Overview of Intel Xeon E5 / 5600 and Core i7 series processors

All information from www.intel.com.

	Intel® Xeon® Processor E5-2690 (20M Cache, 2.90 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2687W (20M Cache, 3.10 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2680 (20M Cache, 2.70 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2670 (20M Cache, 2.60 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2667 (15M Cache, 2.90 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2665 (20M Cache, 2.40 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2660 (20M Cache, 2.20 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2650L (20M Cache, 1.80 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2650 (20M Cache, 2.00 GHz, 8.00 GT/s Intel® QPI)
Code Name	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP
Essentials									
Status	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched
Launch Date	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12
Processor Number	E5-2690	E5-2687W	E5-2680	E5-2670	E5-2667	E5-2665	E5-2660	E5-2650L	E5-2650
# of Cores	8	8	8	8	6	8	8	8	8
# of Threads	16	16	16	16	12	16	16	16	16
Clock Speed	2.9 GHz	3.1 GHz	2.7 GHz	2.6 GHz	2.9 GHz	2.4 GHz	2.2 GHz	1.8 GHz	2 GHz
Max Turbo Frequency	3.8 GHz	3.8 GHz	3.5 GHz	3.3 GHz	3.5 GHz	3.1 GHz	3 GHz	2.3 GHz	2.8 GHz
Cache	20 MB	20 MB	20 MB	20 MB	15 MB	20 MB	20 MB	20 MB	20 MB
Bus/Core Ratio	38	38	35	33	35	31	30	23	28
Bus Type	QPI	QPI	QPI	QPI	QPI	QPI	QPI	QPI	QPI
System Bus	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s	8 GT/s
# of QPI Links	2	2	2	2	2	2	2	2	2
Instruction Set	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit
Instruction Set Extensions	AVX	AVX	AVX	AVX	AVX	AVX	AVX	AVX	AVX
Embedded Options Available	No	No	No	No	No	No	No	No	No
Lithography	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm
Scalability	2S Only	2S Only	2S Only	2S Only	2S Only	2S Only	2S Only	2S Only	2S Only
Max TDP	135 W	150 W	130 W	115 W	130 W	115 W	95 W	70 W	95 W
VID Voltage Range	0.60V-1.35V	0.60V - 1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V
Recommended Customer Price	•	•	•	•	•	•	•	•	•
Memory Specifications									
Max Memory Size (dependent on memory type)	750 GB	750 GB	750 GB	750 GB	750 GB	750 GB	750 GB	750 GB	750 GB
Memory Types	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600	DDR3-800/1066/1333/1600
# of Memory Channels	4	4	4	4	4	4	4	4	4
Max Memory Bandwidth	51.2 GB/s	51.2 GB/s	51.2 GB/s	51.2 GB/s	51.2 GB/s	51.2 GB/s	51.2 GB/s	51.2 GB/s	51.2 GB/s
Physical Address Extensions	•	•	•	•	•	•	•	•	•
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Graphics Specifications									
Integrated Graphics				Graphics may not be available on all computing systems. Please reference the system, motherboard or chipset specifications for compatibility.					
Processor Graphics	•	•	•	•	•	•	•	•	•
Graphics Model	•	•	•	•	•	•	•	•	•
Graphics Base Frequency	•	•	•	•	•	•	•	•	•
Graphics Max Dynamic Frequency	•	•	•	•	•	•	•	•	•
Graphics Output	•	•	•	•	•	•	•	•	•
Intel® Quick Sync Video	•	•	•	•	•	•	•	•	•
Intel® InTru™ 3D Technology	•	•	•	•	•	•	•	•	•
Intel® Insider™	•	•	•	•	•	•	•	•	•
Intel® Wireless Display	•	•	•	•	•	•	•	•	•
Intel® Flexible Display Interface (Intel® FDI)	•	•	•	•	•	•	•	•	•
Intel® Clear Video HD Technology	•	•	•	•	•	•	•	•	•
Dual Display Capable	•	•	•	•	•	•	•	•	•
Macrovision* License Required	•	•	•	•	•	•	•	•	•
Expansion Options									
PCI Express Revision	•	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PCI Express Configurations	•	•	•	•	•	•	•	•	•
# of PCI Express Ports	•	•	40	•	40	40	40	40	40
Package Specifications									
Max CPU Configuration	2	2	2	2	2	2	2	2	2
TCASE	72.0 °C	67°C	85°C	81.8°C	85.0°C	81.8°C	77.4°C	72.0°C	77.4°C
TJUNCTION	88.2°C	84.8°C							
Package Size	52.5mm x 45.0 mm	52.5mm x 45.0 mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm
Graphics and IMC Lithography	•	•	•	•	•	•	•	•	•
Sockets Supported	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011
Low Halogen Options Available	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS
Advanced Technologies									
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Intel® vPro Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Demand Based Switching	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Fast Memory Access	•	•	•	•	•	•	•	•	•
Intel® Flex Memory Access	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Overview of Intel Xeon E5 / 5600 and Core i7 series processors

All information from www.intel.com.

