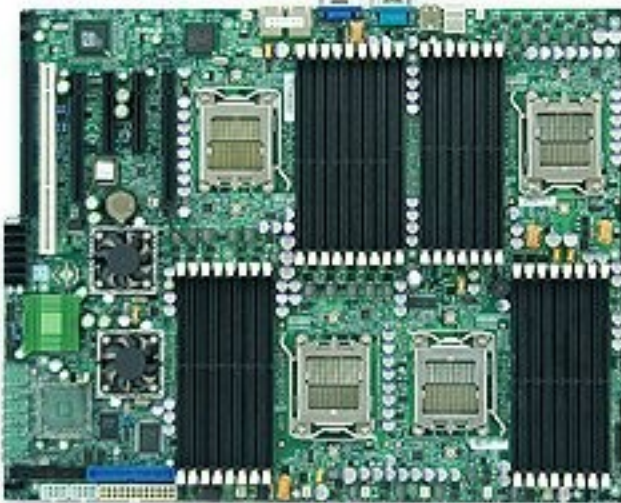
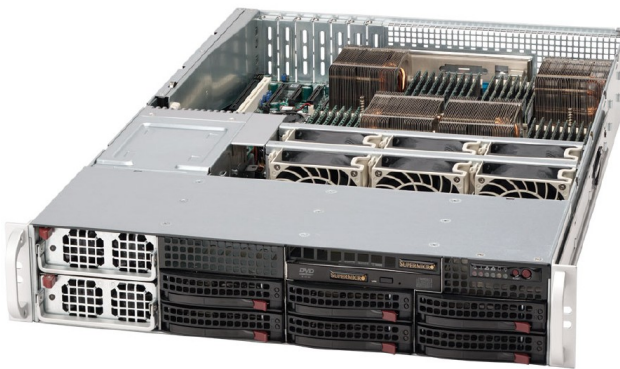


# GRAPHSTREAM

## P4032A-R2C Graphics Server



P4032A-R2C is a 2RU-rackmount server system that can support a wide range of applications in enterprise-datacenter environments.

P4032A-R2C is optimized for GPU-accelerated 3D graphics applications that require more resources than typical workstation-class systems can provide.

P4032A-R2C can provide superior platform support for some of the world's most advanced technical and visual computing applications in energy, finance, manufacturing, media, medicine, national security, and scientific research.

- 16way SMP via four quad-core AMD Opteron™ 64-bit CPUs up to 3.1 GHz
- Up to 256 GBytes main memory, using standard Commercial Off-The-Shelf (COTS) 8GB modules
- Up to four GPU cards and eight dual-link DVI outputs via external GPU chassis
- Integrated I/O and storage:
  - Expansion card slots: 4pc PCI Express, 1pc PCI-X
  - Two integrated Gigabit Ethernet ports
  - Six hot-swap SAS/SATA HDD bays
- Enterprise-grade high-availability server features supporting 24x7 operation at full load:
  - Disk drives with 1.2 million hour MTBF at high duty cycle, 100% power-on hours
  - 1200-watt 1+1 modular redundant hot-swappable power supply
  - 6 redundant hot-swappable cooling fans
  - Standards-based remote monitoring and management: IPMI v2.0, providing remote power/reset control, serial console over LAN, and KVM over IP
  - Tool-free access design with integrated sliding rails
- Full compatibility with Windows and Linux/GNU operating systems and applications assured via use of pure mainstream open-standard architecture, standard interfaces, and mainstream COTS components
- Built alongside "Tier-1" name-brand server products in ISO-certified manufacturing facilities, using premium-quality, cost-efficient COTS components made by leading high-volume server component manufacturers, including Supermicro ([www.supermicro.com](http://www.supermicro.com))
- Supported by GraphStream as a single fully integrated system

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## System

Weight	
Minimum config, 2pc HDD	72.0 lbs / 32.7 kg
Temperature	
Operating	+50 to +95 degF / +10 to +35 degC
Non-operating	-40 to +158 degF / -40 to +70 degC
Humidity (non-condensing)	
Operating	8% to 90%
Non-operating	5% to 95%

