WSG 70105, WIV 70105, WSG 70205, WIV 70205	
ZENITH	Zenith* Corporate* PC Q77	Zenith Corporate PC H61, B75, H77	Zenith Corporate PC H61, B75	Zenith All in One PC, Zenith Smart Style Eco PC, Zenith Smart Style Ultimate PC

△ Model numbers and configurations of OEMs are subject to change without notice and may be available at their sole discretion

Notebook table - OEMs and other brands△

OEM	Business Ultrabooks™	3rd Gen Intel® Core™ i5 and Core™ i7 Processor with vPro™ Technology based Notebooks	3rd Gen Intel® Core™ i3/ i5/ i7 Processor based Notebooks	Intel® Pentium® Processor based Notebooks
acer	S3-391, S7-191, S7-391		Acer Aspire* E1-571, E1-571G,V3-571G, V5-471P, V5- 571, V5-571G, M3-581TG, M5-481T, V5-472P, V5-472, R7-571, R7-571G, V5-572P, V5-571P, V7-581, V5-572G, V5-572	Aspire V5-531, V5-431, E1-431, E1-531
DELL	Latitude* 6430u	Latitude E6430, E6530, E6230, E6330, E6430s, E6430ATG, E5430, E5530, 6430u	Latitude 6430u, E6430, E6530, E6230, E6330, E6430s, E6430ATG, E5430, E5530, Vostro 3460, 3560, 3360, 2420, 2520	Vostro* 2420, 2520
FUJITSU	LIFEBOOK* U772		LIFEBOOK LH531, AH531, P702, S752, S762, LH532, T901, NH532, UH572	LIFEBOOK LH531, AH532, AH531, LH532
HCL	HCL* Series 3074		Series 1065, Series 1064, Series 1055	Series 1044, Series 1024, Series 1085, Series 1114
hp	Folio* 13, Elitebook* 9470m	Elitebook 8x70p, 2170p, 2570p series, Elitebook 810 Revolve, Probook* 6x60b series	Envy Pro X2, Probook 4x40 s series, HP 450/650	HP Essential* 450/650 series
lenovo	Thinkpad X1 Carbon, T430U, X220t (Convertible)	Thinkpad* X230, L430, 530, T430, 430s, T530	Thinkpad* X230, X131e, L430, 530, T430, 430s, T530, T430, T530	X230, L430
SONY		SVE1413WPNB, SVE1413XPNB, SVE1413YPNB	3rd Gen - i3-3120, i5-3320, i7-3520	
TOSHIBA	Portege* Z930	Portege R930, Tecra R940, Tecra R950, Satellite Pro S850	Portege R930, Tecra R940, Tecra R950, Satellite Pro S850, Satellite Pro C840	
WIPRO	WNBIF47XXX		WNBHF47XXX	WNBHF49XXX

△ Model numbers and configurations of OEMs are subject to change without notice and may be available at their sole discretion

