

# The most innovative workspace for in-memory computing



By leveraging Bull technologies in mission-critical applications and supercomputing, Atos brings to the market a complete range of x86 servers, bullion™.

Bullion reaches the highest level of quality of service, performance, availability and scalability to meet the 3 big challenges an IT Department is facing: Data Center optimization, IT modernization and Big Data efficient implementation.

## Optimize your Data Center

Data Centers have to accompany the rise of Cloud, Big Data and mobility, while guaranteeing the relevant levels of service.

Designed for the private cloud and targeting next generation Data Centers, bullion is the right answer to consolidate, rationalize and virtualize your Data Centers. Efficiency generator, bullion dramatically enhances users' financial equation, providing more performance and agility.

## Modernize your IT

Ensuring the right evolution of application environment is a key success factor for any IT modernization project. It has to be based on highly reliable, powerful, open and scalable platforms.

And no other platform fits that need better than bullion. New usage trends of the digital world are now at your reach: Cloud, mobility (Bring Your Own Device: BYOD), Big Data.

## Make sense of your data

Big Data is now in everyone's mind offering also a high-speed way to transform data into real value.

How shall you properly manage the never ending growth of data volume, velocity, variety, and transform them into an asset for your organization? With the new storage potential of its storage box and its unique memory capacity, bullion provides unrivalled features for in-memory computing as well as event processing or analytics.

## A powerful and modular range

The bullion server range consists of 4 complementary models, based on the Intel® Xeon® processor E7 v4 Family. They share the same innovative technologies from 2 to 16 processors with a maximum memory capacity of 24 TB, unmatched on the market.

Depending on their needs, from S2 to S16, the users simply add 3U compute modules, connected via the Connecting Box, a patented system inherited from Bull to get rid of cabling. Then you have access to configurations from 8 to 384 cores to host Virtual Machines (VM) clusters, critical database or In-Memory applications.

In addition, for more agility in configuring, bullion servers propose innovative design with hot plug memory and I/O blades.

Finally bullion proposes a storage box accepting SAS / SSD or NL-SAS disks for a capacity of more than 4 PB for one single server. This storage environment is ideal for Hadoop applications or intensive analytics.

## Dedicated Atos services

In addition to the bullion range, Atos proposes a full set of added value services. Our best experts deliver specific offers, including power audits and architecture consulting.

Atos' Business Technology & Innovation Centers (BTIC) are open to share field experience on real case studies with dedicated workshops and hands-on sessions.



