



**Affordable AIX™
entry servers for
mission-critical
environments**

Escala PL450 Series

With their mainframe-like features the Escala PL450 Series systems lead the way for AIX entry- to mid-level servers. Fast and affordable, they are easy to install, integrate and manage:

- Innovative, powerful, affordable, open and adaptable AIX Power5™ system design
- Up to 40 dynamic micro-partitions facilitating server consolidation projects
- Mainframe-inspired reliability, availability and serviceability (RAS) capabilities.

The Escala PL450 Series servers are perfect as multitasking departmental or regional servers for mission-critical applications running on AIX 5L™. The performance, reliability and affordability of the Escala PL450 Series servers make them a strategic platform for server consolidation, scalable database servers, e-commerce application servers, Web servers, operations systems, and business intelligence (BI) workloads.

Mainframe-inspired RAS helps keep systems available

The Escala PL450 Series continues the Escala tradition of world-class RAS to departmental systems by introducing dynamic firmware updates, in which applications remain operational while system firmware is updated for most operations.

Extensive configurability

The servers in the Escala PL450 Series are available in a cost optimized 1U drawer using the innovative Quad Core Chip modules at 1.65 GHz. Other models (2U or 4U) are available as a 4-core systems with 1.65GHz, 1.9 GHz or 2.1GHz POWER5+ processors.

Customers have extensive growth potential with up to 64GB of memory, up to eight optional I/O drawers resulting in 15.2TB

of disk storage and up to 59 hot-plug PCI-X slots in a choice of 19" rack-mount or desk-side packages. For the ultimate in server availability, the Escala PL450 Series can be clustered with Bull's ARF™ (Application Rollover Facility) or IBM's HACMP™ software designed to provide continuous availability.

Outstanding Consolidation and Workload management capabilities

The Escala PL450 Series provides innovations like micro-partitioning which allows businesses to increase system utilization while increasing throughput.

Micro-partitioning helps lower costs by allowing the system to be finely tuned to consolidate multiple independent AIX and Linux workloads. A single model PL450 can host as many as 40 micro-partitions. Breakthroughs like the virtual I/O, which allows the undetectable sharing of expensive disk drives, communications adapters and Fibre Channel-attached disks, drive down complexity and hence administrative expenses. The shared processor pool allows for automatic non-disruptive balancing of processing power between partitions assigned to the shared pool - resulting in increased throughput and utilization.

