Is your HPC infrastructure delivering maximum value?

Highlights

- Simplify HPC administration with a single tool for monitoring and managing aggregated workload, infrastructure and license consumption information

- Address a wide range of requirements by presenting extensive HPC resource information to administrators, managers and users through a single pane of glass

- Prepare for growth and the expansion of HPC usage with simple extensibility and scalability

High-performance computing (HPC) drives cutting-edge scientific research, innovative product development and business analytics across a wide range of organizations, and as HPC use grows, organizations can often struggle to provide sufficient resources to their users. Effective monitoring and troubleshooting information is essential to understand how resources are consumed so that they can be properly allocated to ensure the needs of all users are met.

IBM® Spectrum LSF RTM is designed to help manage the growth in demand for HPC by providing an operational dashboard for IBM Spectrum LSF environments. By providing comprehensive workload monitoring, reporting, and management, the solution can help an organization better understand the complex dynamics of its HPC environment. IBM Spectrum LSF RTM can help organizations make informed business decisions about allocating resources, allowing them to provide HPC to more users, while improving productivity, streamlining administration, and helping to lower the cost of managing an HPC environment.

Identifying distinct information requirements

Clear visibility means you need to provide different information to different users and groups.

Line-of-business managers need to be sure they have access to the resources they were promised when they invested in HPC. To facilitate planning, they need to know whether they will have sufficient resources for upcoming projects and the ability to troubleshoot potential issues. With IBM Spectrum LSF RTM, managers can determine why utilization is higher or lower than expected, as well as identify the cause of failures or instances of users abusing their privileges.

IT managers must ensure that they are meeting service-level commitments to internal customers. With IBM Spectrum LSF RTM, IT managers can get an advanced warning when service-level agreements (SLAs) are about to be broken. For example, an alert can be created to inform IT management that a pending time policy is about to be violated. This unique feature in IBM Spectrum LSF RTM gives IT managers a robust, proactive problem notification facility to help ensure that SLAs are consistently met.

HPC administrators need to know which servers have crashed, whether a particular workload caused the crash and which users were affected. IBM Spectrum LSF RTM can help administrators identify such problems and prevent them from happening in the future. In addition, IBM Spectrum LSF RTM allows them to determine whether a particular job type is over-loading storage systems, whether users are abusing the system and at what point storage utilization becomes a problem for the entire system.

License administrators have to maximize the utilization of software licenses. IBM Spectrum LSF RTM shows resource utilization, which is essential for optimizing license purchasing decisions and justifying decisions to management. IBM Spectrum LSF RTM also helps ensure that users have the resources they need and are fully using the licenses they are allotted. At the same time, IBM Spectrum LSF RTM offers insight into whether a shortage of licenses is causing long waits for resources and slowing productivity.

End users want to know when their workloads will finish and whether workloads from other users are slowing their work. With IBM Spectrum LSF RTM, users can profile their applications to understand optimal memory, CPU and other resources needed. In addition, users can gain insight into other groups using the HPC system and make sure they get their fair allocation of resources.

System administrators need ways to uncover the source of system crashes so they can avoid future issues. The *syslog* monitoring facility in IBM Spectrum LSF RTM enables administrators to easily determine whether crashes are related to hardware, system configuration or some other component, so they can take the best course of corrective action.

Addressing diverse requirements

IBM Spectrum LSF RTM enables organizations to provide each user with a "single-pane-of-glass" view of operational information to make immediate decisions as well historical information to conduct deeper, longer-term analyses.

"With the very rich way in which IBM Spectrum LSF RTM allows us to view grid performance data, we can demonstrate how users are getting their fair share of the infrastructure and identify any sharing conflicts."

—A representative for a global pharmaceutical company

Streamlining administration

IBM Spectrum LSF RTM helps streamline HPC administration. Within minutes of installation, organizations can start monitoring hundreds to thousands of data points on a large portion of their hardware. To help prevent ongoing problems, organizations can set up alerts to notify administrators, managers and users of issues that can affect productivity. For example, IBM Spectrum LSF RTM can notify operations personnel of pending key performance indicator (KPI) or SLA violations before they happen.

Expanding the reach of IBM Spectrum LSF RTM

IBM Spectrum LSF RTM can be extend to monitor non-IBM Spectrum LSF devices, including storage arrays, login servers, network switches and routers. As long as a device is network-connected and it can run a script that can return data, IBM Spectrum LSF RTM can collect data, monitor and generate alerts for the device. As it's based on the open-source Cacti tool, organizations can use a variety of plug-ins. For example, a plug-in is available to monitor and manage IBM Spectrum Scale™ storage systems, formerly known as IBM General Parallel File System (GPFS™).

Maximizing the value of IBM Spectrum LSF RTM

To make the most of IBM Spectrum LSF RTM, organizations should consider implementing several best practices that facilitate information transparency and guide access to HPC resource information. For example, management teams should require users to define projects for their jobs. Doing so helps management effectively bill back those customers for HPC usage and determine the cost of HPC for each project. Managers must also establish business commitments and KPIs for their internal customers.

In addition, management teams should encourage users to better understand workload requirements so they can request the correct amount of memory, CPU and other resources. Management teams should lead by example; showing their commitment to understanding resource allocation and usage will encourage users to follow suit.

Organizations should also provide management teams with the ability to access information from other teams through IBM Spectrum LSF RTM. For example, users and managers across the organization should be able to gain Simple Network Management Protocol (SNMP) access to information about storage or networking through IBM Spectrum LSF RTM. For some companies, this concept is known as "independent view and verification."

Meeting the challenge for growth in HPC demand

HPC is no longer the sole domain of scientists and engineers. As the number and diversity of HPC users increase, organizations need ways to better manage resources so that everyone has clear, ongoing visibility into HPC usage. With growing demand for HPC, IBM Spectrum LSF RTM helps administrators, managers and users improve allocation, planning, troubleshooting and more. This scalable platform can help lower the cost of HPC administration and promote the effective utilization of HPC resources.

Why IBM?

IBM Spectrum Computing offers a comprehensive portfolio of software-defined infrastructure solutions designed to help your organization deliver IT services in the most efficient way possible, optimizing resource utilization to speed time to results and reduce costs. These offerings help maximize the potential of your infrastructure to accelerate your analytics, HPC, Apache Hadoop, Spark and cloud-native applications at any scale, extract insight from your data and get higher-quality products to market faster.

Whether deployed in a data center or on the cloud, IBM Spectrum Computing solutions fuel product development, critical business decisions and breakthrough insights in financial services, manufacturing, digital media, oil and gas, life sciences, government, research and education. From designing Formula One race cars to credit risk analysis, organizations in a wide variety of industries are using IBM Spectrum Computing as a foundation for software-defined infrastructure solutions for big data, analytics, HPC and cloud to improve business results.

For more information

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

Listen to the IBM webcast, "Achieve operational efficiency":
ibm.biz/achieve-operational-efficiency

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