# Technical specifications

	bullion S2	bullion S4	bullion S8	bullion S16
<b>DESIGN</b>				
Form factor	19" 3U	19" 6U	19" 12U	19" 24U
<b>PROCESSORS</b>				
Numbers	2 max 48 cores and 96 threads	2 - 4 max 96 cores and 192 threads	2 - 8 max 192 cores and 384 threads	2 - 16 max 384 cores and 768 threads
Type	Intel® Xeon® processor E7 v4 Family - 4, 8, 10, 14, 16, 18, 20, 22, or 24 cores			
L3 cache	Up to 60MB shared cache			
<b>ARCHITECTURE</b>				
Chipset	Chipset Intel® C602J			
Quick Path Interconnect	Max 9.6 GT/s			
Scalability	2 processors	2 to 4 processors via BCS2 (Bull Coherence Switch 2)	2 to 8 processors	2 to 16 processors
Hardware Partitioning	Non	Yes	Yes	Yes
<b>MEMORY BLADES</b>				
Min / max	48 GB - 3 TB	48 GB - 6 TB	48 GB - 12 TB	48 GB - 24 TB
Type	DDR4 RDIMM, LR-DIMM (64BG only)			
Memory blades capacity	32GB, 48GB, 64GB, 96GB, 128GB, 192GB, 256GB, 384GB			
Memory blade	Up to 8 blades, 4 or 6 slots/blade	Up to 16 blades, 4 or 6 slots/blade	Up to 32 blades, 4 or 6 slots/blade	Up to 64 blades, 4 or 6 slots/blade
Memory availability	Hot plug memory blades - hot add depending on OS / hypervisor			
<b>EMBEDDED I/O PORTS</b>				
NIC	ports 1Gb Ethernet : 2	ports 1Gb Ethernet : 2, up to 4	ports 1Gb Ethernet : 2, up to 8	ports 1Gb Ethernet : 2, up to 16
Management ports	1	1 Gb embedded ethernet ports to be used 2	4	8
USB ports	3	3, up to 6	3, up to 12	3, up to 24
PS/2 port (mouse/ keyboard)	Through USB or management port			
<b>I/O BLADES</b>				
BUS	PCIe Gen3 x8			
I/O blades	Up to 7 blades	Up to 14 blades	Up to 28 blades	Up to 56 blades
I/O availability	Hot swap I/O blades depending on OS / hypervisor			
<b>I/O BLADES TYPES</b>				
NIC I/O blade	1GbE: 2 or 4 ports per I/O blade ; 10GbE: 2 ports per I/O blade			
HBA I/O blade	8Gb/s: 2 or 4 ports per I/O blade; 16Gb/s: 2 ports per I/O blade			
Flash I/O blade	SSD Flash 1.6TB			
SAS I/O blade	12Gb/s: 2 ext. ports per I/O blade			
<b>STORAGE</b>				
Internal disks chassis	Up to 2 HDD, hot plug	Up to 4 HDD, hot plug 2.5" SATA - 2.5" SSD & SAS 10Krpm & 15Krpm	Up to 8 HDD, hot plug	Up to 16 HDD, hot plug
Storage Controller	1 I/O blade with RAID 0:1 (12Gb/s) Raid controller 9380 4i4e for RAID 5 /6 on bullions storage box disks			
Add-on disks (EBOD)	SAS 12 Gb/s connectivity - details on page 4			
SAN	EMC, NetApp, ...			

# Technical specifications (suite)

	bullion S2	bullion S4	bullion S8	bullion S16
<b>VIDEO</b>				
Video controller	1	Up to 2	Up to 4	Up to 8
Memory			8 MB	
<b>SECURITY</b>				
2-level password			Yes	
<b>POWER SUPPLY*</b>				
Hot swap PSU			1+1	
Power supply number	2, redundant	Up to 4, redundant	Up to 8, redundant	Up to 16, redundant
		Active/passive power supply optional solution with ultra capacitor (UCM)		
Power type		Label 80+ Platinum, 94% efficient		
Power consumption		1600 watts with PFC (PF=0,95)		
Auto-sensing		220V 60/50Hz		
<b>COOLING*</b>				
Fan specifications	6 hot swap, redundant n+1	Up to 12 hot swap, redundant n+1	Up to 24 hot swap, redundant n+1	Up to 48 hot swap, redundant n+1
<b>PHYSICAL SPECIFICATIONS*</b>				
Dimensions (HxLxW)	130 (3U) x 445 mm (19") x 820 mm (max)	260 (6U) x 445 mm (19") x 820 mm (max)	520 (12U) x 445 mm (19") x 820 mm (max)	1040 (24U) x 445 mm (19") x 820 mm (max)
		Recommended to use Bull racks		
Weight	45 kg maximum	Up to 90 kg	Up to 180 kg	Up to 360 kg
Operating constraints		10°C at 35°C, gradient 20°C/h, 20% at 60%, gradient 5%/h.		
<b>OS &amp; SOFTWARE</b>				
Management software	Server Hardware Console (plug-in for VMware® vCenter available), Bull Platform Manager, Bull iCare			
Operating System	VMware® vSphere (ESXi™), Red Hat® Enterprise Linux®, Suse® Linux Enterprise Server, Microsoft® Windows Server			
<b>SYSTEM MANAGEMENT</b>				
BMC		IPMI 2.0		
Remote management	Standard via on-board iBMC (connection through the management port)			
<b>AVAILABILITY &amp; RAS FEATURES</b>				
Memory RAS features	ECC, Enhanced SDDC, Enhanced DDDC, Memory Sparing, MCA recovery, hot-add memory (depending on OS)			
Serviceability / Hot swap devices	Memory blades (hot add depending on OS), I/O blades (depending on OS), UCM, disk drives, power supplies, fans			
Redundancy	Power supplies, fans, QPI paths, BCS2 connection (XQPI paths)			
<b>WARRANTY &amp; SERVICES</b>				
Standard warranty*		3 years warranty		
Warranty extension		Bull Global Care		
Other services		IT infrastructure Advisory and energy audits Service Assurance HA, capacity and performance management Installation and integration services		
<b>REGULATOR &amp; SAFETY</b>				
Conformity	Safety (CE, IEC, UL, CSA + APAC certifications), Electromagnetic Compatibility (EC, FCC, ICES-03, VCCI certifications), Environment (RoHS II & WEEE directives, REACH regulation)			