Server table - OEMs and other brands△

OEM	Intel® Xeon® Processor E3-1200 v2 Sequence based Servers (UP)	Intel® Xeon® Processor E5 Series based Servers	Intel® Xeon® Processor E7 based Expandable Servers	Intel® Itanium® Processor based Servers
acer	Acer* AT110 F2 based on Intel C202 (Pedestal Server), Acer AT310 F2 based on Intel C204 (Pedestal server, 4U Rack mountable), AR320 F2 based on Intel C204 (1U Rack Optimized Server)	Acer AT350 F2 (Pedestal Server 4U Rack mountable), AR360 F2 (1U Rack Optimized), AR380 F2 (2U Rack Optimized). All servers based on Intel C606 Chipset		
DELL	T110 II, R210 II	T320, T420, T620, R320, R420, R520, R620, R720, R720xd, R820, M420, M520, M620, M820, C6220, C8220	R910, M910	
FUJITSU	TX 100 S3, TX 140 S1, RX100 S7	RX200 S7, RX300 S7		
HCL	HCL IGL 1700/01 AE, HCL IGL 1700/01 CI, HCL IGL 1700/01 BP, HCL IGL 1700/01 BP-E, HCL IGL 1701 KP (Workstation), HCL IGL 1701 CW (Workstation)	HCL IGL 2700/01 CP, HCL IGL 2700/01 SP, HCL IGL 2700 GZ, HCL IGL 2700 JF, HCL IGL 2700/01 VC	HCL IGL 4700 PS	
hp	ML110G7, DL120G7	Gen 8 Server Series - E5-2400 series: HP ProLiant* BL420c, DL360e, DL380e, ML350e. E5-2600 series: HP ProLiant BL460c, DL160, DL360p, DL380p, ML350p, DL560, BL660	Bl620c G7, BL680c G7, DL 580 G7, DL980 G7	HP Integrity* Bl860c, Bl870c, rx2660, rx3600, rx6600, rx7640, rx8640, Superdome* NS1200, NS14200, NS16200, BL860c i2, BL870c i2, BL890c i2, rx2800 i2, Superdome 2 NS2000, NS5000-CG, NS3000, NB50000c, Nb50000c- CG, NB54000c, NS1200, NS14200, NS16200, NS5000CG, NS2000, NS2200, NB50000c, NB50000c-CG, NS2000T, NS2000ST, NS2200T, NS2200ST, NB54000c, NB54000c-CG
IBM	IBM* Tower: x3100M4, IBM Rack: x3250M4	IBM Tower: x3300M4, x3500M4, IBM Rack: x3630M4, x3650M4, x3530M4, x3550M4, x3750M4, IBM Blade: HS23, HS23E, x220, x240, x440	IBM Rack: x3690X5, x3850X5, IBM Blade: HX5	
WIPRO	Z1550, Z1551, Z1160, Z1260, Z1560	Wipro* netPower* Z2255, Z2262, Z2263, Z2264, Z2165, Z2271, Z2272, Z2551, Z2553, ZZ2561, Z2562, Z2563, Z2564, Z4284, Z8283	Wipro netpower Z4460 (4 socket), Wipro netpower Z4470 (4 socket), Wipro netpower Z8601 (8 socket)	

△ Model numbers and configurations of OEMs are subject to change without notice and may be available at their sole discretion

DESKTOP PCs

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Base Frequency (GHz)	Intel® Turbo Boost Technology[8] - Max Turbo (GHz)	Memory Speed DDR3 only (MHz)	Cache	Cores / Threads	Power (Max TDP)	Intel® Technologies			
								Intel® VT[11]	Intel® HD Graphics	Intel® 64[12]	Intel® vPro™ Technology[13, ¥]
	3rd Generation Intel® Core™ Processor Family (22nm)										
intel inside CORE i7	i7-3770K	3.50	3.90	1600/1333	8 MB L3	4/8	77W	✓	✓	✓	
	i7-3770	3.40	3.90	1600/1333	8 MB L3	4/8	77W	✓	✓	✓	✓
	i5-3570K	3.40	3.80	1600/1333	6 MB L3	4/4	77W	✓	✓	✓	
	i5-3570	3.40	3.80	1600/1333	6 MB L3	4/4	77W	✓	✓	✓	✓
	i5-3550	3.30	3.70	1600/1333	6 MB L3	4/4	77W	✓	✓	✓	✓
	i5-3470	3.20	3.60	1600/1333	6 MB L3	4/4	77W	✓	✓	✓	✓
	i7-3770S	3.10	3.90	1600/1333	8 MB L3	4/8	65W	✓	✓	✓	✓
	i7-3770T	2.50	3.70	1600/1333	8 MB L3	4/8	45W	✓	✓	✓	✓
	i5-3570S	3.10	3.80	1600/1333	6 MB L3	4/4	65W	✓	✓	✓	✓
	i5-3570T	2.30	3.30	1600/1333	6 MB L3	4/4	45W	✓	✓	✓	✓
intel inside CORE i5	i5-3550S	3.00	3.70	1600/1333	6 MB L3	4/4	65W	✓	✓	✓	✓
	i5-3475S	2.90	3.60	1600/1333	6 MB L3	4/4	65W	✓	✓	✓	✓
	i5-3470S	2.90	3.60	1600/1333	6 MB L3	4/4	65W	✓	✓	✓	✓
	i5-3450S	2.80	3.50	1600/1333	6 MB L3	4/4	65W	✓	✓	✓	
	i5-3470T	2.90	3.60	1600/1333	3 MB L3	2/4	35W	✓	✓	✓	✓
	i5-3350P	3.10	3.30	1600/1333	6 MB L3	4/4	69W	✓		✓	
	i5-3335S	2.70	3.20	1600/1333	6 MB L3	4/4	65W	✓	✓	✓	
	i5-3330	3.00	3.20	1600/1333	6 MB L3	4/4	77W	✓	✓	✓	
	i5-3330S	2.70	3.20	1600/1333	6 MB L3	4/4	65W	✓	✓	✓	
	i3-3240	3.40	NA	1600/1333	3 MB L3	2/4	55W	✓	✓	✓	
intel inside CORE i3	i3-3240T	2.90	NA	1600/1333	3 MB L3	2/4	35W	✓	✓	✓	
	i3-3225	3.30	NA	1600/1333	3 MB L3	2/4	55W	✓	✓	✓	
	i3-3220	3.30	NA	1600/1333	3 MB L3	2/4	55W	✓	✓	✓	
	i3-3220T	2.80	NA	1600/1333	3 MB L3	2/4	35W	✓	✓	✓	

