IBM Spectrum LSF Suites

Enhance the value of high-performance computing with faster processing and easier management

Highlights

- Enhance user productivity by hiding the complexity of workload-intensive computing environments
- Streamline management of compute clusters and prioritize workloads to address rapidly changing demands in highly competitive industries
- Maximize return on investment (ROI) by optimizing utilization of systems

High-performance computing (HPC) isn't just for large organizations and technically skilled users anymore. In today's competitive business environment, where virtually every industry requires shorter design cycles and higher-quality results, HPC is for organizations of any size. It's for users who demand analysis and answers from huge volumes of data. However, by the nature of the work they do and the computing infrastructure necessary to do it, HPC environments are complex. Which means organizations need effective tools to maximize the value of their HPC infrastructure by making it easier to use and manage, and to prioritize work.

IBM® Spectrum™ LSF Suites provides a tightly integrated solution that delivers the systems management and workload prioritization organizations need—while helping enhance user productivity by hiding complexity.

In today's world, when simply deploying a workload scheduler is no longer enough, IBM Spectrum LSF Suites can help meet the range of needs an HPC environment faces. For users, it can help take advantage of technologies such as accelerators designed to speed results. For the infrastructure, it can help get the most from additional compute capacity available in the cloud during peaks in workloads. For the organization, it can help respond to market changes that drive constantly-shifting priorities for both individual projects and the overall business. At the same time, it can help reduce costs and increase ROI.

IBM Spectrum LSF Suites meets growing HPC needs three ways

As information from big-data sources and the Internet of Things grows, organizations of all sizes and types are joining traditional users such as scientific researchers, universities and governments in adopting HPC. By 2021, estimates are that the market for storage in HPC environments will increase over its 2016 level by a compound annual growth rate of 7.8 percent, and the market for servers will increase by 5.8 percent.[1]

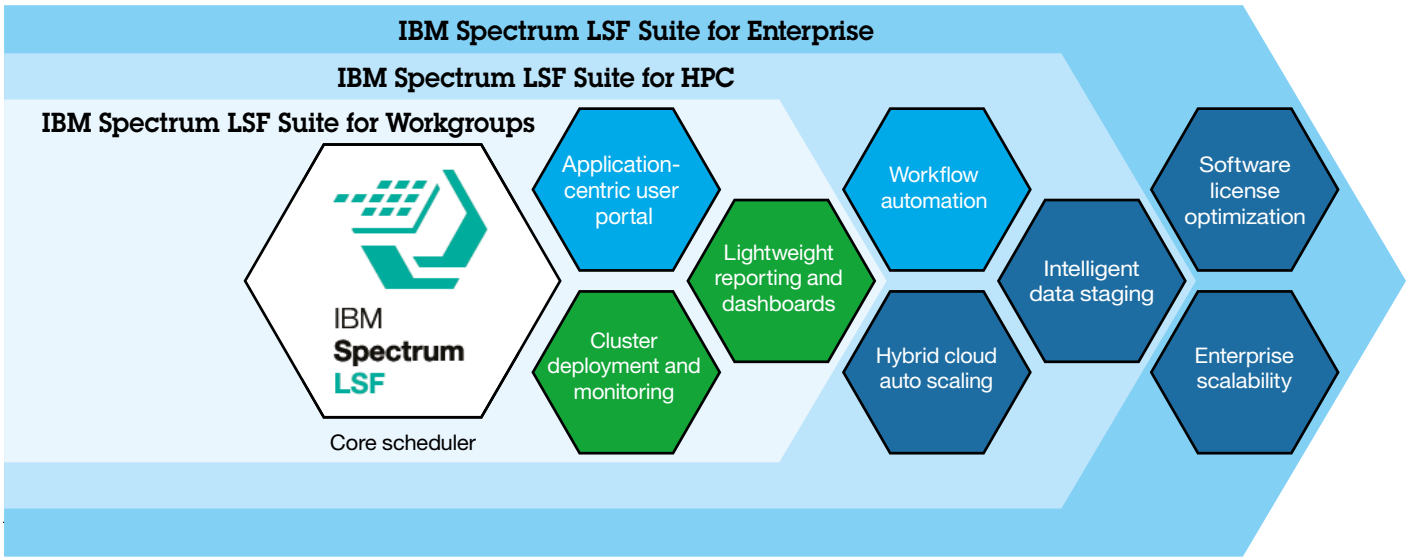
To meet these demands, IBM Spectrum LSF Suites is designed to provide a new approach for extracting meaning from massive data volumes, for decreasing latency in processing and for speeding applications. And while enabling core management and prioritization capabilities is central to all installations, IBM Spectrum LSF Suites is available in three versions with progressively stronger capabilities: "Workgroup," which scales up to 128 nodes; "HPC," which scales up to 1,024 nodes; and "Enterprise," with no node limit.

