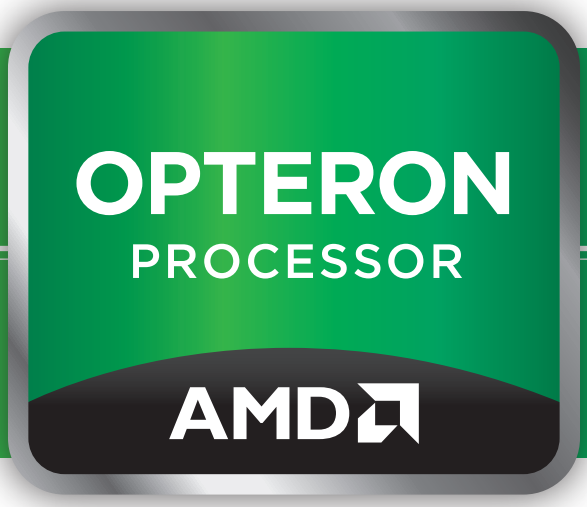


AMD Server Solutions Playbook

A Comprehensive Guide to the AMD Opteron™ 6000, 4000 and 3000 Series Server Platforms

v4. December 2012.

This AMD Server Solutions playbook was created to help our component channel sales partners choose the right server platforms for their customers to help them meet their business needs today and tomorrow. It includes AMD Opteron™ processor-specific information to help you in making recommendations, comparing competitive offerings, positioning AMD solutions for specific workload needs, referencing specific partner motherboard and barebones solutions, etc.

Table Of Contents

Choose the server platform that's right for your customer

> AMD Opteron™ Processors 1
> How AMD Compares to the Competition 2
> Workload-Focused Product Strategy 3

How AMD Opteron™ benefit your customer's workload needs

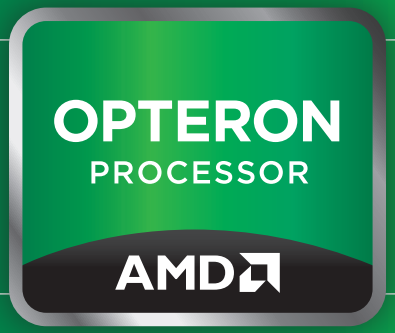
> Virtualization 4
> Database 5
> Cloud Computing 6
> High Performance Computing 9
> IT Infrastructure 17

AMD Opteron™ 6300 Series Processor Parts & Specifications 18
AMD Opteron™ 6200 Series Processor Parts & Specifications 21
AMD Opteron™ 4300 Series Processor Parts & Specifications 24
AMD Opteron™ 4200 Series Processor Parts & Specifications 27
AMD Opteron™ 3300 Series Processor Parts & Specifications 30
AMD Opteron™ 3200 Series Processor Parts & Specifications 32
AMD Opteron™ Processor Product Feature Details 35
AMD Opteron™ Chipset Specifications 36

Motherboards and Barebones

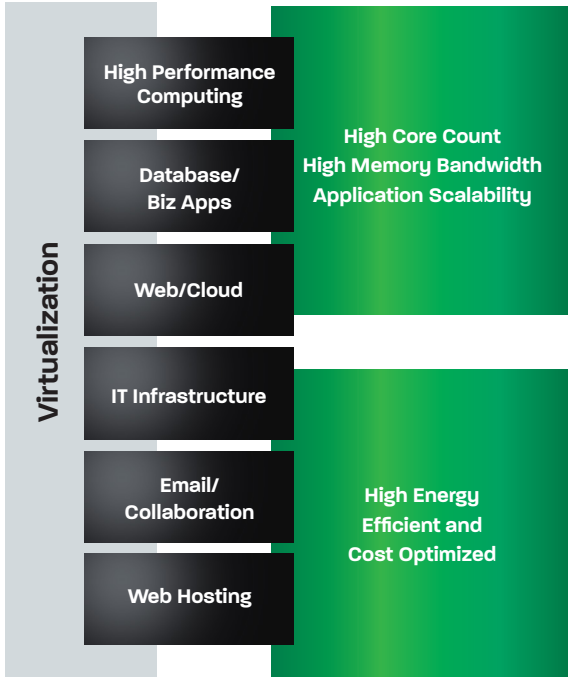
> ASUS 37
> MSI 41
> Supermicro 42
> Tyan 59

AMD Distributors 69
Server Resources 70



Choose the server platform that's right for your customer

AMD OPTERON™ PROCESSORS



AMD Opteron™ 6000 Series Processors

- **AMD Opteron 6100 Series processor** — 8 and 12 cores
- **AMD Opteron 6200 Series processor** — 4, 8, 12 and 16 cores
- **AMD Opteron 6300 Series processor** — 4, 8, 12 and 16 cores

AMD Opteron™ 4000 Series Processors

- **AMD Opteron 4100 Series processor** — 4 and 6 cores
- **AMD Opteron 4200 Series processor** — 6 and 8 cores
- **AMD Opteron 4300 Series processor** — 4, 6 and 8 cores

AMD Opteron™ 3000 Series Processors

- **AMD Opteron 3200 Series processor** — 4 and 8 cores
- **AMD Opteron 3300 Series processor** — 4 and 8 cores

AMD Opteron™ 6300 Series Processors

> Ideal for performance and scalability
> 4, 8, 12, and 16 cores available
> 2/4 socket; 4 memory channels
> Delivers up to 24%+[1] higher performance
> Easily integrated into existing AMD Opteron 6000 Series platform
> G34 socket platform
> AMD SR5600 Series Chipset

AMD Opteron™ 4300 Series Processors

> Ideal for power and cost efficiency
> 4, 6 and 8 cores available
> 1/2 socket; 2 memory channels
> Up to 24% higher performance per watt than previous generations[2]
> Easily integrated into existing AMD Opteron 4000 Series platform
> C32 socket platform
> AMD SR5600 Series Chipset

AMD Opteron™ 3300 Series Processors

> Ideal for low cost servers
> 4 and 8 cores available
> 1 socket, 2 memory channels
> Server-class performance in a 1P platform
> AM3+ socket platform
> Low acquisition cost for fast amortization
> AMD SR5600 Series Chipset
> Cost-effective and low power

SUBSTANTIATION

1. Estimate based on preliminary measurements of server side Java performance in AMD labs as of August 30, 2012. 1,199,838 operations per second using 2 x AMD Opteron™ processors Model 6278. 1,489,668 operations per second using 2 x AMD Opteron™ processors Model 6380. SVR-168
2. Comparison based on 2P SPECpower_ssj2008 data submitted to SPEC as of Nov 27, 2012: 60.9W at Active Idle, 256W and 971,064 ssj_ops at 100% of target load, and 3052 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 4386 in Tyan YR190B8228 server, 32GB (4 x 8GB DDR3-1600) memory, YM-2451C power supply, 128GB SATA SSD disk drive, Microsoft® Windows Server® 2008 x64 Enterprise Edition SP1. 61.8W at Active Idle, 299W and 870,780 ssj_ops at 100% of target load, and 2453 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 4284 in Tyan YR190B8228 server, 32GB (4 x 8GB DDR3-1600) memory, YM-2451C power supply, 128GB SATA SSD disk drive, Microsoft® Windows Server® 2008 x64 Enterprise Edition SP1. SPEC, SPECpower and SPECpower_ssj are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org. SVR-312

HOW AMD COMPARES TO THE COMPETITION

	4P			
PROCESSOR COMPARISON	**AMD OPTERON™ 6200 SERIES PROCESSOR**	**AMD OPTERON™ 6300 SERIES PROCESSOR**	**INTEL XEON E7-4800 SERIES PROCESSOR**	**INTEL XEON E5-4600 SERIES PROCESSOR**
SPECS AND PRICING				
Target configurations	1P, 2P or 4P	1P, 2P or 4P	4P	4P
Cores per processor	4, 8, 12 and 16 cores	4, 8, 12 and 16 cores	6, 8 and 10 cores	4, 6 and 8 cores
Max memory speed (MHz)	1600	1866**	1066	1600
Minimum TDP per core	5.31	5.31	13	11.88
Top bin processor price	$1,265	$1,392	$4,394	$3,616
Lowest cost processor option	$266	$293	$890	$551

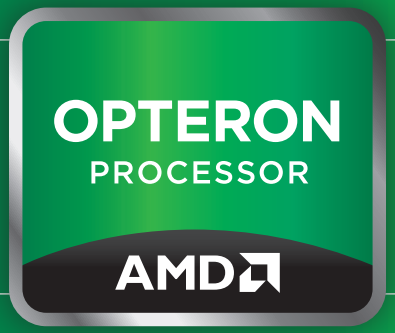
	2P						
PROCESSOR COMPARISON	**AMD OPTERON™ 6200 SERIES PROCESSOR**	**AMD OPTERON™ 6300 SERIES PROCESSOR**	**INTEL XEON E5-2600 SERIES PROCESSOR**	**INTEL XEON E5-2400 SERIES PROCESSOR**	**AMD OPTERON™ 4200 SERIES PROCESSOR**	**AMD OPTERON™ 4300 SERIES PROCESSOR**	**INTEL XEON E5-2400 SERIES PROCESSOR**
SPECS AND PRICING							
Target configurations	1P, 2P or 4P	1P, 2P or 4P	1P or 2P	1P or 2P	1P or 2P	1P or 2P	1P or 2P
Cores per processor	4, 8, 12 and 16 cores	4, 8, 12 and 16 cores	2, 4, 6 and 8 cores	4, 6 and 8 cores	6 and 8 cores	4, 6 and 8 cores	4, 6 and 8 cores
Max memory speed (MHz)	1600	1866**	1600	1600	1600	1866**	1600
Minimum TDP per core	5.31	5.31	8.75	8.75	4.38	8.12	8.75
Top bin processor price	$1,265	$1,392	$2,057	$1,440	$455	$501	$1,440
Lowest cost processor option	$266	$293	$198	$188	$125	$191	$188

	1P		
PROCESSOR COMPARISON	**AMD OPTERON™ 3200 SERIES PROCESSOR**	**AMD OPTERON™ 3300 SERIES PROCESSOR**	**INTEL XEON E3-12XXL V2 SERIES PROCESSOR**
SPECS AND PRICING			
Target configurations	1P	1P	1P
Cores per processor	4 or 8 cores	4 or 8 cores	2 or 4 cores
Max memory speed (MHz)	1866**	1866**	1600
Minimum TDP per core	8.13	6.3	8.5
Top bin processor price	$229	$229	$294
Lowest cost processor option	$99	$125	$189

**1866MHz supported only with a single physical DIMM per memory channel
AMD pricing found at http://www.amd.com/us/products/pricing/Pages/server-opteron.aspx as of November 2012. Intel pricing found at http://files.shareholder.com/downloads/INTC/2230713706x0x620518/06E8C4D8-4C4B-4E71-A015-EF30C0418B16/Copy_of_Dec_11_12_Recommended_Customer_Price_List.pdf as of December 2012

WORKLOAD-FOCUSED PRODUCT STRATEGY

	Private Cloud	Public Cloud	Big Data
Workload Apps			
	Web Services Hosted Applications Search and Social Media Applications Media Streaming	Virtualized IT Infrastructure VDI (Virtual Desktop Infrastructure) Web Services Database	Hadoop HPC apps include LS Dyna Physics Life Sciences Molecular Dynamics
Thread Density			
AMD Opteron™ 6000 Series Processors	Enterprise virtualization	Cloud app layer, memcache, back end	Performance HPC clusters
Thread Power Efficiency			
AMD Opteron™ 4000 Series Processors	SMB/Branch office virtualization	Low power cloud front end, app layer	
Thread Cost			
AMD Opteron™ 3000 Series Processors		Dedicated hosting and small business servers	



How AMD Opteron™ processors benefit your customer's workload needs

VIRTUALIZATION

STRIKING THE BALANCE BETWEEN PERFORMANCE AND PRICE

Meet your customer's datacenter and bottom line requirements with a balance of consistent performance, dependability, and price for their virtualization & private cloud computing deployments. AMD-powered clouds deliver the compute power they need on an efficient and rock-solid platform for virtualization and private cloud environments that make smart business sense and deliver real-world results.

Workload Need	AMD Platform Benefits
Balance of price and performance	> 4P servers with up to 64 cores allow for 4P performance at 2P prices in the AMD Opteron 6000 series processors.[1]
Consolidate to save	> More cores per processor (up to 16 cores/CPU) with up to four memory channels per CPU and virtualization hardware enhancements such as AMD Virtualization (AMD-V™) Technology help to support more core dense servers, which can result in greater ROI. > Ideal for virtualization solutions that your customers are using, such as VMware vSphere™, Windows® Hyper-V Server, Citrix XenServer™, and Red Hat Enterprise Virtualization. > Scale during peak cycles with more cores, memory channels and I/O capabilities.
Reduce power and space	> AMD Opteron™ 6300 Series processor-based servers allow you to run up to twice the VMs per CPU as Intel Xeon E5-2600 Series-based servers, deploying up to 672 VMs in as little as 6 square feet of floor space.[2] > Innovative power-saving features such as AMD-P 2.0 technology, C6, and TDP Power Capping allow for superior power efficiency and more control of your power and cooling costs; rack dense servers and blades reduce space requirements. > **Control your power budget and get more flexible, dense deployments** – use TDP Power Cap to set TDP ceiling. > **Optimize performance per watt at load/idle** – monitor, adjust processor power states, and turn off unused parts of the processor with AMD-P 2.0 technology.
Run application at near native performance	> Reduce latency associated with virtualization via hardware enhancements found in AMD Virtualization (AMD-V™) 2.0 Technology. See product specs for more information on AMD-V™ technology. > **Run more or more robust VMs or virtual desktops per server** – AMD Opteron 6300 Series processors offer up to 100% more cores than Intel Xeon E5-2600 series processors.[3] > **High Memory throughput to support multiple VMs and help reduce latency** – 4 channels of up to 1866** MHz.
Seamless migration	> Consistent features, images, and software between the AMD Opteron™ 6000 and 4000 Series Platforms. > Consistency across the AMD Opteron™ 6000 and 4000 series processors for easy upgradeability and backwards compatibility between generations.
I/O Virtualization	> Help improve performance by assigning a virtual machine to an I/O device. > Protect virtual machine memory from peripheral-based attacks and provide increased integrity and security.

HOW TO SELL

> Understand how the customer is using virtualization. Every situation is unique, the business drivers will dictate what platforms to deploy. It is important to have an in depth conversation with your customer to see what the right fit is for them.

> Understand what virtualization solution they are looking at, is it VMware or Microsoft® with Hyper-V?

> Focus on presenting the price/performance and cost/VM advantages of AMD servers rather than just raw performance.

SUBSTANTIATION:
1. Based on 2P capable Six-Core AMD Opteron™ processor Model 2435 1ku pricing of $989 as of 10-19-09 vs. 4P capable AMD Opteron™ processor Model 6172 1ku pricing of $989 as of 4-25-2011. SVR-22
2. Based on a 1 VM/core model, AMD Opteron™ 6300 Series-based servers have up to 16 cores per processor. 672 VMs equals a 42U rack of (21) 2P 2U servers. Intel Xeon E5-2600-based servers have up to 8 cores per processor as of 4/6/12 at www.intc.com/pricelist.cfm, which yields up to 336 VMs in a 42U rack of (21) 2P servers. The square footage of a standard rack is 6 ft (2ft x 3ft). SVR-136
3. AMD Opteron™ 6300 Series processors have up to 16 cores. Intel Xeon E5-2600 Series processors have up to 8 cores per processor. Intel Xeon E7-4800 Series has up to 10 cores per processor. See www.intc.com/pricelist.cfm as of 4/2/12. SVR-140

**1866MHz supported only with a single physical DIMM per memory channel

DATABASE WORKLOADS

STRIKING THE BALANCE BETWEEN PERFORMANCE AND PRICE

More Memory Channels Enable:

> Fast access to data tables that reside in memory.
> Fast read and write operations.
> A database to load a larger number of records into memory for fast processing rather than swapping data back and forth from hard drives.

Workload Need	AMD Platform Benefits
Scale during peak cycles	> Up to 64 cores, 16 memory channels, and I/O capabilities (PCI Express Gen 2 for high speed I/O peripherals) in 4P. > **Faster memory bandwidth** – 78% faster[2] in 4P for the AMD Opteron 6200 series processors, for fast data access to improve performance. > **Tackle peak demands** – unlock power headroom and boost clock speed with AMD Turbo CORE technology.
Handle data management and analysis on same platform	> Up to 16 cores with 4 memory channels and 16MB of L3 cache per CPU for updating, searching, and analyzing data.
Consolidate databases to save cost	> More cores per processor (up to 16 cores/CPU) to drive multiple databases per server.
Reduce power consumption during low usage	> The innovative AMD-P 2.0 technology suite of power saving features allow consolidation with great power efficiency. > AMD Opteron™ 6300 Series processors support ultra low voltage memory, which has 17% lower voltage than standard memory.[3]

HOW TO SELL

> Understand how the customer is using database.

> Understand what database platforms the customer is using.

SUBSTANTIATION:
1. SVR-22: Based on 2P capable Six-Core AMD Opteron™ processor Model 2435 1ku pricing of $989 as of 10-19-09 vs. 4P capable AMD Opteron™ processor Model 6172 1ku pricing of $989 as of 4-25-2011.
2. For AMD Opteron™ processors supporting a maximum memory speed of DDR3-1600, theoretical memory bandwidth = 12.8GB/s x number of memory channels per server. For AMD Opteron™ processors supporting a maximum memory speed of DDR3-1333, theoretical memory bandwidth = 10.667GB/s x number of memory channels per server. The max theoretical bandwidth for four AMD Opteron™ processor Model 6282 SE is 205 GB/s. For Intel Xeon processors, theoretical memory bandwidth = SMI speed x 9 bits per SB lane x 16 lanes. The max theoretical bandwidth for four Intel Xeon processor Model E7-4870 is 115 GB/s. For more information, please see page 7 of http://www.intel.com/Assets/PDF/ datasheet/322824.pdf. SVR-101.
3. AMD Opteron™ 6300 Series processors support ultra low voltage (1.25V) memory and they also support standard memory (1.5V). SVR-141

CLOUD COMPUTING WORKLOADS

STRIKING A BALANCE BETWEEN PERFORMANCE AND PRICE

With AMD processor-based solutions, your customer's company has a highly scalable and dependable server platform that can fulfill all their cloud data center requirements at a great value. By using AMD Opteron™ processors as the foundation of their data center, they have the compute power and flexibility to efficiently handle the demands of running a cloud environment while meeting their bottom-line requirements with a balance of performance, efficient power consumption, and price.

WHY MORE MEMORY CHANNELS MATTER FOR WEB/CLOUD COMPUTING

With the growing popularity of virtualized Web servers, it is important to have memory resources (at least 2GB) for each virtual machine (VM). AMD Opteron™ processor-based server platforms support up to four memory channels. More memory channels enable:

> Increased paths to access the information in memory.
> Reading and writing more information simultaneously over the channels.

With more memory, large data applications such as Memcached and Apache Hadoop help:

> Cloud applications run faster.
> Distribute the processing power across a larger number of nodes with more memory.

Large memory footprints and more channels of high performance memory help with:

> Cloud computing challenges.
> Driving better performance and lower latency for memory access.

HOW TO SELL

> Balanced platforms (performance, power, and price) designed for internet-based computing.

> Specialized ultra-low power platform to optimize energy efficiency.

> High core density allows for fewer physical servers to manage and superior use of floor space.

CLOUD COMPUTING WORKLOADS

DEDICATED WEB HOSTING

Workload Need	AMD Platform Benefits
Enterprise Class	> Delivering performance and flexibility with worry-free, enterprise class reliability, software and OS certification and manageability.
Fast Payback	> AMD Opteron™ 3300 Series processors offer up to 61% lower cost per core than Intel Xeon E3-12xxLv2 Series processors.[1]
Cores	> Delivering more cores and better price performance in the AMD Opteron 3000 series processors.[2,3]

SUBSTANTIATION

1. Intel Xeon processor Model E3-1265Lv2 has 4 cores and a price of $294 as of 10/17/12 at www.intc.com/pricelist.cfm. AMD Opteron™ processor Models 3380 has 8 cores and a preliminary price of $229. SVR-307
2. Intel Xeon processor Model E3-1220L has 2 cores and E3-1260L has 4 cores as of 1/9/12 at www.intc.com/pricelist.cfm. AMD Opteron™ processor Models 3250, 3260, and 3280 have 4, 4, and 8 cores respectively. SVR-110
3. AMD Opteron™ 3200 Series processors provide up to 60% better performance per $ than Intel Xeon E3-12xxL Series processors. Comparison drawn between the Intel Xeon E3-12xxL and AMD Opteron 3200 Series processors with the highest SPECint_rate2006 to price ratio. The estimated SPECint®_rate2006 scores for the AMD Opteron 3200 Series processors reflect current expectations based on the performance of AMD Opteron 4200 Series processors and are subject to change. The results for the Intel Xeon processors reflect the highest 1P results published on http://www.spec.org/cpu2006/results as of Jan 9, 2012 with each processor operating at its default frequency.
   - 70.3, 1 x Intel Xeon processor Model E3-1220L in IBM System x3250 M4 (Intel Xeon E3-1220L), 16 GB (2 x 8 GB 2Rx8 PC3-10600E-9, ECC), Red Hat Enterprise Linux Server Release 6.1, Kernel 2.6.32-131.0.15.el6.x86_64, C/C++: Version 12.1.0.225 of Intel Compiler XE Build 20110803, http://www.spec.org/cpu2006/results/res2011q4/cpu2006-20111121-18865.html.
   - 139, 1 x Intel Xeon processor Model E3-1260L in IBM System x3250 M4 (Intel Xeon E3-1260L), 16 GB (2 x 8 GB 2Rx8 PC3-10600E-9, ECC), Red Hat Enterprise Linux Server Release 6.1, Kernel 2.6.32-131.0.15.el6.x86_64, C/C++: Version 12.1.0.225 of Intel Compiler XE Build 20110803, http://www.spec.org/cpu2006/results/res2011q4/cpu2006-20111121-18877.html.
   - SPECint®_rate score= 75 (est.), 1 x AMD Opteron™ processors Model 3250.
   - SPECint®_rate score= 80 (est.), 1 x AMD Opteron™ processors Model 3260.
   - SPECint®_rate score= 117 (est.), 1 x AMD Opteron™ processors Model 3280.
   - Intel Xeon processor Model E3-1220L is $189 as of 1/9/12 at www.intc.com/pricelist.cfm.
   - Intel Xeon processor Model E3-1260L is $294 as of 1/9/12 at www.intc.com/pricelist.cfm.
   - AMD Opteron™ processor Model 3250 has a preliminary price of $99 as of 1/9/12.
   - AMD Opteron™ processor Model 3260 has a preliminary price of $125 as of 1/9/12.
   - AMD Opteron™ processor Model 3280 has a preliminary price of $229 as of 1/9/12. SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. For the latest SPECint_rate2006 results, visit http://www.spec.org/cpu2006/results. SVR-114

CLOUD COMPUTING WORKLOADS

Workload Need	AMD Platform Benefits
Stable platforms with balance of CPU, I/O, and power	> Superior price/performance and expandability (AMD Opteron™ 6300 Series) and/or performance / per watt (AMD Opteron™ 4300 Series). > Intel will lead with price, while AMD will lead with **price AND platform functionality**. > Up to 78% higher[1] memory bandwidth in 4P AMD Opteron 6200 series processors for fast data access and to improve performance.
Low power servers	> The lowest two-socket server TDP (35W) (AMD Opteron™ 4300 Series). > **Offering parts that are specifically designed for servers** - Intel may use desktop or laptop components for low power web/cloud bids. > **Extremely low TDP per core** – 5.3W for AMD Opteron processor Model 6262 HE and 4.4W for AMD Opteron processor Model 4256 EE. > **Higher performance/watt** – AMD Opteron™ 6300 Series processors offer up to 40% higher performance/watt than AMD Opteron 6200 Series processors.[2] > **Run more cores in the same power/thermal envelope** – up to 60-100% more cores.[3] > **Control your power budget and get more flexible, denser deployments** – use TDP Power Cap to set TDP ceiling. > **Optimize performance per watt at load/idle** – monitor, adjust processor power states, and turn off unused parts of the processor with AMD-P 2.0.
Handle large quantity of transactions while keeping user response time low	> Up to 64 Cores, 16 memory channels, and I/O capabilities to handle heavy user demand; I/O capabilities include PCI Express® Gen 2 for high speed I/O peripherals in 4P offerings.