\* excluding storage module

# bullion storage box

## A performant and scalable storage capacity

The **bullion storage box** (an EBOD offer) enables maximum flexibility for your projects: storage capacity may be increased to more than 2 PB on one single server with optimized reading and loading time while ensuring maximum data availability.

The storage box available on all bullion server models brings an additional capacity to bullion RAID drives. Increasing storage capacity is simplified through daisy chaining mechanisms and loops can be created between different modules.

The bullion storage box offer is composed

of 2 different disks enclosures (2U) to fit various use cases:

- a 2.5" enclosure for transactional and analytical applications with a priority for low latency (SAS / SSD disks)
- a 3.5" enclosure for Hadoop like applications with priority to high sequential throughput on large data volumes (NL-SAS high capacity disks).

## Maximum storage capacity

**2.5" drawer:** 6 to 24 disks / drawer ; SSD (400, 800GB or 1,6TB) or SAS disks (900GB, 1,2 or 1,8TB) 10 Krpm

**3.5" drawer:** 6 to 12 disks / drawer ; NL-SAS disks (2, 4 or 8TB) 7,2 Krpm

	bullion S2 & bullion S4		bullion S8		bullion S16
	2.5"	3.5"	2.5"	3.5"	
Max. drawers number	24	24	48	48	contact your Atos interface for configuration
Max. drives number	576	288	1152	576	
Max. raw capacity	1036 TB	2304 TB	2073 TB	4608 TB	
Max. loops number*	4*		8*		

\* possible mix between 2.5" and 3.5 enclosures

## Technical specifications

Form factor	19 " 2U
Dimensions (HxLxW)	88,9 mm (2U) x 483 x 630 IEC rack compliant
Weight	2.5 " drawer: 24 kg with disks / 3.5 " drawer: 26 kg with disks
Connection interface	3 x12Gb/s mini SAS universal connectors per I/O module ; up to 2 x I/O modules per drawer (necessary with multi pathing)
Conformity	EN/IEC/UL 60950-1, CNS14336 CB report: CE, UL, cUL, FCC, BSMI, VCCI, CCC (PSU only)
CEM (EMC)	FCC pt15B Class A, EN55022 Class A, CISPR 22 Class A, EN 55024, CISPR24, EN61000-3- 2/3, CNS13438
Voltage	100 - 240V AC
Frequency	60/50Hz
Energy efficiency	>80% @ 100V, >80% @ 240V (>30% charge) 580W ; 90 PLUS® Platinum certified
Operating constraints	5° to 40°C (maximum 35° above 2000 meters)



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## Discover bullion benefits

If you want to form an opinion about a particular solution, nothing beats seeing it in action. Atos' Business Technology & Innovation Centers (BTIC) and Grenoble Demo Center provide a welcoming environment where customers and experts can meet and exchange ideas.

As well as bullion servers, the Demo Center plays host to hardware from various suppliers and welcomes many visitors, whether for technology briefings, 'Proofs of Concept' or benchmarking exercises.