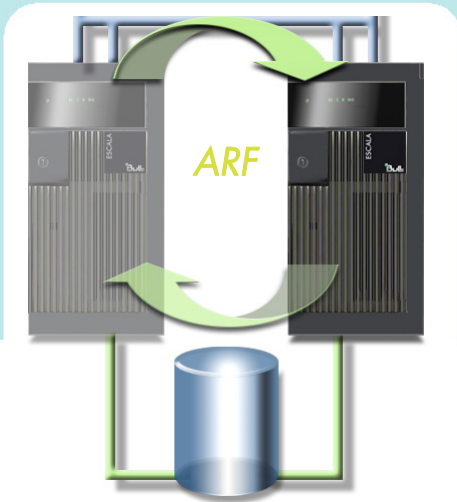


Architect of an Open World™

Technical Specifications – PL450 Series

ARCHITECTURE	PL450R-XS	PL450R-VL	PL450R/T-L	PL450R/T
System packaging	19" rack drawer (1U)	19" rack drawer (2U)	19" rack drawer (4U)	19" rack drawer (4U) or tower
Number of cores per system	4	4	4	2 or 4
Power on Demand (PoD) support	N/A	N / A	N / A	Yes
Advanced Virtualization Features (micropartitions)	Optional	Optional	Optional	Optional
Processor	64-bit POWER5+™	64-bit Power5+	64-bit Power5+	64-bit Power5+
CPU clock rate	1.65GHz	1.5GHz, 1.65GHz	1.5GHz, 1.65GHz	1.65GHz, 1.9 GHz, 2.1GHz
System Memory per node (min-max)	1GB – 32GB	1GB – 32GB DDR2	1GB – 32GB DDR2	1GB – 64GB DDR2
L3 cache	36MB	72 MB	72 MB	36MB or 72MB
Dual Ultra320 SCSI controllers (internal)		2	2	2
RAID daughter card	Optional	Optional	Optional	Optional
Maximum micro-partitions	40	40	40	40
MEDIA BAYS				
Bays	1 slimline	1 slimline	2 slimline + 1 half high	2 slimline + 1 half high
Tape drive (VDAT, VXA or DAT)	External	N/A	Optional	Optional
DVD RAM /ROM	Optional	Optional	Optional	Optional
EXPANDABILITY				
Slots for hot swap PCI-X adapters in base	2	3	6	5 (4 if dual RIO-2 I/O Hub)
Slots for hot-swap disk drive bays in base	N/A	4	8 (4 Standard + 4 Optional)	8 (4 Standard + 4 Optional)
Disk capacity (min-max) in base	36.4 GB / 600 GB	73 GB / 1.2 TB	73 GB / 2.4 TB	73 GB / 2.4 TB
Internal disk speed	10 / 15 krpm	10 or 15krpm	10 or 15krpm	10 or 15krpm
I/O drawers (D20)	N/A	N / A	4	8
Max. PCI-X slots with I/O drawers	N/A	N / A	34	59
Max. internal disks with I/O drawers	N/A	N / A	56 (16.8 TB)	104 (31.2 TB)
Bull StoreWay disk subsystems	Optional	Optional	Optional	Optional
EMC2 Symmetrix	Optional	Optional	Optional	Optional
Overland and STK Libraries	Optional	Optional	Optional	Optional
RAS FEATURES				
Chipkill™ ECC, bit-steering memory	Standard	Standard	Standard	Standard
Service processor	Standard	Standard	Standard	Standard
Hot-swappable disk bays	Standard	Standard	Standard	Standard
Hot-plug PCI-X slots (base system and I/O drawers)	N / A	N / A	Standard	Standard
Dynamic Processor De-allocation	Standard	Standard	Standard	Standard
Dynamic de-allocation of PCI slots	Standard	Standard	Standard	Standard
Redundant and hot-plug cooling fans	N / A	Standard	Standard	Standard
Hot-plug power supply	Standard	Standard	Standard	Standard
Redundant hot-plug power supply	Optional	Optional	Optional	Optional
COMMUNICATIONS CONNECTIVITY				
Ports USB / serial / HMC	2 / 1 / 2 (Standard)	2 / 2 / 2 (Standard)	2 / 2 / 2 (Standard)	2 / 2 / 2 (Standard)
Dual port Ethernet 10/100/1000 Mbps	Standard	Standard	Standard	Standard
Ethernet 10/100/1000 Mbps 1 port/2 ports	Optional	Optional	Optional	Optional
Ethernet 1 Gbps 1 port / 2 port	Optional	Optional	Optional	Optional
Ethernet 10 Gbps	Optional	Optional	Optional	Optional
CONSOLES				
HMC	Optional	Optional	Optional	Optional
IVM (Integrated Virtualization Manager)	Optional	Optional	Optional	Optional
OPERATING SYSTEM				
AIX 5L v5.2/5.3	Standard	Standard	Standard	Standard
Suse Linux Enterprise 9	Optional	Optional	Optional	Optional
Red Hat Enterprise Linux AS4	Optional	Optional	Optional	Optional
HIGH AVAILABILITY				
ARF	Optional	Optional	Optional	Optional
HACMP	Optional	Optional	Optional	Optional
PERFORMANCE				
rPerfs max	20.25	20.25	20.25	24.86
SPECIFICATIONS				
Operating temperature	5 to 35 degrees C	5 to 35 degrees C	5 to 35 degrees C	5 to 35 degrees C
Relative humidity	8% to 80%	8% to 80%	8% to 80%	8% to 80%
Operating voltage	100 to 127 or 200 to 240 V - 1 phase	100 to 127 or 200 to 240 V	100 to 127 or 200 to 240 V	100 to 127 or 200 to 240 V
Power consumption	400 watts (max – 2-way)		750 watts	750 watts
Thermal output	1365 BTU/hour (max – 2-way)		2557 Btu/hour	2557 Btu/hour
SIZE				
Rack	43mm H x 440mm W x 710mm D	89mm H x 483mm W x 686mm D	178mm H x 437mm W x 731mm D	178mm H x 437mm W x 731mm D
Tower		N / A	N / A	533mm H x 201mm W x 779mm D