SUBSTANTIATION

1. For AMD Opteron™ processors supporting a maximum memory speed of DDR3-1600, theoretical memory bandwidth = 12.8GB/s x number of memory channels per server. For AMD Opteron™ processors supporting a maximum memory speed of DDR3-1333, theoretical memory bandwidth = 10.667GB/s x number of memory channels per server. The max theoretical bandwidth for four AMD Opteron™ processor Model 6282 SE is 205 GB/s. For Intel Xeon processors, theoretical memory bandwidth = SMI speed x 9 bits per SB lane x 16 lanes. The max theoretical bandwidth for four Intel Xeon processor Model E7-4870 is 115 GB/s. For more information, please see page 7 of http://www.intel. com/Assets/PDF/datasheet/322824.pdf. SVR-101.
2. Comparison based on 2P SPECpower_ssj2008 data as of Oct 16, 2012: 77.9W at Active Idle, 308W and 1,636,298 ssj_ops at 100% of target load, and 4,040 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 6380 in Supermicro 1022G-NTF server, 64GB (8 x 8GB DDR3-1600) memory, Supermicro PWS-563-1H20 power supply, 240GB SATA disk drive, Microsoft® Windows Server® 2008 R2 x64 Enterprise Edition. 82.6W at Active Idle, 320W and 1,233,423 ssj_ops at 100% of target load, and 2,892 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 6278 in Supermicro 1022G-NTF server, 64GB (8 x 8GB DDR3-1600) memory, Supermicro PWS-563-1H20 power supply, 240GB SATA disk drive, Microsoft® Windows Server® 2008 R2 x64 Enterprise Edition. SPEC and SPECjbb are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org. SVR-305
3. AMD Opteron™ 6300 Series processors have up to 16 cores. Intel Xeon E5-2600 Series processors have up to 8 cores per processor. Intel Xeon E7-4800 Series has up to 10 cores per processor. See www.intc.com/pricelist.cfm as of 4/2/12. SVR-140

HIGH PERFORMANCE COMPUTING WORKLOADS

SCALABLE SOLUTIONS FOR ANY SIZE PROBLEM

AMD is recognized as a leader in high performance computing (HPC), recently receiving two awards from HPCwire: a Readers' Choice Award for **'Best HPC Collaboration between Government and Industry'**[1] and an Editors' Choice Award for **'Top Five Vendors to Watch.'**[1] These awards further underscore AMD's leadership position in supercomputing with its AMD Opteron™ processor family and its recent addition of the high performance AMD Opteron™ 6300 Series processor.

AMD provides massive compute capability, performance and flexibility to **power the world's number one ranked supercomputer.**[2] This ranking, the sixth number-one spot for AMD-based supercomputers in the last five years, highlights AMD's commitment to enabling indispensable computing technology by offering competitive performance at low cost.

NEW CORE ARCHITECTURE

With the new AMD Opteron architecture, customers are provided the flexibility to optimally tune codes based on workload requirements. This architecture is based on a building block called a module. Each module has two tightly coupled x86 processing engines that are called cores.

Each integer *core* has its own dedicated resource.

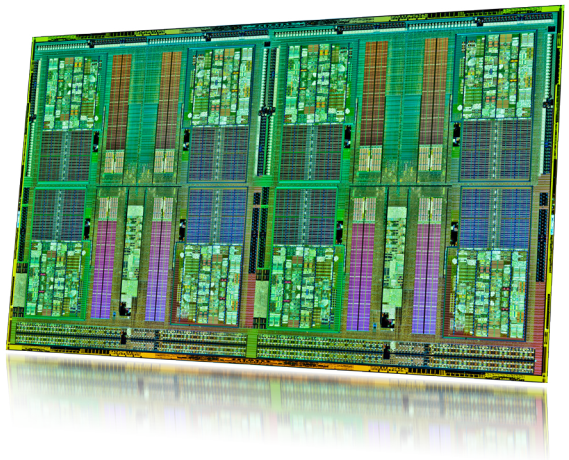
> Integer Scheduler
> Execution Engine
> L1 Cache

Each pair of *cores in a module share some resources.**

> Instruction Fetch
> Decode
> Floating Point Unit
> L2 Cache

Processors can boost core frequencies by allocating more power to individual cores.

> Cores that are idle can "go to sleep" and turn off their power draw, allocating more power to the active cores.



1. Taken from http://sites.amd.com/us/business/it-solutions/compute-intensive-hpc/Pages/compute-intensive-hpc.aspx December 2012
2. Taken from http://www.top500.org/lists/2012/11/ as of December 2012

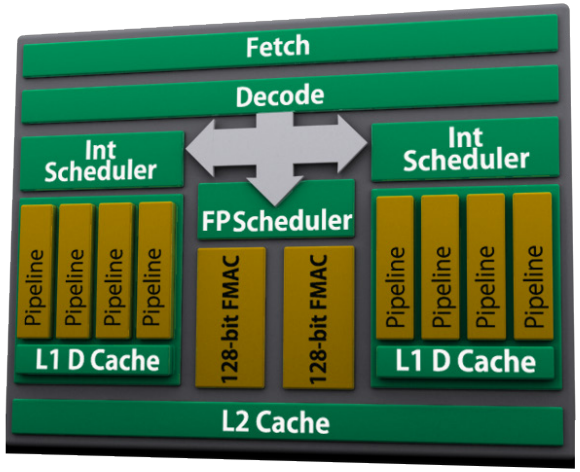
*Sharing of CPU resources is an engineering design decision intended to provide superior performance for a broad range of applications while maximizing power efficiency. Since most of the shared resources can provide more performance than a single CPU core can take advantage of, it makes good engineering sense to share among multiple cores. For more information, visit www.amd.com/HPC or http://developer.amd.com.

HIGH PERFORMANCE COMPUTING WORKLOADS

TODAY'S AMD OPTERON™ 6300 SERIES PROCESSORS

Greater Performance

- Agile compute module x86 processor:
  - Scalable up to 4 sockets with up to 16 cores.
  - Four DDR-3 memory channels: up to 1866 MHz memory and 1.5 TB capacity in 4P systems.
  - Up to 3.5 GHz base frequency.
- Up to 24% higher Java performance[1] over previous generation.



Next Generation "Piledriver" Core

Greater Efficiency

- Up to 40% higher performance per watt than previous generation.[2]
- C6 power state enables ultra low power by gating power to idle cores.
- Flexible power management.
- Consistency with AMD Opteron™ 6200 Series:
  - Same power/thermals.
  - Same socket.
  - Same software certifications.

SUBSTANTIATION

1. Comparison based on highest 2P SPECjbb2005 benchmark data as of Oct 16, 2012. 1493967 bops (16 JVMs and 93373 bops/JVM) using 2 x AMD Opteron™ processors Model 6380 in Supermicro 1022G-URF server, 128GB (16 x 8GB DDR3-1600) memory, Microsoft® Windows Server® 2008 Enterprise x64 Edition R2. 1199838 bops (16 JVMs and 74990 bops/JVM) using 2 x AMD Opteron™ processors Model 6278 in HP ProLiant BL465c Gen8 server, 128GB (16 x 8GB DDR3-1600) memory, Microsoft® Windows Server® 2008 Enterprise x64 Edition R2. SPEC and SPECjbb are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org. SVR-168
2. SVR-305 - Comparison based on 2P SPECpower_ssj2008 data as of Oct 16, 2012: 77.9W at Active Idle, 308W and 1,636,298 ssj_ops at 100% of target load, and 4,040 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 6380 in Supermicro 1022G-NTF server, 64GB (8 x 8GB DDR3-1600) memory, Supermicro PWS-563-1H20 power supply, 240GB SATA disk drive, Microsoft® Windows Server® 2008 R2 x64 Enterprise Edition. 82.6W at Active Idle, 320W and 1,233,423 ssj_ops at 100% of target load, and 2,892 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 6278 in Supermicro 1022G-NTF server, 64GB (8 x 8GB DDR3-1600) memory, Supermicro PWS-563-1H20 power supply, 240GB SATA disk drive, Microsoft® Windows Server® 2008 R2 x64 Enterprise Edition. SPEC and SPECjbb are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org.

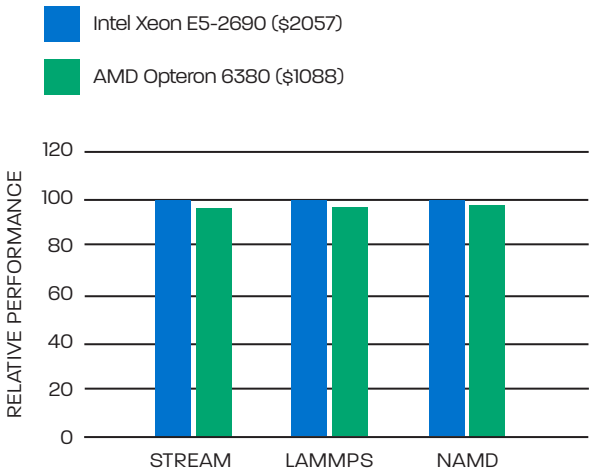
HIGH PERFORMANCE COMPUTING WORKLOADS

COMPETITIVE PERFORMANCE AT LOWER COST

Driving HPC Adoption

> Competitive raw performance
> Significantly better performance/$
> Easy upgrade path for existing customers

More Compute per dollar for technical workloads

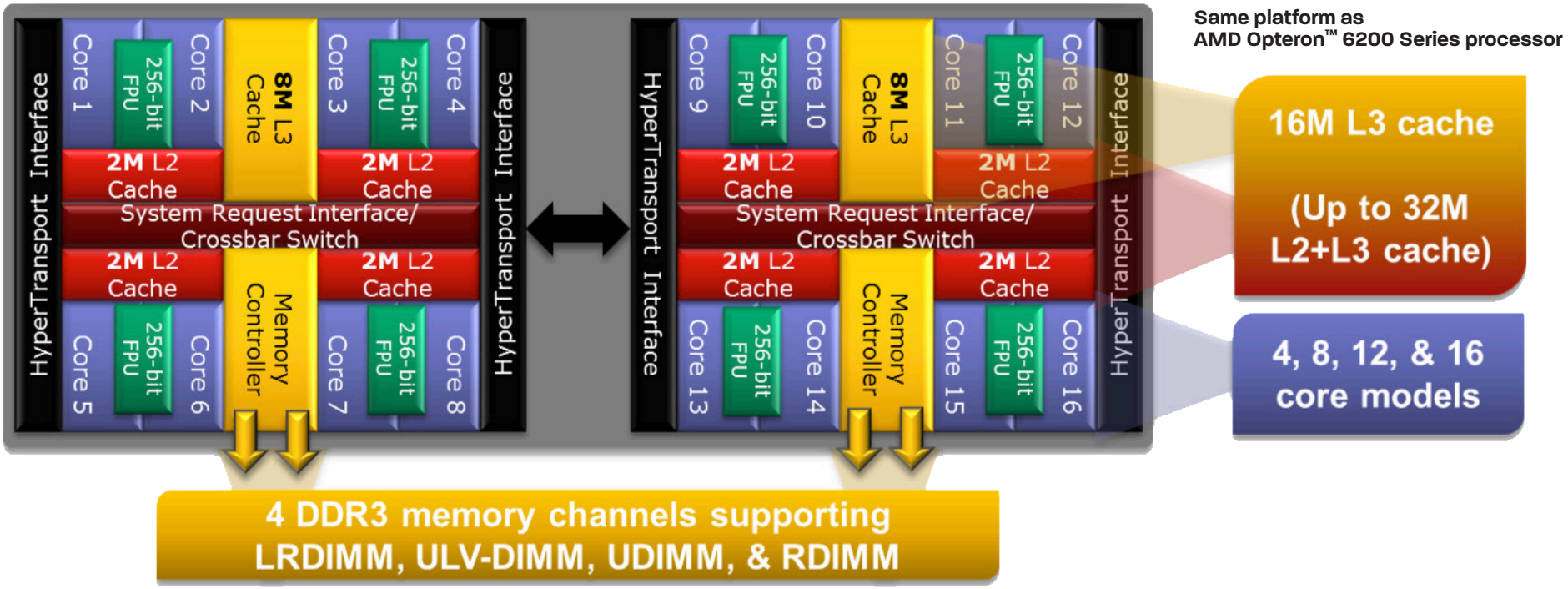


BENCHMARK SCORES AND CONFIGURATION:
STREAM:
75 GB/s with 2 x AMD Opteron™ processors Model 6380 in Supermicro H8DGT server, 64GB (8 x 8GB DDR3-1600) memory, SuSE Linux® Enterprise Server 11 SP2 64-bit
77 GB/s with 2 x Intel Xeon processors Model E5-2690 in Supermicro X9DRT-HIBFF server, 64GB (8 x 8GB DDR3-1600) memory, SuSE Linux® Enterprise Server 11 SP2 64-bit
LAMMPS:
304 rating with 2 x AMD Opteron™ processors Model 6380 in Supermicro H8DGT server, 64GB (8 x 8GB DDR3-1600) memory, SuSE Linux® Enterprise Server 11 SP2 64-bit, GCC 4.7.0 Compiler, OMPI 1.5.3
Compiler Flags: -O3 -freciprocal-math -march=bdver1 -mavx -mfma4
301 rating with 2 x Intel Xeon processors Model E5-2690 in Supermicro X9DRT-HIBFF server, 64GB (8 x 8GB DDR3-1600) memory, SuSE Linux® Enterprise Server 11 SP2 64-bit, Intel Professional Compiler v12.1.3, OMPI 1.6.0+knem 0.9.8, Hyper-Threading disabled, Turbo Boost Technology enabled
Compiler Flags: -O3 -fno-alias -ip -unroll0 -no-prec-div
NAMD:
2268 rating with 2 x AMD Opteron™ processors Model 6380 in Supermicro H8DGT server, 64GB (8 x 8GB DDR3-1600) memory, SuSE Linux® Enterprise Server 11 SP2 64-bit, GCC 4.7.0 Compiler, OMPI 1.6.0+Knem 0.9.8
Compiler Flags: -O3 -m64 -march=bdver1 -mfa4 -mavx
2193 rating with 2 x Intel Xeon processors Model E5-2690 in Supermicro X9DRT-HIBFF server, 64GB (8 x 8GB DDR3-1600) memory, SuSE Linux® Enterprise Server 11 SP2 64-bit, Intel Professional Compiler v12.1.3, OMPI 1.5.5+Knem 0.98, Hyper-Threading disabled, Turbo Boost Technology enabled
Intel pricing as of October 15, 2012 www.intel.com
AMD pricing as of December, 2012

HIGH PERFORMANCE COMPUTING WORKLOADS

MULTI-CHIP MODULE (MCM) PACKAGE

The AMD Opteron™ 6300 series processor is organized as a Multi-Chip Module (two CPU dies in the package), interconnected using a HyperTransport link. Each die has its own memory controller interface to allow external connection of up to two memory channels per die. This memory interface is shared among all the CPU core pairs on each die. Each core pair appears to the operating system as two completely independent CPU cores. Thus, to the OS, the device shown below appears as 16 CPUs.



HIGH PERFORMANCE COMPUTING WORKLOADS

SCENARIO ONE: TWO INTEGER CORES

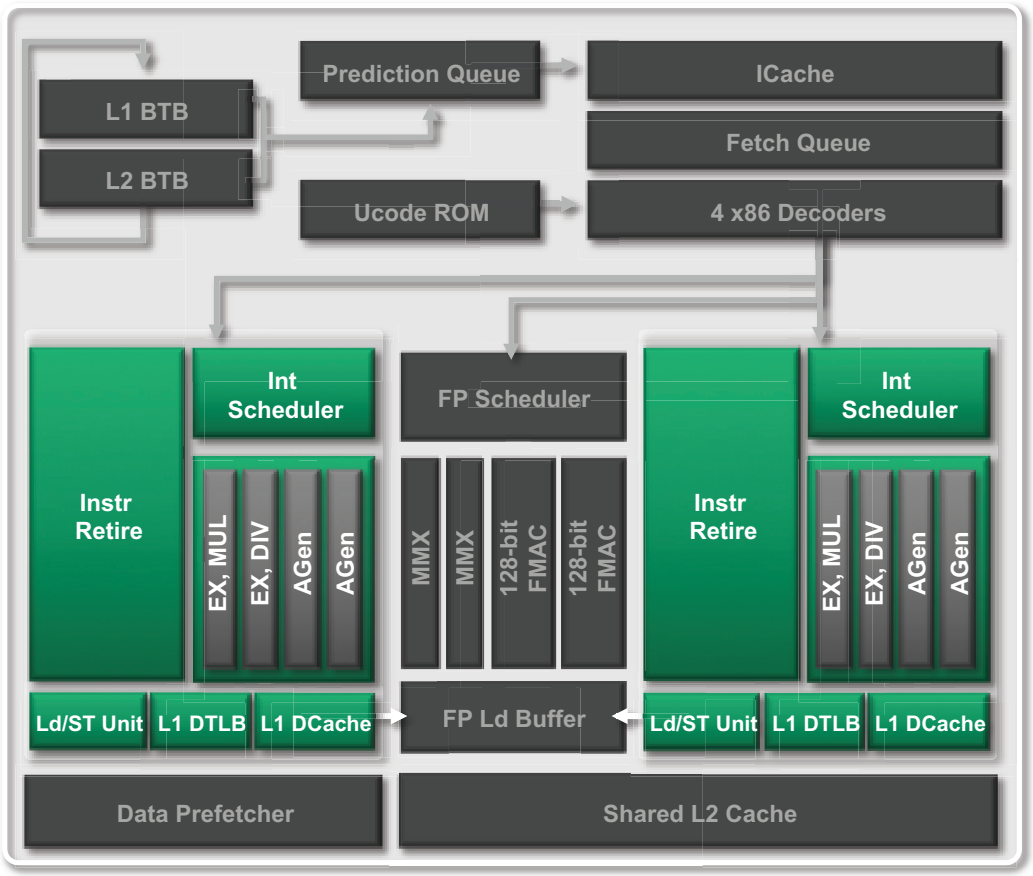
Agile compute unit.
Scenario one: A dedicated Integer pipe for each thread.

Efficient hardware paths:

> Shared L1 Cache, Fetch and Decoders, L2 cache, L3 cache for all the threads
> Dedicated integer scheduler
> Dedicated integer pipes

Workload types:

> Exchange Server
> File Server
> Virtualization workloads for VDI
> Transactions with small to moderate data
> Search algorithms requiring small to moderate data



HIGH PERFORMANCE COMPUTING WORKLOADS

SCENARIO TWO: TWO GENERAL PURPOSE CORES

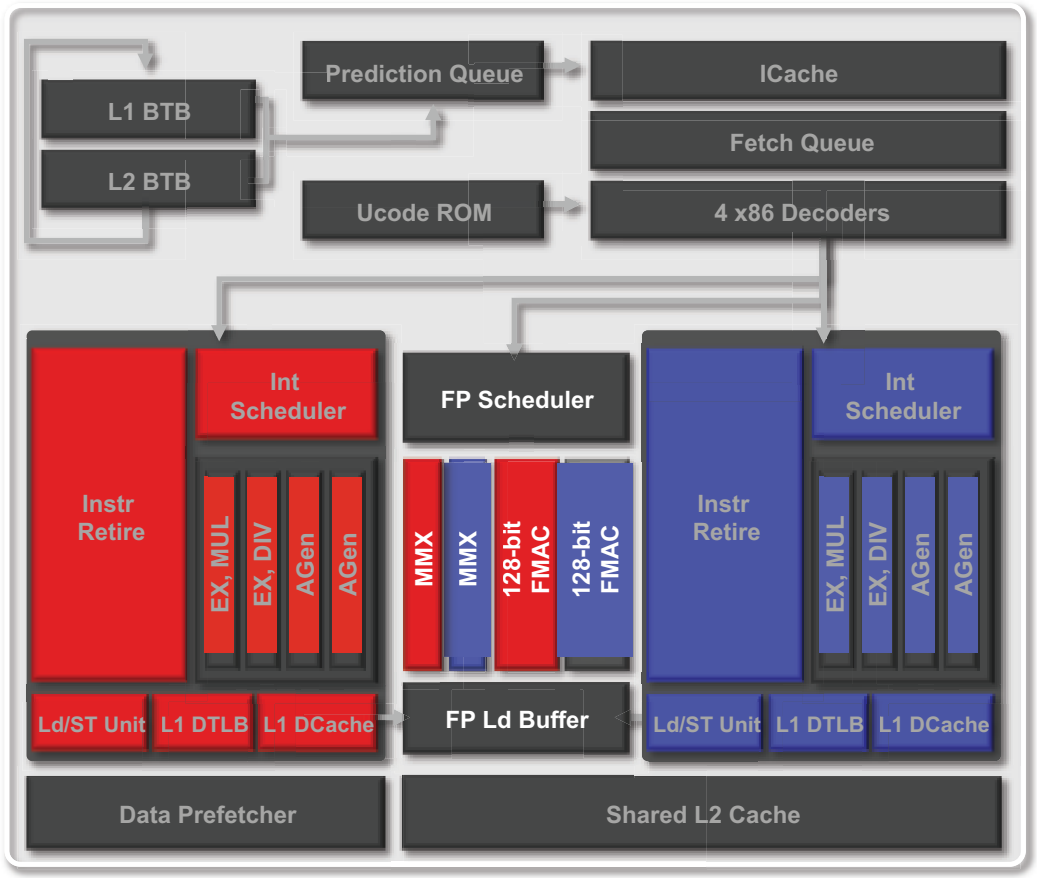
Agile compute unit.
Scenario two: Threads sharing all resources.

