

Bull Sequana X440 E5 compute servers



The Bull Sequana X400 series is a comprehensive family of rack-mounted servers optimized for High Performance Computing and offering an optimum balance between cost and efficiency.

The Bull Sequana X440 E5 compute/service nodes integrate 4 2-way nodes within a rack-mounted 2U chassis. Equipped with the latest generation of Intel® Xeon® processors, they offer even more performance and improved energy efficiency.

These cost-effective and ultra-dense servers are perfectly sized to deliver the level of performance demanded by power-hungry HPC applications. The Bull X440 E5 servers are ideally suited for two uses:

- ▶ as compute nodes within a cluster, in combination with Bull X430 E5 service nodes (standard or cost-effective) and/or
- ▶ as light service nodes in small clusters. They support Linux environments and Bull SuperComputer Suite.

Designed for Extreme Computing

The Bull Sequana X440 E5 servers combine all the features needed to deliver high-level performance for complex workloads:

- ▶ the market-leading performance and bandwidth of Intel® Xeon® Processors Scalable family;
- ▶ very large memory capacity (up to 12/16 DIMM sockets per node);
- ▶ high-end connectivity, with 1 PCI-Express Gen 3 (16x) slot per node and a Super I/O Module (SIOM) for networking options;
- ▶ optimal internal storage capacity with up to 3x 3.5" HDDs or 6x 2.5" HDDs per node;
- ▶ best-in-class, scalable remote management features, with IPMI2 and RedFish..

An economical light service node

The Bull X440 E5 servers have all features needed for a light service node such as:

- ▶ a management node (cluster management, monitoring and control, etc.),
- ▶ a login node (user connection, development and compilation environments, etc.),
- ▶ a gateway server (for network, storage, etc.).

Breakthrough computing density

The packaging of the Bull X440 E5 servers enables four nodes, i.e. 4 x 2 processors, to be fitted into a 2U chassis.

With a high number of cores and a compute performance up to 10 teraflops, the X440 servers deliver breakthrough density for rack-mounted servers, while offering all the flexibility of commodity servers.

They save on chassis, power supply, cabling, and rack costs. Their outstanding density also makes it possible to minimize the footprint, and to significantly reduce real estate or rental costs.

To get the full benefit from the density of the Bull X440 E5 nodes, Atos recommends the use of racks fitted with the Bull Cool Cabinet Door.

The RAID level that matches your needs

RAID (Redundant Array of Independent Disks) is a data storage virtualization technology that stores data on multiple hard disks for the purposes of data redundancy and performance improvement. RAID technology is available in different levels, which each provides a different balance between reliability, availability, performance, capacity - and cost!

Bull X440 E5 servers offer a wide choice of RAID options to match your requirements.



Eco-friendly energy efficiency

The Bull X440 E5 servers feature a highly efficient Power Supply Unit (certified 80 PLUS Titanium). And for even more energy efficiency, they include optimized cooling features such as PWM cooling fans and air shrouds.

Outstanding system availability

The Bull Sequana X440 E5 servers were designed with ease of maintenance in mind:

- ▶ two redundant hot-swap Power Supply Units - if a PSU fails, the other PSU takes over, and the faulty PSU can be replaced without disruption;
- ▶ each node is "hot-swappable" and screwless: a node can be easily removed for maintenance while the other three continue to operate.

A large choice of options and models to match your needs and budget

The Bull X440 E5 servers come with many options which result in a large variety of potential combinations. Whether your top priority is performance, protection against disk failures, data redundancy, disk capacity, robustness, or cost-effectiveness, there is a Bull X440 E5 model to serve your needs.

Bull Sequana X440 E5 with 3.5" Drive Bays



Bull Sequana X440 E5 with 2.5" Drive Bays



The table below summarizes all available options, and shows the benefits of the resulting combinations:

Disks	Raid	SIOM (Super I/O Modules)	Benefits
3x 3.5" HDDs	6x 2.5" HDDs/ SSDs	Standard (software RAID)	According to your infrastructure
		Light (RAID 0, 1,10)	Cost-efficient
		Full (RAID 0, 1,5,6, 10,50)	Entry level RAID
		1 GbE 2 or 4 ports	Performance
		10 GbE 2 or 4 ports SFP+	Advanced I/O
		10 GbE 2 or 4 ports RJ45	Redundancy
			Performance + redundancy + reliability

Bull Sequana X440 E5 technical specifications

Form Factor	Rack-mounted 2U drawer accommodating 4 servers
Processors	Per node: 2 Intel® Xeon® Processors Scalable family (code-named Skylake EP)
Architecture	Upcoming Intel® chipset Upcoming Intel® interconnect
Memory	Per node: Up to 12 DDR4 DIMM sockets, ready for future memory technology with 16 DIMM sockets Support of the highest available memory transfer rate
Expansion Slots	Per node: 2 PCI-Express 3.0 x16 (low profile) 1 PCI-Express 3.0 x16 for SIOM only
Media and Storage	Per node: Standard option: maximum internal storage capacity: 3 x SATA3 7.2 Krpm 3.5" HDDs OR 6x SATA3 7.2 Krpm 2.5" HDDs or SDDs Light Raid option: Broadcom 3008 controller for 3x 3.5" or 6x 2.5" SAS3 (12 Gbps) ports; RAID 0, 1, 10 Full Raid option: Broadcom 3108 controller for 3x 3.5" or 6x 2.5" SAS3 (12 Gbps) ports; RAID 0, 1, 5, 6, 10, 50
Video	Per node: Aspeed Graphics embedded video controllers
Network	Per node: SIOM with various options: 2 or 4 ports for 1GbE, 10GbE SFP+ or 10GbE RJ45
I/O Ports	Per node: 2 rear USB ports 3.0 1 SVGA video port 1 serial port EDR with optional InfiniBand card and OPA in x16 PCIe slot
Management	Per node: Embedded Aspeed AST2500 BMC on dedicated RJ45 port (IPMI 2.0 with virtual media-over-LAN and Redfish)
Ventilation	4 x 80mm heavy-duty PWM fans with optimal fan speed control
Power Supply	2 shared redundant hot-swap PSUs with PMBus (with independent power control for each server)  2200 Watts w/PFC (80 PLUS Titanium) AC input 180/240V ~ 10.5-8A ~ 60/50Hz DC output 12V/150A - +5Vsb/4A
Physical Specifications	88 x 438 x 762 mm (HxWxD), Weight: 38.6 kg (for chassis including 4 servers)
OS & Cluster Software	Red Hat Enterprise Linux & Bull SuperComputer Suite
Regulatory Compliance	Safety (EC, IEC, UL, CSA certifications); Electromagnetic Compatibility (EC, FCC, ICES-03, VCCI certifications), Environment (RoHS II & WEEE directives, REACH regulation)
Warranty & Services	Standard server warranty 1 year, Extended warranty: consult us

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Bull is the European leader in HPC and its products include bullx, the energy-efficient supercomputer; bullion, one of the most powerful x86 servers in the world developed to meet the challenges of Big Data; Evidian, the software security solutions for identity and access management; Trustway, the hardware security module and Hoox, the ultra-secure smartphone. Bull is part of Atos.

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