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Front Side Bus (MHz)	Cache	Cores / Threads	Power (Max TDP)	Intel® Technologies			
							Intel® VT[11]	Enhanced Intel SpeedStep® Technology	Intel® 64[12]	Execute Disable Bit[14]
	Intel® Atom™ Processors									
intel Atom inside	D2550	1.86	NA	1 MB L2	2/4	10W			✓	
	D2500	1.86	NA	1 MB L2	2/2	10W			✓	✓

¥ Need other compatible components like chipset and firmware

DESKTOP PCs

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Base Frequency (GHz)	Intel® Turbo Boost Technology[8] - Max Turbo (GHz)	Memory Speed DDR3 only (MHz)	Cache	Cores / Threads	Power (Max TDP)	Intel® Technologies			
								Intel® VT[11]	Intel® HD Graphics	Intel® 64[12]	Intel® vPro™ Technology[13, ¥]
	2nd Generation Intel® Core™ Processor Family (32nm)										
	i7-3970X	3.50	4.00	1600/1333	15 MB L3	6/12	150W	✓		✓	
	i7-3960X	3.30	3.90	1600/1333	15 MB L3	6/12	130W	✓		✓	
	i7-3930K	3.20	3.80	1600/1333	12 MB L3	6/12	130W	✓		✓	
	i7-3820	3.60	3.80	1600/1333	10 MB L3	4/8	130W	✓		✓	
	Intel® Celeron® Processor Family (32nm)										
	847	1.10	NA	1333/1066	2 MB L3	2/2	17W	✓		✓	
	807	1.50	NA	1333/1066	1.5MB L3	1/2	17W	✓	✓	✓	
	Intel® Pentium® Processor Family (22nm)										
	G2130	3.20	NA	1333/1600	3 MB L3	2/2	55W	✓	✓	✓	
	G2120	3.10	NA	1333/1600	3 MB L3	2/2	55W	✓	✓	✓	
	G2020	2.90	NA	1333	3 MB L3	2/2	55W	✓	✓	✓	
	G2010	2.80	NA	1333	3 MB L3	2/2	55W	✓	✓	✓	
	Intel® Celeron® Processor Family (22nm)										
	G1620	2.70	NA	1333	2 MB L3	2/2	55W	✓	✓	✓	
	G1610	2.60	NA	1333	2 MB L3	2/2	55W	✓	✓	✓	