	Intel® Xeon® Processor E5-2643 (10M Cache, 3.30 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2640 (15M Cache, 2.50 GHz, 7.20 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2637 (5M Cache, 3.00 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2630L (15M Cache, 2.00 GHz, 8.00 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2630 (15M Cache, 2.30 GHz, 7.20 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2620 (15M Cache, 2.00 GHz, 7.20 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2609 (10M Cache, 2.40 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor E5-2603 (10M Cache, 1.80 GHz, 6.40 GT/s Intel® QPI)	
Code Name	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	Sandy Bridge-EP	
Essentials									
Status	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched	•
Launch Date	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	Q1'12	
Processor Number	E5-2643	E5-2640	E5-2637	E5-2630L	E5-2630	E5-2620	E5-2609	E5-2603	
# of Cores	4	6	2	6	6	6	4	4	
# of Threads	8	12	4	12	12	12	4	4	
Clock Speed	3.3 GHz	2.5 GHz	3 GHz	2 GHz	2.3 GHz	2 GHz	2.4 GHz	1.8 GHz	
Max Turbo Frequency	3.5 GHz	3 GHz	3.5 GHz	2.5 GHz	2.8 GHz	2.5 GHz			
Cache	10 MB	15 MB	5 MB	15 MB	15 MB	15 MB	10 MB	10 MB	
Bus/Core Ratio	35	30	35	25	28	25	24	18	
Bus Type	QPI	QPI	QPI	QPI	QPI	QPI	QPI	QPI	
System Bus	8 GT/s	7.2 GT/s	8 GT/s	8 GT/s	7.2 GT/s	7.2 GT/s	6.4 GT/s	6.4 GT/s	
# of QPI Links	2	2	2	2	2	2	2	2	
Instruction Set	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	
Instruction Set Extensions	AVX	AVX	AVX	AVX	AVX	AVX	AVX	AVX	
Embedded Options Available	No	No	No	No	No	Yes	No	No	
Lithography	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	
Scalability	2S Only	2S Only	2S Only	2S Only	2S Only	2S Only	2S Only	2S Only	•
Max TDP	130 W	95 W	80 W	60 W	95 W	95 W	80 W	80 W	
VID Voltage Range	0.60V-1.35V	0.60V-1.35V	0.6V - 1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V	0.60V-1.35V	•
Recommended Customer Price	•	•	•	•	•	•	•	•	
Memory Specifications									
Max Memory Size (dependent on memory type)	750 GB	750 GB	750 GB	750 GB	750 GB		750 GB	750 GB	
Memory Types	DDR3-800/1066/1333/1600	DDR3-800/1066/1333	DDR3-800/1066/1333/1600	DDR3-800/1066/1333	DDR3-800/1066/1333		DDR3-800/1066	DDR3-800/1066	
# of Memory Channels	4	4	4	4	4	4	4	4	
Max Memory Bandwidth	51.2 GB/s	42.6 GB/s	51.2 GB/s	42.6 GB/s	42.6 GB/s		34.1 GB/s	34.1 GB/s	
Physical Address Extensions	•	•	•	•	•	•	•	•	
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Graphics Specifications									
Integrated Graphics				Graphics may not be available on all computing systems. Please reference the system, motherboard or chipset specifications for compatibility.					
