

# IBM System x™ and BladeCenter® VMware VMotion Compatibility Guide

VMware VMotion Compatibility Guide for System x™ and BladeCenter® Servers



## Disclaimer

This document is intended as a resource to explain the current VMware VMotion compatibility constraints, and to compare two different CPUs for VMotion compatibility. By default, VMware VirtualCenter supports migrations with VMotion across CPUs in the same compatibility groups. For example VMotion will move a virtual machine from a machine within the same Group, ie. Group A, but not between different groups, ie. Group A to Groups B through D.

**NO OFFICIAL TESTING OF VMOTION COMPATIBILITY ON IBM SERVERS HAS BEEN PERFORMED BY IBM. This document is intended as a guide, not as a final answer. IBM makes no warranty that an individual user will achieve those results equivalent to the levels stated in this document.**

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### **IBM Server VMotion Compatibility Guide (Table A).....**

*Table A is used to determine the VMotion compatibility between IBM System x and BladeCenter servers. The table is organized into Groups, A,B,C,D,E,F, VirtualCenter supports live migrations using VMotion across CPUs within the same compatibility groups. There are fixes that will allow migrations between groups, and can be found on the VMware support site. VMware URL's are provided at the bottom of this guide.*

### **Intel Processor VMotion Compatibility Guide (Table B).....**

*Table B is organized into the same Groups as Table A, but provides broader scope beyond IBM Servers. This table is only for Intel processors, similar information can be found on the VMware support site. VMware URL's are provided at the bottom of this guide.*

### **AMD Processor VMotion Compatibility Guide (Table C) .....**

*Table C is organized into the same Groups as Table A, but provides broader scope beyond IBM Servers. This table is only for AMD processors, similar information can be found on the VMware support site. VMware URL's are provided at the bottom of this guide.*

VMware URL's:

[VMotion CPU Compatibility Requirements for Intel Processors](#)

[VMotion CPU Compatibility Requirements for AMD Processors](#)

[Migrations with VMotion Prevented Due to CPU Mismatch—How to Override Masks](#)

# IBM System x™ and BladeCenter® VMware VMotion Compatibility Guide

VMware VMotion Compatibility Guide for System x™ and BladeCenter® Servers



**TABLE A**

This worksheet is intended as a resource to explain the current VMotion compatibility constraints, and to compare 2 different CPUs for VMotion compatibility. By default, VirtualCenter supports migrations with VMotion across CPUs in the same compatibility groups below (i.e. within group A, not from group A to groups B-D). However, official testing on IBM servers has not taken place to verify VMotion compatibility. This is intended as a guide, not as a final answer.

