IBM Deep Computing Visualization Solutions for Product Lifecycle Management

IBM Deep Computing and Visualization

Is your business struggling to engineer new products and maintain existing ones with diminished revenue? To be successful, you need to maintain the productivity of your existing R&D installations while allowing them to collaborate with other sites and with your suppliers. You have to balance these objectives against the rising costs of IT infrastructure, and against the demands of efficient and secure inter-companies' collaboration. Visualization and collaboration help you meet these competing demands.

Your designers and engineers generate massive amounts of disparate data in all of their activities. You want to exploit this data to maintain your competitive advantage. Visualization can help you find solutions to key business problems by presenting that data in a form that allows for rapid detection and resolution of potential problems that could hamper manufacturing, cause production

Highlights

- *Inspect massive amounts of design and analysis data through visual analysis and interpretation*
- *View data in all combinations of environments ranging from immersive to thin clients*
- *Allow engineers to access and modify remote data files in real-time as they were local and foster collaboration among teams*
- *Help reduce implementation costs by using commodity components*
- *Scale the visualization solution without sacrificing performance while aiding investment protection*

delays and result in increased production costs. Moreover, visualization will allow geographically distributed teams to collaborate efficiently towards better, more economical and successful products. If you could see, really see, the scope of the data and how disparate datasets interrelate, you could make that insightful breakthrough.

Visualization and collaboration help balance cost and productivity

Visualization and collaboration are keys to unlocking data secrets. An effective visualization solution allows you to do more with less:

- *More data: handle today's large and distributed data volumes and tomorrow's exponential growth*
- *More eyes: give more experts secure access to the visualizations with a rich set of local and remote collaboration tools and environments*
- *More functionality: support efficient decision-making processes via a rich set of data exploration functions*
- *More flexibility: provide modular, configurable systems based on virtualized hardware and software components and standards*
- *Less time: enable fast implementation with easy access to visualization and collaboration capabilities requiring minimal training*
- *Low cost: rely on commodity-based solutions that provide leading price performance, scalability and security*

With a best-practices visualization solution, your teams can collaborate on and see—even around the globe—the visual representations of all appropriate data no matter where it was collected or is located. For example, engineers and designers of a mechanical component can collaborate with scientists at a headquarters location, sharing data and interacting with the same visual models, in real time. Together they can find correlations and detect and resolve issues to help your company make decisions quickly and with a greater degree of confidence.

An effective visualization solution also requires massive computing power and intensive graphics rendering capabilities, meaning you would normally need an extremely specialized and monolithic infrastructure. IBM Deep Computing Visualization solutions offer an alternative approach. Using high performance workstations and innovative middleware leverages the capabilities of the latest generation of commodity graphics adapters to create an extraordinarily flexible and powerful visualization solution.

A flexible, scalable open solution

IBM Deep Computing Visualization solutions use high-performance workstations with NVIDIA graphics providing OpenGL® rendering capability. Running on Linux® with a Gigabit Ethernet or InfiniBand interconnect, middleware manages one or more physical displays as a single logical display and controls the high-performance transmission of graphics commands to appropriate rendering nodes in a manner that is transparent to the user and the application.

This architecture allows you to manage your hardware, applications and data centrally and offers the ability to scale to fit your needs.

The open standards advantage

IBM bases its visualization solutions on the Linux operating system and uses OpenGL interfaces for graphics rendering. IBM is committed to open standards because they offer significant advantages for your business:

- *High performance: built for scalability and flexibility*
- *Cost-effective: open source platform often requires no licensing fees*
- *Flexible: provides complete portability, running on multiple platforms*
- *Built for growth: sets records for cluster computing scalability*

In today's on demand environment, open standards offer the performance and flexibility your business needs to remain competitive.

IBM middleware is the glue

IBM Deep Computing Visualization solutions employ unique middleware that manages the graphics resources of the clustered nodes. The middleware virtualizes the computing, graphics processing, memory and storage, eliminating bottlenecks inherent in the graphics pipeline. The middleware distributes the graphics context from the application—using a seamless intercept method—to the nodes. The nodes perform the requested processing and pass the partially rendered images back to the middleware, which then optimizes the transmission and assembly of complete visualizations to appropriate display or projection technology.

This architecture allows the solution to render visualizations to large immersive cave powerwall or tiled displays, to workstations or to remote thin clients. And because only pixels need to be broadcast throughout the network, your valuable data can remain safe inside your data center. With the rendering performed centrally, all users can expect high performance—no matter where the visualization is being displayed.

Resource virtualization also helps protect your investment by shielding your applications from hardware changes and technology decay. Hardware upgrades and the addition of nodes to the visualization cluster are transparent to applications, meaning you can scale your solution as your visualization needs grow.

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Visualization solutions to meet the dynamic needs of your business:

You need to increase screen resolution and/or size while maintaining performance:

IBM virtualization solutions enable the display of applications on large multiprojector display walls or caves

and/or high-resolution monitors at no, or minimal, performance cost. This feature allows users to make more accurate decisions based on increased display contents.

You need to enable remote use of the application while maintaining performance:
IBM visualization solutions allow remote use of the application by sending the graphics display of the applications to users located anywhere on the network. This feature provides for easier management of graphics applications by keeping the application in one central location, while avoiding unnecessary, costly and potentially insecure data transfers to remote collaborators.

You need to improve the application's graphics performance:
In some cases, the application's performance is limited by the lack of performance of the graphics hardware, or by the large amount of graphics processing required. IBM visualization solutions compensate for this limitation and are designed to provide graphics performance on commodity workstations that goes beyond what can be expected from traditional commercially available graphics adaptors.

For more information

Contact your IBM representative or IBM Business Partner or visit:

ibm.com/servers/deepcomputing/visualization

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