Processor Graphics	•	•	•	•	•	•	•	•	
Graphics Model	•	•	•	•	•	•	•	•	
Graphics Base Frequency	•	•	•	•	•	•	•	•	
Graphics Max Dynamic Frequency	•	•	•	•	•	•	•	•	
Graphics Output	•	•	•	•	•	•	•	•	
Intel® Quick Sync Video	•	•	•	•	•	•	•	•	
Intel® InTru™ 3D Technology	•	•	•	•	•	•	•	•	
Intel® Insider™	•	•	•	•	•	•	•	•	
Intel® Wireless Display	•	•	•	•	•	•	•	•	
Intel® Flexible Display Interface (Intel® FDI)	•	•	•	•	•	•	•	•	
Intel® Clear Video HD Technology	•	•	•	•	•	•	•	•	
Dual Display Capable	•	•	•	•	•	•	•	•	
Macrovision* License Required	•	•	•	•	•	•	•	•	
Expansion Options									
PCI Express Revision	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	•
PCI Express Configurations									
# of PCI Express Ports	40	40	40	40	40	40	40	40	
Package Specifications									
Max CPU Configuration	2	2	2	2	2	2	2	2	•
TCASE	73°C	77.4°C	70.0°C	69.8°C	77.4°C	77.4°C	70.0°C	70.0°C	
TJUNCTION									
Package Size	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	
Graphics and IMC Lithography									•
Sockets Supported	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	FCLGA2011	
Low Halogen Options Available	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	
Advanced Technologies									
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0	No	No	
Intel® vPro Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	No	No	
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Intel® Demand Based Switching	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Intel® Fast Memory Access	•	•	•	•	•	•	•	•	
Intel® Flex Memory Access	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Overview of Intel Xeon E5 / 5600 and Core i7 series processors

All information from www.intel.com.

	Intel® Xeon® Processor X5690 (12M Cache, 3.46 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5687 (12M Cache, 3.60 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5680 (12M Cache, 3.33 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5677 (12M Cache, 3.46 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5675 (12M Cache, 3.06 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5672 (12M Cache, 3.20 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5670 (12M Cache, 2.93 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5667 (12M Cache, 3.06 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5660 (12M Cache, 2.80 GHz, 6.40 GT/s Intel® QPI)
Code Name	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP
Essentials									
Status	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched
Launch Date	Q1'11	Q1'11	Q1'10	Q1'10	Q1'11	Q1'11	Q1'10	Q1'10	Q1'10
Processor Number	X5690	X5687	X5680	X5677	X5675	X5672	X5670	X5667	X5660
# of Cores	6	4	6	4	6	4	6	4	6
# of Threads	12	8	12	8	12	8	12	8	12
Clock Speed	3.46 GHz	3.6 GHz	3.33 GHz	3.46 GHz	3.06 GHz	3.2 GHz	2.93 GHz	3.06 GHz	2.8 GHz
Max Turbo Frequency	3.73 GHz	3.86 GHz	3.6 GHz	3.73 GHz	3.46 GHz	3.6 GHz	3.33 GHz	3.46 GHz	3.2 GHz
Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache
Bus/Core Ratio	26	27	25	26	23	24	22	23	21
Bus Type	QPI	QPI	QPI	QPI	QPI	QPI	QPI	QPI	QPI
System Bus	6.4 GT/s	6.4 GT/s	6.4 GT/s	6.4 GT/s	6.4 GT/s	6.4 GT/s	6.4 GT/s	6.4 GT/s	6.4 GT/s
# of QPI Links	2	2	2	2	2	2	2	2	2
Instruction Set	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit
Instruction Set Extensions	SSE4.2	SSE4.2	SSE4.2	SSE4.2	SSE4.2	SSE4.2	SSE4.2	SSE4.2	SSE4.2
Embedded Options Available	No	No	No	No	No	No	No	No	No
Lithography	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm
Scalability	•	•	•	•	•	•	•	•	•
Max TDP	130 W	130 W	130 W	130 W	95 W	95 W	95 W	95 W	95 W
VID Voltage Range	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V