CPU Compatibility Group	CPU Family	CPU Details	IBM xSeries & System x Servers
A	Intel Pentium 4, Intel Xeon, and Intel Xeon MP (Family 15)	Early versions of Intel P4 CPUs prior to Model 3, Stepping 1 (often referred to as Willamette & Northwood) and early versions of the Intel P4 Xeon and Xeon MP CPUs (often referred to as Foster, Prestonia, & Gallatin), <b>which do not support the SSE3 instructions.</b>	HS20(8832-21x,31x,41x,51x,61x,9Tx,G1x,G1x,J1x,L1x,LTx,M1x, 8678-21x,41x,51x,61x), HS40(8839-21x,41x,51x,61x,71x,6Tx), x225(8649-4x,5x,6x), x235(8671-1x,2x,3x,4x,6x,7x,8x,Gx,Kx,Lx,Mx), x335(8676-11x,12x,21x,22x,71x,72x,G1x,G2x,J1x,J2x,L1x,L2x,M1x,M2x), x345(8670-51x,61x,71x,91x,F1x,G1x,J1x,K1x,L1x,M1x), 360(8686-xxx), x365(8861-1Rx,4Rx, 8862-xxx), x440(8687-xxx), x445(8870-xxx)
B1	Intel Pentium 4, Intel Xeon, and Intel Xeon MP (Family 15)	All the processor in the Intel Pentium 4 family which do support the SSE3 instructions, but don't support Intel's XD (eXecute Disable) bit:	HS20(8843-01x,11x,21x,31x,41x,J1x,L1Y,4TU,LTU,JTx),x226(8648-00X,00Y,0AX,0AY,0BX,0BY,10X,10Y,1AX,1AY,1BX,1BY,20X,20Y,2AX,2AY,2BX,2BY), x236(8841-01Y,11Y,21Y,31Y,41Y), x335(8837-21X,22x,2Ax,31x,32x,3Ax,41x,42x,4Ax), x336(8837-01Y,02Y,11Y,21Y,22Y,2AY,31Y,41Y,42Y,4AY), x346(8840-01Y,11Y,21x,22x,31x,32x,41x,42x)
B2	Intel Pentium 4, Intel Xeon, and Intel Xeon MP (Family 15)	All the processors in the Intel Pentium 4 family which do support the SSE3 instructions AND support Intel's XD (eXecute Disable) bit: * Later versions of Intel P4 CPUs from Model 3, Stepping 1 and beyond (introduced in early 2004, and often referred to as Prescott, or numbered 5x0j, 5x5j, 5x9j) * 64-bit (EM64T) enabled versions of the Intel P4 CPUs (often referred to as Prescott 2M, and Cedar Mill, or numbered 5x1, 5x6, 6x0, 6x1, 6x2) * 64-bit (EM64T) enabled versions of the Intel P4 Xeon and Xeon MP CPUs (often referred to as Irwindale, Cranford, Potomac) * Dual-core versions of the Intel P4 CPUs marketed as Pentium D (often referred to as Smithfield, and Pressler, or numbered 8x0) * Dual-core versions of the Intel P4 Xeon CPUs marketed as Xeon LV (often referred to as Sossaman) * Dual-core versions of the Intel P4 Xeon and Xeon MP CPUs (often referred to as Paxville, Dempsey, and Tulsa, or numbered 5xxx, 7xxx)	x226(8648 & 8488-30x,3Ax,3Bx,40x,4Ax,4Bx,50x,5Ax,5Bx,60x,6Ax,6Bx,A2x,A4x,A6x,B2x,B4x,B6x,C2x,C4x,C6x,D2x,D4x,D6x), x236(8841-15Y,16Y,25Y,35Y,45Y), x260, x336(8837-15Y,16Y,1VY,25Y,35Y,36Y,3VY,45Y), x346(8840-15x,16x,25x,35x,36x,45x,05x,55x,D1x,DRx,0Rx,1Rx,1Sx,2Rx,3Rx,3Sx,4Rx), x366(8863-xxx), x460(8872-xxx), HS20(8832-Nxx)(Note 