

## TECHNOLOGY AUDIT

# SmartPeak WLM v7.1






SmartPeak

## BUTLER GROUP VIEW

### ABSTRACT

*SmartPeak WLM, by SmartPeak, is a workload management tool that operates in Microsoft Windows server and desktop environments, enabling computing resources to be allocated to processes depending on defined policy criteria. Many organisations are looking to increase agility, consolidate infrastructure, and improve service levels. By dynamically enforcing resource allocation policies at run-time, SmartPeak WLM can enable improved application response times, and better availability in physical and virtual environments, through better resource control, leading to overall service level improvements, and direct business benefits. Butler Group believes that this product would benefit most organisations running Microsoft server and desktop products, enabling potentially reduced operating costs, with the out-of-the-box configuration offering substantial quality of service improvements almost immediately. Correspondingly, we recommend that the 21-day free trial of the product that is available via the company's Web site is strongly considered by potential customers.*

### KEY FINDINGS

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|--|--|
|  Improves application performance and server availability.  |  Very likely to enhance success of server consolidation strategies.   |
|  Benefits across the Windows data centre, including database, Web server, terminal server, workstation, and virtualised environments. |  Extends management to guest operating systems to offer end-to-end resource management in virtual environments. |
|  Only suitable for Microsoft environments.  |  Does not support Linux environments.   |

Key:  Product Strength  Product Weakness  Point of Information

### LOOK AHEAD

Product development plans include increased management reporting and chargeback capabilities, the incorporation of disk I/O control, and support for Longhorn and 64-bit versions of Vista.

## FUNCTIONALITY

Today's business environment often leaves IT managers struggling to attain performance levels that satisfy increasingly demanding users, while working within imperatives to minimise expenditure on data centre assets, especially as it is well-known that these can be wastefully under-utilised at times of off-peak demand. Popular measures such as consolidating server populations, or virtualisation, are commonly undertaken to achieve greater sharing of resources (and therefore cost savings), but failure to invest in requisite technology management capabilities that enable the more intensive demand profiles to be managed can risk service degradation or unavailability at a time of high demand, if resources sharing is too concentrated. Uneven workloads make it difficult to provision resources so as to meet performance targets, especially when resource sharing may result in processes sharing resources even though they have demand profiles that could easily lead to contention.

Standard infrastructure management tools often allocate resources crudely, and can risk a situation in which processes conduct what amounts to little more than a free-for-all for computing resources, which can easily result in service interruption, as operating systems that reach overload have to be restarted to reach a stable position. However, between the two extremes of all resource demands being totally satisfied, and service failure due to contention, there are many possible successful outcomes. There will always be some processes with less exacting performance needs than others, and this characteristic can be exploited to apportion resources according to defined priorities. Defining the relative requirements for process performance, and being able to exercise low-level control over how resources are allocated to processes, can allow resource contention to be avoided.

### *Product Analysis*

Operating in Microsoft environments, SmartPeak WLM allows administrators to set up management policies that subsequently control dynamically the availability of CPU, memory, and bandwidth resources to individual processes during execution, in real time. In a PC environment, the equivalent would be an ability to use Windows Task Manager to continually adjust the properties of every process on the system, 20 times per second, to ensure that they shared resources as required. In the same way, SmartPeak WLM changes the relative priorities of processes running within shared environments, and can be configured to ensure that each is afforded sufficient resources to fulfil service level agreements, and overall meet a complementary profile of performance needs in which some take precedence over others.

This approach meets a number of pressing challenges that face IT managers across a range of infrastructure product and technology areas, and provides benefits when used with a number of server-based products and technologies in Microsoft environments, as summarised in Table 1.