¥ Need other compatible components like chipset and firmware

NOTEBOOKS

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Base Frequency (GHz)	Intel® Turbo Boost Technology[8] - Max Turbo (GHz)	Memory Speed DDR3 only (MHz)	Cache	Cores / Threads	Power (Max TDP)	Intel® Technologies		
								Intel® VT[11]	Intel® HD Graphics	Intel® vPro™ Technology[13, ¥]
	3rd Generation Intel® Core™ i7 and i5 - Ultra Processors (22nm)									
	i7-3689Y	1.50	2.60	1600	4 MB L3	2/4	13W	✓	✓	✓
	i7-3687U	2.10	3.30	1600	4 MB L3	2/4	17W	✓	✓	✓
	i5-3439Y	1.50	2.30	1600	3 MB L3	2/4	13W	✓	✓	✓
	i5-3437U	1.90	2.90	1600	3 MB L3	2/4	17W	✓	✓	✓
	3rd Generation Intel® Core™ i7 and i5 - DC Power Optimized Performance Processors (22nm)									
	i7-3540M	3.00	3.70	1600	4 MB L3	2/4	35W	✓	✓	✓
	i7-3520M	2.90	3.60	1600	4 MB L3	2/4	35W	✓	✓	✓
	i5-3380M	2.90	3.60	1600	3 MB L3	2/4	35W	✓	✓	✓
	i5-3360M	2.80	3.50	1600	3 MB L3	2/4	35W	✓	✓	✓
	i5-3340M	2.70	3.40	1600	3 MB L3	2/4	35W	✓	✓	✓
	3rd Generation Intel® Core™ i7 - Extreme Edition and QC Performance Processors (22nm)									
	i7-3940XM	3.00	3.90	1600	8 MB L3	4/8	55W	✓	✓	✓
	i7-3920XM	2.90	3.80	1600	8 MB L3	4/8	55W	✓	✓	✓
	i7-3840QM	2.80	3.80	1600	8 MB L3	4/8	45W	✓	✓	✓
	i7-3820QM	2.70	3.70	1600	8 MB L3	4/8	45W	✓	✓	✓
	i7-3740QM	2.70	3.70	1600	6 MB L3	4/8	45W	✓	✓	✓
	i7-3720QM	2.60	3.60	1600	6 MB L3	4/8	45W	✓	✓	✓
	2nd Generation Intel® Core™ i7 Extreme Edition, Intel® Core™ i7 and i5 Processors (32nm)									
	i7-2960XM	2.70	3.70	1600	8 MB L3	4/8	55W	✓	✓	✓
	i7-2640M	2.80	3.50	1333	4 MB L3	2/4	35W	✓	✓	✓
	i5-2540M	2.60	3.30	1333	3 MB L3	2/4	35W	✓	✓	✓
	i5-2520M	2.50	3.20	1333	3 MB L3	2/4	35W	✓	✓	✓

NOTEBOOKS

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Base Frequency (GHz)	Intel® Turbo Boost Technology[8] - Max Turbo (GHz)	Memory Speed DDR3 only (MHz)	Cache	Cores / Threads	Power (Max TDP)	Intel® Technologies		
								Intel® VT[11]	Intel® HD Graphics	Intel® vPro™ Technology[13, ¥]
	Intel® Celeron® Processors (22nm)									
	1037U	1.80	NA	1600	2 MB L3	2/2	17W	✓	✓	
	1020M	2.10	NA	1600	2 MB L3	2/2	35W	✓	✓	
	1007U	1.50	NA	1600	2 MB L3	2/2	17W	✓	✓	
	1000M	1.80	NA	1600	2 MB L3	2/2	35W	✓	✓	
	Intel® Celeron® Processors (32nm)									
	B840	1.90	NA	1333	2 MB L3	2/2	35W	✓	✓	
	B830	1.80	NA	1333	2 MB L3	2/2	35W	✓	✓	
	B800	1.50	NA	1333	2 MB L3	2/2	35W	✓	✓	
	B730	1.80	NA	1333	1.5 MB L3	1/2	35W	✓	✓	
	887	1.50	NA	1333	2 MB L3	2/2	17W	✓	✓	
	877	1.40	NA	1333	2 MB L3	2/2	17W	✓	✓	