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## Chassis

Configuration	
2RU rackmount, compliant with EIA RS-310D standard	
Dimensions	
Height	3.5" / 89mm / 2RU
Width	17.2" / 437 mm
Depth	27.75" / 708mm
Tool-free access design	
Top cover with pushbutton latches	
Integrated roller-bearing full-extension sliding rail mounting system	
Clear service access to all internal components	
Make/model	
Supermicro CSE-828TQ-R1200B	
<a href="http://www.supermicro.com/products/chassis/2U/828/SC828TQ-R1200LP.cfm">www.supermicro.com/products/chassis/2U/828/SC828TQ-R1200LP.cfm</a>	
<a href="http://www.supermicro.com/manuals/chassis/2U/SC828_10a.pdf">www.supermicro.com/manuals/chassis/2U/SC828_10a.pdf</a>	
<a href="http://www.supermicro.com/manuals/other/BPN-SAS-828TQ.pdf">www.supermicro.com/manuals/other/BPN-SAS-828TQ.pdf</a>	

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## Power supply

Configuration	
1+1 redundant hot-swappable modules	
Input	
100-240 VAC, 50-60 Hz, 15-6 A max	
Max total output power	
1200W	
Max output current per rail	
+3.3V	20.0A
+5V	20.0A
+5Vsb	4.0A
+12V	100.0A single-rail
-12V	0.6A
Agency certifications for safety/EMC	
USA: UL listed	
Canada: CUL listed	
Germany: TUV certified	
Europe: CE Mark	
EN 60950 / IEC 60950 compliant	
Make/model	
Supermicro PWS-1K22-1R / PDB-PT828-8824	

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## Cooling

6pc hot-swappable 80mm x 38mm mid-chassis cooling fan module	
4-wire PWM; max 6500 RPM; up to 84.3CFM per module	
Supermicro FAN-0099L4	
4pc passive copper CPU cooler	
Supermicro SNK-P0023+	
<a href="http://www.supermicro.com/support/resources/Thermal/index.cfm">www.supermicro.com/support/resources/Thermal/index.cfm</a>	

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## Mainboard

Make/model	
Supermicro MBD-H8QMi-2	
<a href="http://www.supermicro.com/Aplus/motherboard/Opteron8000/MCP55/H8QMi-2.cfm">www.supermicro.com/Aplus/motherboard/Opteron8000/MCP55/H8QMi-2.cfm</a>	
<a href="http://www.supermicro.com/manuals/motherboard/MCP55/MNL-H8QM3i-2+.pdf">www.supermicro.com/manuals/motherboard/MCP55/MNL-H8QM3i-2+.pdf</a>	

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## CPU options

Capacity	
4pc Socket 1207 for AMD Opteron™ CPU	
Example CPU configuration	
4pc AMD Opteron 8393 3.1GHz quad-core CPU	
<a href="http://www.amd.com/opteron">www.amd.com/opteron</a>	

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## Memory options

Capacity	
32pc DDR2 registered ECC DIMM	
Up to 256GB using 8GB modules	

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## I/O

Mainboard I/O controllers	
1pc NVIDIA NForce Professional 3600+3050 I/O controller set	
<a href="http://www.nvidia.com/page/nforce_pro.html">www.nvidia.com/page/nforce_pro.html</a>	
1pc NEC uPD720400 PCI-X controller	
<a href="http://www.am.necel.com">www.am.necel.com</a>	
1pc Intel 82546 dual-port Gigabit Ethernet controller	
<a href="http://www.intel.com/design/network/products/lan/controllers/82546.htm">www.intel.com/design/network/products/lan/controllers/82546.htm</a>	