Recommended Customer Price	1663.00	1663.00	1663.00	1663.00	1440.00	1440.00	1440.00	1440.00	1219.00
Memory Specifications									
Max Memory Size (dependent on memory type)	288 GB	288 GB	288 GB	288 GB	288 GB	288 GB	288 GB	288 GB	288 GB
Memory Types	DDR3-800/1066/1333	DDR3-800/1066/1333	DDR3-800/1066/1333	DDR3-800/1066/1333	DDR3-800/1066/1333	DDR3-800/1066/1333	DDR3-800/1066/1333	DDR3-800/1066/1333	DDR3-800/1066/1333
# of Memory Channels	3	3	3	3	3	3	3	3	3
Max Memory Bandwidth	32 GB/s	32 GB/s	32 GB/s	32 GB/s	32 GB/s	32 GB/s	32 GB/s	32 GB/s	32 GB/s
Physical Address Extensions	40-bit	40-bit	40-bit	40-bit	40-bit	40-bit	40-bit	40-bit	40-bit
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Graphics Specifications									
Integrated Graphics	No	No	No	No	No	No	No	No	No
Processor Graphics	•	•	•	•	•	•	•	•	•
Graphics Model	•	•	•	•	•	•	•	•	•
Graphics Base Frequency	•	•	•	•	•	•	•	•	•
Graphics Max Dynamic Frequency	•	•	•	•	•	•	•	•	•
Graphics Output	•	•	•	•	•	•	•	•	•
Intel® Quick Sync Video	•	•	•	•	•	•	•	•	•
Intel® InTru™ 3D Technology	•	•	•	•	•	•	•	•	•
Intel® Insider™	•	•	•	•	•	•	•	•	•
Intel® Wireless Display	•	•	•	•	•	•	•	•	•
Intel® Flexible Display Interface (Intel® FDI)	•	•	•	•	•	•	•	•	•
Intel® Clear Video HD Technology	•	•	•	•	•	•	•	•	•
Dual Display Capable	•	•	•	•	•	•	•	•	•
Macrovision* License Required	•	•	•	•	•	•	•	•	•
Expansion Options									
PCI Express Revision	•	•	•	•	•	•	•	•	•
PCI Express Configurations	•	•	•	•	•	•	•	•	•
# of PCI Express Ports	•	•	•	•	•	•	•	•	•
Package Specifications									
Max CPU Configuration	2	2	2	2	2	2	2	2	2
TCASE	78.5°C	80.4°C	78.5°C	80.4°C	81.3°C	82.9°C	81.3°C	82.9°C	81.3°C
TJUNCTION	•	•	•	•	•	•	•	•	•
Package Size	42.5mm X 45mm	42.5mm X 45mm	42.5mm x 45mm	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm	42.5mmX45mm
Graphics and IMC Lithography	•	•	•	•	•	•	•	•	•
Sockets Supported	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366
Low Halogen Options Available	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS
Advanced Technologies									
Intel® Turbo Boost Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® vPro Technology	•	•	•	•	•	•	•	•	•
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	•	•	•	•	•	•	•	•	•
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Demand Based Switching	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Monitoring Technologies	No	No	No	No	No	No	No	No	No
Intel® Fast Memory Access	•	•	•	•	•	•	•	•	•
Intel® Flex Memory Access	•	•	•	•	•	•	•	•	•
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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All information from www.intel.com.

	Intel® Xeon® Processor X5650 (12M Cache, 2.66 GHz, 6.40 GT/s Intel® QPI)	Intel® Xeon® Processor X5647 (12M Cache, 2.93 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor L5640 (12M Cache, 2.26 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor L5638 (12M Cache, 2.00 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor L5630 (12M Cache, 2.13 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor L5618 (12M Cache, 1.87 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor L5609 (12M Cache, 1.86 GHz, 4.80 GT/s Intel® QPI)	Intel® Xeon® Processor E5649 (12M Cache, 2.53 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor E5645 (12M Cache, 2.40 GHz, 5.86 GT/s Intel® QPI)
Code Name	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP
Essentials									
Status	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched	Launched
Launch Date	Q1'10	Q1'11	Q1'10	Q1'10	Q1'10	Q1'10	Q1'10	Q1'11	Q1'10
Processor Number	X5650	X5647	L5640	L5638	L5630	L5618	L5609	E5649	E5645