3), HS20(8843-05x,25x,35x,45x,55x,0Rx,2Rx,3Rx,4Rx,5Rx,M5x,MTx,7981-2Fx,3Fx)(Note 3), x3400(7973-12x,14x,16x,7974-12x,14x,16x), x3500(7977-12x, 2xx), x3550(7978-Gxx, 45U, 4SU), x3650(7979-G5x,G5x,Hxx,7980-51x,52x,53x,54x,55x), x3800(8865-xxx,8866-xxx), x3850(8863-xxx,8864-xxx), x3950(8872-xxx,8874-xxx,8878-xxx,8879-xxx)
C	Intel Xeon DP, and Intel Xeon MP	All the processors in the Intel Xeon family, based on the new "Intel Core Microarchitecture" which do support the SSE3 instructions, Intel's XD (eXecute Disable) bit, AND contain new SSE4 instructions: * Dual-core versions of the Intel Xeon and Xeon MP CPUs (often referred to as Woodcrest)	HS21(8853-NTx,L4U,7995-A1x,C1x,A2x,C2x,L1x,L2x,L3x,L4x,L5x,L6x,H1x,NTx,8853-A1x,C1x,A2x,C2x,C3x,J1x,J2x,L1x,L2x,L3x,L4x,L5x,L6x,NTx,H1x), x3400(7973-42x,52x,62x,7974-42x,52x,62x,7975-42x,52x,62x,B2x,C2x,7976-42x,4Ax,52x,5Ax,62x,6Ax,B2x,C2x), x3500(7977-42x,52x,62x,72x,82x,92x,B2x,C2x,F2x,G2x,H2x), x3550 (7978-21x,22x,31x,32x,41x,42x,4Ax,51x,5Ax,61x,6Ax,71x,7Ax,A1x,C1x,A2x,C2x,CBx,CCx,C3x,JAx,JBx), x3650(7979-21x,2Ax,31x,3Ax,41x,4Ax,51x,5Ax,61x,6Ax,71x,7Ax,A1x,A2x,ABx,C1x,CAx,CBx,C3x,JAx,JBx)
D	AMD Opteron	AMD Opteron CPUs prior to Revision E (130nm versions often referred to as Sledgehammer) which do not support the SSE3 instructions, and do NOT support AMD's NX (No eXecute) bit.	LS20(8850-51x)(4), e325(8835-21x,22x,31x,32x,5DX,51x,52x,61x,62x), e326(8848-61x,62x,71x,72x)(Note 4)
E	AMD Opteron	All the processors in the AMD Opteron family, which do support the SSE3 instructions AND support AMD's NX (No eXecute) bit: * Single-core AMD Opteron CPUs from Revision E and beyond (90nm versions often referred to as Venus, Troy, and Athens) * Dual-core AMD Opteron CPUs (90nm versions often referred to as Denmark, Italy, & Egypt)	LS20(8850-61x,71x,91x,56x,66x,66U,76x,72x,82x,92x)(4), e326(8848-45x,46x,55x,56x,65x,66,x81x,82,7969-46x,55x,56x,65x,66x,81x,82x,91x,92x)(Note 4), e326m(7969-xxx)
F	AMD Opteron	All the processors in the AMD Opteron family, based on the new "Rev F" architecture which do support the SSE3 instructions, do support AMD's NX (No eXecute) bit, AND contain new SSE4 instructions: * AMD Opterons, "Rev F" and later	LS21(7971-21x,2Tx,31x,3Ax,51x,6Ax,7Ax), LS41(7972-31x,32x,3Ax,3Bx,4Tx,51x,52x,6Ax,6Bx,7Ax,7Bx), x3455(7984-11x,31x,41x,51x,52x,6Ax,6Bx), x3655(7985-11x,12x,1Ax,1Bx,21x,2Ax,41x,4Ax,51x,5Ax,61x,6Ax), x3755(8877-xxx)