Efficient hardware paths:

> Shared L1 Cache, Fetch and Decoders, Floating point scheduler and
floating point pipes, L2 cache, L3 cache for all the threads
> Dedicated integer scheduler
> Dedicated integer pipes

Workload types:

> Excel runner, code produced by Mathworks, Wolfram Mathematica
> Virtualization workloads for back-office and front office
> Transactions with small to moderate data size
> Search with compute algorithms



HIGH PERFORMANCE COMPUTING WORKLOADS

SCENARIO THREE: SINGLE HEAVY LIFTING CORE

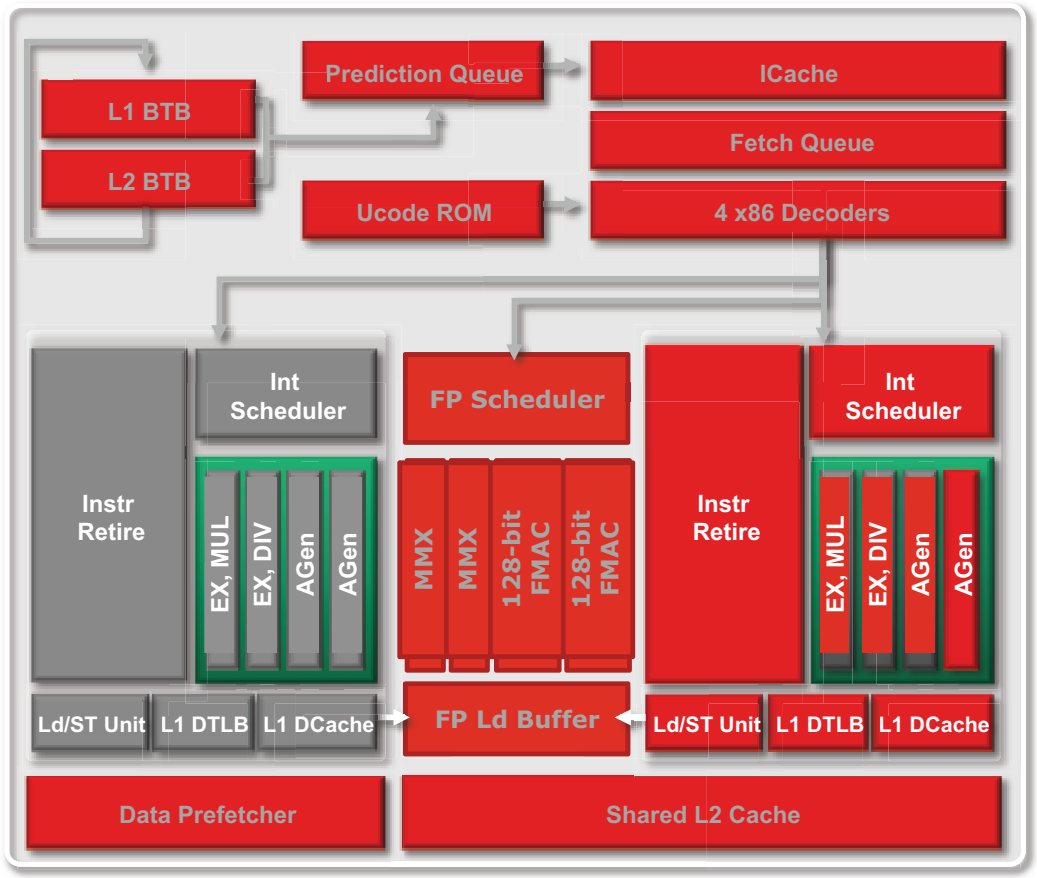
Agile compute unit.
Scenario three: ***Focused*** single thread performance.

Dedicated processor:

> L1 Cache
> Fetch and Decoder
> Integer Scheduler
> FP Scheduler (2 x MMX, FMAC)
> L2 Cache
> L3 Cache shared but with half the threads

Workload examples:

> Engineering Analysis
> Systemic Analysis
> Biomechanical Analysis
> Genomics
> Transactions with moderate to moderate large data requirements
> Search with compute algorithms with larger data



HIGH PERFORMANCE COMPUTING WORKLOADS

Workload Need	AMD Platform Benefits
Large Memory Footprints	> Flexible large memory footprints with 4P servers. > Flexible Positioning. > "Agile Compute Unit." > Up to 4 memory channels and 3 DIMMs per channel, which allows for more robust memory configurations. > **Superior Price/Performance** - One of the most compelling factors to highlight for HPC with your customers is value. Work a price/performance analysis based on the customer's workloads. > NUMA (Non-Uniform Memory Access) architecture - AMD's architecture is NUMA aware if supported in the OS being used.
Cache Friendly Codes	> **Sizeable caches** – L2/core and L3/die support cache friendly codes shown in scenario three in previous page.
Integer-based Codes	> Up to 16 dedicated integer cores per CPU provides core density for integer-based codes. (Up to 64 dedicated integer cores in 4P server)
Dense Floating Point capabilities for complex math algorithms	> Typical Application Code. > Up to sixteen 128-bit floating point units per processor or eight 256-bit floating point units per processor. > Floating point scheduler with two 128-bit fused multiply-accumulate-capable units. > AMD Opteron™ 6300 Series offer up to 93% more GFLOPS per rack than the competition when running 128-bit HPC code.[3]

SUBSTANTIATION

1. In 128-bit mode, the AMD Opteron™ processor Model 6386 SE is expected to have a max theoretical GFLOPS per rack equal to (21) 2P 2U servers per rack x 2 processors per server x 2.8GHz x 16 floating point processing unit per processor x (4) 32-bit operations/cycle. This equates to 7,526 GFLOPS/rack. In 128-bit mode, the Intel Xeon processor Model E5-2690 has a max theoretical GFLOPS of (21) 2P 2U servers per rack x 2 processors per server x 2.9GHz x 8 floating point processing units per processor x (4) 32-bit operations/cycle. This equates to 3,898 GFLOPS/rack. Intel spec info available at www.intc.com/pricelist.cfm as of 4/6/12. SVR-139

IT INFRASTRUCTURE WORKLOADS FILE/PRINT/EMAIL/COLLABORATION

STRIKING THE BALANCE BETWEEN PERFORMANCE AND PRICE

With the growing popularity of virtualized infrastructure servers, it is important to have core resources for each VM. More cores enable you to:

> Help the server to run more VMs simultaneously.
> Consolidate file, print, or email servers, helping to save server cost, operational cost, and data center floor space.

WHY MORE MEMORY CHANNELS MATTER FOR INFRASTRUCTURE

Infrastructure servers are the backbone of most networking services that drive today's businesses. Increasingly, infrastructure servers are being consolidated and virtualized in order to help reduce costs.

> The greater the consolidation, the greater potential for efficiency and cost savings.
> To get the best performance for these virtual servers, there needs to be enough memory in the physical server — typically a minimum of 2GB per VM.
> Supporting more memory channels gives the processor increased paths to access the information in memory, both reading and writing more information simultaneously over the channels.

Workload Need	AMD Platform Benefits
Reduce cost and power consumption while maintaining efficient file and print services	> Low cost (as low as $125 processor)[1] and power efficient (HE models) processors that help to reduce total cost of ownership (TCO).
Handle growing quantity and size of emails and network traffic	> More cores and memory channels per processor (up to 16 cores and 4 memory channels per processor). > AMD Opteron™ 6300 Series processors offer up to 100% more cores than Intel Xeon E5-2600 Series processors.[2] > **Getting more for your dollar with AMD** – Don't get fooled by only looking at "raw" performance, as cost and power efficiency are often top customer concerns.
Consolidate Microsoft™ Exchange servers	> AMD CPU architecture and virtualization enablement allows for near native performance while consolidating servers.

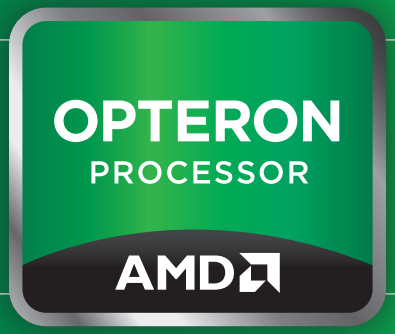
HOW TO SELL

> Low cost, power efficient 2P servers with a range of core and memory options to handle growing demands of email and collaboration.

> Consolidate older 2P email and infrastructure servers with new 4P solutions that can be more cost effective, energy efficient and provide room for your business to continue to grow.

> AMD-based servers that run Microsoft Windows® handle the business needs of today with additional capacity to support the growing workloads of tomorrow.

SUBSTANTIATION
1. Pricing from http://www.amd.com/us/products/pricing/Pages/server-opteron.aspx as of August 2012.
2. AMD Opteron™ 6300 Series processors have up to 16 cores. Intel Xeon E5-2600 Series processors have up to 8 cores per processor. Intel Xeon E7-4800 Series has up to 10 cores per processor. See www.intc.com/pricelist.cfm as of 4/2/12. SVR-140



AMD Opteron™ Processor Parts and Specifications

AMD OPTERON™ 6300 SERIES PROCESSOR PRODUCT SPECIFICATIONS

MODEL NUMBER	OPN	CORE COUNT	CORE FREQUENCY	ALL-CORE TURBO FREQUENCY	AMD TURBO CORE MAX FREQUENCY	BUS SPEED	CMOS TECH	L2 CACHE	L3 CACHE	TDP
6386 SE	OS6386YETGGHK	16	2.8 GHz	3.2 GHz	3.5 GHz	6.4 GTS	32 NM	8 x 2 MB	16 MB	140W
6380	OS6380WKTGGHK	16	2.5 GHz	2.8 GHz	3.4 GHz	6.4 GTS	32 NM	8 x 2 MB	16 MB	115W
6378	OS6378WKTGGHK	16	2.4 GHz	2.7 GHz	3.3 GHz	6.4 GTS	32 NM	8 x 2 MB	16 MB	115W
6376	OS6376WKTGGHK	16	2.3 GHz	3.2 GHz	3.3 GHz	6.4 GTS	32 NM	8 x 2 MB	16 MB	115W
6348	OS6348WKTCGHK	12	2.8 GHz	3.1 GHz	3.4 GHz	6.4 GTS	32 NM	6 x 2 MB	16 MB	115W
6344	OS6344WKTCGHK	12	2.6 GHz	2.9 GHz	3.2 GHz	6.4 GTS	32 NM	6 x 2 MB	16 MB	115W
6328	OS6328WKT8GHK	8	3.2 GHz	3.5 GHz	3.8 GHz	6.4 GTS	32 NM	4 x 2 MB	16 MB	115W
6320	OS6320WKT8GHK	8	2.8 GHz	3.1 GHz	3.3 GHz	6.4 GTS	32 NM	4 x 2 MB	16 MB	115W
6308	OS6308WKT4GHK	4	3.5 GHz	N/A	N/A	6.4 GTS	32 NM	2 x 2 MB	16 MB	115W
6366 HE	OS6366VATGGHK	16	1.8 GHz	2.3 GHz	3.1 GHz	6.4 GTS	32 NM	8 x 2 MB	16 MB	85W

AMD OPTERON™ 6300 SERIES PROCESSOR PRODUCT SPECIFICATIONS

Cache Sizes	Total Cache: 32MB (16 core), 28MB (12 core), 24MB (8 core), 20MB (4 core) L1 Cache: 16KB Data per core + 64KB Instruction (per module) L2 Cache: 1MB (per core) L3 Cache: 16MB (per socket)
Process Technology	32-nanometer SOI (silicon-on-insulator) technology
Hypertransport™ Technology Links	Four x16 links @ up to 6.4GT/s per link
Memory	Supports R/U DDR3, LV DDR3, ULV DDR3 and LR DDR3 Up to 1.5 TB memory capacity, supports up to 12 DIMMs per CPU
Memory channels per processor	4
Memory Speed	Up to 1866 MHz
Memory Types	1.25, 1.35, 1.5 Volts of DDR3 memory in either UDIMM or RDIMM
Die Size	316mm^2 per die
Packaging	Socket G34 — 1944-pin organic Land Grid Array (LGA)

END USER BENEFITS:

> Unleash unprecedented performance of highly threaded applications through massive, industry leading core density.

>AMD Opteron™ 6300 Series processors offer up to 60-100% more cores than Intel Xeon processors.[1]

> Bring unparalleled efficiency to your processing, power and financial budgets.

SUBSTANTIATION

1. AMD Opteron™ 6300 Series processors have up to 16 cores. Intel Xeon E5-2600 Series processors have up to 8 cores per processor. Intel Xeon E7-4800 Series has up to 10 cores per processor. See www.intc.com/pricelist.cfm as of 4/2/12. SVR-140

AMD OPTERON™ 6300 SERIES PROCESSOR PRODUCT FEATURE DETAILS

NEW KEY FEATURES:

> **2nd Generation Core Architecture** – designed to drive more core density and greater throughput.

> **AMD Turbo CORE Technology** – AMD Opteron™ 6300 Series processors have a 44% higher max boost than Intel Xeon E5-2600 Series processors.[1]

> **Flex FP** – delivers up to sixteen 128-bit floating point units per processor.

> **AMD Virtualization™ (AMD-V™) Technology 2.0** – heightens virtualization efficiency with new enhancements to the AMD-V suite of virtualization to optimize data center rack space and help minimize management tasks.

> **Processor Cores** – Delivering 60-100% more cores[2] – over the competition – for scalable systems.

> **Memory bandwidth** – Quad memory channels and high memory capacity for robust configurations.

> **Performance** – 60-100% more cores than our competition.[2] FMAC units in the Flex FP help drive more performance by executing FMA4 instructions that execute complex calculations in half the cycles as the competition.

> **AMD-P 2.0 Technology** – Power-saving features like C6 Power State and TDP Power Cap along with 1.25 (volt) ULV-DIMM. C6 Power State shuts down power to idle cores. TDP Power Cap gives you the flexibility to set power limits without capping processor frequency.

SUBSTANTIATION

1. As of 4/2/12 AMD Opteron™ 6300 Series processors are expected to have a max boost of 1.3 GHz over base frequency. Intel Xeon E5-2600 Series processors have a max boost of 0.9 GHz over base frequency according to http://ark.intel.com/compare/64592,64588,64594,64593,64586,64598,64591,64587,64590,64585,64584,64597,64589,64595,64583,64596 as of 4/2/12. SVR-143
2. AMD Opteron™ 6300 Series processors have up to 16 cores. Intel Xeon E5-2600 Series processors have up to 8 cores per processor. Intel Xeon E7-4800 Series has up to 10 cores per processor. See www.intc.com/pricelist.cfm as of 4/2/12. SVR-140

AMD OPTERON™ 6200 SERIES PROCESSOR PRODUCT SPECIFICATIONS

MODEL NUMBER	OPN	CORE COUNT	CORE FREQUENCY	ALL-CORE TURBO FREQUENCY	AMD TURBO CORE MAX FREQUENCY	BUS SPEED	CMOS TECH	L2 CACHE	L3 CACHE	TDP
6284 SE	OS6284YETGGGU	16	2.7GHz	3.1GHz	3.4GHz	6.4 GT/s	32nm SOI	8 x 2MB	16MB	140W
6282 SE	OS6282YETGGGU	16	2.6GHz	3.0GHz	3.3GHz	6.4 GT/s	32nm SOI	8 x 2MB	16MB	140W
6278	OS6278WKTGGGU	16	2.4GHz	2.7GHz	3.3GHz	6.4 GT/s	32nm SOI	8 x 2MB	16MB	115W
6276	OS6276WKTGGGU	16	2.3GHz	2.6GHz	3.2GHz	6.4 GT/s	32nm SOI	8 x 2MB	16MB	115W
6274	OS6274WKTGGGU	16	2.2GHz	2.5GHz	3.1GHz	6.4 GT/s	32nm SOI	8 x 2MB	16MB	115W
6272	OS6272WKTGGGU	16	2.1GHz	2.4GHz	3.0GHz	6.4 GT/s	32nm SOI	8 x 2MB	16MB	115W
6262 HE	OS6262VATGGGU	16	1.6GHz	2.1GHz	2.9GHz	6.4 GT/s	32nm SOI	8 x 2MB	16MB	85W
6238	OS6238WKTCGGU	12	2.6GHz	2.9GHz	3.2GHz	6.4 GT/s	32nm SOI	6 x 2MB	16MB	115W
6234	OS6234WKTCGGU	12	2.4GHz	2.7GHz	3.0GHz	6.4 GT/s	32nm SOI	6 x 2MB	16MB	115W
6220	OS6220WKT8GGU	8	3.0GHz	3.3GHz	3.6GHz	6.4 GT/s	32nm SOI	4 x 2MB	16MB	115W
6212	OS6212WKT8GGU	8	2.6GHz	2.9GHz	3.2GHz	6.4 GT/s	32nm SOI	4 x 2MB	16MB	115W
6204	OS6204WKT4GGU	4	3.3GHz	N/A	N/A	6.4 GT/s	32nm SOI	2 x 2MB	16MB	115W

The industry's only solution with 16 physical cores.
The only solution offering a choice of 4, 8, 12 and 16 cores.

AMD OPTERON™ 6200 SERIES PROCESSOR PRODUCT SPECIFICATIONS

Cache Sizes	Total Cache: 32MB (16 core), 28MB (12 core), 24MB (8 core), 20MB (4 core) L1 Cache: 16KB/core + 64KB instruction/module L2 Cache: 1MB (per core) L3 Cache: 16MB (per socket)
Process Technology	32-nanometer SOI (silicon-on-insulator) technology
Hypertransport™ Technology Links	Four x16 HT3 links at up to 6.4GT/s per link
Memory	Integrated DDR3 memory controller — Up to 102.4 GT/s memory bandwidth per CPU for Socket G34
Memory channels per processor	4
Memory Speed	Up to 1600 MHz
Memory Types	1.25, 1.35, 1.5 Volts of DDR3 memory in either UDIMM or RDIMM
Die Size	316mm^2 per die
Packaging	Socket G34 — 1944-pin organic Land Grid Array (LGA)

END USER BENEFITS:

> Unleash unprecedented performance of highly threaded applications through massive, industry-leading core density.

> Today's highly threaded applications demand more scalability and the AMD Opteron 6200 Series processors are the world's only 16-core x86 processor, delivering 60-160% more cores than competing processors.[1]

> Bring unparalleled efficiency to your processing, power and financial budgets.

SUBSTANTIATION

1. Comparison of 16-core AMD Opteron™ 6200 Series processor with 8-core Intel Xeon E5-2600 Series processor and 10-core Intel Xeon E7 Series processors according to www.intc.com/pricelist.cfm as of 4/12/12. SVR-30.

AMD OPTERON™ 6200 SERIES PROCESSOR PRODUCT FEATURE DETAILS

NEW KEY FEATURES:

> **2nd Generation Core Architecture** – designed to drive more core density and greater throughput.

> **AMD Turbo CORE Technology** – allows processors to independently boost their clock speeds, scaling frequency up 500MHz-1GHz automatically to respond to the need for more application performance.[1]

> **Flex FP** – delivers up to sixteen 128-bit integer units per processor.

> **AMD Virtualization™ (AMD-V™) Technology 2.0** – these are platform-based virtualization features that reduce virtualization overhead and provide near native performance. This heightens virtualization efficiency with new enhancements to the AMD-V suite of virtualization to optimize data center rack space and help minimize management tasks.

> **Processor Cores** – Delivering 60% more cores in 4p[2] – over the competition – for scalable systems.

> **Processor Cache** – Twice the L2 cache per core over previous generation.

> **Memory bandwidth** – 33% higher memory bandwidth[3] and new 1.25V ULV memory offering.

> **Performance** – Up to 51% greater throughput than our previous generation,[4] 60% more cores in 4p than our competition.[2] FMAC units in the Flex FP help drive more performance by executing FMA4[5] instructions that execute complex calculations in half the cycles as the competition.

> **AMD-P 2.0 Technology** – New power-saving features like C6 Power State and TDP Power Cap along with 1.25 (volt) ULV-DIMM. C6 Power State shuts down power to idle cores. TDP Power Cap gives you the flexibility to set power limits without capping processor frequency.

SUBSTANTIATION

1. SVR-27: AMD Opteron 6200 Series processors experience all core boost of up to 500 MHz (P2 base to P1 boost state) and up to 1.3 GHz max turbo boost (half or fewer cores boost from P2 to P0 boost state).
2. SVR-74: Comparison of 16-core AMD Opteron™ 6200 Series processor with 10-core Intel Xeon E7 Series processors. Comparison of 16-core AMD Opteron™ 6200 Series processor with 8-core Intel Xeon E5-2600 Series processor. See http://www.intc.com/pricelist.cfm as of 3/14/12.
3. SVR-26: Testing based on STREAM benchmark. 4P: 146GB/s using 4 x AMD Opteron™ procesor Model 6276 in "Drachma" reference design kit, 64GB (16 x 4GB DDR3-1600) memory, SuSE Linux® Enterprise Server 64-bit 110GB/s using 4 x AMD Opteron™ processors Model 6176 in "Drachma" reference design kit, 64GB (16 x 4GB DDR3-1333) memory, SuSE Linux® Enterprise Server 11 64-bit. 2P: 73GB/s using 2 x AMD Opteron™ 6200 Series processors in "Dinar" reference design kit, 32GB (8 x 4GB DDR3-1600) memory, SuSE Linux® Enterprise Server 64-bit 55GB/s using 2 x AMD Opteron™ processors Model 6176 in "Dinar" reference design kit, 32GB (8 x 4GB DDR3-1333) memory, SuSE Linux® Enterprise Server 11 64-bit.
4. SVR-16 : Based on HPL results measured in AMD labs as of April 13, 2012. 180 GFlops using 2 x AMD Opteron processors Model 6176 SE in "Dinar" reference design kit, 32GB (8 x 4GB DDR3-1333) memory, SuSE Linux® Enterprise Server 11 SP1 64-bit. 271 GFlops using 2 x AMD Opteron processors Model 6282 SE in "Dinar" reference design kit, 64GB (8 x 8GB DDR3-1600) memory, SuSE Linux® Enterprise Server 11 SP1 64-bit.
5. SVR-41: FMAC can execute an FMA4 execution (a=b+c*d) in one cycle vs. 2 cycles that would be required for FMA3 or standard SSE floating point calculation.

AMD OPTERON™ 4300 SERIES PROCESSOR PRODUCT SPECIFICATIONS

MODEL NUMBER	OPN	CORE COUNT	CORE FREQUENCY	ALL-CORE TURBO FREQUENCY	AMD TURBO CORE MAX FREQUENCY	BUS SPEED	CMOS TECH	L2 CACHE	L3 CACHE	TDP
4386	OS4386WLU8KHK	8	3.1GHz	3.4GHz	3.8GHz	6.4 GT/s	32nm SOI	4 x 2MB	8MB	95W
4340	OS4340WKU6KHK	6	3.5GHz	3.7GHz	3.8GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	95W
4334	OS4334WKU6KHK	6	3.1GHz	3.3GHz	3.5GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	95W
4376 HE	OS4376OFU8KHK	8	2.6GHz	2.9GHz	3.6GHz	6.4 GT/s	32nm SOI	4 x 2MB	8MB	65W
4332 HE	OS4332OFU6KHK	6	3.0GHz	3.3GHz	3.7GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	65W
4310 EE	OS4310HPC4KHK	4	2.2GHz	2.4GHz	3.0GHz	6.4 GT/s	32nm SOI	2 x 2MB	8MB	35W

AMD OPTERON™ 4300 SERIES PROCESSOR PRODUCT FEATURE DETAILS

Cache Sizes	Total Cache: 16MB (8 core), 14MB (6 core) and 12MB (4-core) L1 Cache: 16KB/core + 64KB instruction/module L2 Cache: 1MB (per core) L3 Cache: 8MB (per socket)
Process Technology	32-nanometer SOI (silicon-on-insulator) technology
Hypertransport™ Technology Links	Two x16 links at up to 6.4GT/s per link
Memory	Supports R/U DDR3, LV DDR3, ULV DDR3 and LR DDR3 Up to 384 GB memory capacity, supports up to 6 DIMMs per CPU
Memory channels per processor	2
Memory Speed	Up to 1866 MHz*
Die Size	316mm^2 per die
Packaging	Socket C32 — 1207-pin Organic Land Grid Array (OLGA)

END USER BENEFITS:

> Unleash unprecedented performance of highly threaded applications through massive, industry leading core density.