¥ Need other compatible components like chipset and firmware

SERVERS

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Max Turbo Clock Speed (GHz)	Memory Speed DDR3 only (MHz)	Cache	Intel® QPI$^{\Phi}$ (GT/Sec)	Cores / Threads	Power (Max TDP)	System Type$^{\Omega}$
	Intel® Itanium® Processor 9000 Sequence~								
	9560	2.53	2.53	1067	32 MB L3	6.40	8/16	170W	MP
	9550	2.40	2.40	1067	32 MB L3	6.40	4/8	170W	MP
	9540	2.13	2.13	1067	24 MB L3	6.40	8/16	170W	MP
	9520	1.73	1.73	1067	20 MB L3	6.40	4/8	130W	MP
	9350	1.73	1.86	800	24 MB L3	4.80	4/8	185W	MP
	9340	1.60	1.73	800	20 MB L3	4.80	4/8	185W	MP
	9330	1.46	1.60	800	20 MB L3	4.80	4/8	155W	MP
	9320	1.33	1.46	800	16 MB L3	4.80	4/8	155W	MP
	9310	1.60		800	10 MB L3	4.80	2/4	130W	MP

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Max Turbo Clock Speed (GHz)	Memory Speed DDR3 only (MHz)	Cache	Intel® QPI$^{\Phi}$ (GT/Sec)	Cores / Threads	Power (Max TDP)	System Type$^{\Omega}$
	Intel® Xeon® Processor E7-8800/4800/2800 Sequence~								
	E7-8870	2.40	2.80	1066	30 MB L3	6.40	10/20	130W	Up to 8 Processors
	E7-8860	2.26	2.66	1066	24 MB L3	6.40	10/20	130W	Up to 8 Processors
	E7-8850	2.00	2.40	1066	24 MB L3	6.40	10/20	130W	Up to 8 Processors
	E7-8830	2.13	2.40	1066	24 MB L3	6.40	8/16	105W	Up to 8 Processors
	E7-8867L	2.13	2.53	1066	30 MB L3	6.40	10/20	105W	Up to 8 Processors
	E7-8837	2.66	2.80	1066	24 MB L3	6.40	8/8	130W	Up to 8 Processors
	E7-4870	2.40	2.80	1066	30 MB L3	6.40	10/20	130W	Up to 4 Processors
	E7-4860	2.26	2.66	1066	24 MB L3	6.40	10/20	130W	Up to 4 Processors
	E7-4850	2.00	2.40	1066	24 MB L3	6.40	10/20	130W	Up to 4 Processors
	E7-4830	2.13	2.40	1066	24MB L3	6.40	8/16	105W	Up to 4 Processors
	E7-4820	2.00	2.26	978‡	18 MB L3	5.86	8/16	105W	Up to 4 Processors
	E7-4807	1.86		800‡	18 MB L3	4.80	6/12	95W	Up to 4 Processors
	E7-2870	2.40	2.80	1066	30 MB L3	6.40	10/20	130W	Up to 2 Processors
	E7-2860	2.26	2.66	1066	24 MB L3	6.40	10/20	130W	Up to 2 Processors
	E7-2850	2.00	2.40	1066	24 MB L3	6.40	10/20	130W	Up to 2 Processors
	E7-2830	2.13	2.40	1066	24MB L3	6.40	8/16	105W	Up to 2 Processors
	E7-2820	2.00	2.26	978‡	18 MB L3	5.86	8/16	105W	Up to 2 Processors only
	E7-2803	1.73		800‡	18 MB L3	4.80	6/12	105W	Up to 2 Processors only

‡ 1066 Mhz frequency runs at an effective frequency of 978 Mhz when run at 5.86GHz SMI link speed

Φ Intel® QuickPath Interconnect (Intel® QPI) unleashes the parallel processing performance of next-generation Intel® 45nm microarchitectures.

Ω Scalability mentioned is with Intel Chipsets Only. OEMs can use their proprietary Node Controls to enhance the scalability