Table 1: SmartPeak WLM benefits across technology types		
Product / Technology Type	Issues	SmartPeak WLM Benefits
Database servers	Licensing costs, and support issues, with using virtualisation to consolidate server resources – therefore little opportunity to share servers.	Server partitioning allows reduced licensing costs, and strong management of resource availability.
Terminal servers	Performance is critical, but resource-hungry.	Policy controls apportionment of processor, memory and network bandwidth, and can be application-, and/or user-, and/or state-based.
Web servers	When Web applications share a server, degradation of critical instances' performance must be prevented.	Dynamic partitioning and allocation of system resources to individual Web applications. Process management can mitigate the effects of Denial of Service attacks.
Workstations	Uneven demands for shared resources can result in some applications' performance being degraded.	Application-, and/or user-, and/or state-based policies allow resource to be divided or partitioned to a granular level.
Virtualised host operating system environments	1. Resource management focuses at host level – lack of management within guest operating system environments.	Management of resource usage by each process within a virtual machine, allowing more effective consolidation.
	2. Failure to optimise savings due to lack of capability to manage performance	Stabilised performance can enable optimal consolidation, saving licence and management costs.

Source: SmartPeak DATAMONITOR

SmartPeak WLM can save the need for increased investment in servers; by dynamically controlling the effects of peak demand on response times, it can maintain satisfactory performance levels using existing server resources. Tests have proved that capacity is approximately halved when demand on a server processor reaches 100% capacity, because there is typically a doubling of both time-outs and response times experienced by applications. The product distributes resources according to policies and service level agreements so that key performance metrics such as processor queue length are significantly reduced when using SmartPeak WLM, with the benefits of these control features also being available on workstations when they run under high demand.

SmartPeak WLM does not try to conflict with the role of a complete infrastructure management tool, but it can provide numerous performance and efficiency benefits in Microsoft Windows server- and desktop- based computing environments, with few overheads and at an accessible price.

## **Product Operation**

In order to define the policy governing resource allocation to processes, administrators set up 'share factors', these being relative numerical controls that are used to determine priorities of processes when executing. Share factors can be applied to application groups, and users (either as individuals, or by defined groups), and can be modified by a number of settings, allowing the prioritisation to be influenced by, for example, whether an application is running in the foreground or background on a system. Further policy elements can be defined, as follows:

- Maximum CPU allocation, allowing lower-priority processes to share resource, but limiting their impact on overall performance.
- Maximum allocation of resource that a process can be allowed, a useful feature with regard to processes that are known to be highly demanding of resources.
- Reservations of a guaranteed amount of resource.

A product feature called Smart Scheduler runs on individual server machines as agent software in the execution environment, in order to enforce resource allocation policies in real time.

A centralised auditing system is also incorporated within the product. Primarily, this deals with distribution, collection, and viewing of events raised, and includes a management console. Configuration settings allow the event functions to be tailored to customer requirements, and components within the auditing system allow the following means of distribution to be used:

- Windows Event Log, on a local or remote server.
- File Log, using configurable common text file formats, on a local or remote server.
- Mapping events to Simple Network Management Protocol (SNMP) traps.
- Using Simple Message Transfer Protocol (SMTP) to send individual or summary events to e-mail recipients.

A Proxy Auditing component allows offline machines to cache captured events, and then pass them to a central Auditing server once a connection is re-established. Centralised logging of performance data and events, with Web-based reporting, is also provided.