> AMD Opteron™ 4300 Series processors offer up to 15% higher performance than the previous generation.[1]

> Bring unparalleled efficiency to your processing, power and financial budgets.

SUBSTANTIATION

1. Comparison based on 2P SPECint_rate2006 data submitted to SPEC as of Nov 27th, 2012. 329, 2 x AMD Opteron™ processors Model 4386 in Tyan YR190-B8228 server, 64GB (4 x 16GB DDR3-1600) memory, Red Hat Enterprise Linux® Server release 6.3 64-bit, x86 Open64 4.5.2 Compiler Suite. 285, 2 x AMD Opteron™ processors Model 4284 in Dell PowerEdge R515 server, 32GB (8 x 4GB DDR3-1600) memory, Red Hat Enterprise Linux® Server release 6.1 64-bit, x86 Open64 4.2.5.2 Compiler Suite. SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org. SVR-311

*1866MHz supported only with a single physical DIMM per memory channel

AMD OPTERON™ 4300 SERIES PROCESSOR PRODUCT FEATURE DETAILS

NEW KEY FEATURES:

> **2nd Generation Core Architecture** – designed to drive more core density and greater throughput.

> **AMD Turbo CORE Technology** – allows processors to independently boost their clock speeds, scaling frequency up to 300MHz automatically to respond to the need for more application performance.[1]

> **C6 Power State** – Low power state that helps reduce power consumption while servers are at idle.

> **AMD Virtualization™ (AMD-V™) Technology 2.0** – heightens virtualization efficiency with new enhancements to the AMD-V suite of virtualization to optimize data center rack space and help minimize management tasks.

> **Energy Efficient Processor Cores** – AMD Opteron™ 4300 Series features processors offer 24% higher performance per watt than AMD Opteron 4200 Series processors.[2]

> **AMD-P 2.0 Technology** – Power-saving features like C6 Power State and TDP Power Cap along with 1.25 (volt) ULV-DIMM. C6 Power State shuts down power to idle cores. TDP Power Cap gives you the flexibility to set power limits without capping processor frequency.

SUBSTANTIATION

1. AMD Opteron 4300 Series processors experience all core boost of up to 300 MHz (P2 base to P1 boost state) and up to 1 GHz max turbo boost (half or fewer cores boost from P2 to P0 boost state). SVR-204.
2. Comparison based on 2P SPECpower_ssj2008 data submitted to SPEC as of Nov 27, 2012: 60.9W at Active Idle, 256W and 971,064 ssj_ops at 100% of target load, and 3052 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 4386 in Tyan YR190B8228 server, 32GB (4 x 8GB DDR3-1600) memory, YM-2451C power supply, 128GB SATA SSD disk drive, Microsoft® Windows Server® 2008 x64 Enterprise Edition SP1. 61.8W at Active Idle, 299W and 870,780 ssj_ops at 100% of target load, and 2453 overall ssj_ops/watt using 2 x AMD Opteron™ processors Model 4284 in Tyan YR190B8228 server, 32GB (4 x 8GB DDR3-1600) memory, YM-2451C power supply, 128GB SATA SSD disk drive, Microsoft® Windows Server® 2008 x64 Enterprise Edition SP1. SPEC, SPECpower and SPECpower_ssj are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org. SVR-312

AMD OPTERON™ 4200 SERIES PROCESSOR PRODUCT SPECIFICATIONS

MODEL NUMBER	OPN	CORE COUNT	CORE FREQUENCY	ALL-CORE TURBO FREQUENCY	AMD TURBO CORE MAX FREQUENCY	BUS SPEED	CMOS TECH	L2 CACHE	L3 CACHE	TDP
4284	OS4284WLU8KGU	8	3.0GHz	3.3GHz	3.7GHz	6.4 GT/s	32nm SOI	4 x 2MB	8MB	95W
4280	OS4280WLU8KGU	8	2.8GHz	3.1GHz	3.5GHz	6.4 GT/s	32nm SOI	4 x 2MB	8MB	95W
4276 HE	OS4276OFU8KGU	8	2.6GHz	2.9GHz	3.6GHz	6.4 GT/s	32nm SOI	4 x 2MB	8MB	65W
4274 HE	OS4274OFU8KGU	8	2.5GHz	2.8GHz	3.5GHz	6.4 GT/s	32nm SOI	4 x 2MB	8MB	65W
4256 EE	OS4256HJU8KGU	8	1.6GHz	1.9GHz	2.8GHz	6.4 GT/s	32nm SOI	4 x 2MB	8MB	35W
4240	OS4240WLU6KGU	6	3.4GHz	3.6GHz	3.8GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	95W
4238	OS4238WLU6KGU	6	3.3GHz	3.5GHz	3.7GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	95W
4234	OS4234WLU6KGU	6	3.1GHz	3.3GHz	3.5GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	95W
4230 HE	OS4230OFU6KGU	6	2.9GHz	3.2GHz	3.7GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	65W
4226	OS4226WLU6KGU	6	2.7GHz	2.9GHz	3.1GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	95W
4228 HE	OS4228OFU6KGU	6	2.8GHz	3.1GHz	3.6GHz	6.4 GT/s	32nm SOI	3 x 2MB	8MB	65W

The world's lowest-power-per-core server processor.[1]

SUBSTANTIATION

1. SVR-58: As of March 16, 2012 AMD Opteron™ processor Models 4200 EE have the lowest known power per core of any x86 server processor, at 35W TDP (35W/8 = 4.375W/core). Intel's lowest power per core server processor, Intel Xeon E5-2650L, is 70W TDP (70W/8 = 8.75W/core). See www.intc.com/pricelist.cfm as of 3/16/12. Previous record held by AMD Opteron processor Models 4100 EE at 35W TDP / 6 cores = 5.83 W/core.

AMD OPTERON™ 4200 SERIES PROCESSOR PRODUCT FEATURE DETAILS

Cache Sizes	Total Cache: 16MB (8 core), 14MB (6 core) L1 Cache: 16KB/core + 64KB instruction/module L2 Cache: 1MB (per core) L3 Cache: 8MB (per socket)
Process Technology	32-nanometer SOI (silicon-on-insulator) technology
Hypertransport™ Technology Links	Two x16 HT3 links at up to 6.4GT/s per link
Memory	Integrated DDR3 memory controller — Up to 6.4 GT/s memory bandwidth per CPU for Socket C32
Memory channels per processor	up to 2
Memory Speed	1600MHz
Memory Types	1.25, 1.35, 1.5 Volts of DDR3 memory in either UDIMM or RDIMM
Die Size	316mm^2
Packaging	Socket C32 — 1207 Organic Land Grid Array (OLGA)

END USER BENEFITS:

> **Designed for enterprise workloads while still delivering a performance punch**
A 33% increase in core count packs plenty of processing performance into a smaller, more efficient, 8-core design while maintaining very aggressive power/thermal ranges.[1,2]

> **Delivering new levels of enterprise scalability for demanding cloud applications and SMB/Infrastructure applications**
Scale your cloud workload with up to 8 cores in a low power processor.

> **Bringing unparalleled efficiency to your processing, power and financial budgets**
The lowest enterprise-class power per core with up to 8 cores in only 35W of power, shattering the previous record.[3]

SUBSTANTIATION
1. SVR-46: Based on AMD Opteron 4100 Series processor at 346 mm2 vs. AMD Opteron 4200 Series processor at 316mm^2.
2. SVR-59: Based on 8-core AMD Opteron™ 4200 Series processors at 35W, 65W and 95W TDP compared to 6-core AMD Opteron™ 4100 Series processors at 35W, 65W and 95W TDP when utilizing "1VM per core" loading rule.
3. SVR-58: As of March 16, 2012 AMD Opteron™ processor Models 4200 EE have the lowest known power per core of any x86 server processor, at 35W TDP (35W/8 = 4.375W/core). Intel's lowest power per core server processor, Intel Xeon E5-2650L, is 70W TDP (70W/8 = 8.75W/core). See www.intc.com/pricelist.cfm as of 3/16/12. Previous record held by AMD Opteron processor Models 4100 EE at 35W TDP / 6 cores = 5.83 W/core.

AMD OPTERON™ 4200 SERIES PROCESSOR PRODUCT FEATURE DETAILS

NEW KEY FEATURES:

> **2nd Generation Core Architecture** – designed to drive more core density and greater throughput.

> **AMD Turbo CORE Technology** – allows processors to independently boost their clock speeds, scaling frequency up 300MHz automatically to respond to the need for more application performance.[1]

> **C6 Power State** – Reduces processor power consumption at active idle by up to 39%.[2]

> **AMD Virtualization™ (AMD-V™) Technology 2.0** – heightens virtualization efficiency with new enhancements to the AMD-V suite of virtualization to optimize data center rack space and help minimize management tasks.

> **Energy Efficient Processor Cores** – AMD Opteron 4200 Series features 46% lower power per core than the competition.[3]

> **Energy Efficient Processor Cache** – Twice the L2 cache per core over previous generation.[4]

> **Performance** – FMAC units in the Flex FP help drive more performance by executing FMA4[5] instructions that execute complex calculations in half the cycles as the competition.

> **AMD-P 2.0 Technology** – New power-saving features like C6 Power State and TDP Power Cap along with 1.25 (volt) ULV-DIMM. C6 Power State shuts down power to idle cores. TDP Power Cap gives you the flexibility to set power limits without capping processor frequency.

SUBSTANTIATION

1. SVR-63: AMD Opteron 4200 Series processors experience all core boost of up to 300 MHz (P2 base to P1 boost state) and up to 1.2 GHz max turbo boost (half or fewer cores boost from P2 to P0 boost state).
2. SVR-62: Based on testing in AMD Performance Labs as of March 2012, an AMD Opteron™ processor model 4174 (6-core 2.3GHz) consumes 6.47W in the active idle C1E power state while an AMD Opteron™ processor model 4284 (8-core 3.0GHz) consumes only 3.977W in the active idle C1E power state with new C6 power gating employed. System configuration: "Kruger-P" reference design kit, 32GB (4x 8GB DDR3-1066) memory, Seagate ST3500413AS SATA disk drive, Microsoft® Windows Server 2008 x64 Enterprise Edition R2 SP1.
3. SVR-80: Based on AMD Opteron™ 6200 Series processor with 16 cores at 85W TDP (5.3125W/core) versus lowest wattage, highest core Intel Xeon processor with 6 cores at 60W TDP (10W/core) according to www.intel.com as of November, 2011.
4. SVR-49: AMD Opteron 4200 Series processors have 1024 KB L2 cache per core while AMD Opteron 4100 Series processors have 512 KB L2 cache per core.
5. SVR-41: FMAC can execute an FMA4 execution (a=b+c*d) in one cycle vs. 2 cycles that would be required for FMA3 or standard SSE floating point calculation.

AMD OPTERON™ 3300 SERIES PROCESSOR PRODUCT SPECIFICATIONS

MODEL NUMBER	OPN	CORE COUNT	CORE FREQUENCY	ALL-CORE TURBO FREQUENCY	AMD TURBO CORE MAX FREQUENCY	BUS SPEED	CMOS TECH	L2 CACHE	L3 CACHE	TDP
3380	OS3380OLW8KHK	8	2.6GHz	2.9GHz	3.6GHz	5.2GT/s	32nm SOI	8MB	8MB	65W
3350 HE	OS3350HOW4KHK	4	2.8GHz	3.1GHz	3.8GHz	5.2GT/s	32nm SOI	4MB	8MB	45W
3320 EE	OS3320SJW4KHK	4	1.9GHz	2.1GHz	2.5GHz	5.2GT/s	32nm SOI	4MB	8MB	25W

AMD OPTERON™ 3300 SERIES PROCESSOR PRODUCT FEATURE DETAILS

Cache Sizes	Total Cache: 16MB (8 core), 12MB (4 core) L2 Cache: up to 8MB total L3 Cache: up to 8MB total
Process Technology	32 nm SOI
Hypertransport™ Technology Links	1 non-coherent HT3 link @ 5.2GT/s
Memory	Dual Channel DDR3 ECC UDIMM, SODIMM support
Memory channels per processor	2
Memory Speed	Up to 1866*
Die Size	315mm^2
Packaging	AM3+

NEW KEY FEATURES:

> **Great value** with up to 61% lower processor cost,[1] up to 18% better price/performance,[2] up to 26% lower watts per core (TDP),[3] and up to 100% more cores[4] to deliver cost effective, multi-core solution versus the competition.

> Enterprise class processors giving you **true server functionality** with ECC and reliability features, enterprise OS support, and manageability.

SUBSTANTIATION

1. Intel Xeon processor Model E3-1265Lv2 has 4 cores and a price of $294 as of 10/17/12 at www.intc.com/pricelist.cfm. AMD Opteron™ processor Models 3380 has 8 cores and a preliminary price of $229. SVR-307
2. Comparison drawn between the Intel Xeon E3-12xxL and AMD Opteron 3300 Series processors with the lowest ratio of price to SPECint_rate2006 score. The estimated SPECint®_rate2006 scores for the AMD Opteron 3300 Series processors reflect current expectations based on a 10% uplift in performance over the AMD Opteron 3200 Series and are subject to change. The results for the Intel Xeon processors reflect the highest 1P results published on http://www.spec.org/cpu2006/results as of Oct 19, 2012 with each processor operating at its default frequency. – 176, 1 x Intel Xeon processor Model E3-1265Lv2, http://www.spec.org/cpu2006/results/res2012q2/cpu2006-20120522-22302.html– Intel Xeon processor Model E3-1265Lv2 is $294 as of 10/19/12 at www.intc.com/pricelist.cfm. – SPECint®_rate score= 88 (est.), 1 x AMD Opteron™ processors Model 3350 HE.– AMD Opteron™ processor Model 3350 HE has a preliminary price of $125 as of 10/19/12. SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. For the latest SPECint_rate2006 results, visit http://www.spec.org/cpu2006/results. SVR-201
3. Intel Xeon processor Model E3-1220Lv2 has 2 cores and 17W TDP, which equals 8.5 watts/core. TDP values as of 10/17/12 at www.intc.com/pricelist.cfm. The AMD Opteron™ processor Models 3320 EE has 4 cores and a 25W TDP, which equals 6.25 watts/core. SVR-199
4. Intel Xeon processor Model E3-1220Lv2 has 2 cores and E3-1265Lv2 has 4 cores as of 5/24/12 at www.intc.com/pricelist.cfm. AMD Opteron™ 3300 Series processors offer 4, 4, and 8 cores respectively. SVR-200

*1866MHz supported only with a single physical DIMM per memory channel

AMD OPTERON™ 3200 SERIES PROCESSOR PRODUCT SPECIFICATIONS

MODEL NUMBER	OPN	CORE COUNT	CORE FREQUENCY	ALL-CORE TURBO FREQUENCY	AMD TURBO CORE MAX FREQUENCY	BUS SPEED	CMOS TECH	L2 CACHE	L3 CACHE	TDP
3280	OS3250HOW4MGU	8	2.4GHz	2.7GHz	3.4GHz	N/A	32nm SOI	8MB	8MB	65W
3260	OS3260HOW4MGU	4	2.7GHz	3.0GHz	3.7GHz	N/A	32nm SOI	4MB	4MB	45W
3250	OS3280OLW8KGU	4	2.5GHz	2.8GHz	3.5GHz	N/A	32nm SOI	4MB	4MB	45W

AMD OPTERON™ 3200 SERIES PROCESSOR PRODUCT FEATURE DETAILS

Cache Sizes	Total Cache: 16MB (8 core), 8MB (4 core) L2 Cache: up to 8MB total L3 Cache: up to 8MB total
Process Technology	32 nm SOI
Hypertransport™ Technology Links	1 non-coherent HT3 link @ 5.2GT/s
Memory	Dual Channel DDR3
Memory channels per processor	2
Memory Speed	Up to 1866[1]
Memory Types	ECC UDIMM
Die Size	315mm^2
Packaging	AM3+

SUBSTANTIATION
1. 1866MHz supported only with a single physical DIMM per memory channel

AMD OPTERON™ 3200 SERIES PROCESSOR PRODUCT FEATURE DETAILS

NEW KEY FEATURES:

> **Great value** with up to 48% lower processor cost,[1] up to 14% better price/performance,[2] up to 4% less power per core,[3] and up to 100% more cores[4] to deliver cost effective, multi-core solution.

> **Fast payback** – In as few as 7 months – up to 14% quicker than with the competition – hosting fees can cover your server hardware costs.[5]

> Enterprise class processors giving you **true server functionality** with ECC and reliability features, enterprise OS support, and manageability.

SUBSTANTIATION

1. 1kU price for Intel Xeon E3-1220L (2-core) is $189 as of 12/22/11 at www.intc.com/pricelist.cfm. AMD Opteron™ 3250 (4-core) 1kU preliminary price is $99. SVR-109 ($99/4 cores = less than $25 per core.)
2. Comparison drawn between the Intel Xeon E3-12xxL and AMD Opteron™ 3200 Series processors with the lowest price to SPECint®_rate2006 score ratio. The results for the AMD Opteron and Intel Xeon processors reflect the highest 1P results published on http://www.spec.org/cpu2006/ results as of 8/2/12 with each processor operating at its default frequency. Intel Xeon processor Model E3-1265Lv2 is $294 with a SPECint_rate2006 score of 176 as of 8/2/12 at www.intc.com/pricelist.cfm and http://www.spec.org/cpu2006/results/res2012q2/cpu2006-20120522-22302.html. AMD Opteron™ processor Model 3250 is $99 with a SPECint_rate2006 score of 69 as of 8/2/12 at http://www.spec.org/cpu2006/results/res2012q2/ cpu2006-20120416-21048.html. SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. For the latest SPECint_rate2006 results, visit http://www.spec.org/cpu2006/results. SVR-114
3. Intel Xeon processor Model E3-1220L has 2 cores and 20W TDP, which equals 10 watts/core. Intel Xeon processor Model E3-1260L has 4 cores and 45W TDP, which equals 11.25 watts/core. Pricing and TDP values as of 1/9/12 at www.intc.com/pricelist.cfm. Both the AMD Opteron™ processor Models 3250 and 3260 have 4 cores and 45W TDP, which equals 11.25 watts/core. AMD Opteron™ processor Model 3280 has 8 cores and 65W TDP, which equals 8.1 watts/core. SVR-112
4. Intel Xeon processor Model E3-1220L has 2 cores and E3-1260L has 4 cores as of 1/9/12 at www.intc.com/pricelist.cfm. AMD Opteron™ processor Models 3250, 3260, and 3280 have 4, 4, and 8 cores respectively. SVR-110
5. In as few as 7 months - up 14% quicker than with the competition - hosting fees can cover your server hardware costs. Calculation based on the time it takes for monthly hosting fees of $89.99 to sum up to the cost of an AMD Opteron™ 3200 Series processor-based server (est. $573) vs. an Intel Xeon E3-12xxL processor-based server (est. $643). It does account for software, deployment, management, and power costs. Not accounting for licensing, deployment, management, or power costs, it takes seven months of hosting revenue to pay back the cost of an AMD Opteron™ processor Model 3250-based server and eight months of hosting revenue to pay back the cost of an Intel Xeon processor Model E3-1250L-based server. This assumes receiving $89.99 dedicated hosting monthly fee, which is in between the pricing for the Server 4 and Server 4i Standard Application L packages as of 1/9/12 at www.1and1.com. AMD Opteron 3250 based server costs $573 (est.) and an Intel Xeon E3-1220L based server costs $643 (est.). The processor and motherboard make up the cost differences between an AMD Opteron 3200 Series based server and an Intel Xeon E3-120xL Series based server. The costs for chassis, drive, and memory are expected to be the same in a like-for-like configuration. Low-end processor costs: AMD Opteron™ 3250 1kU preliminary price is $99 and Intel Xeon E3-1220L is $189 as of 1/9/12 at www.intc.com/pricelist. cfm. MSI motherboard for Intel (MS-S012): approximately $170 as of 12/20/11. MSI motherboard for AMD (MS-S023): approximately $190 as of 12/20/11. Chassis: Antec Sonata Proto No Power Supply ATX Mid Tower Case (Black) - SONATA PROTO BLACK $63.99 as of 12/22/11 at http:// www.superbiiz. com/detail.php?p=CA-SONATAT&c=pw&hash=5efdcBmU0Y8T1mgEYZeWu3W7ae1goOVs6iHd1Zx3H40dumgkEYh%2BuMKcEZ Z8J VMKn4%2BmtpaTc5koTCFpcooi3vj5GJGvl61%2FdXuNXKJqZ%2FNfES0xTXNJs8R9%2Fw. Hard drive: 1TB SATA2 7200rpm 64MB Enterprise Hard Drive $124.32 pricing as of 12/16/11 at http://www.eworldsale.com/western-digital-re4-wd1003fbyx-1tb-sata2-7200rpm-64mb-enterprise-hard-drive35_8733_64564.html. Memory: 4GB x 2 Unbuffered, 1.5V 2 Rank $95.99 pricing as of 12/16/11 at http://www.crucial.com/store/partspecs.aspx?IMODULE=CT2KIT51272BA1339. SVR-116

AMD OPTERON™ PROCESSOR PRODUCT FEATURE DETAILS

AMD OPTERON™ 4200 AND 6200 SERIES PROCESSORS OS AND HYPERVISOR MAINSTREAM SUPPORT SUMMARY

ASSUMES latest updates/patches are installed*

ENABLED

Optimized to support some or all of AMD's 2nd generation core architecture new features and new instructions

- Linux kernel 2.6.37 +; 3.0 +
- Novell SLES 11 SP2 (includes Xen 4.1)
- RHEL 6.2 with KVM (with z-stream updates)
- RHEL 6.3 Release Candidate with KVM
- RHEL derivatives including CentOS 6.2 and Scientific Linux 6.2
- Ubuntu 11.04; 12.04 (includes KVM)
- VMware® vSphere 5.0; 5.0u1
- Windows® Server 2008 R2 SP1 (scheduler patch available) Windows Server 2012 Release Candidate (includes Hyper-V)
- Xen 4.1 +

Also include latest software advances.

COMPATIBLE

Will boot and run but not take advantage of AMD's 2nd generation core architecture new features outside of new instructions

Includes new instruction support:

- Linux kernel 2.6.32 – 2.6.36
- Novell SLES 11 SP1 (with latest updates and upgrade to Xen 4.0.2_21511_02-0.7.1)
- RHEL 6.1 with KVM (with z-stream updates)
- RHEL derivatives including CentOS 6.1 and Scientific Linux 6.1
- Ubuntu 10.10

Does not support new instructions for either Bulldozer or Sandy Bridge:

- Hyper-V R1, Hyper-V R2, Hyper-V R2 SP1 (must be patched)
- Novell SLES 10 SP4 (includes Xen 3.2.3)
- RHEL 5.7 – 5.8 (includes KVM) and RHEL derivatives including CentOS, Scientific Linx
- Solaris 10u9, 11
- VMware vSphere 4.1u2
- Windows Server 2003 R2 SP2
- Windows Server 2008 SP2
- Windows Server 2008 R2
- Xen 3.4.4

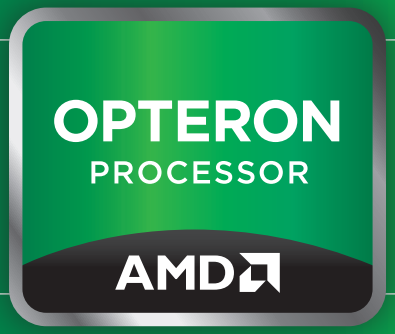
Will run but not necessarily provide performance/uplift.