SERVERS

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Max Turbo Clock Speed (GHz)	Memory Speed DDR3 only (MHz)	Cache	Intel® QPI Φ (GT/Sec)	Cores / Threads	Power (Max TDP)	System Type
	Intel® Xeon® Processor E5-4600 Sequence~								
	E5-4650	2.70	3.30	1600/1333/1066/800	20MB L3	8.00	8/16	130W	Up to 4 Processors
	E5-4650L	2.60	3.10	1600/1333/1066/800	20MB L3	8.00	8/16	115W	Up to 4 Processors
	E5-4640	2.40	2.80	1600/1333/1066/800	20MB L3	8.00	8/16	95W	Up to 4 Processors
	E5-4620	2.20	2.60	1333/1066/800	16MB L3	7.20	8/16	95W	Up to 4 Processors
	E5-4617	2.90	3.40	1600/1333/1066/800	15MB L3	7.20	6/6	130W	Up to 4 Processors
	E5-4610	2.40	2.90	1333/1066/800	15MB L3	7.20	6/12	95W	Up to 4 Processors
	E5-4607	2.20		1066/800	12MB L3	6.40	6/12	95W	Up to 4 Processors
	E5-4603	2.00		1066/800	10MB L3	6.40	4/8	95W	Up to 4 Processors
	Intel® Xeon® Processor E5-2600 and E5-1600 Sequence~								
	E5-2690	2.90	3.80	1600/1333/1066/800	20MB L3	8.00	8/16	135W	DP
	E5-2687W«	3.10	3.80	1600/1333/1066/800	20MB L3	8.00	8/16	150W	DP
	E5-2680	2.70	3.50	1600/1333/1066/800	20MB L3	8.00	8/16	130W	DP
	E5-2670	2.60	3.30	1600/1333/1066/800	20MB L3	8.00	8/16	115W	DP
	E5-2667	2.90	3.50	1600/1333/1066/800	15MB L3	8.00	6/12	130W	DP
	E5-2665	2.40	3.10	1600/1333/1066/800	20MB L3	8.00	8/16	115W	DP
	E5-2660	2.20	3.00	1600/1333/1066/800	20MB L3	8.00	8/16	95W	DP
	E5-2650	2.00	2.80	1600/1333/1066/800	20MB L3	8.00	8/16	95W	DP
	E5-2650L	1.80	2.30	1600/1333/1066/800	20MB L3	7.20	8/16	70W	DP
	E5-2643	3.30	3.50	1600/1333/1066/800	10MB L3	8.00	4/8	130W	DP
	E5-2640	2.50	3.00	1333/1066/800	15MB L3	7.20	6/12	95W	DP
	E5-2637	3.00	3.50	1600/1333/1066/800	5MB L3	8.00	2/4	80W	DP
	E5-2630	2.30	2.80	1333/1066/800	15MB L3	7.20	6/12	95W	DP
	E5-2630L	2.00	2.50	1333/1066/800	15MB L3	7.20	6/12	60W	DP
	E5-2620	2.00	2.50	1333/1066/800	15MB L3	7.20	6/12	95W	DP
	E5-2609	2.40		1066/800	10MB L3	6.40	4/4	80W	DP
	E5-2603	1.80		1066/800	10MB L3	6.40	4/4	80W	DP
	E5-1660	3.30	3.90	1600/1333/1066/800	15MBL3		6/12	130W	UP
	E5-1650	3.20	3.80	1600/1333/1066/800	12MBL3		6/12	130W	UP
	E5-1620	3.60	3.80	1600/1333/1066/800	10MBL3		4/8	130W	UP

« Workstation only SKU

Φ Intel® QuickPath Interconnect (Intel® QPI) unleashes the parallel processing performance of next-generation Intel® 45nm microarchitectures.

SERVERS

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Max Turbo Clock Speed (GHz)	Memory Speed DDR3 only (MHz)	Cache	Intel® QPI Φ (GT/Sec)	Cores / Threads	Power (Max TDP)	System Type
	Intel® Xeon® Processor E5-2400 Sequence~								
	E5-2470	2.30	3.10	1600/1333/1066/800	20MB L3	8.00	8/16	95W	Up to 2 Processors
	E5-2450	2.10	2.90	1600/1333/1066/800	20MB L3	8.00	8/16	95W	Up to 2 Processors
	E5-2450L	1.80	2.30	1600/1333/1066/800	20MB L3	8.00	8/16	70W	Up to 2 Processors
	E5-2440	2.40	2.90	1333/1066/800	15MB L3	7.20	6/12	95W	Up to 2 Processors
	E5-2430	2.20	2.70	1333/1066/800	15MB L3	7.20	6/12	95W	Up to 2 Processors
	E5-2430L	2.00	2.50	1333/1066/800	15MB L3	7.20	6/12	60W	Up to 2 Processors
	E5-2420	1.90	2.40	1333/1066/800	15MB L3	7.20	6/12	95W	Up to 2 Processors
	E5-2407	2.20		1066/800	10MB L3	6.40	4/4	80W	Up to 2 Processors
	E5-2403	1.80		1066/800	10MB L3	6.40	4/4	80W	Up to 2 Processors