**Notes:**

- (1) The incompatibilities between processors that support nX/xD only apply to guest operating systems that can use nX/xD. The default settings can be changed to restore compatibility on a per-VM basis (trading off some security for compatibility, as in between compatibility groups B1 & B2).
- (2) The incompatibilities between processors that support SSE3/SSE4 apply to all guest operating systems. The default settings can be changed to restore compatibility on a per-VM basis (but may affect VM stability after migrations, and is NOT SUPPORTED).
- (3) Depending on the specific model, it may be necessary to mask the nX/xD bit in order for VMotion to work.
- (4) Some early models used the Sledgehammer processor. Later models used the Troy or Italy processor. Testing will determine VMotion compatibility

# IBM System x™ and BladeCenter® VMware VMotion Compatibility Guide



## VMware VMotion Compatibility Guide for System x™ and BladeCenter® Servers

**Table C**

This worksheet is intended as a resource to explain the current VMware VMotion compatibility constraints, and to compare 2 different CPUs for VMotion compatibility. By default, VMware VirtualCenter supports migrations with VMotion across CPUs in the same compatibility groups. Use this table for non-IBM servers, and to determine VMotion compatibility between IBM and non-IBM servers.

CPU Compatibility Group	CPU Family Notes	Code Name	Model Number	Frequency	L2	L3	Front Side Bus	
A	Intel Pentium 4, Intel Xeon, and Intel Xeon MP (Foster, Prestonia, Gallatin) prior to Model 3, DO NOT support SSE3	Foster DP	Xeon 1.4 Xeon 1.5 Xeon 1.7 Xeon 2.0	1400Mhz 1500Mhz 1700Mhz 2000Mhz	256KB 256KB 256KB 256KB		400MT/s 400MT/s 400MT/s 400MT/s	
		Foster MP	Xeon MP 1.4 Xeon MP 1.5 Xeon MP 1.5 Xeon MP 1.6	1400Mhz 1500Mhz 1500Mhz 1600Mhz	256KB 256KB 256KB 256KB	512KB 512KB 1024KB 1024KB	400MT/s 400MT/s 400MT/s 400MT/s	
		Prestonia DP	Xeon 1.8 Xeon 2.0A Xeon 2.0B Xeon 2.2 Xeon 2.4 Xeon 2.4B Xeon 2.6 Xeon 2.66 Xeon 2.8 Xeon 2.8B Xeon 3.0 Xeon 3.06 Xeon 3.06 Xeon LV 1.6 Xeon LV 2.0 Xeon LV 2.4	1800Mhz 2000Mhz 2000Mhz 2200Mhz 2400Mhz 2400Mhz 2600Mhz 2667Mhz 2800Mhz 2800Mhz 3000Mhz 3066Mhz 3066Mhz 1600Mhz 2000Mhz 2400Mhz	512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB		400MT/s 400MT/s 533MT/s 400MT/s 400MT/s 400MT/s 533MT/s 533MT/s 400MT/s 533MT/s 533MT/s 400MT/s 400MT/s 400MT/s 533MT/s	
		Gallatin DP	Xeon 2.4B Xeon 2.8B Xeon 3.06 Xeon 3.2 Xeon 3.2	2400Mhz 2800Mhz 3066Mhz 3200Mhz 3200Mhz	512KB 512KB 512KB 512KB 512KB	1024KB 1024KB 1024KB 1024KB 2048KB	533MT/s 533MT/s 533MT/s 533MT/s 533MT/s	