NOT SUPPORTED

Will not run on AMD's 2nd generation core architecture platforms and/or will not be supported by OSV

- Linux kernel 2.6.31 or earlier
- Novell SLES 10 thru SP3
- Novell SLES 11
- RHEL 4.x
- RHEL 5.0 – 5.5
- RHEL 5.6 (can run with patches but is not supported by Red Hat)
- RHEL 6.0
- Solaris 10 – 10u8
- VMware ESX 3.5
- VMware ESX 4.0 – 4.1u1
- Windows Server 2003 versions prior to R2 SP2

*Please note: For proper support of available features/processors, the latest updates/patches always need to be installed.



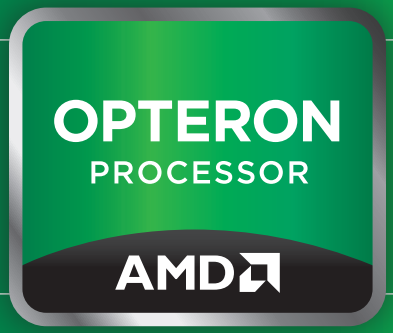
AMD Opteron™ Processor Chipset Specifications

AMD OPTERON™ 6000 AND 4000 PLATFORM CHIPSET SPECIFICATIONS

MODEL NUMBER	PROCESSOR INTERFACE	PCI EXPRESS®	NUMBER OF PCIE® PORTS/ENGINES	VIRTUALIZATION	ERROR DETECTION/ISOLATION	MAX. TDP/IDLE	PROCESS TECHNOLOGY	PACKAGE
SR5650	HyperTransport™ 3.0 technology (5.2GT/s)	v2.0	22 lanes/8 engines	AMD-Vi (IOMMU 1.26)	HyperTransport™ Error Handling, PCIe® Advanced Error Reporting, PCIe® End-to-End Cycle Redundancy Check	12.6W/5.4W	TSMC 65nm	29 x 29mm FCBGA
SR5670	HyperTransport™ 3.0 technology (5.2GT/s)	v2.0	30 lanes/9 engines	AMD-Vi (IOMMU 1.26)	HyperTransport™ Error Handling, PCIe® Advanced Error Reporting, PCIe® End-to-End Cycle Redundancy Check	15.4W/5.75W	TSMC 65nm	29 x 29mm FCBGA
SR5690	HyperTransport™ 3.0 technology (5.2GT/s)	v2.0	42 lanes/11 engines	AMD-Vi (IOMMU 1.26)	HyperTransport™ Error Handling, PCIe® Advanced Error Reporting, PCIe® End-to-End Cycle Redundancy Check	18W/6.15W	TSMC 65nm	29 x 29mm FCBGA

PRODUCT SPECIFICATIONS — SOUTHBRIDGE	
USB Ports	12 USB 2.0 + 2 USB 1.1
PCI Bus Support	PCI rev 2.3
Serial ATA	AHCI 1.1 SATA 3.0 GB/s with SW RAID support
SATA Ports	6 (can be independently disabled)
Max. TDP/Idle	4W/1W
Process Technology	TSMC .13um
Package	528 ball FCBGA, 21x21mm, 0.8mm pitch

There are three different I/O bridge chipset options on AMD Server Platforms, all featuring the AMD SP 5100 Southbridge Chipset.



Motherboards and Barebones

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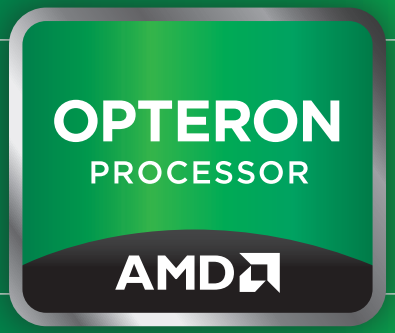

ASUS Motherboards
ASUS Rack Servers

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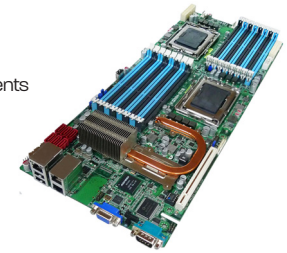
Information is provided for reference only. Please confirm specifications with your vendor before purchase.

ASUS MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

KGNH-D16

Key Positioning: Half-Sized server boards for high density data center environments

Workloads: High Density Data Center, High Performance Computing

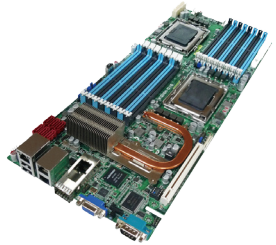


Socket: G34 – 2 socket **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5650 & SP5100
Form Factor	Half SSI, 6.8" x 16.7"
Memory	16 (4-channel per CPU) DDR3 800/1066/1333/1600* UDIMM with ECC/non ECC DDR3 800/1066/1333/1600* RDIMM *DDR3 1600 can only be supported with AMD Opteron™ 6200 Series processor Max 256GB (RDIMM) / 64GB (UDIMM)*
Expansion Slots	1 * PCIe x 16 (Gen2 X 16 Link)
Storage	AMD SP5100: 6 SATA2 300MB/s ports
LAN	2* Intel 82574L + 1* Mgmt LAN
VGA	ASPEED AST2050 8MB
Management	Optional ASMB4-iKVM for KVM-over-Internet

KGMH-D16/QDR

Key Positioning: Half-Sized SSI Serverboards with high I/O Bandwidth

Workloads: High Performance Computing



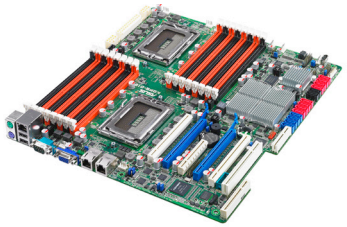
Socket: G34 – 2 socket **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5670 & SP5100
Form Factor	6.8" x 16.7"
Memory	16 (4-channel per CPU) DDR3 800/1066/1333/1600 RDIMM DDR3 1600 can only be supported with AMD Opteron™ 6200 Series processor
Expansion Slots	Slot 1: PCIe x16 (Gen2 X16 Link)
Storage	6* SATA2 300MB/s ports
LAN	2* Intel 82574L GbE LAN + 1* Management LAN
VGA	ASPEED AST2050 8MB
Management	Optional ASMB4-iKVM

ASUS MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

KGPE-D16

Key Positioning: G34 Mainstream Solution for Performance and Power Efficiency

Workloads: High Performance Computing, Professional Workstation, GPU Computing, Cloud Computing



Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors	
Chipset	AMD SR5690 & SP5100
Form Factor	12" x 13"
Memory	16 (4-channel per CPU) DDR3 800/1066/1333/1600 RDIMM DDR3 1600 can only be supported with AMD Opteron™ 6200 Series processor
Expansion Slots	Slot 6: PCIe x16 (Gen2 x16 Link for 1U FH/FL Card) (Auto turn off if slot 5 is occupied, MIO supported) Slot 5: PCIe x16 (Gen2 x16 Link) Slot 4: PCIe x8 (Gen2 x4 Link) Slot 3: PCIe x16 (Gen2 x16 Link) (Auto switch x8 link if slot 2 is occupied) Slot 2: PCIe x16 (Gen2 x8 Link) Slot 1: PCI 32bit / 33 MHz
Storage	6* SATA2 300MB/s ports (AMD SP5100) Optional ASUS PIKE SAS storage card
LAN	2* Intel 82574L GbE LAN + 1* Management LAN
VGA	ASPEED AST2050 8MB
Management	ASMB5-iKVM onboard

RS704DA-E6/PS4

Key Positioning: Duo High Computing Node in 1U with AMD G34

Workloads: High Performance Computing

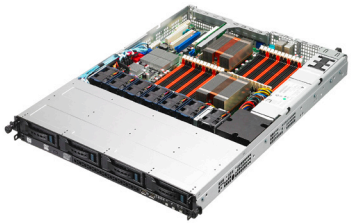
Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors	
Chipset	AMD SR5670 + SP5100
Form Factor	28" x 17.5" x 1.72"
Memory	16 DIMMs per Node (4-channel per CPU, 8 DIMMs per CPU) DDR3 1066/1333/1600 Reg DIMM/ Unbuffered DIMM with ECC Max. 256GB(RDIMM) / 64GB(UDIMM)
Expansion Slots	1 per node PCIe G2x16 slot (x16 link) (Low profile/HL) per node
Storage	AMD SP5100: 6 SATA2 300MB/s ports Optional: ASUS PIKE 2008 8-port SAS2 6G RAID card 2* Hot-swap 3.5" HDD Bays per Node (Total 4x 3.5: HDD
LAN	2* Intel PCIe GbE LAN (82574L) + 1 Mgmt LAN per Node 1* Single Port Mellanox ConnectX QDR InfiniBand with QSFP interface
VGA	Aspeed AST2050 8MB
Management	ASWM2.0; Optional ASMB4-iKVM for KVM-over-IP support (ASMB4 default for North America)

ASUS RACK SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

RS500A-S6/PS4

Key Positioning: AMD G34 High Computing node for Intense Memory Demands

Workloads: Enterprise/Database Servers, High Performance Computing, Virtualization Servers



Socket: G34 – 2 socket **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5690 + SP5100
Form Factor	24.21" x 17.5" x 1.72"
Memory	24 DIMMs (4-channel per CPU) DDR3 1066/1333/1600 Reg DIMM/ Unbuffered DIMM with ECC Max. 256GB(RDIMM) / 64GB(UDIMM)
Expansion Slots	1 PCIe G2x16 (G2 x16 link) (FH/HL)
Storage	AMD SP5100: 6 SATA2 300MB/s ports Optional: ASUS PIKE 2008 8-port SAS2 6G RAID card ASUS PIKE 2008/IMR 8-port SAS2 6G RAID card 4* Hot-swap SAS/SATA2 HDD Bays
LAN	1* Intel 82580EB (Quad port) + 1* Mgmt LAN
VGA	Aspeed AST2050 8MB
Management	ASWM2.0; Optional ASMB4-iKVM for KVM-over-IP support (ASMB4 default for North America)

RS500A-E6/PS4

Key Positioning: Mainstream High Speed Computing Node

Workloads: Enterprise/Database Servers, Web/Email Servers, Cloud Computing

Socket: G34 – 2 socket **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5650 + SP5100
Form Factor	24.21" x 17.5" x 1.72"
Memory	16 DIMMs (4-channel per CPU) DDR3 1066/1333/1600 Reg DIMM/ Unbuffered DIMM with ECC Max. 256GB(RDIMM) / 64GB(UDIMM)
Expansion Slots	1 PCIe G2x16 (G2 x16 link) (FH/HL)
Storage	AMD SP5100: 6 SATA2 300MB/s ports Optional: ASUS PIKE 2008 8-port SAS2 6G RAID card ASUS PIKE 2008/IMR 8-port SAS2 6G RAID card 4* Hot-swap SAS/SATA2 HDD Bays
LAN	2* Intel PCIe GbE LAN (82574L) + 1* Mgmt LAN
VGA	Aspeed AST2050 8MB
Management	ASWM2.0; Optional ASMB4-iKVM for KVM-over-IP support (ASMB4 default for North America)

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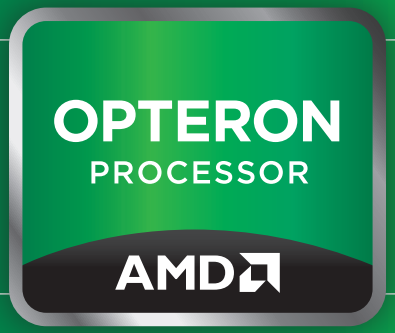
Company Overview:
> Founded in 1989, ASUS is now a $10 billion brand with 10,000 employees worldwide.
> Historically ASUS was the R&D and manufacturing behind many of the big brands – we have a world-class R&D team of 3,000 engineers.
> ASUS is the maker of the world's bestselling and most award winning motherboards.
> BusinessWeek has ranked ASUS among its InfoTech 100 for the 12th straight year.
> ASUS won 3,398 distinguished product awards in 2010 (9 per day).



MSI Motherboards

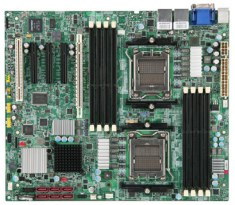
Information is provided for reference only. Please confirm specifications with your vendor before purchase.

MSI MOTHERBOARDS—AMD OPTERON™ 4000 SERIES PLATFORM

MS-91F7

Key Positioning: Value DP Server

Workloads: Pedestal or Rackmount

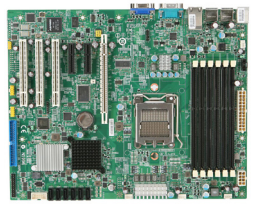


Socket: C32 – 2 socket **CPU: AMD Opteron™ 4100/4200/4300 Series Processors**	
Chipset	AMD SR5650 + SP5100
Form Factor	CEB, 12" x 10.2"
Memory	8 x DDR3 DIMM slots DDR3 (800/1066/1333) ECC / LV U/R DIMM (1.5V, 1.35V)
Expansion Slots	1 x PCIex16 3x PCIex8 (one for x4 Signal), (option one PCIe x8 for SR5670) 1 x PCI
Storage	6 x SATA from SP5100 Supports 6 SATAII devices Supports up to 3Gb/s data transfer rate
LAN	Supports dual Gb LAN by Intel 82574
VGA	AST1100/2050
Management	Aspeed AST1100 BMC controller (option AST2050 IPMI with iKVM)

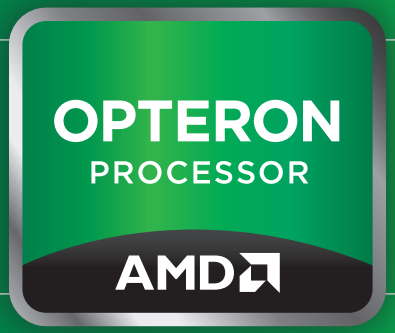
MS-96D7

Key Positioning: Entry UP Server/Workstation

Workloads: Pedestal or Rackmount



Socket: C32 – 1 socket **CPU: AMD Opteron™ 4100/4200/4300 Series Processors**	
Chipset	AMD SR5650 + SP5100
Form Factor	ATX, 12" x 9.6"
Memory	6 x DDR3 DIMM slots DDR3 (800/1066/1333) ECC U/R DIMM
Expansion Slots	1 x PCIex16 (PCIex16 slot) 2 x PCIex2 (PCIex4 slot) 3 x PCI
Storage	6 x SATA from SP5100 Supports 6 SATA devices Supports up to 3Gb/s data transfer rate
LAN	Supports dual Gb LAN by Intel 82574 Gb Ethernet controller
VGA	AST1100
Management	Aspeed AST1100 BMC controller with IPMI



Supermicro A+ Motherboards
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SUPERMICRO A+ MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

H8DGT-HL(IBQ)F

Key Positioning: High Performance Twin Server w/ 40Gb/s IB option

Workloads: HPC, Data center, Quantum chemistry, Financial simulation, Genomics, Astrophysics and Oil and Gas

Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors	
Chipset	AMD SR5690/SP5100
Form Factor	Proprietary 6.8" x 16.64"
Memory	256 GB ECC Registered or 64 GB unbuffered ECC/non-ECC DDR3 1866/1600/1333/1066 SDRAM in 8 DIMMs
Expansion Slots	1 PCI-E 2.0 x16, 1 PCI-E 2.0 x8 (using x4 slot) for SAS daughter board support
Storage	6 SATA2 ports, RAID 0, 1, 10 (via daughter board)
LAN	Dual LAN with Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	MELLANOX CONNECT-X2 IB W/ SINGLE QSFP CONNECTOR SUPPORT (H8DGT-HLIBQF) BUILT-IN EIDE/USB PORTS: Up to 5 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, +3.3Vcc, +Vbat, and HyperTransport™ technology voltage 1.2V, and total of 2-fan status, supports system management utility THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	2U: SC217HQ-R1620B, SC827H-R1620B, SC827HD-R1620B

H8DGU(-F)

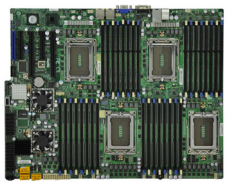
Key Positioning: High Performance Supermicro UIO Server

Workloads: Appliance server, Application server, HPC, Storage and Database

Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors	
Chipset	AMD SR5670/SP5100
Form Factor	Proprietary 12.1" x 13"
Memory	512 GB ECC Registered or 128 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	1U Left Slot: 1 PCI-E 2.0 x16 and UIO; or 2 PCI-E 2.0 x8; or 1 PCI-E 2.0 x16; or 1 PCI-E 2.0 x8 and UIO 2U Left Slot: 2 PCI-E 2.0 x8 and UIO; or 3 PCI-E 2.0 x8; or 1 PCI-E 2.0 x16 and UIO
Storage	6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN (-F version only), Watch Dog, SuperDoctor III
Other	BUILT-IN EIDE/USB PORTS: Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports PS/2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, -12V, +3.3Vcc, +Vbat, and HyperTransport™ technology voltage 1.2V, and total of 8-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	1U: SC815TQ-720UB/563UB, SC113TQ-700UB/563UB 2U: SC825TQ-R720UB, SC213A-R900UB, SC216A-R900UB

SUPERMICRO A+ MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

H8QG6-F/H8QGi-F
H8QG6+-F/H8QGi+-F



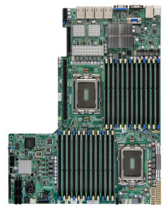
Key Positioning: Maximum Performance / Dual GPU Ready

Workloads: High-end HPC, High-end enterprise server, SQL server, high performance computer cluster (HPCC), Medical, Engineering intensive and Laboratory applications

Socket: G34 – 4 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	AMD SR5690/SR5670 & SP5100 AMD SR5690/SP5100 (+ version only)
Form Factor	SWTX 16.48" x 13"
Memory	1 TB ECC Registered or 256 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 32 DIMMs
Expansion Slots	H8QG6-F/H8QGi-F: 2 PCI Express 2.0 x16 1 PCI Express 2.0 x8 1 PCI Express 2.0 x8 or 1 Universal I/O slot H8QG6+-F/H8QGi+-F: 1 PCI Express 2.0 x16
Storage	LSI 2008 SAS2 Controller for 8 SAS2 / SATA ports, RAID 0, 1, 10; Optional RAID 5 support with AOC-SAS2-RAID5-KEY (H8QG6(+)-F only): 6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	BUILT-IN EIDE/USB PORTS: Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports PS/2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +5V, +12V, +3.3Vcc, +3.3Vsb, Vbat, and total of 9-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED Indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	H8QG6+-F/H8QGi+F: 1U: SC818TQ-1400LPB H8QG6-F/H8QGi-F: 2U: SC828TQ+-R1400LPB 4U: SC748TQ-R1400B, SC848A-R1800B

H8DGU-LN4F+



Key Positioning: Flexible GbE Networking and GPU support

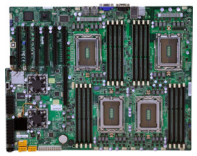
Workloads: High-end enterprise server, SQL server, high performance computer cluster (HPCC)

Socket: G34 – 2 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	AMD SR5690/SP5100
Form Factor	Proprietary 12.8" x 16.5"
Memory	768 GB ECC Registered or 128 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 24 DIMMs
Expansion Slots	1U Left Slot: 1 PCI-E 2.0 x16 and UIO; or 2 PCI-E 2.0 x8; or 1 PCI-E 2.0 x16; or 1 PCI-E 2.0 x8 and UIO 2U Left Slot: 2 PCI-E 2.0 x8 and UIO; or 3 PCI-E 2.0 x8; or 1 PCI-E 2.0 x16 and UIO 2U Right Slot: 3 PCI-E 2.0 (x4 + x1 + x1) (via RSC-R2UU-2E2E4R Riser Card)
Storage	6 SATA2 ports, RAID 0, 1, 10
LAN	Quad LAN with two Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	BUILT-IN EIDE/USB PORTS: Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports PS/2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, +3.3Vcc, +3.3Vsb, Vbat, and HyperTransport™ technology voltage 1.2V, and total of 8-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	1U: SC819TQ-R700UB, SC119TQ-R700UB 2U: SC829TQ-R920UB, SC219A-R920UB

SUPERMICRO A+ MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

H8QGL-6F(+)
H8QGL-iF(+)



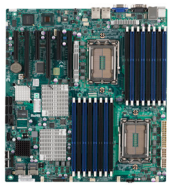
Key Positioning: Maximum Performance with 3 PCI Express 2.0 x 16

Workloads: High-end database server, SQL server, high performance computer cluster (HPCC), storage, video editing

Socket: G34 – 4 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	Dual AMD SR5690/SP5100 AMD SR5690/SP5100 (+ version only)
Form Factor	SWTX 16.48" x 13"
Memory	512 GB ECC Registered or 128 GB unbuffered ECC/non-ECC DDR3 1866/1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	H8QGL-6F/H8QGL-iF: 3x PCI-E 2.0 x16, 2x PCI-E 2.0 x8 (in x16 slot), 1x PCI-E 2.0 x4 (in x16 slot) H8QGL-6F+/H8QGL-iF+: 1x HyperTransport slot, 1x PCI-E 2.0 x16
Storage	LSI 2008 SAS2 Controller for 8 SAS2 / SATA ports, RAID 0, 1, 10; Optional RAID 5 support with AOC-SAS2-RAID5-KEY (H8QGL-6F(+) only) 6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	BUILT-IN USB PORTS: Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, PS/2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +5V, +12V, +3.3Vcc, +3.3Vsb, Vbat, and total of 9-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	H8QGL-6F+/H8QGLiF+: 1U: SC818TQ-1400B H8QGL-6F/H8QGL-iF: 2U: SC828TQ+-R1400LPB 4U: SC748TQ-R1400B , SC848A-R1800B

H8DG6(-F)
H8DGi(-F)



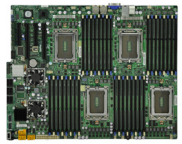
Key Positioning: High Performance with 6Gb/s SAS option

Workloads: High-end database server, SQL server, high performance computer cluster (HPCC), Storage, Video editing

Socket: G34 – 2 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	Dual AMD SR5690/SP5100
Form Factor	EATX 12" x 13"
Memory	512 GB ECC Registered or 128 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	3 PCI Express 2.0 x16 1 PCI Express 2.0 x8 2 PCI Express 2.0 x4 (using x8 slot)
Storage	LSI 2008 SAS2 Controller for 8 SAS2 / SATA ports, RAID 0, 1, 10; Optional RAID 5 support with AOC-SAS2-RAID5-KEY (H8DG6(-F) only) 6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN (-F version only), Watch Dog, SuperDoctor III
Other	BUILT-IN EIDE/USB PORTS: Up to 8 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, PS/2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header MONITORS: CPU core voltages, 3.3V, +5V, +12V, -12V, 3.3V standby, 1.5V, VBAT, HyperTransport™ technology voltage 1.2V, memory voltage 1.5V, and total of 8-fan status, supports system management utility, mem VTT, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	2U: SC825TQ-R720LPB, SC213A-R900LPB, SC216A-R900LPB 3U: SC836A-R1200B, SC835TQ-R920B 4U: SC747TQ-R1400, SC745TQ-R800B, SC743TQ-865B

H8QG7(+)-LN4F
H8QGi(+)-LN4F



Key Positioning: Maximum Performance / LSI 2208 SAS2 / 4 GbE LAN

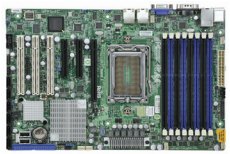
Workloads: High-end HPC, High-end enterprise server, SQL server, high performance computer cluster (HPCC), Medical, Engineering intensive and Laboratory applications