# of Cores	6	4	6	6	4	4	4	6	6
# of Threads	12	8	12	12	8	8	4	12	12
Clock Speed	2.66 GHz	2.93 GHz	2.26 GHz	2 GHz	2.13 GHz	1.87 GHz	1.86 GHz	2.53 GHz	2.4 GHz
Max Turbo Frequency	3.06 GHz	3.2 GHz	2.8 GHz	2.4 GHz	2.4 GHz	2.26 GHz	1.86 GHz	2.93 GHz	2.67 GHz
Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB	12 MB Intel® Smart Cache	12 MB	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache
Bus/Core Ratio	20	22	17	•	16	•	14	19	18
Bus Type	QPI	QPI	QPI	QPI	QPI	QPI	QPI	QPI	QPI
System Bus	6.4 GT/s	5.86 GT/s	5.86 GT/s	5.86 GT/s	5.86 GT/s	5.86 GT/s	4.8 GT/s	5.86 GT/s	5.86 GT/s
# of QPI Links	2	2	2	2	2	2	2	2	2
Instruction Set	64-bit	64-bit	64-bit	•	64-bit	•	64-bit	64-bit	64-bit
Instruction Set Extensions	SSE4.2	SSE4.2	SSE4.2	•	SSE4.2	•	SSE4.2	SSE4.2	SSE4.2
Embedded Options Available	No	No	No	Yes	No	Yes	No	No	Yes
Lithography	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm
Scalability	•	•	•	•	•	•	•	•	•
Max TDP	95 W	130 W	60 W	60 W	40 W	40 W	40 W	80 W	80 W
VID Voltage Range	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	1.0 - 1.5V	0.750V-1.350V	1.0 - 1.5V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V
Recommended Customer Price	996.00	774.00	996.00	•	551.00	•	440.00	774.00	551.00
Memory Specifications									
Max Memory Size (dependent on memory type)	288 GB	288 GB	288 GB	•	288 GB	•	288 GB	288 GB	288 GB
Memory Types	DDR3-800/1066/1333	DDR3-800/1066	DDR3-800/1066/1333	•	DDR3-800/1066	•	DDR3-800/1066	DDR3-800/1066/1333	DDR3-800/1066/1333
# of Memory Channels	3	3	3	•	3	•	3	3	3
Max Memory Bandwidth	32 GB/s	25.6 GB/s	32 GB/s	•	25.6 GB/s	•	25.6 GB/s	32 GB/s	32 GB/s
Physical Address Extensions	40-bit	40-bit	40-bit	•	40-bit	•	40-bit	40-bit	40-bit
ECC Memory Supported	Yes	Yes	Yes	•	Yes	•	Yes	Yes	Yes
Graphics Specifications									
Integrated Graphics	No	No	No	No	No	No	No	No	No
Processor Graphics	•	•	•	•	•	•	•	•	•
Graphics Model	•	•	•	•	•	•	•	•	•
Graphics Base Frequency	•	•	•	•	•	•	•	•	•
Graphics Max Dynamic Frequency	•	•	•	•	•	•	•	•	•
Graphics Output	•	•	•	•	•	•	•	•	•
Intel® Quick Sync Video	•	•	•	•	•	•	•	•	•
Intel® InTru™ 3D Technology	•	•	•	•	•	•	•	•	•
Intel® Insider™	•	•	•	•	•	•	•	•	•
Intel® Wireless Display	•	•	•	•	•	•	•	•	•
Intel® Flexible Display Interface (Intel® FDI)	•	•	•	•	•	•	•	•	•
Intel® Clear Video HD Technology	•	•	•	•	•	•	•	•	•
Dual Display Capable	•	•	•	•	•	•	•	•	•
Macrovision* License Required	•	•	•	•	•	•	•	•	•
Expansion Options									
PCI Express Revision	•	•	•	•	•	•	•	•	•
PCI Express Configurations	•	•	•	•	•	•	•	•	•
# of PCI Express Ports	•	•	•	•	•	•	•	•	•
Package Specifications									
Max CPU Configuration	2	2	2	•	2	•	2	•	2
TCASE	81.3°C	80.4°C	69.4°C	85°C	63.1°C	87°C	63.1°C	76.2°C	76.2°C
TJUNCTION	•	•	•	•	•	•	•	•	•
Package Size	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm		42.5mm X 45mm		42.5mm x 45mm	42.5mm X 45mm	42.5mm X 45mm
Graphics and IMC Lithography	•	•	•	•	•	•	•	•	•
Sockets Supported	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366
Low Halogen Options Available	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS
Advanced Technologies									
Intel® Turbo Boost Technology	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Intel® vPro Technology	•	•	•	•	•	•	•	•	•
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	•	•	•	•	•	•	•	•	•
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	•	Yes	•	Yes	Yes	Yes
Intel® Demand Based Switching	Yes	Yes	Yes	•	Yes	•	Yes	Yes	Yes
Thermal Monitoring Technologies	No	No	No	•	No	•	No	No	No
Intel® Fast Memory Access	•	•	•	•	•	•	•	•	•
Intel® Flex Memory Access	•	•	•	•	•	•	•	•	•
Execute Disable Bit	Yes	Yes	Yes	•	Yes	•	Yes	Yes	Yes

Overview of Intel Xeon E5 / 5600 and Core i7 series processors

All information from www.intel.com.

