IBM Spectrum Symphony

High-performance grid services for distributed computing and big data analytics

Not all grid computing is the same

For many large enterprises, grid computing is the primary solution for accelerating a wide variety of distributed computing and big data analytic processes. Plus for grid-enabled applications, maximising performance and scale are the primary concerns. However not all grid middleware is the same.

Some products impose architectural limitations or restrict your choice of operating systems or developer tools. Another potential constraint is persuading multiple lines of business (LOBs) to share a common infrastructure. Their fear of losing control and missing service level objectives can lead to cumbersome, expensive, application-specific grids sized to peak demand.

Facing increasing financial pressures, organisations like yours are looking for better ways to improve IT performance, reduce infrastructure costs and expenses and meet your company's demand for higher-quality answers faster.

Benefit from fast, scalable performance that's easier to manage

IBM Spectrum Symphony software helps you control the massive compute power available in your current and future technical computing systems to address your most challenging and complex problems.

IBM Spectrum Symphony is a high-performance grid middleware and management solution that runs on virtually any hardware and operating system. You can run pre-integrated applications available from a variety of independent software vendors (ISVs), or you can easily adapt and accelerate your own compute- and data-intensive parallel workloads on a grid, helping to make them fast and flexible.

IBM Spectrum Symphony software can help you achieve breakthrough results in business and research activities. Its power and control also help address challenges in parallel application development and deployment and in technical computing infrastructure management. IBM Spectrum Symphony software can help deliver faster, better-quality results – even while using a smaller amount of required infrastructure.

The numbers are impressive for IBM® Spectrum Symphony:

- **Scales to 40,000 service instances per application**
- **Provides sub millisecond (ms) latency for grid services**
- **Throughput exceeding 17,000 tasks per second**
- **Reallocates up to 1,000 grid services per second.**

Help reduce infrastructure expenses and management costs

The resource-sharing model in IBM Spectrum Symphony makes it practical to deploy multiple heterogeneous applications on the same shared grid. Plus at the same time preserve LOB ownership while delivering service-level guarantees.

- **Built for your most challenging big data problems**
- **Low-latency Hadoop MapReduce-compatible implementation is built in**
- **Multitenant heterogeneous application architecture**
- **Optimised to accelerate big data workload performance.**

With this extraordinary capability, IBM Spectrum Symphony helps your IT administrators avoid many of the business and technical concerns that often hinder the sharing of resources and lead to discrete, siloed grids. By sharing resources fluidly while preserving ownership, resources are used more fully, delivering better performance and helping minimise infrastructure costs for your enterprise.

A single infrastructure for distributed computing and big data

Analytic workloads are increasingly both compute- and data-intensive. Many types of applications demand fast analyses of vast amounts of data stored using in-memory data grids or distributed file systems.

Unlike other grid management solutions that require a separate infrastructure to support these data-intensive problems, IBM Spectrum Symphony Advanced Edition includes an Apache Hadoop-compatible MapReduce implementation optimised for low latency, reliability and resource sharing. Using this capability, users can run Hadoop and non-Hadoop applications on the same shared distributed infrastructure. In addition, the multitenant architecture of IBM Spectrum Symphony allows multiple MapReduce engines to be deployed on a single shared infrastructure.

Give business-critical workloads the rapid response they need

IBM Spectrum Symphony is able to react almost instantly to changes in application demand, reallocating as many as 1,000 compute engines per second to different workloads depending on sharing policies and application priorities that you define. This can deliver better application performance, better utilisation and a faster response to business-critical demands.

Four editions of IBM Spectrum Symphony

IBM Spectrum Symphony is available in four editions, all of which feature low-latency, high-performance computing (HPC) service-oriented architecture as well as agile service and task scheduling. The editions range in scalability from one or two hosts for IBM Spectrum Symphony Developer Edition, to up to 5,000 hosts and 128,000 cores for IBM Spectrum Symphony Advanced Edition.

IBM Spectrum Symphony Developer Edition: Build and test applications without the need for a full-scale grid (available for download at no cost).

IBM Spectrum Symphony Express Edition: For departmental clusters, this is an ideal, cost-effective solution.

IBM Spectrum Symphony Standard Edition: Choose this version for enterprise-class performance and scalability.

IBM Spectrum Symphony Advanced Edition: Your best choice for distributed compute- and data-intensive applications, including Hadoop MapReduce.

Optional applications to extend IBM Spectrum Symphony capabilities

Several add-on tools and complementary products can be used with both IBM Spectrum Symphony Standard and IBM Spectrum Symphony Advanced Edition. They are all designed to help you do more while spending less.

IBM Spectrum Symphony Desktop Harvesting: This add-on harnesses the resources from available idle desktops, adding them to the pool of potential candidates to help complete tasks. IBM Spectrum Symphony services do not interfere with other applications running on the desktops. Harvested resources are managed directly through the integrated management interface.

IBM Spectrum Symphony Server and VM Harvesting: To take full advantage of your enterprise resources, this addition allows you to tap idle or under utilised servers and virtual machines (VMs). Instead of requiring new infrastructure investments, IBM Spectrum Symphony Server and VM Harvesting locate and aggregate these server resources as part of the grid whenever extra capacity is needed to handle larger workloads, or when the speed of results is critical.

IBM Spectrum Symphony GPU Harvesting: To unleash the power of general-purpose graphic processing units (GPUs), this tool enables applications to share expensive GPU resources more effectively and to scale beyond the confines a single GPU. Sharing GPUs more efficiently among multiple applications, and detecting and addressing GPU-specific issues at run time help improve service levels and reduce capital spending.

IBM Spectrum Symphony Co-Processor Harvesting: Extending IBM Spectrum Symphony to harness idle Intel Xeon Phi CPU resources to build a scalable, high-performance operating environment designed to meet critical service levels and cost structures.

IBM Spectrum LSF Analytics: IBM Spectrum LSF Analytics is an advanced analysis and visualisation tool for analysing massive amounts of workload and infrastructure usage data collected from IBM Spectrum Symphony clusters. It enables you to easily correlate job, resources and license data from multiple IBM Spectrum Symphony clusters for data-driven decision making.

Why IBM?

IBM Spectrum Computing offers a comprehensive portfolio of software-defined infrastructure solutions designed to help your organisation deliver IT services in the most efficient way possible, optimising resource utilisation to speed time to results and reduce costs. These offerings help maximise 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 centre (DC) 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, organisations 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 Symphony, contact your IBM representative or IBM Business Partner (BP), or visit: **ibm.com**/systems/spectrum-computing/products/symphony/

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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