

IBM System p

In the world of UNIX and Linux, IBM System p is a well-known name and an excellent choice in an environment that asks for simplification and control over infrastructure.

IBM System p models are equipped with the POWER5 or POWER6 processors.

The models with POWER5 processors have been renamed to "System p5", reserving the "System p" name for models with POWER6 processors. Currently POWER6 is available in the midrange System p 570 and in the JS22 blades. Availability in low-end and high-end systems is planned for 2008.

The combination of this technology and the latest version of IBM AIX give you major opportunities to fully exploit your investment. In the next topics, we will run through some advantages of System p.

- Performance

While the POWER5 processors have speeds up to 2.3 GHz, the System p 570 server offers clients 2- to 16-core POWER6 processor configurations at speeds of 3.5, 4.2 or 4.7 GHz. Processor cards and caches have been redesigned to make full use of these higher clock speeds.

- Reliability

Among others, POWER6 has added Memory error-correction extensions: The memory chips are organized such that the failure of any specific memory module is designed to only affect a single bit within an ECC word (bit scattering), thus allowing for error correction and continued operation in the presence of a complete DRAM chip failure (Chipkill™ recovery).

POWER6

memory also utilizes memory scrubbing and dynamic bit steering, which uses correctable error thresholding to determine when available spare memory modules on each DIMM should be used to replace ones that have exceeded their threshold value.

POWER6 exploitation of the processor storage key feature brings a mainframe-inspired reliability and capability to the UNIX market for the first time. Storage keys can reduce the number of intermittent outages associated with undetected memory overlays inside the kernel. Applications can also use the POWER6 Storage Key feature to increase the reliability of large, complex applications running under the latest versions of the AIX operating system.

- Availability

One of the significant mainframe-inspired availability enhancements in systems with the POWER6 processor is the ability to do processor instruction retry and alternate processor recovery. This significantly reduces exposure to both hard and soft errors in the processor core.

Another major advancement in POWER6 processors is single processor checkstopping. Prior to POWER6 processors, a processor checkstop would result in a system checkstop. A new feature in System p 570 is the ability to contain most processor checkstops to the partition that was using the processor at the time. This significantly reduces the probability of any one processor affecting total system availability.

- Service ability

The System p

Service Processor provides the capability to diagnose, check the status of, and sense the operational conditions of a system. It runs on its own power boundary and does not require resources from a system processor to be operational to perform its tasks.

- Virtualization techniques

Virtualization

techniques essentially are a means of keeping control of your hardware farm. Logical partitioning, Micro Partitioning, virtual LAN and Virtual I/O Server software (VIOS) are key elements of the POWER family of servers. Logical partitioning or LPAR technology has its origin in the IBM mainframes – called System z now – and is now available on the IBM UNIX systems. It allows the creation of independent Operating environments on a single machine.

POWER

Hypervisor firmware manages the time-slicing of LPARs. The POWER Hypervisor is a firmware layer sitting between the hosted operating system and the server hardware, and it handles dispatching of the physical processors.

In practice, processor capacity is frequently not fully utilized. The Micro-partition feature of POWER-technology provides an answer to this issue. Micro-Partitioning enhances LPAR by enabling multiple partitions to share one physical processor.

With this technique, virtual processors use a pool of physical processors. The virtual processors are scheduled and dispatched to any of the physical processors available in the pool. Micro-Partitioning enables multiple logical partitions to run on a single processor in a time-sliced manner.

Virtual LAN

allows clients to create virtual Ethernet connections to provide inter-partition communication between logical partitions on a POWER processor-based server without the need for network I/O adapters and switches. Connectivity outside of the POWER processor-based server can be achieved using an I/O server partition that acts as an IP forwarder to the Local Area Network through an Ethernet I/O adapter.

The Virtual

I/O Server allows you to virtualize both I/O and network resources. It is a custom AIX partition that's used to provide I/O resource sharing. The I/O Server acts as the host system and actually owns the physical resources. These resources are then virtualized out to the client LPARs.

Virtualization takes a new step with Live Partition Mobility. This provides the ability to relocate a running LPAR from one physical machine to another physical machine without disrupting the LPAR's operation. Live Partition Mobility provides clients significant flexibility in their management of workloads. It can be used to balance loads between physical servers without incurring downtime, and also to move LPARs off of a server in order to perform planned maintenance on the server without incurring an outage. Live Partition Mobility can also improve system availability by allowing LPARs to be moved off of a server in response to a pending system outage.