	Intel® Xeon® Processor E5640 (12M Cache, 2.66 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor E5630 (12M Cache, 2.53 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor E5620 (12M Cache, 2.40 GHz, 5.86 GT/s Intel® QPI)	Intel® Xeon® Processor E5607 (8M Cache, 2.26 GHz, 4.80 GT/s Intel® QPI)	Intel® Xeon® Processor E5606 (8M Cache, 2.13 GHz, 4.80 GT/s Intel® QPI)	Intel® Xeon® Processor E5603 (4M Cache, 1.60 GHz, 4.80 GT/s Intel® QPI)			
Code Name	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP	Westmere-EP			
Essentials									
Status	Launched	Launched	Launched	Launched	Launched	Launched	•	•	•
Launch Date	Q1'10	Q1'10	Q1'10	Q1'11	Q1'11	Q1'11	•	•	•
Processor Number	E5640	E5630	E5620	E5607	E5606	E5603	•	•	•
# of Cores	4	4	4	4	4	4	•	•	•
# of Threads	8	8	8	4	4	4	•	•	•
Clock Speed	2.66 GHz	2.53 GHz	2.4 GHz	2.26 GHz	2.13 GHz	1.6 GHz	•	•	•
Max Turbo Frequency	2.93 GHz	2.8 GHz	2.66 GHz				•	•	•
Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	12 MB Intel® Smart Cache	8 MB Intel® Smart Cache	8 MB Intel® Smart Cache	4 MB Intel® Smart Cache	•	•	•
Bus/Core Ratio	20	19	18	17	16	12	•	•	•
Bus Type	QPI	QPI	QPI	QPI	QPI	QPI	•	•	•
System Bus	5.86 GT/s	5.86 GT/s	5.86 GT/s	4.8 GT/s	4.8 GT/s	4.8 GT/s	•	•	•
# of QPI Links	2	2	2	2	2	2	•	•	•
Instruction Set	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	•	•	•
Instruction Set Extensions	SSE4.2	SSE4.2	SSE4.2	SSE4.2	SSE4.2	SSE4.2	•	•	•
Embedded Options Available	No	No	Yes	No	No	No	•	•	•
Lithography	32 nm	32 nm	32 nm	32 nm	32 nm	32 nm	•	•	•
Scalability							•	•	•
Max TDP	80 W	80 W	80 W	80 W	80 W	80 W	•	•	•
VID Voltage Range	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	0.750V-1.350V	•	•	•
Recommended Customer Price	774.00	551.00	387.00	276.00	219.00	188.00	•	•	•
Memory Specifications									
Max Memory Size (dependent on memory type)	288 GB	288 GB	288 GB	288 GB	288 GB	288 GB	•	•	•
Memory Types	DDR3-800/1066	DDR3-800/1066	DDR3-800/1066	DDR3-800/1066	DDR3-800/1066	DDR3-800/1066	•	•	•
# of Memory Channels	3	3	3	3	3	3	•	•	•
Max Memory Bandwidth	25.6 GB/s	25.6 GB/s	25.6 GB/s	25.6 GB/s	25.6 GB/s	25.6 GB/s	•	•	•
Physical Address Extensions	40-bit	40-bit	40-bit	40-bit	40-bit	40-bit	•	•	•
ECC Memory Supported	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
Graphics Specifications									
Integrated Graphics	No	No	No	No	No	No	•	•	•
Processor Graphics	•	•	•	•	•	•	•	•	•
Graphics Model	•	•	•	•	•	•	•	•	•
Graphics Base Frequency	•	•	•	•	•	•	•	•	•
Graphics Max Dynamic Frequency	•	•	•	•	•	•	•	•	•
Graphics Output	•	•	•	•	•	•	•	•	•
Intel® Quick Sync Video	•	•	•	•	•	•	•	•	•
Intel® InTru™ 3D Technology	•	•	•	•	•	•	•	•	•
Intel® Insider™	•	•	•	•	•	•	•	•	•
Intel® Wireless Display	•	•	•	•	•	•	•	•	•
Intel® Flexible Display Interface (Intel® FDI)	•	•	•	•	•	•	•	•	•
Intel® Clear Video HD Technology	•	•	•	•	•	•	•	•	•
Dual Display Capable	•	•	•	•	•	•	•	•	•
Macrovision* License Required	•	•	•	•	•	•	•	•	•
Expansion Options									
PCI Express Revision	•	•	•	•	•	•	•	•	•
PCI Express Configurations	•	•	•	•	•	•	•	•	•