		Gallatin MP	Xeon MP 1.5 Xeon MP 1.9 Xeon MP 2.0 Xeon MP 2.0 Xeon MP 2.2 Xeon MP 2.2 Xeon MP 2.5 Xeon MP 2.7 Xeon MP 2.8 Xeon MP 3.0	1500Mhz 1900Mhz 2000Mhz 2000Mhz 2200Mhz 2200Mhz 2500Mhz 2700Mhz 2800Mhz 3000Mhz	512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB 512KB	1024KB 1024KB 1024KB 2048KB 2048KB 2048KB 2048KB 2048KB 2048KB 2048KB	400MT/s 400MT/s 400MT/s 400MT/s 400MT/s 400MT/s 400MT/s 400MT/s 400MT/s 400MT/s	
		B1	Intel Pentium 4, Intel Xeon, and Intel Xeon MP (Family 15)	Nocona DP	Xeon 2.8 Xeon 3.0 Xeon 3.2 Xeon 3.4 Xeon 3.6 Xeon LV 2.8	2800Mhz 3000Mhz 3200Mhz 3400Mhz 3600Mhz 2800Mhz	1024KB 1024KB 1024KB 1024KB 1024KB 1024KB	
B2	Intel Pentium 4, Intel Xeon, and Intel Xeon MP (Family 15)	Irwindale DP	Xeon 2.8 Xeon 3.0 Xeon 3.2 Xeon 3.4 Xeon 3.6 Xeon 3.8 Xeon MV 3.0 Xeon MV 3.2	2800Mhz 3000Mhz 3200Mhz 3400Mhz 3600Mhz 3800Mhz 3000Mhz 3200Mhz	2048KB 2048KB 2048KB 2048KB 2048KB 2048KB 2048KB 2048KB		800MT/s 800MT/s 800MT/s 800MT/s 800MT/s 800MT/s 800MT/s 800MT/s	
			Cranford MP	Xeon MP 3.16 Xeon MP 3.66	3166Mhz 3667Mhz	1024KB 1024KB		667MT/s 667MT/s
			Potomac MP	Xeon MP 2.83 Xeon MP 3.0 Xeon MP 3.33	2833Mhz 3000Mhz 3333Mhz	1024KB 1024KB 1024KB	4096KB 8192KB 8192KB	667MT/s 667MT/s 667MT/s
		Paxville DP	DC Xeon 2.8	2800Mhz	2x1024KB		800MT/s	
		Paxville MP	DC Xeon 7020 DC Xeon 7030 DC Xeon 7040 DC Xeon 7041	2667Mhz 2800Mhz 3000Mhz 3000Mhz	2x1024KB 2x1024KB 2x1024KB 2x1024KB		667MT/s 800MT/s 667MT/s 800MT/s	
			Dempsey DP	DC Xeon 5030 DC Xeon 5050 DC Xeon 5060 DC Xeon 5080 DC Xeon MV 5063	2667Mhz 3000Mhz 3200Mhz 3733Mhz 3200Mhz	2x2048KB 2x2048KB 2x2048KB 2x2048KB 2x2048KB		667MT/s 667MT/s 1066MT/s 1066MT/s 1066MT/s
		Tulsa MP	DC Xeon 7110M DC Xeon 7110N DC Xeon 7120M DC Xeon 7120N DC Xeon 7130M DC Xeon 7130N DC Xeon 7140M DC Xeon 7140N DC Xeon 7150N	2600Mhz 2500Mhz 3000Mhz 3000Mhz 3200Mhz 3166Mhz 3400Mhz 3333Mhz 3500Mhz	2x1024KB 2x1024KB 2x1024KB 2x1024KB 2x1024KB 2x1024KB 2x1024KB 2x1024KB 2x1024KB	4096KB 4096KB 4096KB 4096KB 8192KB 8192KB 16384KB 16384KB 16384KB	800MT/s 667MT/s 800MT/s 667MT/s 800MT/s 667MT/s 800MT/s 667MT/s 667MT/s	
			Sossaman DP	DC Xeon LV 1.66 DC Xeon LV 2.0 DC Xeon ULV 1.66	1667Mhz 2000Mhz 1667Mhz	2048KB 2048KB 2048KB		667MT/s 667MT/s 667MT/s
		C	Intel Xeon DP, and Intel Xeon MP	WoodCrest DP	DC Xeon 5110 DC Xeon 5120 DC Xeon 5130 DC Xeon 5140 DC Xeon 5150 DC Xeon 5160 DC Xeon LV 5128 DC Xeon LV 5138 DC Xeon LV 5148	1600Mhz 1866Mhz 2000Mhz 2333Mhz 2666Mhz 3000Mhz 1866Mhz 2133Mhz 2333Mhz	4096KB 4096KB 4096KB 4096KB 4096KB 4096KB 4096KB 4096KB 4096KB	
Clovertown DP	QC Xeon E5310 QC Xeon E5320 QC Xeon E5335 QC Xeon E5345 QC Xeon E5355 QC Xeon E5365 QC Xeon LV L5310 QC Xeon LV L5320				1600Mhz 1866Mhz 2000Mhz 2333Mhz 2666Mhz 3000Mhz 1600Mhz 1866Mhz	2x4096KB 2x4096KB 2x4096KB 2x4096KB 2x4096KB 2x4096KB 2x4096KB 2x4096KB		1066MT/s 1066MT/s 1333MT/s 1333MT/s 1333MT/s 1333MT/s 1066MT/s 1066MT/s