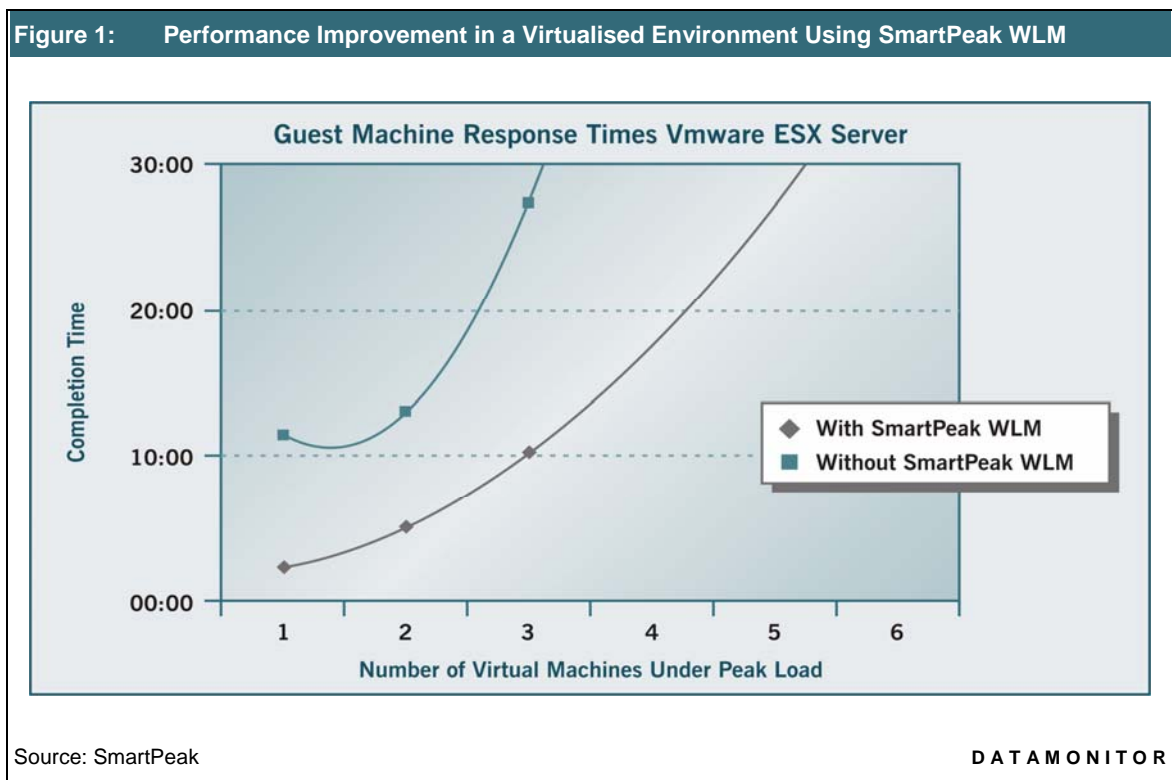
SmartPeak WLM provides patented resource control over CPU, memory, and bandwidth resources on Windows desktops and servers. This is achieved through the following components and techniques:

- Smart Scheduler, which allows the intelligent management of CPU resource by mapping business priorities or SLA agreements to how the CPU resource is allocated, via a number of controls: Share Factors, which allocate the share of CPU accessible to each application; Reservations, which guarantee a minimum level of resource to critical applications; Soft Limits, which restrict CPU consumption by a given task if required by a more critical application or user; Application CPU Control, allowing hard processor limits to be applied to applications individually, or in groups; and Processor Affinity, which limits processes' access to the CPUs on multi-processor systems.

- Virtual Memory limits can be defined for individual applications, or on a user and group basis. If the defined memory limits are exceeded SmartPeak WLM can prevent the launch of new applications, and issue an event.
- Physical memory control based on user, process, or machine state can alleviate slow response times.
- Bandwidth Manager allows restrictions on network throughput and quota limit, based on a user, process, or computer.

SmartPeak WLM also analyses applications to detect when memory is being used inefficiently, and uses this information to conduct real-time application optimisation to reduce usage of memory resources. The product enables DLLs and ActiveX controls to be optimised and reloaded in real time, so that savings occur immediately without incurring interruption to the particular application. Any recurring need for the same optimisation is detected when the target application loads, and is automatically performed without intervention. The product’s management console allows configuration of the analysis and optimisation schedule, and the ability to exclude specific applications or components from optimisation. A monitoring console can be used to view results, and to start optimisation manually.