# of PCI Express Ports	•	•	•	•	•	•	•	•	•
Package Specifications									
Max CPU Configuration	2	2	2	2	2	2	•	•	•
TCASE	77.6°C	77.6°C	77.6°C	•	•	•	•	•	•
TJUNCTION							•	•	•
Package Size	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm	42.5mm X 45mm	•	•	•
Graphics and IMC Lithography	•	•	•	•	•	•	•	•	•
Sockets Supported	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	FCLGA1366	•	•	•
Low Halogen Options Available	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	•	•	•
Advanced Technologies									
Intel® Turbo Boost Technology	Yes	Yes	Yes	No	No	No	•	•	•
Intel® vPro Technology	•	•	•	•	•	•	•	•	•
Intel® Hyper-Threading Technology	Yes	Yes	Yes	No	No	No	•	•	•
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
Intel® Virtualization Technology for Directed I/O (VT-d)	•	•	•	•	•	•	•	•	•
Intel® Trusted Execution Technology	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
Intel® Demand Based Switching	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•
Thermal Monitoring Technologies	No	No	No	No	No	No	•	•	•
Intel® Fast Memory Access	•	•	•	•	•	•	•	•	•
Intel® Flex Memory Access	•	•	•	•	•	•	•	•	•
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	•	•	•

Overview of Intel Xeon E5 / 5600 and Core i7 series processors

All information from www.intel.com.

	Intel® Core™ i7-3960X Processor Extreme Edition (15M Cache, 3.30 GHz)	Intel® Core™ i7-3930K Processor (12M Cache, 3.20 GHz)	Intel® Core™ i7-3820 Processor (10M Cache, 3.60 GHz)	Intel® Core™ i7-2700K Processor (8M Cache, 3.5 GHz)	Intel® Core™ i7-2600S Processor (8M Cache, 2.80 GHz)	Intel® Core™ i7-2600K Processor (8M Cache, 3.40 GHz)	Intel® Core™ i7-2600 Processor (8M Cache, 3.40 GHz)		
Code Name	Sandy Bridge-E	Sandy Bridge-E	Sandy Bridge-E	Sandy Bridge	Sandy Bridge	Sandy Bridge	Sandy Bridge		
Essentials									
Status	Launched	Launched	Launched	Launched	Launched	Launched	Launched	•	•
Launch Date	Q4'11	Q4'11	Q1'12	Q4'11	Q1'11	Q1'11	Q1'11	•	•
Processor Number	i7-3960X	i7-3930K	i7-3820	i7-2700K	i7-2600S	i7-2600K	i7-2600		
# of Cores	6	6	4	4	4	4	4		
# of Threads	12	12	8	8	8	8	8		
Clock Speed	3.3 GHz	3.2 GHz	3.6 GHz	3.5 GHz	2.8 GHz	3.4 GHz	3.4 GHz		
Max Turbo Frequency	3.9 GHz	3.8 GHz	3.8 GHz	3.9 GHz	3.8 GHz	3.8 GHz	3.8 GHz		
Cache	15 MB Intel® Smart Cache	12 MB Intel® Smart Cache	10 MB Intel® Smart Cache	8 MB Intel® Smart Cache	8 MB Intel® Smart Cache	8 MB Intel® Smart Cache	8 MB Intel® Smart Cache		
Bus/Core Ratio	57	57	45	35	28	34	34		
Bus Type	DMI	DMI	DMI	DMI	DMI	DMI	DMI		
System Bus	5 GT/s	5 GT/s	5 GT/s	5 GT/s	5 GT/s	5 GT/s	5 GT/s		
# of QPI Links	•	•	•	•	•	•	•		
Instruction Set	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit		
Instruction Set Extensions	SSE4.2, AVX	SSE4.2, AVX	SSE4.2, AVX	SSE4.1/4.2, AVX	SSE4.1/4.2, AVX	SSE4.1/4.2, AVX	SSE4.1/4.2, AVX		
Embedded Options Available	No	No	No	No	No	No	Yes		
Lithography	32nm	32nm	32 nm	32 nm	32 nm	32 nm	32 nm		
Scalability	•	•	•	•	•	•	•		
Max TDP	130 W	130 W	130 W	95 W	65 W	95 W	95 W		
VID Voltage Range	0.6V-1.35V	0.6V-1.35V	0.600V − 1.350V	•	•	•	•		