*not available if HMC present



A High Availability solution for Bull Escala servers

Application Roll-over Facility

Application Roll-over Facility, a solution developed by Bull, permits system administrators to easily move an application and its environment from a system to another system, in order to manage system workload issues, for maintenance purposes or in the event of hardware failures. Application Roll-over Facility provides low cost and easy to install application availability for the entire Escala range.

Application Roll-over Facility (ARF) is based on a standard cluster architecture with at least two nodes (servers or partitions) sharing one or several disk sub-systems. In case of system failure or simply for maintenance or administration purposes, the services associated with an application or a node can be activated on the backup node. ARF can also be proposed as a disaster recovery solution by using mirroring functionalities.

Easy node installation and configuration

- use of simple menus;
- ability to quickly propagate the node definition across all the cluster nodes;
- ability to initiate snapshot creation for saving the topology and the cluster configuration.

A scalable solution

- ability to easily add one or several nodes to the cluster, especially to rapidly adjust to workload changes on the system;
- no limitation on the number of nodes in the cluster.

Easy-to-use flexibility

- automatic or manual failover of one or several applications from one node to the backup node;
- immediate visualization of the status of the main resources by the ARF Watch facility.

Non-stop monitoring

- permanent checking of the availability of each node by a heartbeat mechanism;
- immediate notification to the system administrator in case of failure;
- event logging (trace files).

Reduced costs

- a license price independent of the number of processors and partitions ;
- compatibility with the scripts written for HACMP.

Professional services

Bull proposes a complete range of services from consulting to operational support, based on years of experience in business continuity on large production servers.



Bull Escala servers designed for reliability

At the heart of this solution, the range of Bull Escala servers provides functionalities largely inspired by mainframe technologies.

These functionalities enable a commitment to **business continuity** in large part due to the component redundancy, the failure prevention,

the error auto-correction mechanism and the integration of advanced diagnostic aids. With the AIX 5L™ v5.3 operating system, recognized for its reliability, its security and its standard compliancy, the Escala servers provide innovating **virtualization** and micro-partitionning features allowing

optimum use of resources. Finally, the **Power on Demand** (PoD) option allows the addition of processor and memory resources as required. Installed on the system, they are activated only in case of peaks of activity or additional workloads, for example in case of the application failover by ARF.

ARF technical specifications

Architecture

Supported servers	Bull Escala server with minimum of AIX 5L v5.1
Maximal number of supported nodes	unlimited
Heartbeat	Ethernet, IP on Fiber or RS232 serial line with PPP (Point-to Point Protocol Subsystem) for two node configurations.
Supported disks	External Ultra SCSI disks Bull StoreWay FDA or EMC Clariion (CX or AX) disk subsystems
Components which can be taken into account	Applications, nodes, disks
Addition of a node to the cluster	Yes
Disaster Recovery	Yes, with AIX™ mirroring, Mirrorview between CX disks or FDA Remote Data Replication between FDA disk subsystems.

Functionalities

Network redundancy management	Provided by the Etherchannel feature of AIX™
Type of application failover	Automatic or manual
Time for detection and application failover	<2mn (without application reactivation)
Concurrent access to a database	No
Failover configuration	Simple recovery scenarios
Application reintegration to original node after recovery	On system administrator decision
Application failover between partitions	Yes
Supported applications	Unique restriction: applications not supporting IP aliasing
Several applications on the same node	Yes, each of them accessible with its own network address
Integration of partitioning technologies	Yes through application restart scripts

Cluster management

Node Installation and configuration	SMIT (System Management Interface Tool)
Propagation of a node configuration across all the cluster nodes	Yes
Snapshot creation	Yes
Error notification	Yes
Event traceability	Yes with log files
Management console	No
Visualization of the cluster status	Oui avec l'utilitaire ARF Watch
Workload management	Yes with WLM

Licenses

License type	1 license per node, dependent of the system class
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