Figure 1 shows the published results of stress testing that was designed to run complex processes at peak load, causing resource contention on a system running a virtual machine using VMware ESX Server. The test was repeated for an increasing number of guest virtual machines within one physical host, comparing the results with and without SmartPeak WLM. The test clearly illustrates that while performance was significantly improved even for one VM, SmartPeak WLM enabled performance levels to be far less significantly degraded when more virtual machines were added to the host system, compared to a marked deterioration without using SmartPeak WLM.



## ***Product Emphasis***

Many organisations hoping to consolidate their infrastructure resources to reduce costs in Windows environments are likely to face barriers in applying sufficient control, to ensure that high levels of demand can still be catered for despite no longer having the luxury of spare capacity. Resource contention can very easily be a result of such consolidation, which can lead to poor infrastructure performance, an impact on service, and pressure for expenditure to remedy the poor performance – the very opposite of the likely original objective.

SmartPeak WLM provides dynamic workload management for Windows infrastructure, allowing policy-based control at a granular level comparable to what has previously only been available on mainframe and mid-range systems. This can be applied to a number of product types (databases, Web servers, terminal servers, workstations, and virtualised environments), providing SmartPeak's customers with many means of gaining a rapid return on their investment. Used across the Windows data centre, SmartPeak WLM can also improve quality of service, ensure performance of critical applications, improve system availability, and give system administrators a better chance to troubleshoot servers.

## **DEPLOYMENT**

The product is available on Windows 2000 Professional or Server (including Terminal Services), Windows XP (32-bit and x64 editions), Windows Server 2003 (32-bit and x64 editions, including Terminal Services), and Windows Vista (32-bit editions). It is agent based, requiring only the agent to be installed on the server or workstation, where it subsequently executes rule-based control using its associated configuration settings, which are also installed locally. Installation of the agent and its configuration settings can be automatically undertaken by the product's integrated deployment framework. The deployment framework can co-exist on the same server, but typically is located on a separate server, allowing a centralised management configuration. The product can also be installed in a standalone configuration (with no deployment framework).

The deployment framework is built around standard Windows Installer technology, and manages distribution of agents and configurations throughout the policy lifecycle: in the post-installation environment, agents request software that they require from the deployment framework. Where they share deployment features (e.g. desktops in one department), resources can be grouped in order to incur a reduced management overhead. The deployment framework also provides version control over the roll-out of new software, or updates configuration settings to specified users and groups.

Control of the Deployment Server is provided by a management console, which incorporates testing and troubleshooting facilities that can deal with deployed agents. Management console facilities can be automated using a scripting language that supports Component Object Module (COM) automation (such as VBScript). The console stores configuration settings in the Deployment Server, allowing such information to be shared across multiple systems. In addition, the integrated deployment architecture allows SmartPeak software and configurations to be managed centrally, so administrators can apply rules to all servers and workstations from one console. Configurations are created as standard Microsoft Installer (MSI) packages, and consequently can alternatively be deployed using third-party deployment tools.

The out-of-the-box default configuration offers significant benefit almost immediately. A full product training course takes a day, but SmartPeak's Solution Assessment Package includes on-site training with an engineer. The resource overhead for ongoing maintenance is low, as configuration is straightforward and settings do not often need to be changed.

## PRODUCT STRATEGY

The target market for SmartPeak WLM is across all industries, addressing large organisations managing hundreds of servers running Windows server software, at data centre scale. The product enhances reliability and performance within programmes of consolidation of applications onto fewer servers, enabling savings on maintenance costs, and software licensing (for operating systems, and server management software). If an implementation of Microsoft SQL Server Enterprise Edition were consolidated from 6 single-CPU servers onto a quad processor server, using SmartPeak WLM to guarantee quality of service, the licensing savings alone from reducing from six to four SQL Server licences would be US\$50,000 (calculated on the basis that Microsoft SQL Server 2005 Enterprise Edition costs approximately US\$25,000 per CPU licence). With the further benefit of avoiding additional hardware costs to support server software, SmartPeak WLM provides a direct Return on Investment (ROI) that Butler Group believes can easily exceed the purchase price and implementation costs.