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Max Turbo Clock Speed (GHz)	Memory Speed DDR3 only (MHz)	Cache	Cores / Threads	Power (Max TDP)	System Type
	Intel® Xeon® Processor E3-1200v2 Sequence~							
	E3-1290 v2»	3.70	4.10	1600/1333	8 MB L3	4/8	87W	UP
	E3-1280 v2	3.60	4.00	1600/1333	8 MB L3	4/8	69W	UP
	E3-1270 v2	3.50	3.90	1600/1333	8 MB L3	4/8	69W	UP
	E3-1265L v2	2.50	3.50	1600/1333	8 MB L3	4/8	45W	UP
	E3-1240 v2	3.40	3.80	1600/1333	8 MB L3	4/8	69W	UP
	E3-1230 v2	3.30	3.70	1600/1333	8 MB L3	4/8	69W	UP
	E3-1220 v2	3.10	3.50	1600/1333	8 MB L3	4/4	69W	UP
	E3-1220L v2	2.30	3.50	1600/1333	3 MB L3	2/4	17W	UP
	E3-1275 v2	3.50	3.90	1600/1333	8 MB L3	4/8	77W	UP
	E3-1245 v2	3.40	3.80	1600/1333	8 MB L3	4/8	77W	UP
	E3-1225 v2	3.20	3.60	1600/1333	8 MB L3	4/4	77W	UP

» Requires high efficiency heatsink capable of maintaining 85˚C Tcase

Φ Intel® QuickPath Interconnect (Intel® QPI) unleashes the parallel processing performance of next-generation Intel® 45nm microarchitectures.

SERVERS

Intel® processor reference chart

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Max Turbo Clock Speed (GHz)	Memory Speed DDR3 only (MHz)	Cache	Intel® QPI◊ (GT/Sec)	Cores / Threads	Power (Max TDP)	System Type
	Intel® Xeon® Processor 3500 Sequence~								
	W3580	3.33	3.60	1333/1066/800	8 MB◊ L3	6.40	4/8	130W	UP
	W3565	3.20	3.46	1066/800	8 MB◊ L3	4.80	4/8	130W	UP
	W3550	3.06	3.33	1066/800	8 MB◊ L3	4.80	4/8	130W	UP
	W3530	2.80	3.06	1066/800	8 MB◊ L3	4.80	4/8	130W	UP
	W3520	2.66	2.93	1066/800	8 MB◊ L3	4.80	4/8	130W	UP

Intel® Brand or Processor Family	Processor Number	Clock Speed (GHz)	Max Turbo Clock Speed (GHz)	GDDR5 Memory Speed (GT/s)	Cache	Cores	Board TDP (Watts)	System Type
	Intel® Xeon Phi™ Coprocessor Sequence~							
	5110P	1.053	NA	5.0	30 MB	60	225W	

Φ Intel® QuickPath Interconnect (Intel® QPI) unleashes the parallel processing performance of next-generation Intel® 45nm microarchitectures.
◊ Intel® Smart Cache provides a higher-performance, more-efficient cache subsystem. Optimized for industry-leading multi-threaded applications.

