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## Highlights

- Optimize your virtualized IBM® Power Systems™
  - Understand current workloads performance from virtual machine to physical hardware
  - Simple real-time graphical performance information highlighting overcommitted resources
  - Ability to replay saved performance data to analyze historical performance data
  - Accelerate the resolution of performance issues
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# IBM PowerVP Virtualization Performance

The dynamic pace of change that is encountered with today's virtualized environments and workloads require flexible infrastructure. This flexible infrastructure allows virtual workloads to be mobile and to dynamically contract and expand within the virtual data center as needed by the business. Performance is key to the benefit of this new flexibility introduced by server virtualization and cloud deployments which yields the benefits of consolidation, flexibility and reduction of risk.

The ability to manage and monitor the performance of both the virtualized workloads as well as the physical hardware mapping is critical. IBM PowerVP™ provides the performance intelligence to make key decisions in the virtualized infrastructure such as VM placement and exploitation of key server resources for optimized workload performance.

## Real-time performance monitoring

As benefits of server virtualization continues to be realized it becomes even more important to be able to monitor virtualized workloads. VM placement of virtualized workloads becomes an important part of the equation for optimal performance providing better performing local memory, cache and Central Processing Unit (CPU) affinity. PowerVP provides a rich real-time continuous graphical display which allows monitoring of Power Systems virtualized by the PowerVM® hypervisor. This monitor provides detailed resource data directly from the PowerVM hypervisor which has the most accurate information on resource utilization for the Power server.



The PowerVP monitor has the ability to set various thresholds to control the display. These include color coded indications of health of the system, green for normal, yellow for caution, red for warning and white for unused. The thresholds are customizable to meet the needs of a particular installation. The color thresholds are applied to each of the components monitored which includes compute, memory, storage and network resources. When the PowerVP user interface is active, the performance data displayed on the screen is also saved to a historical file so it can be replayed later for further analysis. There is also a mode which allows performance data to be captured without the user interface so that data can be viewed historically in case an operator or performance analyst isn't present during a performance problem.

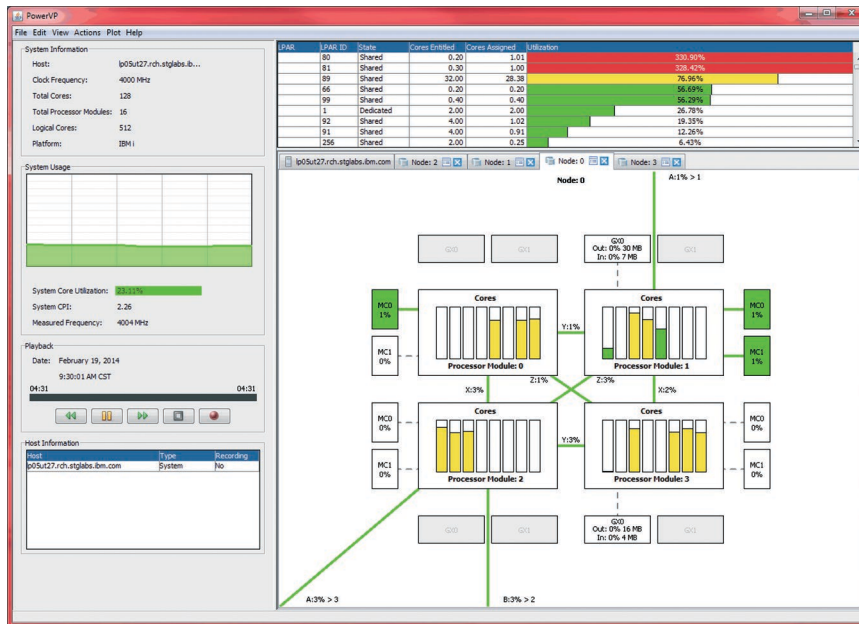
**DVR-like replay**

A key feature of PowerVP is the ability to replay saved performance data within its user interface. This is similar to a DVR-like interface with the ability to pause, fast forward or go in

reverse. This allows the user of PowerVP to go to a certain point in time and to see what particular resource or resources were in contention. This information can be used to rebalance the workloads or to change virtualization settings to optimize performance in the future since workloads typically follow processing schedules. One of the options to rebalance the placement of VMs would potentially be to use the Dynamic Platform Optimizer (DPO) a feature of the hypervisor on certain POWER7® servers.