Workload management is a requirement unaddressed by either virtualisation or clustering technologies, and SmartPeak WLM can act as a complementary technology to either (e.g. by maximising the performance of each physical or virtual machine, managing contention, and guaranteeing resources when required), or as an alternative means of increasing efficiency. SmartPeak has technology partnerships with Microsoft, HP, Citrix, IBM, Intel, and VMware, and believes that only HP and Microsoft market competing products. It undertakes direct sales where necessary, and has key business partnerships with HP, CSC, and EDS, who provide indirect sales routes. SmartPeak expects to undertake similar relationships with more systems integrators soon, and in 2007 plans to broaden its route to market through a global reseller programme that will look to address the mid-market as well as the enterprise market.

SmartPeak states that the average cost of a project is UK£100,000. Customers initially buy a perpetual license for the software (UK£250 per physical CPU socket accessed by each physical server the product is placed on), and thereafter pay an optional subscription of 20% of the purchase cost annually (with multiple-year pricing options available), which includes all major and minor upgrades to the software, hot fixes, service packs, and new version releases. A range of support options are available depending upon requirements, up to 24x7 coverage. Product development plans include the incorporation of disk I/O control, increased management reporting and chargeback capabilities, and support for 64-bit editions of Vista and Longhorn.

## COMPANY PROFILE

SmartPeak is headquartered in Daresbury, in Cheshire (UK), with regional offices in New York and Munich. The company is owned by AppSense Holdings, which is funded privately by individuals and venture capital companies. AppSense, the well-established technology company, is also associated with this group – AppSense's major product grew up as an infrastructure management offering, before the decision was taken that AppSense would focus on its capabilities to manage user environments, and as a basis for solutions around Terminal Services and Citrix technology. SmartPeak uses some of the same technology on which AppSense's offerings were founded, as a basis for SmartPeak WLM. Butler Group sees the opportunity to be able to establish a new product on the foundation of proven technology as an advantage for SmartPeak.

SmartPeak was established in 2004 and has 180 employees, and SmartPeak WLM was also launched in that year. The company states that over 1,500 customers use SmartPeak's technology, a total that is partly due to the heritage from AppSense (although SmartPeak added 400 customers in 2005). AppSense Holdings now has over 2,000 customers overall. SmartPeak is privately owned, and chooses not to disclose its detailed financial performance, other than to reveal that it achieved a Compound Annual Growth Rate of 72% from 2002 to 2005 (as AppSense, for most of that time), and that its revenues for the year 2005 were 39% higher than those in the prior year, with profits 60% higher.

Key customers include Daimler Chrysler, The Mechanics Bank, Banner Health, and Alstom. Banner Health is quoted by SmartPeak as crediting its use of SmartPeak WLM with a 100% increase in its server capabilities in terms of concurrent connections, and a dramatic reduction in the number of servers required to complete a project. The Mechanics Bank states that SmartPeak WLM prevents its applications from monopolising CPU and memory resources, and hence the bank can guarantee performance of key services without purchasing more servers.

## SUMMARY

SmartPeak WLM solves the fundamental problem of how to intelligently allocate system resources in a Windows environment. Its dynamic workload management allows applications to coexist safely on one server, guaranteeing performance and service levels in both data centre and desktop environments. SmartPeak can illustrate solutions with database, Web server, terminal server, and workstation products running on Windows, and additionally is particularly of value in virtualised environments, where it can augment commonly used management solutions by allowing control within guest operating systems. Butler Group finds SmartPeak WLM to be an excellent product that can deliver significant benefits to users of Windows-based computing systems, giving IT managers peace of mind in taking the step of consolidating multiple applications on one server. By dynamically managing each application's access to CPU, memory, and bandwidth it contributes strongly to the twin, business-oriented goals of guaranteed quality of service, and better resource utilisation.

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