Socket: G34 – 4 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	AMD SR5690/SR5670 & SP5100 AMD SR5690/SP5100 (+ version only)
Form Factor	SWTX 16.48" x 13"
Memory	1 TB ECC Registered or 256 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 32 DIMMs
Expansion Slots	H8QG7-LN4F/H8QGi-LN4F: 2 PCI-Express 2.0 x16, 2 PCI-Express 2.0 x8 H8QG7+-LN4F/H8QGi+-LN4F: 1 PCI-Express 2.0 x16
Storage	LSI 2208 SAS2 Controller for 8 SAS2/ SATA ports, HW RAID 0, 1, 5, 6, 10, 50, 60 support (H8QG7(+)-LN4F only), 6 SATA2 ports, RAID 0, 1, 10
LAN	Four LAN with Intel® I350 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	BUILT-IN USB PORTS: Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 1 SATA DOM power connector, TPM header, 1 fast UART 16550 serial port PS/2 mouse & keyboard conn. PC HEALTH MONITORING: Monitors CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +5V, +12V, +3.3Vcc, +3.3Vsb, Vbat, and total of 9-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED Indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	H8QG7+-LN4F/H8QGi+-LN4F: 1U: SC818TQ-1400LPB H8QG7-LN4F/H8QGi-LN4F: 2U: SC828TQ+-R1400LPB 4U: SC748TQ-R1400B SC848A-R1800B

SUPERMICRO A+ MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

H8SGL(-F)



Key Positioning: High Performance Entry Level

Workloads: File/print server, firewall applications, ISP, mail server, web server for small business

H8DGT-HF
H8DGT-HIBQF

Key Positioning: High Density, Flexible IT Infrastructure

Workloads: HPC cluster computer nodes, datacenter, cloud computing, data farm, front end server and other computing intensive applications

H8DGG-QF

Key Positioning: GPU Solution

Workloads: Specialized HPC cluster nodes, video editing, medical imaging, oil and gas simulation, quantum chemistry, financial simulation, astrophysics

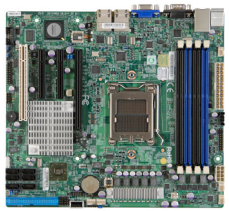
Socket: G34 – 1 socket **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**		**Socket: G34 – 2 socket** **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**		**Socket: G34 – 2 socket** **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5650/SP5100	Chipset	AMD SR5670/SP5100	Chipset	Dual AMD SR5690/SP5100
Form Factor	ATX 12" x 8"	Form Factor	Proprietary 6.8" x 16.64"	Form Factor	Proprietary 7.74" x 16.64"
Memory	256 GB ECC Registered or 64 GB unbuffered ECC/ non-ECC DDR3 1600/1333/1066 SDRAM in 8 DIMMs	Memory	512 GB ECC Registered or 128 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 16 DIMMs	Memory	512 GB ECC Registered or 128 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	1 PCI Express 2.0 x8 (using x16 slot), 1 PCI Express 2.0 x8, 1 PCI Express x4 (using x8 slot), 3 32-bit PCI	Expansion Slots	1 PCI Express 2.0 x16	Expansion Slots	3 PCI Express 2.0 x 16 2 PCI Express 2.0 x8 (using x 16 slot)
Storage	6 SATA2 ports, RAID 0, 1, 10	Storage	6 SATA2 ports, RAID 0, 1, 10 (via daughter board)	Storage	6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with two Intel 82574L Controllers	LAN	Dual LAN with Intel 82576 Gigabit Ethernet	LAN	Dual LAN with Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller	VGA	Matrox G200eW graphics controller	VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN (-F version), Watch Dog, SuperDoctor III	Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III	Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	BUILT-IN EIDE/USB PORTS: Single ATA133/100, Up to 8 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, PS/2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, -12V, +3.3Vcc, +3.3Vsb, Vbat, and HyperTransport™ technology voltage 1.2V, and total of 6-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED Indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss	Other	MELLANOX CONNECT-X2 40GBPS INFINIBAND (H8DGT-HIBQF ONLY) BUILT-IN EIDE/USB PORTS: Up to 5 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, +3.3Vcc, +3.3Vsb, Vbat, and HyperTransport™ technology voltage 1.2V, and total of 2-fan status, supports system management utility THERMAL CONTROL: Fan speed control or PWM fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, internal/ external modem ring-on, WOL, control of power-on mode for recovery from AC power loss	Other	Built-in EIDE/USB Ports: Up to 4 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, TPM header MONITORS: CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, +3.3Vcc, +3.3Vsb, Vbat, and HyperTransport™ technology voltage 1.2V, and total of 8-fan status, supports system management utility THERMAL CONTROL: PWM Fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	Mini 1U: SC512F-350B 1U: SC813MTQ-350CB, SC811TQ-350B, SC113MTQ-330CB Mid-Tower: SC733E-500B, SC733i-500B, SC733T-500B, SC733TQ-500B	Optimized Chassis	2U: SC827H-R1400B, SC827H-R1620B, SC827HD-R1400B, SC217HQ-R1600B	Optimized Chassis	1U: SC818G-1400B, SC118G-1400B

SUPERMICRO A+ MOTHERBOARDS—AMD OPTERON™ 4000 SERIES PLATFORM

H8SCM(-F)

Key Positioning: Energy Efficient UP server

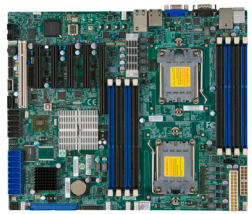
Workloads: ISP, Application server, Appliance server, General servers, and Entry level server



H8DCL-6(F)
H8DCL-i(F)

Key Positioning: Cost optimized ATX DP platform with 6Gb/s SAS option

Workloads: Database server, SQL server, HPC, Storage, Video editing



Socket: C32 – 1 socket **CPU: AMD Opteron™ 4100/4200/4300 Series Processors**		**Socket: C32 – 2 socket** **CPU: AMD Opteron™ 4100/4200/4300 Series Processors**	
Chipset	AMD SR5650/SP5100	Chipset	AMD SR5690/SP5100
Form Factor	Micro-ATX 9.6" x 8.6"	Form Factor	ATX 12" x 10"
Memory	128 GB ECC Registered or 32 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 4 DIMMs	Memory	256 GB ECC Registered or 64 GB unbuffered ECC/non-ECC 1600/1333/1066 SDRAM in 8 DIMMs
Expansion Slots	1 PCI-E 2.0 x8 (using x16 slot), 1 PCI-E 2.0 x8, 1 PCI-E 2.0 x4 (using x8 slot), 1 32-bit PCI	Expansion Slots	1 PCI-E 2.0 x8 (using in x16 slot), 3 PCI-E 2.0 x8, 1 PCI-E 2.0 x4 (using in x8 slot), 1 32-bit PCI
Storage	6 SATA2 ports, RAID 0, 1, 10	Storage	LSI 2008 SAS2 Controller for 8 SAS2; Optional RAID 5 support with AOC-SAS2-RAID5-KEY (H8DCL-6(F) only) 6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with two Intel 82574L Gigabit Ethernet	LAN	Dual LAN with two Intel 82574L Gigabit Ethernet
VGA	Matrox G200eW graphics controller	VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN (-F version only), Watch Dog, SuperDoctor III	Management	IPMI 2.0 + KVM with dedicated LAN (F version only), Watch Dog, SuperDoctor III
Other Features	BUILT-IN EIDE/USB PORTS: Single ATA133/100 Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, PS2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header PC HEALTH MONITORING: Monitors CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, -12V, +3.3Vcc, +3.3Vsb, Vbat, and HyperTransport™ technology voltage 1.2V, and total of 5-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss	Other	BUILT-IN EIDE/USB PORTS: Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, PS/2 mouse & keyboard conn., 1 SATA DOM power connector, TPM header PC HEALTH MONITORING: Monitors CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, +3.3Vcc, +3.3Vsb, Vbat, and HyperTransport™ technology voltage 1.2V, and total of 6-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED Indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	Mini 1U: SC512F-350B 1U: SC813MTQ-350CB, SC811TQ-350B, SC113MTQ-330CB, SC111LT-330CB/360CB Mini-Tower: SC731D/i-300B	Optimized Chassis	3U: SC835TQ-R920B, SC936A-R900B/1200B 4U: SC842TQ-665/865 Mid-tower: SC732i-500B

SUPERMICRO A+ MOTHERBOARDS—AMD OPTERON™ 4000 SERIES PLATFORM

H8DCT-HLN4F
H8DCT-HIBQF

Key Positioning: Cost Optimized Twin Server with 40Gb/s IB or 4 GbE LAN option

Workloads: HPC, Data center, Quantum chemistry, Financial simulation, Genomics, Astrophysics and Oil and Gas

Socket: C32 – 2 socket CPU: AMD Opteron™ 4100/4200/4300 Series Processors	
Chipset	AMD SR5690/SP5100 (H8DCT-HIBQF) AMD SR5670/SP5100 (H8DCT-HLN4F)
Form Factor	Proprietary 6.8" x 16.64"
Memory	192 GB ECC Registered or 64 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 12 DIMMs
Expansion Slots	1 PCI Express 2.0 x16, 1 PCI Express 2.0 x8 (using x4 slot for Supermicro SAS adapter)
Storage	6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with Intel i350 Gigabit Ethernet (H8DCT-HIBQF) Quad LAN with Intel i350 Gigabit Ethernet (H8DCT-HLN4F)
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other Features	MELLANOX CONNECT-X2 IB W/ SINGLE QSFP CONNECTOR SUPPORT (H8DCT-HIBQF) BUILT-IN EIDE/USB PORTS: Up to 4 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 1 fast UART 16550 serial port, TPM header PC HEALTH MONITORING: Monitors CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, +3.3Vcc, +Vbat, and HyperTransport™ technology voltage 1.2V, and total of 2-fan status, supports system management utility THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	2U: SC217HQ-R1620B, SC827H-R1620B, SC827H-R1400B, SC827HD-R1400B

H8DCT-IBQF
H8DCT-F

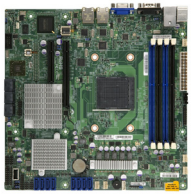
Key Positioning: Cost Optimized Twin Server with 40Gb/s IB option

Workloads: HPC, Data center, Quantum chemistry, Financial simulation, Genomics, Astrophysics and Oil and Gas.

Socket: C32 – 2 socket CPU: AMD Opteron™ 4100/4200/4300 Series Processors	
Chipset	AMD SR5670/SP5100
Form Factor	Proprietary 6.5" x 16.64"
Memory	192 GB ECC Registered or 64 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 12 DIMMs
Expansion Slots	1 PCI Express 2.0 x16
Storage	4 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with Intel 82576 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	MELLANOX CONNECT-X2 IB W/ SINGLE QSFP CONNECTOR SUPPORT (H8DCT-IBQF) BUILT-IN EIDE/USB PORTS: Up to 4 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 2 fast UART 16550 serial ports, TPM header PC HEALTH MONITORING: Monitors CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, +3.3Vcc, +Vbat, and HyperTransport™ technology voltage 1.2V, and total of 2-fan status, supports system management utility THERMAL CONTROL: Fan speed control & overheat LED Indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	1U: SC808T-780B, SC809TQ-780B 2U: SC827H-R1620B, SC827H-R1400B

SUPERMICRO A+ MOTHERBOARDS—AMD OPTERON™ 3000 SERIES PLATFORM

H8SML-7(F)
H8SML-i(F)



Key Positioning: Energy Efficient UP server w/ LSI 2308 SAS2

Workloads: ISP, Application server, Appliance server, General servers, and Entry level server

Socket: AM3+ – 1 socket
CPU: AMD Opteron™ 3000 Series Processors

Chipset	AMD SR5650/SP5100
Form Factor	Micro-ATX 9.6" x 9.6"
Memory	32 GB unbuffered ECC/non-ECC DDR3 1600/1333/1066 SDRAM in 4 DIMMs
Expansion Slots	1 PCI-Express 2.0 x8 (H8SML-i(F) only) (using x16 slot), 1 PCI-Express 2.0 x4 (using x8 slot), 1 PCI-Express 2.0 x8
Storage	LSI 2308 SAS2 Controller for 8 SAS2/ SATA ports SW RAID 0, 1, 10 support (H8SML-7(F) only), 6 SATA2 ports, RAID 0, 1, 10
LAN	Dual LAN with two Intel® 82574 Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other	BUILT-IN EIDE/USB PORTS: Up to 7 USB 2.0 ports OTHER ONBOARD I/O DEVICES: 1 SATA DOM power connector, TPM header 2 fast UART 16550 serial ports PS/2 mouse & keyboard conn. PC HEALTH MONITORING: Monitors CPU core & DIMM voltage, SR56x0 chipset voltage 1.1V, +1.8V, +5V, +12V, -12V, +3.3Vcc, +3.3Vsb, Vbat, and HyperTransport™ technology voltage 1.2V, and total of 5-fan status, supports system management utility, chassis intrusion header THERMAL CONTROL: Fan speed control & overheat LED indication BIOS: AMI 16 Mb SPI Flash ROM OTHERS: ACPI power management, WOL, control of power-on mode for recovery from AC power loss
Optimized Chassis	Mini 1U: SC512F-350B 1U: SC813MTQ-350CB, SC811TQ-350B, SC113MTQ-330CB, SC111LT-330CB/360CB

SUPERMICRO A+ SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

A+ Server 1022GG-TF

Key Features:
> Support up to 2 GPU cards
> 512 GB DDR3 1600/1333/1066 SDRAM
> 2 Gigabit Ethernet ports
> IPMI 2.0 management
> 1400W Gold Level high-efficiency power supply

Workloads: Specialized HPC cluster nodes, medical imaging, oil and gas simulation, quantum chemistry, financial simulation, astrophysics

SERVERBOARD: H8DGG-QF / HyperTransport™ technology Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors	
Chipset	Dual AMD SR5690/SP5100
Form Factor	1U Rackmount 437 x 43 x 716mm (17.2" x 1.7" x 28.2")
Memory	512 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	2 PCI Express 2.0 x16 1 PCI Express 2.0 x8 in x16 slot (accommodates AOCs up to 5.9" in length)
Storage	SATA: 9 TB
Connectivity/VGA/Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: AMD SP5100 for 3 SATA RAID SUPPORT: 0,1 DRIVE BAYS: 3 x 3.5" hot-swap SATA drive bays PERIPHERAL BAYS: Yes, optional optical drive POWER SUPPLY: 1400W Gold Level high-efficiency power supply COOLING SYSTEM: 8 x 4cm heavy duty counter-rotating fans with air shroud & optimal fan speed control

A+ Server 1122GG-TF

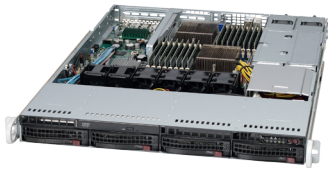
Key Features:
> Support up to 2 GPU cards
> 512 GB DDR3 1600/1333/1066 SDRAM
> Support 6 2.5" HDDs
> 2 Gigabit Ethernet ports
> IPMI 2.0 management
> 1400W Gold Level high-efficiency power supply

Workloads: Specialized HPC cluster nodes, medical imaging, oil and gas simulation, quantum chemistry, financial simulation, astrophysics

SERVERBOARD: H8DGG-QF / HyperTransport™ technology Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors	
Chipset	AMD SR5690/SP5100
Form Factor	1U Rackmount 437 x 43 x 716mm (17.2" x 1.7" x 28.2")
Memory	512 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	2 PCI Express 2.0 x16 1 PCI Express 2.0 x8 in x16 slot (accommodates AOCs up to 5.9" in length)
Storage	SATA: 6 TB
Connectivity/VGA/Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog
Other	ONBOARD SAS/SCSI/SATA/IDE/RAID: AMD SP5100 for 6 SATA RAID SUPPORT: 0,1, 10 (6 SATA2 ports) DRIVE BAYS: 6 x 2.5" hot-swap SATA drive bays PERIPHERAL BAYS: N/A POWER SUPPLY: 1400W Gold Level high-efficiency power supply COOLING SYSTEM: 8 x 4cm heavy duty counter-rotating fans with air shroud & optimal fan speed control

SUPERMICRO A+ SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

A+ Server 1022G-URF
A+ Server 1022G-NTF



Key Features:
> 4 SAS/SATA hard drive bays
> Universal I/O slot and PCI Express
> 512 GB DDR3 1600/1333/1066 SDRAM
> 2 Gigabit Ethernet ports
> IPMI 2.0 management
> 700W Gold Level high-efficiency redundant power supply (1022G-URF) 560W Gold Level high-efficiency power supply (1022G-NTF)

Workloads: High-end enterprise server, SQL server, high-performance computer cluster (HPCC)

A+ Server 1012G-MTF

Key Features:
> Short depth chassis
> Four 3.5" SATA drive bays
> 256 GB DDR3 1600/1333/1066 SDRAM
> 350W Gold Level high-efficiency power supply
> IPMI 2.0 management
> Cost-effective

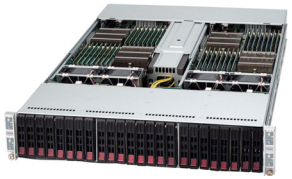
Workloads: File/print server, firewall applications, mail server, web server for small business, server appliance, cluster node, ISP

Serverboard: H8DGU-F / HyperTransport™ technology Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors		**Serverboard: H8SGL-F / HyperTransport™ technology Socket: G34 – 1 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5670/SP5100	Chipset	AMD SR5650/SP510
Form Factor	1U Rackmount 437 x 43 x 650mm (17.2" x 1.7" x 25.6")	Form Factor	1U Rackmount 437 x 43 x 503mm (17.2" x 1.7" x 19.8")
Memory	512 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 16 DIMMs	Memory	256 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 8 DIMMs
Expansion Slots	1 Universal I/O (UIO) slot (1022G-URF only) 1 PCI Express 2.0 x16 (1022G-URF only) 2 PCI Express 2.0 x8 (1022G-NTF only)	Expansion Slots	1 PCI Express 2.0 x8 (in x16 slot)
Storage	SAS: 12 TB (with UIO) SATA: 12 TB	Storage	SATA: 12 TB
Connectivity/VGA/ Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller	Connectivity/VGA/ Audio	Dual LAN with two Intel 82574L Gigabit Ethernet controllers Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog	Management	IPMI 2.0, SuperDoctor III, Watch Dog
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: UIO SAS 4 port controller* (1022G-URF only), AMD SP5100 for 4 SATA RAID SUPPORT: RAID 0, 1, 5, 10 available with Supermicro™ UIO card (1022G-URF only); RAID 0, 1, 10 with AMD SP5100 DRIVE BAYS: 4 x 3.5" hot-swap SAS or SATA drive bays PERIPHERAL BAYS: 1 slim DVD-ROM drive POWER SUPPLY: 700W Gold Level high-efficiency redundant power supply (1022G-URF only) 560W Gold Level high-efficiency power supply (1022G-NTF only) COOLING SYSTEM: 4 x 4cm heavy duty counter-rotating fans with air shroud & optimal fan speed control	Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: AMD SP5100 for 4 SATA RAID SUPPORT: 0,1,10 DRIVE BAYS: 4 x 3.5" hot-swap SATA drive bays PERIPHERAL BAYS: 1 slim DVD-ROM drive POWER SUPPLY: 350W Gold Level high-efficiency power supply COOLING SYSTEM: 4 x 4cm heavy duty fans with air shroud & optimal fan speed control

*Supermicro UIO Card must be installed

SUPERMICRO A+ SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

A+ Server 2122TG-HTRF
A+ Server 2122TG-HIBQRF



Key Features:
> Excellent performance per watt
> Four hot-swappable nodes in 2U
> 6 2.5" HDDs per node, total 24 HDDs
> Up to 128 Cores in 2U
> More than double computing density (compared to standard 1U servers)
> Independent power control
> Independent cooling control
> Hot-pluggable high-efficiency redundant power
> Save maintenance/management costs
> Improved efficiency through shared resources

Workloads: HPC cluster computer nodes, datacenter, data farm, front-end server and other computing intensive applications

Serverboard: H8DGT-HF/HIBQF / HyperTransport™ technology
Socket: G34 – 2 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	AMD SR5670/SP5100
Form Factor	2U Rackmount 438 x 89 x 679mm (17.25" x 3.47" x 26.75")
Memory	Quad sets of 512 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	Quad sets of PCI Express 2.0 x16 (accommodates low profile AOCs up to 5.9" in length)
Storage	6 TB per node
Connectivity/VGA/ Audio	Quad sets of dual LAN w/ Intel 82576 GbE controller Quad sets of Mellanox Connect-X2 40Gbps InfiniBand (HIBQRF only) Quad sets of Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: Quad sets of AMD SP5100 for 6 SATA RAID SUPPORT: 0,1,10 DRIVE BAYS: Quad sets of 6 x 2.5" hot-swap SATA drive bays PERIPHERAL BAYS: N/A POWER SUPPLY: 1400W Gold Level high-efficiency redundant power supply with PMBus COOLING SYSTEM: Twin sets of 2 x 8cm heavy duty counter-rotating fans with air shroud & optimal fan speed control

A+ Server 2022TG-HTRF
A+ Server 2022TG-HIBQRF

Key Features:
> Excellent performance per watt
> Four hot-swappable nodes in 2U
> Up to 128 Cores in 2U
> More than double computing density (compared to standard 1U servers)
> Independent power control
> Independent cooling control
> Hot-pluggable high-efficiency redundant power reduce power cables and power strips
> Save maintenance/management costs
> Improved efficiency through shared resources

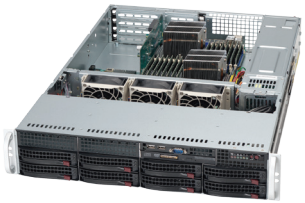
Workloads: HPC cluster computer nodes, datacenter, data farm, front-end server and other computing intensive applications

Serverboard: H8DGT-HF/HIBQF / HyperTransport™ technology
Socket: G34 – 2 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	AMD SR5670/SP5100
Form Factor	2U Rackmount 438 x 89 x 724mm (17.25" x 3.47" x 28.5")
Memory	Quad sets of 512 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	Quad sets of PCI Express 2.0 x16 (accommodates low profile AOCs up to 5.9" in length
Storage	9 TB per node
Connectivity/VGA/ Audio	Quad sets of dual LAN w/ Intel 82576 GbE controller Quad sets of Mellanox Connect-X2 40Gbps InfiniBand (HIBQRF only) Quad sets of Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: Quad sets of AMD SP5100 for 3 SATA RAID SUPPORT: 0,1 DRIVE BAYS: Quad sets of 3 x 3.5" hot-swap SATA drive bays PERIPHERAL BAYS: N/A POWER SUPPLY: 1400W Gold Level high-efficiency redundant power supply with PMBus COOLING SYSTEM: Twin sets of 2 x 8cm heavy duty counter-rotating fans with air shroud & optimal fan speed control

SUPERMICRO A+ SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

A+ Server 2022G-URF4+



Key Features:
> Resource optimized system solution
> 4 Gigabit Ethernet ports
> 768 GB DDR3 1600/1333/1066 SDRAM in 24 DIMMs
> Full-Height Full-Length expansion cards
> IPMI 2.0 management
> 920W Platinum-Level redundant power supply

Workloads: High-end enterprise server, SQL server, high-performance computer cluster (HPCC)