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# IBM System x™ and BladeCenter® VMware VMotion Compatibility Guide



## VMware VMotion Compatibility Guide for System x™ and BladeCenter® Servers

**Table C**

This worksheet is intended as a resource to explain the current VMware VMotion compatibility constraints, and to compare 2 different CPUs for VMotion compatibility. By default, VMware VirtualCenter supports migrations with VMotion across CPUs in the same compatibility groups. Use this table for non-IBM servers, and to determine VMotion compatibility between IBM and non-IBM servers.

CPU Compatibility Group	CPU Family Notes	Code Name	Model Number	Frequency	L2	HT	Watts
D	AMD Opteron Before Rev E	Opteron 200 Series Sledgehammer	Opteron 240	1400Mhz	1024KB	800Mhz	85W
			Opteron 240EE	1400Mhz	1024KB	800Mhz	30W
Opteron 242	1600Mhz		1024KB	800Mhz	85W		
Opteron 244	1800Mhz		1024KB	800Mhz	85W		
Opteron 246	2000Mhz		1024KB	800Mhz	89W		
Opteron 246HE	2000Mhz		1024KB	800Mhz	55W		
Opteron 248	2200Mhz		1024KB	800Mhz	89W		
Opteron 250	2400Mhz		1024KB	800Mhz	89W		
		Opteron 800 Series Sledgehammer	Opteron 840	1400Mhz	1024KB	800Mhz	85W
			Opteron 840EE	1400Mhz	1024KB	800Mhz	30W
Opteron 842	1600Mhz		1024KB	800Mhz	85W		
Opteron 844	1800Mhz		1024KB	800Mhz	85W		
Opteron 846	2000Mhz		1024KB	800Mhz	85W		
Opteron 846HE	2000Mhz		1024KB	800Mhz	55W		
Opteron 848	2200Mhz		1024KB	800Mhz	89W		
Opteron 850	2400Mhz		1024KB	800Mhz	89W		
E	AMD Opteron	Opteron 200 Series Troy	Opteron 242	1600Mhz	1024KB	1000Mhz	85W
			Opteron 244	1800Mhz	1024KB	1000Mhz	85W
			Opteron 246	2000Mhz	1024KB	1000Mhz	85W
			Opteron 246HE	2000Mhz	1024KB	1000Mhz	55W
			Opteron 248	2200Mhz	1024KB	1000Mhz	85W
			Opteron 248HE	2200Mhz	1024KB	1000Mhz	55W
			Opteron 250	2400Mhz	1024KB	1000Mhz	85W
			Opteron 250HE	2400Mhz	1024KB	1000Mhz	55W
			Opteron 252	2600Mhz	1024KB	1000Mhz	85W
			Opteron 254	2800Mhz	1024KB	1000Mhz	85W
		Opteron 256	3000Mhz	1024KB	1000Mhz	85W	
		Opteron 800 Series Athens	Opteron 842	1600Mhz	1024KB	1000Mhz	85W
			Opteron 844	1800Mhz	1024KB	1000Mhz	85W
			Opteron 846	2000Mhz	1024KB	1000Mhz	85W
			Opteron 846HE	2000Mhz	1024KB	1000Mhz	55W
			Opteron 848	2200Mhz	1024KB	1000Mhz	85W
			Opteron 848HE	2200Mhz	1024KB	1000Mhz	55W
			Opteron 850	2400Mhz	1024KB	1000Mhz	85W
