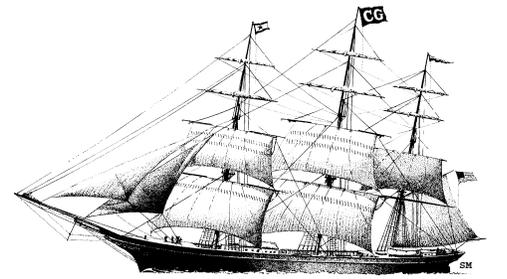


THE CLIPPER GROUP Navigator™



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IBM's AIX5L Delivers Capability on Demand

Analysts: John Young and Mike Kahn

Management Summary

The problem is not new. Neither is the solution. But it does provide the right answer for demanding times in a down economy. IBM continues to position its eServer pSeries and AIX5L as the workhorse for midrange and high-end enterprise applications. Together they offer choices at every level to optimize workload efficiency and cost of ownership.

Most would agree that enterprise workloads are complex, dynamic, and, to varying degrees, unpredictable. Most also would agree that there are many good reasons to put an increasing number of enterprise applications together on larger and larger servers. And most realize that to plan or to execute this while optimizing IT infrastructure is not trivial, especially in a time of budgetary constraints. Whether running mixed workloads or large applications, whether you call it server consolidation, application co-hosting, or workload management, it is increasingly clear that you need more than a big server with lots of processors to make it all happen.

The true value and the revolutionary nature of the pServer with AIX5L solution lies in the inherent capability it offers to improving business efficiency:

- The pSeries spans entry-level desktops, midrange towers, and high-end servers.
- AIX continues its evolution from a distributed client-server operating system supporting 4-way *POWER4*, Symmetric Multiprocessors (SMP) through its 8-way SMP network-centric computing support to its current 32-way SMP e-business computing environment.
- Its Linux support provides UNIX-equivalent qualities of service and is rapidly adding functionality that will make it a mainline application environment.
- Its J2EE application stack and *WebSphere* support position it as a highly-efficient development environment for IT staffs and ISVs.
- AIX5L pricing tackles its primary competitors head-on.

The result has been unmistakable. IBM's pSeries with AIX has increased its presence in the marketplace and stands as a significant threat to take additional market share from both Sun Microsystems and Hewlett Packard. What makes this progress in the market place truly noteworthy is that it has been made without focusing on the potential value that lies within *AIX5L Version 5.2*, just announced, and the foundation it lays for further capabilities.

In this issue of **The Clipper Group Navigator**, we look briefly at the current position of *AIX5L*, evaluate the new capability afforded through *AIX5L Version 5.2*, and anticipate UNIX environments to come. Read on to discover what this solution offers to your business.

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Capability — The “ity” That Keeps on Giving

IBM's *pSeries* server platform and *AIX5L* operating system software features continue to evolve and now include function previously available in IBM's *zSeries* mainframes and, more recently, in *xSeries* servers. However, the revolutionary potential of both the *pSeries* and *AIX5L* does not lie in the evolution of hardware and software technology. Those required elements are already in place. It does not even lie in the support of *Linux* as a second operating environment, nor in services and support, nor in highly competitive pricing. These too are in place, completing the requirements for a state-of-the-art enterprise solution. **What truly marks the value of IBM's UNIX offering is that investing to meet today's business needs simultaneously builds the foundation for further enhanced capabilities.**

Capability is the intersection of function with the optimum resources for implementing that function. In difficult business times, adding function often can improve business efficiency. Doing so, however, can require major investments, often unaffordable, in capacity and software. **Enterprises investing in IBM's *pSeries* with *AIX5L* will find themselves not only able to meet today's needs, but also well positioned for easy and affordable evolution to tomorrow's solutions.**

AIX5L – A Sophisticated Base for Today's Needs

AIX5L reflects IBM's commitment to the integration of *AIX* and *Linux* on a common *pSeries* platform. These complementary operating systems assure an application environment that fully leverages today's technologies and promises equivalent functions for *Linux* workloads in the near term.

With *AIX5L*, IBM has focused on:

- **Maximizing throughput** of its *pSeries* platforms via high performance and very broad scalability;
- **Ensuring continuous availability** while shielding applications from hardware and software errors;
- **Matching computing resources to changing workload requirements;**

- **Managing complex combinations of systems and software;** and
- **Supporting a mixed server environment,** preserving flexibility and investment in skills and applications.