4. Intel internal assessment compared to Intel Xeon processor E5-2600 v2 product family.
5. Assumes maximum density for 2-socket platforms achieved in 1U form factor; maximum density for 4-socket platforms achieved in 2U form factor.
6. Available on select Intel® Core™ processors. Requires an Intel® Hyper-Threading Technology (Intel® HT Technology) enabled system. Consult your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information including details on which processors support HT Technology, visit www.intel.com/content/www/us/en/architecture-and-technology/hyper-threading/hyper-threading-technology.html.
7. Built-in visual features are not enabled on all PCs, and optimized software may be required. Check with your system manufacturer. Learn more at www.intel.com/content/www/us/en/architecture-and-technology/visual-technology/intel-visual-technology-consumer.html.
8. Requires a system with Intel® Turbo Boost Technology capability. Intel Turbo Boost Technology 2.0 is the next generation of Intel Turbo Boost Technology and is available only on select Intel® processors. Consult your PC manufacturer. Performance varies depending on hardware, software and system configuration. For more information, visit www.intel.com/content/www/us/en/architecture-and-technology/turbo-boost/turbo-boost-technology.html.
9. Intel® AES New Instructions (Intel® AES-NI) requires a computer system with an Intel® AES-NI-enabled processor, as well as non-Intel software to execute the instructions in the correct sequence. Intel® AES-NI is available on select Intel® processors. For availability, consult your reseller or system manufacturer. For more information, see http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni.
10. Cross-client claim based on lowest performance data number when comparing desktop and mobile benchmarks. Configurations and performance test as follows: (Mobile) Comparing pre-production 3rd generation Intel® Core™ i5-3320M Processor (4T2C, 3MB cache, up to 3.20 GHz), Intel Reference Board, pre-production BIOS, Memory 8 GB (2x4 GB) Micron* PC3-12800, Hitachi* Travelstar 320 GB hard-disk drive, Intel® HD Graphics 4000, Driver pre-production 8.15.10.2616 , Chipset INF pre-production 9.3.0.1019. Intel® Core™2 Duo Processor P8600 (2T2C, 3M cache, 2.40 GHz, 1066 MHz FSB), HP* dv6, BIOS HP* vF.31, Memory 4 GB (2x2 GB) Micron* PC3-8500, Hitachi* 320 GB hard-disk drive, Mobile Intel® GM45 Chipset Family w/ integrated graphics Driver: 8.15.10.1749, Chipset INF 9.2.0.1030, Microsoft Windows* 7 Ultimate 64-bit 6.1 Build 7601 (Desktop) Comparing pre-production 3rd generation Intel® Core™ i5-3450 Processor (4T4C, 6 MB cache, 3.1GHz base up to 3.5GHz), Intel® Desktop Board DH77KC, Memory 8 GB (2x4 GB) Micron* DDR3-1600, Seagate* 1 TB, Intel® HD Graphics 2500, Driver: 8.15.10.2616 (BIOS:vSLZ7510H.86A.0033.2011.1230.1146, Chipset INF 9.3.0.1019, Intel® Core™ 2 Duo E8400 (2C2T, 3.0GHz, 6MB cache), Memory 4 GB (2x2 GB) Micron* DDR2 800 MHz, Seagate* 1TB hard-disk drive, Intel® G45, Driver: 8.15.10.2189, BIOS:IDG4510H.86A.0135.2011.0225.1100, INF), Microsoft Windows* 7 Ultimate 64-bit 6.1 Build 7601 Business productivity claims based on SYSmark* 2012, which is the mainstream office productivity, data/financial analysis, system management, media creation, 3D modeling, and web development benchmark tool used to characterize the performance of the business client. SYSmark 2012 features user-driven workloads and usage models developed by application experts. Multitasking claims based on PCMark* 7, a hardware performance benchmark for PCs running Microsoft Windows* 7, includes a collection of various single- and multi-threaded CPU, graphics, and HDD test sets with a focus on Windows* application tests. Encryption workload consists of SiSoftware Sandra* 2011—AES256 CPU Cryptographic subtest measures CPU performance while executing AES (Advanced Encryption Standard) encryption and decryption algorithm. For more information go to http://www.intel.com/performance.
11. Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, and virtual machine monitor (VMM). Functionality, performance or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit http://www.intel.com/go/virtualization.
12. 64-bit computing on Intel® architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Consult with your system vendor for more information.
13. Intel® vPro™ technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software, and IT environments. To learn more visit: www.intel.com/content/www/us/en/architecture-and-technology/vpro/vpro-technology-general.html.
14. Enabling Execute Disable Bit functionality requires a PC with a processor with Execute Disable Bit capability and a supporting operating system. Check with your PC manufacturer on whether your system delivers Execute Disable Bit functionality.

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