A+ Server 2022G-URF

Key Features:
> 8 x 3.5" SATA / SAS drive bays*
> Universal I/O slot and PCI Express
> 512 GB DDR3 1600/1333/1066 SDRAM in 16 DIMMs
> 2 Gigabit Ethernet ports
> IPMI 2.0 management
> 720W high-efficiency redundant power supply

Workloads: High-end enterprise server, SQL server, high-performance computer cluster (HPCC)

Serverboard: H8DGU-LN4F+ / HyperTransport™ technology Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series processors		**Serverboard: H8DGU-F / HyperTransport™ technology Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series processors**	
Chipset	AMD SR5690/SP5100	Chipset	AMD SR5670/SP5100
Form Factor	2U Rackmount 437 x 89 x 648mm (17.2" x 3.5" x 27.75")	Form Factor	2U Rackmount 437 x 89 x 648mm (17.2" x 3.5" x 25.5")
Memory	768 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 24 DIMMs	Memory	512 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 16 DIMMs
Expansion Slots	3 PCI Express 2.0 x8 (FH/HL) 1 Universal I/O (UIO) slot	Expansion Slots	1 Universal I/O (UIO) slot 3 PCI Express 2.0 x8 (full size)
Storage	SAS: 24 TB (with UIO) SATA: 24 TB	Storage	SAS: 24 TB (with UIO) SATA: 24 TB
Connectivity/VGA/Audio	Four LAN with two Intel 82576 Gigabit Ethernet controllers Matrox G200eW graphics controller	Connectivity/VGA/Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog	Management	IPMI 2.0, SuperDoctor III, Watch Dog
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: UIO SAS 8 port controller* AMD SP5100 for 6 SATA RAID SUPPORT: RAID 0, 1, 5, 6,10,50,60 available with Supermicro™ UIO card, RAID 0, 1, 10 with AMD SP5100 DRIVE BAYS: 8 x 3.5" hot-swap SAS or SATA drive bays PERIPHERAL BAYS: 1 slim DVD-ROM drive POWER SUPPLY: 920W Platinum Level high-efficiency redundant power supply with I²C built-in COOLING SYSTEM: 4 x 8cm heavy duty fans with air shroud & optimal fan speed control	Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: UIO SAS 8 port controller* AMD SP5100 for 6 SATA RAID SUPPORT: RAID 0, 1, 5, 6,10,50,60 available with Supermicro UIO card, RAID 0, 1, 10 with AMD SP5100 DRIVE BAYS: 8 x 3.5" hot-swap SAS or SATA drive bays PERIPHERAL BAYS: 1 slim DVD-ROM drive POWER SUPPLY: 720W Gold Level high-efficiency redundant power supply with I²C built-in COOLING SYSTEM: 3 x 8cm heavy duty fans with air shroud & optimal fan speed control

*UIO Card is needed for SAS functionality

SUPERMICRO A+ SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

A+ Server 4022G-6F

Key Features:
> Mainstream system in 4U/Tower form factor
> 100% cooling redundancy
> 512 GB DDR3 1600/1333/1066 SDRAM in 16 DIMMs
> 6 PCI Express 2.0 expansion slots
> IPMI 2.0 management
> 920W Platinum level power supply

Workloads: High-end enterprise server, SQL server, high-performance computer cluster (HPCC)

A+ Server 1042G-TF

Key Features:
> 3 x 3.5" SATA drive bays
> 1 TB DDR3 1600/1333/1066 SDRAM in 32 DIMMs
> 2 Gigabit Ethernet ports
> 1400W Gold-Level redundant power supply
> IPMI 2.0 management

Workloads: High-end database server, SQL server, high-performance computer cluster (HPCC)

Serverboard: H8DG6-F / HyperTransport™ technology Socket: G34 - 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors		**Serverboard: H8QGi+-F / HyperTransport™ technology Socket: G34 – 4 socket CPU: AMD Opteron™ 6100/6200/6300 Series processors**	
Chipset	Dual AMD SR5690/SP5100	Chipset	AMD SR5690/SP5100
Form Factor	4U Rackmount/Tower 437 x 178 x 648mm (17.2" x 7" x 25.5")	Form Factor	1U Rackmount 437 x 43 x 705 (17.2" x 1.7" x 27.75")
Memory	512 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 16 DIMMs	Memory	1 TB ECC Registered DDR3 1600/1333/1066 SDRAM in 32 DIMMs
Expansion Slots	3 PCI Express 2.0 x16 1 PCI Express 2.0 x8 2 PCI Express 2.0 x4 (using x8 slots)	Expansion Slots	1 PCI Express 2.0 x16 (low profile)
Storage	SAS: 24 TB SATA: 24 TB	Storage	SATA: 9TB
Connectivity/VGA/ Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller	Connectivity/VGA/ Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog	Management	IPMI 2.0, SuperDoctor III, Watch Dog
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: LSI 2008 SAS2 Controller with RAID 5, AMD SP5100 for 6 SATA RAID SUPPORT: AMD SP5100 (RAID 0, 1, 10); LSI 2008 (RAID 0, 1, 10, RAID 5 Optional) DRIVE BAYS: 8 x 3.5" hot-swap SAS or SATA drive bays PERIPHERAL BAYS: 3 x 5.25" drive bays optional floppy drive POWER SUPPLY: 920W Platinum Level high-efficiency power supply with PMBus COOLING SYSTEM: 3 x 8cm hot-swap cooling fans & 2 x 8cm exhaust fans with air shroud & optimal fan speed control	Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: AMD SP5100 for 3 SATA RAID SUPPORT: RAID 0, 1 DRIVE BAYS: 3 x 3.5" hot-swap SAS/SATA drive bays PERIPHERAL BAYS: 1 slim DVD-ROM drive optional POWER SUPPLY: 1400W Gold Level Power supply COOLING SYSTEM: 6 x 4cm heavy duty counter rotating fans with fan speed control

SUPERMICRO A+ SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

A+ Server 4042G-6RF/ A+ Server 4042G-TRF

Key Features:
> Enterprise level 4-way system
> Up to 5+5 (with optional drive carrier) SAS/SATA Drive Bays
> 2 PCI Express x16 and HyperTransport
> 1 TB DDR3 1600/1333/1066 SDRAM in 32 DIMMs
> 2 Gigabit Ethernet ports
> IPMI 2.0 management with dedicated LAN
> Redundant 1400W Gold-Level power supply

Workloads: Mission-critical applications, enterprise server, large database, e-business, Internet, online transaction processing

A+ Server 2042G-6RF A+ Server 2042G-TRF

Key Features:
> 6 x 3.5" hot-swap SATA/SAS drive bays
> 1 TB DDR3 1600/1333/1066 SDRAM in 32 DIMMs
> 2 Gigabit Ethernet ports
> 1400W Gold-Level redundant power supply
> IPMI 2.0 management over dedicated LAN

Workloads: High-end HPC, High-end enterprise server, SQL server, high-performance computer cluster (HPCC), Medical, Engineering intensive and Laboratory applications

Serverboard: H8QG6-F/i-F / HyperTransport™ technology Socket: G34 - 4 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors		**Serverboard: H8QG6-F / HyperTransport™ technology Socket: G34 – 4 socket CPU: AMD Opteron™ 6100/6200/6300 Series processors**	
Chipset	AMD SR5690/SR5670 & SP5100	Chipset	AMD SR5690/SF5670/SP5100
Form Factor	4U Rackmount/Tower 452 x 178 x 746mm (17.8" x 7" x 29.4")	Form Factor	2U Rackmount 437 x 89 x 709 (17.2" x 3.5" x 27.9")
Memory	1 TB ECC Registered DDR3 1600/1333/1066 SDRAM in 32 DIMM	Memory	1 TB ECC Registered DDR3 1600/1333/1066 SDRAM in 32 DIMM
Expansion Slots	2 PCI Express 2.0 x16 1 PCI Express 2.0 x8 1 Universal I/O or PCI Express 2.0 x8	Expansion Slots	2 PCI Express 2.0 x16 1 PCI Express 2.0 x8 1 Universal I/O or PCI Express 2.0 x8
Storage	SAS: 15 TB (30 TB w/ optional drive carrier) SATA: 15 TB (30 TB w/ optional drive carrier)	Storage	SAS: 18 TB SATA: 18 TB
Connectivity/VGA/ Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller	Connectivity/VGA/ Audio	Dual LAN with Intel 82576 Gigabit Ethernet controller Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog	Management	IPMI 2.0 , SuperDoctor III, Watch Dog
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: LSI® 2008 SAS Controller for 8 SAS/SATA ports (4042G-6RF only), AMD SP5100 for 6 SATA (4042G-TRF only) RAID SUPPORT: AMD SP5100 (RAID 0, 1, 10); LSI 2008 (RAID 0, 1, 10, RAID 5 Optional) DRIVE BAYS: Default 1 mobile rack (5 drives) Support up to 2 mobile racks (10 drives) PERIPHERAL BAYS: 3 x 5.25" drive bays POWER SUPPLY: 1400W Gold Level high efficiency redundant power supply with I²C built-in COOLING SYSTEM: 3 x 8cm hot-swap cooling fans & 3 x 8cm exhaust fans with air shroud & optimal fan speed control	Other Features	LSI 2008 SAS2 Controller for 8 SAS2/SATA ports (2042G-6RF only), AMD SP5100 for 6 SATA (2042G-TRF only) RAID SUPPORT: AMD SP5100 (RAID 0, 1, 10); LSI 2008 (RAID 0, 1, 10, RAID 5 Optional) DRIVE BAYS: 6 x 3.5" hot-swap SAS/SATA drive bays PERIPHERAL BAYS: 1 slim DVD-ROM drive POWER SUPPLY: 1400W Gold Level high-efficiency redundant power supply with I2C built-in COOLING SYSTEM: 6 x 8cm heavy duty fans with fan speed control

SUPERMICRO A+ SERVERS—AMD OPTERON™ 6000 SERIES PLATFORM

A+ Server 2042G-72RF4

Key Features:
> 6 x 3.5" SATA drive bays + 1 x 3.5 hidden bay
> 1TB DDR3 1600/1333/1066 SDRAM in 32 DIMMs
> 4 Gigabit Ethernet ports
> 1400W Platinum Level 94% high efficiency redundant power supplies
> IPMI 2.0 management

Workloads: Mission-critical applications, enterprise server, large database, e-business, Internet, online transaction processing , High performance computer cluster (HPCC)

A+ Server 4042G-72RF4

Key Features:
> 5 x 3.5" SATA drive bays + 3 x 5.25 Peripheral Drive Bay
> 1TB DDR3 1600/1333/1066 SDRAM in 32 DIMMs
> 4 Gigabit Ethernet ports
> 1400W Platinum Level 94% high efficiency redundant power supplies
> IPMI 2.0 management

Workloads: Mission-critical applications, enterprise server, large database, e-business, Internet, online transaction processing , High performance computer cluster (HPCC)

Serverboard: H8QG7-7F, HyperTransport™ technology Socket: G34 - 4 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors		**Serverboard: H8QG7-7F, HyperTransport™ technology Socket: G34 – 4 socket CPU: AMD Opteron™ 6100/6200/6300 Series processors**	
Chipset	AMD SR5690/SR5670 + SP5100	Chipset	AMD SR5690/SR5670 + SP5100
Form Factor	2U Rackmount 437 x 89 x 709mm (17.2" x 3.5" x 27.9 ")	Form Factor	4U Rackmount/ Tower 452 x 178 x 746mm (17.8" x 7" x 29.4")
Memory	1TB of DDR3 Registered ECC 1600/1333/1066 SDRAM in 32 DIMMs	Memory	1TB of DDR3 Registered ECC 1600/1333/1066 SDRAM in 32 DIMMs
Expansion Slots	2 PCI Express 2.0 x16 (low profile) 2 PCI Express 2.0 x8 (low profile)	Expansion Slots	2 PCI Express 2.0 x16 2 PCI Express 2.0 x8
Storage	SAS: 18 TB SATA: 18 TB	Storage	SAS: 15 TB (30 TB w/ optional drive carrier) SATA: 15 TB (30 TB w/ optional drive carrier)
Connectivity/VGA/ Audio	Quad LAN with Intel I350 Gigabit Ethernet Controller Matrox G200eW graphics controller	Connectivity/VGA/ Audio	Quad LAN with Intel I350 Gigabit Ethernet Controller Matrox G200eW graphics controller
Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III	Management	IPMI 2.0 + KVM with dedicated LAN, Watch Dog, SuperDoctor III
Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: LSI 2208 SAS2 Controller, AMD SP5100 for 6 SATA RAID SUPPORT: HW RAID 0, 1, 5, 6, 10, 50 with LSI 2208; RAID 0, 1, 10 with AMD SP5100 DRIVE BAYS: 6x 3.5" hot-swap SATA/ SAS drive bays POWER SUPPLY: 1400W Platinum Level 94% high efficiency redundant digital power supplies COOLING SYSTEM: 6 x8cm heavy duty counter rotating fans with fan speed control	Other Features	ONBOARD SAS/SCSI/SATA/IDE/RAID: LSI 2208 SAS2 Controller, AMD SP5100 for 6 SATA RAID SUPPORT: HW RAID 0, 1, 5, 6, 10 (50, 60 <optional drive carrier required>) with LSI 2208; RAID 0, 1, 10 with AMD SP5100 DRIVE BAYS: 5x 3.5" hot-swap SATA/ SAS drive bays + 3 x 5.25 Peripheral Drive Bay POWER SUPPLY: 1400W Platinum Level 94% high efficiency redundant digital power supplies COOLING SYSTEM: 3 x 8cm hot-swap cooling fans & 3 x 8cm exhaust fans

SUPERMICRO A+ SERVERS—AMD OPTERON™ 4000 SERIES PLATFORM

A+ Server 1012C-MRF

Key Features:
> Optimized for shallow racks
> Eight-Core processor support
> 128 GB DDR3 1600/1333/1066 SDRAM in 4 DIMMs
> PCI Express 2.0 x8 support
> 2 Gigabit Ethernet ports
> Cost-effective

Workloads: File/print server, firewall applications, mail server, web server for small business, server appliance, cluster node

A+ Server 2022TG-H6RF
A+ Server 2022TG-H6IBQRF

Key Features:
> Excellent performance per watt
> Four hot-swappable nodes in 2U
> 3 3.5" SAS HDD per node
> Up to 128 cores in 2U
> LSI SAS 2108 controller (RAID 0, 1, 10, 5, 50, and 6 support)

Workloads: HPC cluster compute nodes, datacenter, data farm, front-end server and other computing intensive applications

A+ Server 2122TG-H6RF
A+ Server 2122TG-H6IBQRF

Key Features:
> Excellent performance per watt
> Four hot-swappable nodes in 2U
> 6 x 2.5" SAS HDD per node
> Up to 128 cores in 2U
> LSI SAS 2108 controller (RAID 0, 1, 10, 5, 50, and 6 support)

Workloads: HPC cluster compute nodes, datacenter, data farm, front-end server and other computing intensive applications

Serverboard: H8SCM-F motherboard / HyperTransport™ technology Socket: C32 – 1 socket CPU: AMD Opteron™ 4100/4200/4300 Series Processors		**Serverboard: H8DGT-HLF/HLIBQF / Hypertransport™ technology Socket: G34 - 2 socket per node CPU: AMD Opteron™ 6100/6200/6300 Series Processors**		**Serverboard: H8DGT-HLF/HLIBQF / Hypertransport™ technology Socket: G34 – 2 socket per node CPU: AMD Opteron™ 6100/6200/6300 Series processors**	
Chipset	AMD SR5650/SP5100	Chipset	AMD SR5670/SP5100	Chipset	AMD SR5670/SP5100
Form Factor	Mini 1U Rackmount 437 x 43 x 369mm (17.2" x 1.7" x 14.5")	Form Factor	2U Rackmount 438 x 88 x 724mm (17.25" x 3.47" x 28.5")	Form Factor	2U Rackmount 438 x 88 x 724mm (17.25" x 3.47" x 28.5")
Memory	128 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 4 DIMMs	Memory	Quad sets of 256 GB ECC Registered DDR3 1866/1600/1333/1066 SDRAM in 8 DIMMs	Memory	Quad sets of 256 GB ECC Registered DDR3 1866/1600/1333/1066 SDRAM in 8 DIMMs
Expansion Slots	1 PCI Express 2.0 x8 in x16 slot	Expansion Slots	Quad sets of PCI Express 2.0 x16 (low profile)	Expansion Slots	Quad sets of PCI Express 2.0 x16 (low profile)
Storage	SATA: 6 TB	Storage	LSI SAS 2108 controller 9 TB per node	Storage	LSI SAS 2108 controller 9 TB per node
Connectivity/VGA/ Audio	Dual LAN with two Intel 82574L Gigabit Ethernet controllers Matrox G200eW graphics controller	LAN	Quad sets of dual LAN w/ Intel 82576 controller Quad sets of Mellanox Connect-X2 40 Gbps InfiniBand (2022TG-H6IBQRF only)	LAN	Quad sets of dual LAN w/ Intel 82576 controller Quad sets of Mellanox Connect-X2 40Gbps InfiniBand (2122TG-H6IBQRF only)
		VGA	Matrox G200eW graphics controller	VGA	Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watch Dog	Management	IPMI 2.0, SuperDoctor III, Watchdog	Management	IPMI 2.0, SuperDoctor III, Watchdog
Other	ONBOARD SAS/SCSI/SATA/IDE/RAID: AMD SP5100 for 2 SATA RAID SUPPORT: 0,1 DRIVE BAYS: 2 x 3.5" internal drive bays PERIPHERAL BAYS: Optional 1 slim DVD-ROM drive POWER SUPPLY: 350W Gold Level high-efficiency power supply COOLING SYSTEM: 2 x 4cm heavy duty counter-rotating fan with air shroud & optimal fan speed control	Other	Quad sets of 3 x 3.5" hot swap SAS drive bays 1620W Platinum level redundant power supply Twin sets of 2x 8cm heavy duty counter rotating fans with air shroud & optimal fan speed control RAID SUPPORT: LSI 2108 RAID 0, 1, 5, support.	Other	Quad sets of 6 x 2.5" hot swap SAS drive bays 1620W Platinum level redundant power supply Twin sets of 2x 8cm heavy duty counter rotating fans with air shroud & optimal fan speed control RAID SUPPORT: LSI 2108 RAID 0, 1, 10, 5, 50, and 6 support

SUPERMICRO A+ SERVERS—AMD OPTERON™ 4000 SERIES PLATFORM

A+ Server 2022TC-HTRF4

Key Features:
> Excellent Performance per watt
> Four hot-swappable nodes in 2U
> 3 3.5" SAS HDD per node
> Up to 64 cores in 2U
> Quad port Ethernet

Workloads: HPC cluster compute nodes, datacenter, data farm, front-end server and virtualization

Serverboard: H8DCT-HLN4F / Hypertransport™ technology
Socket: C32 - 2 socket per node
CPU: AMD Opteron™ 4100/4200/4300 Series Processors

Chipset	AMD SR5670/SP5100
Form Factor	2U Rackmount 438 x 88 x 724mm (17.25" x 3.47" x 28.5")
Memory	Quad sets of 192 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 12 DIMMs
Expansion Slots	Quad sets of PCI Express 2.0 x16 (low profile)
Storage	9 TB per node
LAN	4 sets of Intel I350-AM4 Quad port Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watchdog
Other Features	Quad sets of 3 x 3.5" hot swap SATA drive bays 1620W Platinum level redundant power supply Twin sets of 2x 8cm heavy duty counter rotating fans with air shroud & optimal fan speed control AMD SP5100 (RAID 0, 1)

A+ Server 2122TC-H6RF4

Key Features:
> Excellent Performance per watt
> Four hot-swappable nodes in 2U
> 6 x 2.5" SAS HDD per node
> Up to 64 cores in 2U
> Quad port Ethernet
> LSI SAS 2108 controller (RAID 0, 1, 10, 5, 50, and 6)

Workloads: HPC cluster compute nodes, datacenter, data farm, front-end server and virtualization

Serverboard: H8DCT-HLN4F / Hypertransport™ technology
Socket: C32 – 2 socket per node
CPU: AMD Opteron™ 4100/4200/4300 Series processors

Chipset	AMD SR5670/SP5100
Form Factor	2U Rackmount 438 x 88 x 724mm (17.25" x 3.47" x 28.5")
Memory	Quad sets of 192 GB ECC Registered DDR3 1600/1333/1066 SDRAM in 12 DIMMs
Expansion Slots	Quad sets of PCI Express 2.0 x16 (low profile)
Storage	LSI SAS 2108 controller 9 TB per node
LAN	4 sets of Intel I350-AM4 Quad port Gigabit Ethernet
VGA	Matrox G200eW graphics controller
Management	IPMI 2.0, SuperDoctor III, Watchdog
Other Features	Quad sets of 6 x 2.5" hot swap SAS drive bays 1620W Platinum level redundant power supply Twin sets of 2x 8cm heavy duty counter rotating fans with air shroud & optimal fan speed control

U.S. HEADQUARTERS

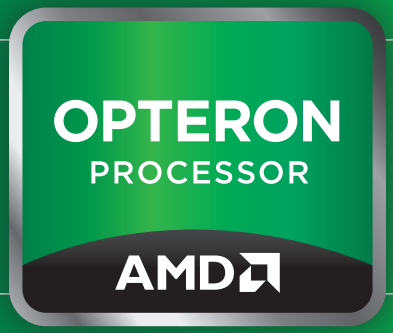
Phone: (408) 503-8000
Hours: 9am - 6pm Pacific Time (Monday - Friday)
Email: support@supermicro.com

FOR MORE INFORMATION, VISIT:

C32 Servers:	http://www.supermicro.com/C32/AMD_C32.cfm?pg=SS
C32 Motherboards:	http://www.supermicro.com/C32/AMD_C32.cfm?pg=MOBO
G34 Servers:	http://www.supermicro.com/G34/AMD_G34.cfm?pg=SS
G34 Motherboards:	http://www.supermicro.com/G34/AMD_G34.cfm?pg=MOBO

Company Overview:

Supermicro is the market leader in server technology innovation and pioneer in green computing. Our application-optimized high-efficiency server, blade, GPU, storage and workstation systems are deployed globally to support a broad range of critical IT infrastructures.



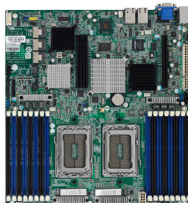
TYAN Motherboards
TYAN Server/Workstation Solutions

TYAN

Information is provided for reference only. Please confirm specifications with your vendor before purchase.