			Opteron 850HE	2400Mhz	1024KB	1000Mhz	55W
			Opteron 852	2600Mhz	1024KB	1000Mhz	85W
Opteron 854	2800Mhz		1024KB	1000Mhz	85W		
Opteron 856	3000Mhz	1024KB	1000Mhz	85W			
DC Opteron 200 Series Italy	Opteron 260HE	1600Mhz	2x1024KB	1000Mhz	55W		
	Opteron 265	1800Mhz	2x1024KB	1000Mhz	95W		
	Opteron 265HE	1800Mhz	2x1024KB	1000Mhz	55W		
	Opteron 270	2000Mhz	2x1024KB	1000Mhz	95W		
	Opteron 270HE	2000Mhz	2x1024KB	1000Mhz	55W		
	Opteron 275	2200Mhz	2x1024KB	1000Mhz	95W		
	Opteron 275HE	2200Mhz	2x1024KB	1000Mhz	55W		
	Opteron 280	2400Mhz	2x1024KB	1000Mhz	95W		
Opteron 285	2600Mhz	2x1024KB	1000Mhz	95W			
Opteron 290	2800Mhz	2x1024KB	1000Mhz	95W			
DC Opteron 800 Series Egypt	Opteron 860HE	1600Mhz	2x1024KB	1000Mhz	55W		
	Opteron 865	1800Mhz	2x1024KB	1000Mhz	95W		
	Opteron 865HE	1800Mhz	2x1024KB	1000Mhz	55W		
	Opteron 870	2000Mhz	2x1024KB	1000Mhz	95W		
	Opteron 870HE	2000Mhz	2x1024KB	1000Mhz	55W		
	Opteron 875	2200Mhz	2x1024KB	1000Mhz	95W		
	Opteron 875HE	2200Mhz	2x1024KB	1000Mhz	55W		
	Opteron 880	2400Mhz	2x1024KB	1000Mhz	95W		
Opteron 885	2600Mhz	2x1024KB	1000Mhz	95W			
Opteron 890	2800Mhz	2x1024KB	1000Mhz	95W			
F	AMD Opteron Rev F	DC Opteron 2000 Series Rosa	Opteron 2210	1800Mhz	2x1024KB	1000Mhz	95W
			Opteron 2210HE	1800Mhz	2x1024KB	1000Mhz	68W
			Opteron 2212	2000Mhz	2x1024KB	1000Mhz	95W
			Opteron 2212HE	2000Mhz	2x1024KB	1000Mhz	68W
			Opteron 2214	2200Mhz	2x1024KB	1000Mhz	95W
			Opteron 2214HE	2200Mhz	2x1024KB	1000Mhz	68W
			Opteron 2216	2400Mhz	2x1024KB	1000Mhz	95W
			Opteron 2216HE	2400Mhz	2x1024KB	1000Mhz	68W
			Opteron 2218	2600Mhz	2x1024KB	1000Mhz	95W
			Opteron 2218HE	2600Mhz	2x1024KB	1000Mhz	68W
		Opteron 2220	2800Mhz	2x1024KB	1000Mhz	95W	
		Opteron 2220SE	2800Mhz	2x1024KB	1000Mhz	120W	
		Opteron 2222SE	3000Mhz	2x1024KB	1000Mhz	120W	
		DC Opteron 8000 Santa Rosa	Opteron 8212	2000Mhz	2x1024KB	1000Mhz	95W
			Opteron 8212HE	2000Mhz	2x1024KB	1000Mhz	68W
			Opteron 8214	2200Mhz	2x1024KB	1000Mhz	95W
			Opteron 8214HE	2200Mhz	2x1024KB	1000Mhz	68W
			Opteron 8216	2400Mhz	2x1024KB	1000Mhz	95W
			Opteron 8216HE	2400Mhz	2x1024KB	1000Mhz	68W
			Opteron 8218	2600Mhz	2x1024KB	1000Mhz	95W
Opteron 8218HE	2600Mhz		2x1024KB	1000Mhz	68W		
Opteron 8220	2800Mhz		2x1024KB	1000Mhz	95W		
Opteron 8220SE	2800Mhz		2x1024KB	1000Mhz	120W		
Opteron 8222SE	3000Mhz	2x1024KB	1000Mhz	120W			