Recommended Customer Price	999.00	583.00	332.00	332.00	294.00	317.00	294.00		
Memory Specifications									
Max Memory Size (dependent on memory type)	64 GB	64 GB	64 GB	32 GB	32 GB	32 GB	32 GB	•	•
Memory Types	DDR3-1066/1333/1600	DDR3-1066/1333/1600	DDR3-1066/1333/1600	DDR3-1066/1333	DDR3-1066/1333	DDR3-1066/1333	DDR3-1066/1333		
# of Memory Channels	4	4	4	2	2	2	2		
Max Memory Bandwidth	51.2 GB/s	51.2 GB/s	51.2 GB/s	21 GB/s	21 GB/s	21 GB/s	21 GB/s		
Physical Address Extensions	•	•	•	•	•	•	•		
ECC Memory Supported	No	No	No	No	No	No	No		
Graphics Specifications									
Integrated Graphics			Graphics may not be available on all computing systems. Please reference the system, motherboard or chipset specifications for compatibility.						
Processor Graphics	•	•	•	Yes	Yes	Yes	Yes		
Graphics Model	•	•	•	Intel® HD Graphics 3000	Intel® HD Graphics 2000	Intel® HD Graphics 3000	Intel® HD Graphics 2000		
Graphics Base Frequency	•	•	•	850 MHz	850 MHz	850 MHz	850 MHz		
Graphics Max Dynamic Frequency	•	•	•	1.35 GHz	1.35 GHz	1.35 GHz	1.35 GHz		
Graphics Output	•	•	•	•	•	•	•		
Intel® Quick Sync Video	•	•	•	Yes	Yes	Yes	Yes		
Intel® InTru™ 3D Technology	•	•	•	Yes	Yes	Yes	Yes		
Intel® Insider™	•	•	•	Yes	Yes	Yes	Yes		
Intel® Wireless Display	•	•	•	No	No	No	No		
Intel® Flexible Display Interface (Intel® FDI)	•	•	•	Yes	Yes	Yes	Yes		
Intel® Clear Video HD Technology	•	•	•	Yes	Yes	Yes	Yes		
Dual Display Capable	•	•	•	Yes	Yes	Yes	Yes		
Macrovision* License Required	•	•	•	•	•	•	•		
Expansion Options									
PCI Express Revision	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
PCI Express Configurations	•	•	•	•	•	•	•		
# of PCI Express Ports	10	10	10	1	1	1	1		
Package Specifications									
Max CPU Configuration	1	1	1	1	1	1	1		
TCASE	66.8°C	66.8°C	66.8°C	72.6°C	69.1°C	72.6°C	72.6°C		
TJUNCTION	•	•	•	•	•	•	•		
Package Size	52.5mm x 45.0mm	52.5mm x 45.0mm	52.5mm x 45.0mm	37.5mm x 37.5mm	37.5mm x 37.5mm	37.5mm x 37.5mm	37.5mm x 37.5mm		
Graphics and IMC Lithography	•	•	•	•	•	•	•		
Sockets Supported	FCLGA2011	FCLGA2011	FCLGA2011	LGA1155	LGA1155	LGA1155	LGA1155		
Low Halogen Options Available	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS	See MDDS		
Advanced Technologies									
Intel® Turbo Boost Technology	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
Intel® vPro Technology	•	•	•	No	Yes	No	Yes		
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Intel® Virtualization Technology (VT-x)	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes, C2 stepping	Yes, C2 stepping	Yes	No	Yes	No	Yes		
Intel® Trusted Execution Technology	No	No	No	No	Yes	No	Yes		
AES New Instructions	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Intel® 64	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Idle States	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Intel® Demand Based Switching	•	•	•	•	•	•	•		
Thermal Monitoring Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Intel® Fast Memory Access	•	•	•	Yes	Yes	Yes	Yes		
Intel® Flex Memory Access	•	•	•	Yes	Yes	Yes	Yes		
Execute Disable Bit	Yes	Yes	Yes	Yes	Yes	Yes	Yes		