TYAN MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

S8236-IL Series



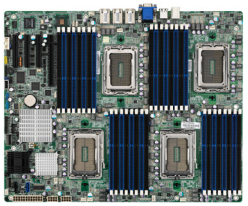
Key Positioning: High-Performance and GPU Computing

Workloads: High-Performance Computing – GPU Workstation

Socket: G34 – 2 sockets
CPU: AMD Opteron™ 6100/6200/6300 Series Processors
See below for SKU options

Chipset	AMD SR5690 + SP5100
Form Factor	12" x 13" EATX
Memory	4 memory channels per CPU 8+8 DDR-III DIMM slots Up to 128GB R-DIMM or 64GB U-DIMM with total (16) DDR3 DIMM slots
Expansion Slots	2 PCIe 2.0 x16 for S8236(W)GM3NR-IL 3 PCIe 2.0 x16 for S8236WGM3NR-HE-IL
Storage	6 SATA (3 Gb/s) ports w/ RAID 0/1/10/5 8 LSI 2008 SAS (6Gb/s) w/ RAID 0/1/1E
LAN	3 GbE Ports (Intel 82576EB + 82574L)
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	7 USB 2.0 ports (2 + 4 + 1)
Compatible Chassis	TYAN GT24 (1U, 4x 3.5" HDDs, SPS/ RPSU) TYAN GT62A (1U, 10x 2.5" HDDs, SPS/ RPSU) TYAN GN70 (2U, 8x 3.5" HDDs, SPS/ RPSU)
SKU Options	S8236GM3NR-IL CHIPSET: SR5690 PCIe 2.0 – x16/x8/x4: 2/0/0; IPMI 2.0; NO SAS S8236WGM3NR-IL CHIPSET: SR5690 PCIe 2.0 – x16/x8/x4: 2/0/0; IPMI 2.0; SAS S8236WGM3NR-HE-IL CHIPSET: SR5690 + SR5650; PCIe 2.0 – x16/x8/x4: 3/0/0; IPMI 2.0; SAS

S8812 Series



Key Positioning: 4-Way High-Performance

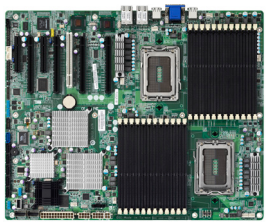
Workloads: High-Performance Computing - CPU Intensive

Socket: G34 – 4 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors
See below for SKU options

Chipset	AMD SR5690 + SP5100
Form Factor	16.2" x 13" MEB
Memory	4 Channel with 8 DIMMs / CPU
Expansion Slots	1x PCIe 2.0 x16 or 1 x8 (in x16) + 1 x8 slots 2x PCIe x8 slots (#1 and #2)
Storage	6 SATA (3 Gb/s) with RAID 0/1/5/10 LSI 2008 SAS (6 Gb/s) with RAID 0/1/1E/10
LAN	Quad 1-Gbit LAN (Intel 82576EB + 2x 82574L)
VGA	Integrated AST2050 graphics
Management	IPMI 2.0 w/ iKVM
Other	N/A
Optimized Chassis	TYAN FT48 (4U 8 3.5" HDD, RPSU) FT48-B8812 "Barebone Solution"
SKU Options	8812WGM3NR

TYAN MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

S8232 Series



Key Positioning: Maximum Memory

Workloads: High-Performance Computing - CPU and Memory Intensive

Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series Processors See below for SKU options	
Chipset	AMD (2) SR5690 + SP5100
Form Factor	16" x 13" MEB
Memory	Up to 192 GB DDR3 RDIMM 1333/1066/800 MHz 4 Channel with 12 DDR3 DIMMs / CPU
Expansion Slots	4x PCIe 2.0 x16, 2 x8, 1 PCI slots
Storage	6 SATA (3 Gb/s) with RAID 0/1/5/10 LSI 2008 SAS (6 Gb/s) with RAID 0/1/1E/10
LAN	Quad 1-Gbit LAN (Dual Intel 82576EB) ports
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	7 USB 2.0 ports (2 + 4 + 1)
Compatible Chassis	9 USB 2.0 ports (4 + 1 + 4) Optional: Audio, IEEE 1394a, TPM
SKU Options	S8232WAG4NRF

S8238-HE Series

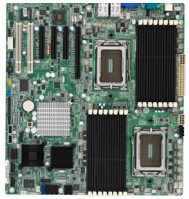
Key Positioning: High-Density Dual-Node Server

Workloads: High-Performance Computing and Cloud Computing

Socket: G34 – 2 socket CPU: AMD Opteron™ 6100/6200/6300 Series processors See below for SKU options	
Chipset	AMD SR5650 / SR5670 + SP5100
Form Factor	6.3" x 18" half-width design
Memory	Up to 96 GB DDR3 RDIMM 1333/1066/800 MHz (8 + 4) DIMMs, 4 Channel / CPU
Expansion Slots	1x PCIe 2.0 x16 slot
Storage	4 SATA (3 Gb/s) with RAID 0/1/5/10
LAN	Dual 1-Gbit LAN (Intel 82576EB) ports
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	1 QDR Infiniband QFSP (ConnectX-2)
Optimized Chassis	TYAN YR190 (1U 2-Node, 4 2.5" HDD) TYAN YR290 (2U, 4-Node, 4 2.5" HDD) YR190-B8238 "Barebone Solution"
SKU Options	S8238GM2NRI Chipset: AMD SR5670 Mellanox QDR Infiniband: Yes S8238GM2NR-LE Chipset: AMD SR5650 Mellanox QDR Infiniband: No

TYAN MOTHERBOARDS—AMD OPTERON™ 6000 SERIES PLATFORM

S8230 Series



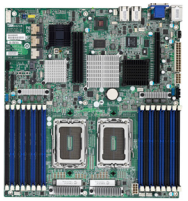
Key Positioning: General Purpose and IT Infrastructure

Workloads: 12-Core Performance

Socket: G34 – 2 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors
See below for SKU options

Chipset	AMD SR5690 / SR5670 + SP5100
Form Factor	12" x 13" EATX
Memory	Up to 128 GB RDIMM or 64 GB UDIMM 4 Channel with 8 DDR3 DIMMs / CPU
Expansion Slots	PCIe 2.0 x8 slot (w/ x4 link) + (1) PCIe 2.0 x8 slot + (1) PCIe 2.0 x16 slot (w/ x16 or x8 link) + (1) PCIe 2.0 x8 slot (w/ x0 or x8 link)
Storage	6 SATA (3 Gb/s) ports 8 LSI 2008 SAS (6 Gb/s) (-W only)
LAN	4x 1-Gbit LAN (Intel 82576EB + 2x 82574L)
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	8 USB 2.0 ports (2 + 2 + 4)
Compatible Chassis	TYAN GT62 (1U, 8x 2.5" hot-swap HDD and RPSU) TYAN GT62-B8230 "Barebone Solution"
SKU Options	S8230GM4NR CHIPSET: SR5690 PCIe 2.0 – X16/X8/X4: 1 / 1 /1 or 0/2/1 IPMI 2.0: YES SAS: NO S8230WGM4NR CHIPSET: SR5690 PCIe 2.0 – X16/X8/X4: 1 / 1 /1 or 0/2/1 IPMI 2.0: YES SAS: YES CHIPSET: SR5670 PCIe 2.0 – X16/X8/X4: 1 / 0 or 0/2 IPMI 2.0: YES SAS: NO S8230WGM4NR-LE CHIPSET: SR5670 PCIe 2.0 – X16/X8/X4: 1 / 0 or 0/2 IPMI 2.0: YES SAS: YES

S8236 Series



Key Positioning: High-Performance and GPU Computing

Workloads: High-Performance Computing – GPU Workstation

Socket: G34 – 2 socket
CPU: AMD Opteron™ 6100/6200/6300 Series Processors
See below for SKU options

Chipset	AMD SR5690 + SP5100
Form Factor	12" x 13" EATX
Memory	Up to 128 GB RDIMM or 64 GB UDIMM 4 Channel with 8 DDR3 DIMMs / CPU
Expansion Slots	2 PCIe 2.0 x16 in 1U or 2U + (2x PCIe 2.0 x16 (slots #6, #6.5))
Storage	6 SATA (3 Gb/s) ports 8 LSI 2008 SAS (6 Gb/s) (-W only)
LAN	3x 1-Gbit LAN (Intel 82576EB + 82574L)
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	7 USB 2.0 ports (2 + 4 + 1)
Optimized Chassis	TYAN GT24 (1U, 4x 3.5" HDD and RPSU) TYAN GT62 (1U, 8x 2.5" HDD and RPSU) TYAN GN70 (2U, 8x 2.5" HDD and RPSU)
SKU Options	S8236GM3NR CHIPSET: SR5690 PCIe 2.0 – X16/X8/X4: 2/0/0 IPMI 2.0: YES SAS: NO S8236WGM3NR CHIPSET: SR5690 PCIe 2.0 – X16/X8/X4: 2/0/0 IPMI 2.0: YES SAS: YES S8236WGM3NR-HE* CHIPSET: SR5690 + SR5650 PCIe 2.0 – X16/X8/X4: 3/0/0 IPMI 2.0: YES SAS: YES

* S8236 Series: HE version not available as a standard product. Build to order only.

TYAN MOTHERBOARDS—AMD OPTERON™ 4000 SERIES PLATFORM

S8228 Series

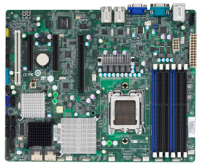
Key Positioning: Power Efficient, High-Density Dual-Node Server

Workloads: IPDC and Cloud Computing

Socket: C32 – 2 socket
CPU: AMD Opteron™ 4100/4200/4300 Series processors
See below for SKU options

Chipset	AMD SR5650 + SP5100
Form Factor	6.3" x 16.4" half-width design
Memory	Up to 96 GB RDIMM DDR3 Memory Dual Channel per CPU (6 + 6 DIMMs)
Expansion Slots	1x PCI Express 2.0 x16 slot
Storage	4 SATA ports (3 Gb/s) with RAID 0/1/5/10
LAN	Three Gbit LAN ports (Intel 82576EB + 82574L)
VGA	Integrated AST2050 Graphics
Management	iKVM and IPMI 2.0
Other	8 USB 2.0 ports (2 + 2 + 4)
Compatible Chassis	TYAN YR190 (1U, 2-Node, 4 2.5" HDD) TYAN YR292 (2U 4-Node, 4 2.5" HDD, RPSU) YR190-B8228 "Barebone Solution"
SKU Options	S8228GM3NR

S8010 Series



Key Positioning: Cost-Effective, Power-Efficient with Leading Price/Performance

Workloads: General Purpose, Storage, and Appliance Server

Socket: C32 – 1 Socket
CPU: AMD Opteron™ 4100/4200/4300 Series Processors
See below for SKU options

Chipset	AMD SR5670 + SP5100
Form Factor	12" x 9.6" ATX
Memory	64 GB RDIMM in 2 Ch with 3 DIMM / Ch 16 GB UDIMM ECC in 2 Ch with 2 / Ch
Expansion Slots	1x PCIe 2.0 x8 (in x16) slot (#6) 2x PCIe 2.0 x8 slots (Slot #4, #2) 1x PCI-32 slot (#1)
Storage	6 SATA ports (3 Gb/s) with RAID 0/1/5/10 8 SAS ports (6 Gb/s) via LSI 2008 (-W only)
LAN	Two Gbit LAN ports (Intel 82574L) 1x Broadcom BCM5221 PHY (Dedicated LAN)
VGA	Integrated ASPEED AST2050 Graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	iKVM and IPMI 2.0
Compatible Chassis	TYAN GT14 (1U, 2x 2.5" internal HDD, short-depth) TYAN GT20 (1U, 4x 3.5" hot-swap HDD, 1x EPS1U PSU) TYAN GT24 (1U, 4x 3.5" hot-swap HDD, RPSU) TYAN GT62 (1U, 8x 2.5" hot-swap HDD, RPSU)
SKU Options	S8010GM2NR S8010WGM2NR

S8228

Key Positioning: Power Efficient, High-Density Dual-Node Server

Workloads: IPDC and Cloud Computing

Socket: C32 – 2 sockets
CPU: AMD Opteron™ 4100/4200/4300 Series processors
See below for SKU options

Chipset	AMD SR5650 + SP5100
Form Factor	6.3" x 16.4" SFF (half-width design)
Memory	2 memory channels per CPU (6+6) DDR-III DIMM slots Up to 96GB R-DIMM or 32GB U-DIMM with total (12) DDR3 DIMM slots
Expansion Slots	1 PCIe 2.0 x16
Storage	4 SATA (3 Gb/s) ports w/ RAID 0/1/10/5
LAN	3 GbE Ports (Intel 82576EB + 82574L)
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	5 USB 2.0 ports (2 + 2 + 1)
Compatible Chassis	TYAN YR190-X2 (1U, 2-Node, 4x 2.5" HDDs per node, SPS per node) TYAN YR292-X4 (2U, 4-Node, 4x 2.5" HDDs per node, RPSU per enclosure)
SKU Options	S8228GM3NR CHIPSET: SR5650; PCIe 2.0 – x16/x8/x4: 1/0/0; IPMI 2.0; NO SAS

* S8236 Series: HE version not available as a standard product. Build to order only.

TYAN SERVER/WORKSTATION SOLUTIONS—AMD OPTERON™ 6000 SERIES PLATFORM

S8239-IL

Key Positioning: High-Density Dual-Node Server motherboards

Workloads: High-Performance Computing and GPU Computing

Socket: G34 – 2 sockets **CPU: AMD Opteron™ 6100/6200/6300 Series processors**	
Chipset	AMD SR5670 + SP5100
Form Factor	6.3" x 18" half-width design
Memory	Up to 128 GB DDR3 U/RDIMM 1333/1066/800 MHz (4 + 4) DIMMs, 4 Channel / CPU
Expansion Slots	1x PCIe 2.0 x16 slot
Storage	4 SATA (3 Gb/s) with RAID 0/1/5/10
LAN	Dual 1-Gbit LAN (Intel 82576EB) ports
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	N/A
Optimized Chassis	TYAN YR292 (2U 2-Node, 8 2.5" HDD / per node)

YR292-S8239-IL

Key Positioning: Dual-nodes server with GPU supporting

Workloads: High-Density Cloud Platforms delivers high performance

Socket: G34 – 2 Sockets **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5670 + SP5100
Form Factor	1U with dual two-socket nodes
Memory	Up to 128 GB DDR3 U/RDIMM 1333/1066/800 MHz (4 + 4) DIMMs, 4 Channel / CPU (per node)
Expansion Slots	1x PCIe 2.0 x16 slot (per node)
Storage	4 hot-swap SATAII (per node)
LAN	Dual 1-Gbit LAN (Intel 82576EB) ports (per node)
VGA	Integrated AST2050 graphics
Management	Integrated IPMI 2.0 w/ iKVM
Other	N/A
Optimized Chassis	TYAN YR292 (2U 2-Node, 8 2.5" HDD / per node)

TYAN SERVER/WORKSTATION SOLUTIONS—AMD OPTERON™ 6000 SERIES PLATFORM

GN70-B8236-IL

Key Features: 2U rackmount server with dual GPU support

Workloads: High-Performance and GPU Computing

YR190-B8028-X2

Key Features: Cost-effective dual-node server

Workloads: High-density IPDC and Cloud Computing

Barebone **Serverboard: B8236GN70W8HR-HE** **Socket: G34 - 2 sockets** **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**		**Barebone** **Serverboard: B8028Y190X2-045V4H** **Socket: G34 - 1 socket/blade, 2 blades** **CPU: AMD Opteron™ 6100/6200/6300 Series Processors**	
Chipset	AMD SR5690 + SP5100	Chipset	AMD SR5650 + SP5100
Form Factor	1U with dual single-socket nodes	Form Factor	1U (28.74" depth)
Memory	96GB RDIMM DDR3 per blade	Memory	256GB Reg. DDR3 1333/1066/800
Expansion Slots	1 HH/HL PCIe 2.0 x16 slot (per node)	Expansion Slots	3 FH/FL PCIe 2.0 x16 slots
Storage	4 hot-swap SATAII per node	Storage	8 hot-swap 6Gbps SAS (or SATAII)
LAN	3 GbE (Intel 82576EB + 82574L) per node	LAN	3 GbE (Intel 82576EB + 82574L)
VGA	ASPEED AST2050 integrated graphics	VGA	ASPEED AST2050 integrated graphics
Management	IPMI 2.0 with iKVM	Management	IPMI 2.0 with iKVM
Other	N/A	Other	N/A

TYAN SERVER/WORKSTATION SOLUTIONS—AMD OPTERON™ 6000 SERIES PLATFORM

FT48-B8812

Key Features: 4-Way High-Peformance

Workloads: High-Performance Computing, CPU Intensive

Barebone
Serverboard: B8812F48W8HR
Socket: G34 - 4 sockets
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	Two AMD SR5690 + SP5100
Form Factor	4U rackmount/tower (27.5" depth)
Memory	256GB Reg. DDR3 1333/1066/800
Expansion Slots	1 x16 and 3 x8 FH/FL PCIe 2.0
Storage	8 hot-swap 6Gbps SAS
LAN	3 GbE (Intel 82576EB + 82574L)
VGA	ASPEED AST2050 integrated graphics
Management	IPMI 2.0 with iKVM
Other	Integrated LSI 2008 SAS Controller

GT24-B8236-IL

Key Features: 1U Rack Server with 48 HT3 Links

Workloads: High Performance Computing and Virtualization

Barebone
Serverboard: B8236G24W4H (or B8236G24V4H without SAS)
Socket: G34 - 4 sockets
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	AMD SR5690 + SP5100
Form Factor	1U (25.4" depth)
Memory	128GB Reg. DDR3 1333/1066/800
Expansion Slots	2 FH/FL PCIe 2.0 x16 slots
Storage	4 hot-swap 6Gbps SAS (or SATAII)
LAN	3 GbE (Intel 82576EB + 82574L)
VGA	ASPEED AST2050 integrated graphics
Management	IPMI 2.0 with iKVM
Other	Integrated LSI 2008 SAS Controller

YR190-B8238-X2

Key Features: Dual-node server with Infiniband

Workloads: High-Performance Computing and Virtualization

Barebone
Serverboard: B8238Y190X2-045V4HI
Socket: G34 - 2 sockets per node, dual-node
CPU: AMD Opteron™ 6100/6200/6300 Series Processors

Chipset	AMD SR5670 + SP5100
Form Factor	1U with dual two-socket nodes
Memory	96GB RDIMM DDR3 per blade
Expansion Slots	1 HH/HL PCIe 2.0 x16 slot (per node)
Storage	4 hot-swap SATAII per node
LAN	2 GbE (Intel 82574L) per node
VGA	ASPEED AST2050 integrated graphics
Management	IPMI 2.0 with iKVM
Other	N/A

TYAN MOTHERBOARDS—AMD OPTERON™ 4000 SERIES PLATFORM

S8225 Series

Key Positioning: GPGPU and Workstation Solution

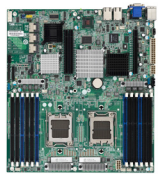
Workloads: Graphics Workstation and Personal Supercomputing

Socket: C32 – 2 socket **CPU: AMD Opteron™ 4100/4200/4300 Series Processors**	
Chipset	AMD (2) SR5690 + SP5100
Form Factor	12" x 13" EATX
Memory	Dual memory channels per CPU 4+4 DDR-III DIMM slots Up to 128 GB R-DIMM with total (8) DDR3 DIMM slots
Expansion Slots	4x PCIe 2.0 x16 slots 1x PCIe 2.0 x8, 1x x4 slot, and 1 PCI-32
Storage	6 SATA ports (3 Gb/s) with RAID 0/1/5/10 8 SAS ports (6 Gb/s) via LSI 2008 Controller (-W only)
LAN	Quad Gbit LAN ports (Intel 82576EB + 2x 82574L)
VGA	Integrated AST2050 Graphics
Management	iKVM and IPMI 2.0
Other	Optional Features Integrated audio and IEEE 1394a support TPM 1.2 support
Compatible Chassis	TYAN FT48 (4U with hot-swap HDD and RPSU) FT48-B8225 "Barebone Solution"
SKU Options	S8225AGM4NRF S8225WAGM4NRF

S8226 Series

Key Positioning: Power-Efficient 1U Optimized Form Factor

Workloads: High-Performance and GPU Computing



Socket: C32 - 2 sockets **CPU: AMD Opteron™ 4100/4200/4300 Series Processors**	
Chipset	AMD SR5690 + SR5650 + SP5100 (2U+)* AMD SR5690 + SP5100 (1U)
Form Factor	12" x 13" EATX
Memory	Dual memory channels per CPU 6+6 DDR-III DIMM slots Up to 128 GB R-DIMM with total (12) DDR3 DIMM slots
Expansion Slots	22x PCIe 2.0 x16 slots (Slot #6, #6.5) 3x PCIe 2.0 x16 slots with SR5650 (-HE version only)
Storage	6 SATA ports (3 Gb/s) with RAID 0/1/5/10 8 SAS ports (6 Gb/s) via LSI 2008 Controller (-W only)
LAN	Three Gbit LAN ports (Intel 82576EB + 82574L)
VGA	Integrated AST2050 Graphics
Management	iKVM and IPMI 2.0
Other	N/A
Compatible Chassis	TYAN GT24 (1U, 4x 3.5" hot-swap HDD and RPSU) TYAN GT62 (1U, 8x 2.5" hot-swap HDD and RPSU) GT24-B8226 "Barebone Solution"
SKU Options	S8226GM3NR S8226WGM3NR S8226WGM3NR-HE*

* S8226 Series: HE version not available as a standard product. Build to order only.

TYAN SERVER/WORKSTATION SOLUTIONS—AMD OPTERON™ 4000 SERIES PLATFORM

YR190-B8228-X2

Key Features: 2U rackmount server with dual GPU support

Workloads: Cloud Computing, IPDC, and Virtualization

Barebone
Serverboard: B8228Y190X2-045V4H
Socket: C32 - 2 sockets per node, dual node
CPU: AMD Opteron™ 4100/4200/4300 Series Processors

Chipset	AMD SR5650 + SP5100
Form Factor	1U with dual single-socket nodes
Memory	96GB RDIMM DDR3 per blade
Expansion Slots	1 HH/HL PCIe 2.0 x16 slot (per node)
Storage	4 hot-swap SATAII per node
LAN	2 GbE (Intel 82574L) per node
VGA	ASPEED AST2050 integrated graphics
Management	IPMI 2.0 with iKVM
Other	N/A

GT24-B8226

Key Features: 1U power-efficient rackmount server

Workloads: General purpose, datacenter, virtualization

Barebone
Serverboard: B8226G24W4H (or B8226G24V4H without SAS)
Socket: C32 - 2 sockets
CPU: AMD Opteron™ 4100/4200/4300 Series Processors

Chipset	AMD SR5690 + SP5100
Form Factor	1U (25.4" depth)
Memory	96GB Reg. DDR3 1333/1066/800
Expansion Slots	2 FH/FL PCIe 2.0 x16 slots
Storage	4 hot-swap 6Gbps SAS (or SATAII)
LAN	3 GbE (Intel 82576EB + 82574L)
VGA	ASPEED AST2050 integrated graphics
Management	IPMI 2.0 with iKVM
Other	N/A

FOR MORE INFORMATION, VISIT:

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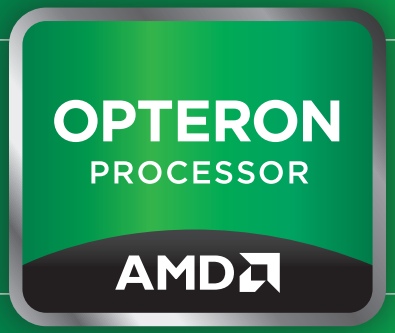
Or contact Michael Kalodrich, Sales Manager at michaelk@tyan.com or (510) 651-8868.

Company Overview:

Created in 1989, TYAN designs, manufactures and markets advanced x86 server/workstation platforms.
TYAN's products are sold to OEMs, VARs, System Integrators, and Resellers around the world for a wide range of applications. As a leading server brand asset owned by MiTAC International Corporation, TYAN is to be deeply enhanced and further developed through the synergy and innovation of the new MiTAC. Products from TYAN feature design enhancements specifically developed for enterprise computer room and data center environments. These highly stable, space-efficient products are very attractive to OEMs and System Integrators designing next generation rackmount server solutions for a wide array of applications.



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