AIX5L, released in May 2001, introduced new 64-bit binary interfaces while ensuring 32-bit binary compatibility with *AIX* Version 4, to preserve investments already made. Together with 32-way Symmetric Multiprocessor (SMP) capability, a new *Journaling File System (JFS2)* supporting 1 TB files¹, an integrated *AIX Workload Manager*, enhanced security, and support for *Linux* applications, ***AIX5L* has become a robust, scalable platform available for mixed enterprise workloads.**

AIX 5.2 Adds “Dynamic” to 5L

Adding new function alone does not optimize the capability of complex systems. Unless systems are able to respond automatically to internal signals, workload and operations run the risk of failing before identification of problems. This both adds to delays in throughput and increases the need for human intervention, both of which are detriments to business efficiency.

With Version 5.2, *AIX5L* moves dramatically forward in improving throughput and resource use by introducing dynamic adjustments to system resources. These dynamic capabilities include:

- **Dynamic logical partitioning (LPAR) that supports adding or removing processors, host adapters, and memory within any of 16 partitions.** No reboot of the system is required. Application processing continues uninterrupted. Applications that are configuration sensitive, such as Oracle, can take advantage of adding resources to a partition to improve performance. Reducing a partition's resources can negatively impact performance if insufficient resources are left for the application.²
- **Dynamic Reconfiguration** application program interface (API) enables applications and system software to automatically adjust to changes in hardware resources.

¹ JFS2 supports 16 TB files and filesystems in *Version 5.2*.

² If an application is bound to a processor, that processor cannot be reconfigured or removed.

- **Dynamic capacity upgrade on demand (CUoD)** enables activating an additional processor without having to reboot the system. A spare processor must be available to activate this function.
- **Dynamic (hot) sparing**, used with dynamic CUoD, substitutes a spare, unlicensed processor for a failed processor. The dynamic CPU Deallocation function begins the process of varying the failed processor off line (based on pre-set thresholds), and the spare processor is brought on-line without operator intervention.

An extensive list of additional enhancements supports each of the four areas of self-managed (or autonomic) systems³. Highlights include:

Hypervisor

The Hypervisor is controlled software (microcode) that isolates system software function from the hardware platform and is a key element in defining virtual resources that run independently of hardware boundaries. The Hypervisor was introduced with the Power 4 pSeries *Model 690* at the same time as *AIX5L Version 5.1*. It is also available with the *Model 670* and will be available on future Power 4-based systems.

Cluster System Management (CSM)

CSM supports day-to-day management of up to 128 servers from a single point of control. These servers include pSeries servers running *AIX5L* and xSeries servers running *Red Hat Linux*. In response to specific events, CSM automatically runs a command across the management server or node, logs the event, and e-mails or pages an administrator. A configuration file manager synchronizes files across the nodes.

AIX Workload Manager (WLM)

WLM provides tuning within a partition or server ensuring that each application receives its appropriate share of resources. The share of resources is dynamically configured by time-of-day based on administrator defined rules. Also, when a specific class of resource reaches predefined limits, the administrator is automatically notified and corrective actions are automatically triggered.

³ Self-configuring, self-optimizing, self-healing, and self-protecting.

Enterprise Storage Support

Logical Volume Manager (LVM) provides support for dynamic changes to logical unit name (LUN) size on RAID and SAN-connected storage devices. I/O size and alignment restrictions are removed from the LVM, improving filesystem and overall system performance.

Other storage enhancements include extending Multipath I/O to cover parallel SCSI disks. Also, support for using split mirrors to back up data is enhanced by the removal of the performance impact when data is reintegrated.

AIX5L — Expands Tomorrow's Capabilities

While *AIX Version 5.2* offers increased function for today's workloads, IBM promises to deliver additional enhancements for tomorrow's increasingly complex environments. Hypervisor enhancements will allow businesses to group workloads on pSeries platforms based on the type of application and its capability, rather than on the type of operating system. Partitions become more flexible as the Workload Manager dynamically adjusts parameters to changing requirements.

Functions and operating systems already proven in other server families will continue to be incorporated into the pSeries family. **New technologies will expand AIX5L's capacity, scalability, and connectivity.**

Conclusion

True business efficiency comes when decisions are optimized at a point closest to the customer's needs. **While the bulk of the IT industry focuses on server consolidations, it is refreshing to see IBM's eServer focus on workload consolidation.** AIX5L is being fitted with capability that makes both workload consolidation and workload management highly efficient.

Today's investment in IBM's pSeries servers with AIX5L provides a structured environment for workload and business growth. **With AIX5L, your business is offered not only capacity on demand but capability on demand.**



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