1pc AMD RN50 graphics controller	
Internal ports	
4pc PCI Express low-profile full-length expansion card slot	
2pc PCI Express x16 slot, each with 16 lanes active	
1pc PCI Express x8 slot with 8 lanes active	
1pc PCI Express x8 slot with 4 lanes active	
1pc PCI-X 64bit 133/100/66 MHz low-profile full-length expansion slot	
6pc SATA port, each supporting 3Gb/s, NCQ, RAID	
1pc ATA 133/100 EIDE port	
1pc FDD port	
External ports (front panel)	
2pc USB 2.0/1.1	
External ports (rear panel)	
2pc RJ45 Gigabit Ethernet	
2pc USB 2.0/1.1	
1pc DB9M serial fast UART 16550	
2pc PS/2 port for keyboard/mouse	
1pc HD15 VGA	

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## Network options

Example optional expansion cards	
PCI Express x8-Gen2 to dual-port 10+10 Gbps Ethernet NIC	
Mellanox MNPH29B-XTC	
<a href="http://www.mellanox.com/related-docs/prod_adapter_cards/PB_ConnectXEN_Cards.pdf">www.mellanox.com/related-docs/prod_adapter_cards/PB_ConnectXEN_Cards.pdf</a>	
PCI Express x8-Gen2 to dual-port 32+32 Gbps InfiniBand-QDR HCA	
Mellanox MHQH29-XTC	
<a href="http://www.mellanox.com/related-docs/prod_adapter_cards/PB_ConnectX_VPI.pdf">www.mellanox.com/related-docs/prod_adapter_cards/PB_ConnectX_VPI.pdf</a>	

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## GPU options

Capacity	
Up to 4 GPU cards in external chassis (NVIDIA Quadro Plex)	
Example max configuration	
External 4-GPU: 2pc NVIDIA Quadro Plex 2200-D2	
<a href="http://www.nvidia.com/page/quadroplex.html">www.nvidia.com/page/quadroplex.html</a>	

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## Storage options

6pc hot-swappable SAS/SATA 3.5" HDD carrier	
1pc 3.5" 1.44MB FDD (optional)	
1pc slim ODD, DVD/CD read-only	
Example optional HDD controller with Battery Backup, RAID acceleration	
LSI SAS8888ELP / IBBU05	
<a href="http://www.lsi.com/storage_home/products_home/internal_raid/megaraid_sas/megaraid_sas_8888elp/index.html">www.lsi.com/storage_home/products_home/internal_raid/megaraid_sas/megaraid_sas_8888elp/index.html</a>	
Example max HDD configuration	
6pc Seagate ST31000340NS 1000GB 7200 RPM SATA	
<a href="http://www.seagate.com/docs/pdf/datasheet/disc/ds_barracuda_es_2.pdf">www.seagate.com/docs/pdf/datasheet/disc/ds_barracuda_es_2.pdf</a>	

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## Platform monitoring and management

1pc IPMIv2.0 Baseboard Management Controller (BMC)	
Supermicro AOC-SIM1U service processor	
<a href="http://www.supermicro.com/products/accessories/addon/SIM.cfm">www.supermicro.com/products/accessories/addon/SIM.cfm</a>	
Advanced Lights-Out Management feature set	
OS-independent implementation; supports Windows, Linux/GNU, other	
Dedicated management Ethernet interface for maximum reliability	
Reliable remote power on/off and hard-reset control	
Serial console over LAN (SOL)	
KVM over IP (optional; mainboard graphics controller only)	
Remote monitoring of system health parameters	
Flexible event triggers; notification via email and/or SNMP	
Embedded Web server; full access without special client software	
Command Line Interface (CLI) can run on any remote Linux client	
Monitored parameters	
CPU and chassis temperatures	
System voltages	
Cooling fan speeds	
Power supply module failure	
Chassis intrusion (optional)	

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## Operating system compatibility

Standards-based platform	
P4O32A-R2C is a mainstream platform that is broadly compatible with operating system software that supports the industry-standard X86_64 64-bit/32-bit architecture.	
Example configurations	
Microsoft Windows Server 2003 x64 Editions	
<a href="http://www.microsoft.com/windowsserver2003/64bit/x64/editions.mspcx">www.microsoft.com/windowsserver2003/64bit/x64/editions.mspcx</a>	
Red Hat Enterprise Linux v4, v5	
<a href="http://www.redhat.com">www.redhat.com</a>	