Get the most from HPC for users, IT and the business

While the quality of hardware in an HPC environment is important, the real value of the HPC infrastructure comes from what the organization can get out of it—whether it's reducing the time necessary for product development and research or increasing the resource access and operational effectiveness of the people who use it. In many cases, however, as HPC environments grow in scale and complexity, that value becomes increasingly difficult to achieve.

IBM Spectrum LSF Suites enables organizations to achieve value in part by hiding complexity, with an interface that enables users who are experts in fields other than technology—engineers or physicians, for example—to access data quickly and easily to conduct research and analysis. It allows the technical team to monitor the cluster, jobs and logs, and to report on their use to managers and stakeholders. The solution also enables users to interact with the cluster via a tightly integrated client for Microsoft Windows environments and via mobile clients for Google Android and Apple iOS platforms.

IBM Spectrum LSF Suites: Simplified packaging to accelerate time to results



Intelligent staging of data helps ensure that the information users need is available when they need it. With IBM Spectrum LSF Suites, data is transferred before jobs are dispatched, enabling users to avoid jobs that are staging data while they occupy compute resources. This drives up cluster utilization. Additionally, when multiple jobs need the same information, data is transferred from its source location only once and then cached. This helps improve throughput and can reduce overall data-transfer costs.

Intelligently respond to changing business demands

Enterprise HPC means high demand on resources, with diverse user communities running numerous applications. This typically results in peaks and troughs in demand. As peaks align and exceed the total compute and storage capacity, an acute shortage of resources and longer time to solution can occur. To address this challenge, IBM Spectrum LSF Suites can dynamically provision external cloud resources from a number of different cloud providers, including IBM Cloud™, until the peak load has passed. This enables computing capacity to grow—and shrink—in response to demand, so you only pay for what you use.

Easily take advantage of new technologies

Graphics processing unit (GPU)-accelerated computing is now commonplace in enterprise HPC environments, and GPU support is emerging in an ever-increasing number of applications. As with any other resources in a computing environment, GPUs must be intelligently managed for maximum effectiveness. From configuration to support for NVIDIA GPUs, IBM Spectrum LSF Suites provides a simplified experience that enables users to be more productive faster. NVIDIA GPUs are automatically detected and configured in IBM Spectrum LSF Suites, dramatically simplifying the administration of GPU servers. In addition, with support for NVIDIA DCGM, IBM Spectrum LSF Suites provides a number of advanced capabilities, including NVIDIA GPU behavior monitoring, health and diagnostics, and accounting and process statistics for GPU workloads. These capabilities help organizations get the most out of their heterogenous computing infrastructure.

IBM Spectrum LSF Suites also provides support for organizations that are using container technologies to help streamline the building, testing and shipping of applications, which enables an application stack to be consistently deployed both on-premises and in the cloud. IBM Spectrum LSF Suites provides a generalized interface that supports Docker, Shifter and Singularity container technologies. Containerized jobs submitted to IBM Spectrum LSF Suites benefit from resource binding, interactive and parallel job support, and reliability from automatic re-running of containers during failures. Organizations can gain additional peace of mind by using access controls to define which container images can be run in the environment.

"IBM Spectrum Computing software has played a key part in our success in Formula 1 over the last decade. Red Bull Racing employs computational fluid dynamics (CFD) to optimize vehicle aerodynamics. IBM Spectrum LSF provides easy-to-use interfaces for managing complex workflows. This allows our aerodynamicists to focus on CFD for car design rather than executing detailed manual steps. This level of simplification and automation reduces the training time from days to hours and enables new users to run full CFD workflows in record time."

—Matt Cadieux, CIO Red Bull Racing

Ultimately, the capabilities that IBM Spectrum LSF Suites adds to its core scheduling and management functions enable improved productivity across the environment. Streamlined productivity among the IT team allows reduced costs, as complex HPC environments can be expensive to maintain. The user interface reduces the chance of expensive end-user errors, helps users become productive more quickly and enables users to focus on outcomes, rather than how to use the environment.

Why IBM?

IBM Spectrum Computing offers a comprehensive portfolio of software-defined infrastructure solutions designed to effectively deliver IT services by optimizing resource utilization to speed time to results and reduce costs. Ideal for technical and HPC applications, IBM Spectrum Computing solutions are designed to simplify and accelerate high-performance simulations and analysis to help uncover insights into business, products and science.

For more information

To learn more about IBM Spectrum LSF Suites, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/systems/spectrum-computing/products/lsf

IBM Spectrum LSF Suites for HPC is available via the IBM Academic Initiative for eligible parties. For details, visit: ibm.onthehub.com

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: **ibm.com**/financing

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[1] Earl Joseph, Steve Conway, Bob Sorensen, and Keven Monroe, "Trends in the Worldwide HPC Market," *Hyperion Research*, June 2017.

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