**System level performance views**

PowerVP provides a system level performance view of the Power server. This shows a view of all the virtual machines that are running on the server and provides a mapping of the VMs to physical resources like CPU, Memory and system buses. The data from the system level view is gathered by an agent that can run in any of the VMs running on the server. Typically this agent runs on one of the VIO Servers in the virtualization infrastructure.



PowerVP System Level View

This system level view displays all the running VMs and also renders a server system diagram showing how the VMs are mapped to the physical hardware. The level of detail of this mapping is down to the processor socket then core within socket and it shows all the utilization of the system buses interconnection as well as memory. The various components have the ability to have thresholds set independently of each other so that this provides the greatest flexibility in monitoring the virtualized server infrastructure.

### Virtual machine drill down

The system level display has the ability to drill down into the details of the guest VMs running on the virtualized server. This drill down is provided by a VM level agent that pulls key operating system data such as CPU utilization and CPU mode, disk transfer rate, network utilization and various metrics measuring CPI (cycles per instruction). This detailed information provides the next level of detail necessary to analyze performance from the total system view all the way through the details of a particular individual workload running within a

guest VM. The VM drill down functionality provides the final information to understand performance from a global view to a detailed workload view running on Power Systems.

### Server firmware requirements

PowerVP utilizes special API calls that the PowerVM hypervisor introduced with newer versions of the hypervisor firmware. The ability to monitor systems using PowerVP is dependent on firmware level 7.7 and higher which is available on certain models of POWER7 and POWER7+™ systems. There is no special firmware requirement for POWER8 systems, PowerVP supports all POWER8 servers.

### Why IBM?

Performance solutions from IBM provide clients with the confidence that comes from integrated design and testing of the solutions. The Power performance tools like PowerVP are deeply integrated and have in-depth understanding of the various performance metrics that are available on Power Systems. This deep understanding of the platform developed by IBM provides the best quality of performance metrics available for IBM Power Systems virtualized server platform.

Feature	Benefits
<b>Real-time graphical monitor</b>	Provides easy to understand health check of the running system
<b>Customizable thresholds and alerts</b>	Allows each client to setup PowerVP to match its performance monitoring needs and allows alerting to the syslog and logging of PowerVP performance data to be initiated based on a CPU or Memory threshold.
<b>DVR-like replay</b>	Saves time by allowing replay of performance data sequences to pinpoint bottlenecks
<b>System level performance views</b>	Provides system level virtualized workload view which gives overall health of system allowing drill down into problem areas
<b>Virtual machine drill down</b>	Provides detailed VM performance information to help analyze performance
<b>Supports AIX, Linux, IBM i VMs</b>	Full Power platform support allows optimization of all PowerVM virtualized workloads from a central location
<b>Background data collection</b>	Allows detailed performance data to be collected without the need for the real-time performance monitor and this data can be exported to an external format for use by third party tools

IBM also has worldwide Global Services technical consultants that have broad experience deploying the IBM performance solutions to optimize IBM systems. When you work with IBM to implement PowerVP performance solutions you can benefit from the extensive intellectual capital that the entire IBM Global Services team has accumulated, tested and has proven.

### For more information

To learn more about the IBM PowerVP please contact your IBM representative or IBM Business Partner, or visit the following website: [ibm.com/systems/power/software/performance](http://ibm.com/systems/power/software/performance)

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Route 100  
Somers, NY 10589

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