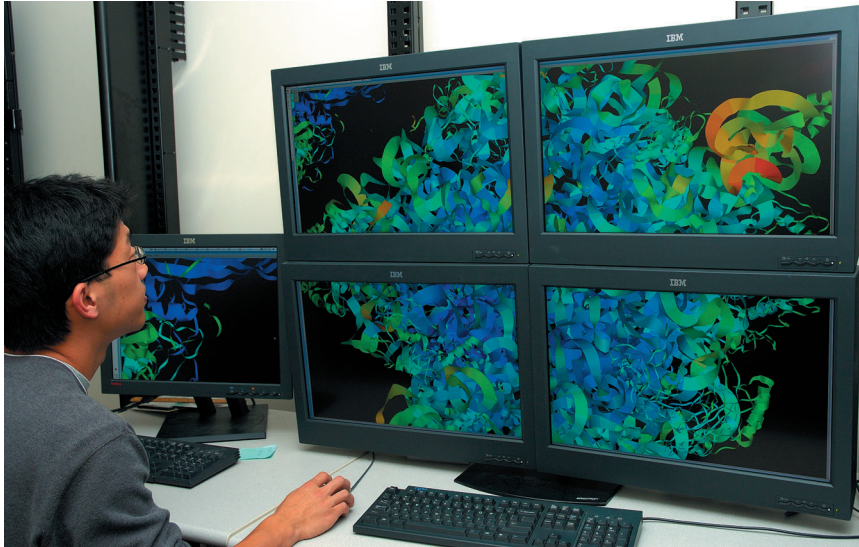


## IBM Deep Computing Visualization: gain insight into your data



### IBM Deep Computing and Visualization

Your business has massive amounts of disparate data. Somewhere in that data is the key to optimizing your revenue stream, responding more effectively to customer needs or mitigating risk and uncertainty. In other words, your next breakthrough may be locked inside that data. If you could see—really see—the scope of that data and how disparate datasets interrelate, you could make that insightful breakthrough.

Visualization is the key to unlocking data secrets. An effective visualization solution allows you to do more with less:

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#### Highlights

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- *Probe massive amounts of complex data through intuitive, visual analysis and interpretation*
- *View data in all combinations of environments ranging from immersive to thin clients*
- *Help reduce implementation costs by using commodity components*
- *Collaborate with colleagues and partners in real-time anywhere*
- *Scale the visualization solution without sacrificing performance while maintaining investment protection*
- *More data: handle today's large and distributed data volumes and tomorrow's exponential data growth*
- *More eyes: give more experts secure access to the visualizations with a rich set of security features, and local and remote collaboration tools and environments*

- *More functionality: support efficient decision making processes made up of rich sets 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 infrastructure requiring minimal training*
- *Less 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. With effective data representations, you can see patterns or find correlations to help you make good decisions quickly and with a greater degree of confidence in your decisions.

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

### **Deep Computing Visualization meets the dynamic needs of your business:**

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

DCV enables the display of applications on large, multi-projector 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:*

DCV allows 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 transfer 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. DCV helps compensate for this limitation and provides graphics performance on commodity workstations that goes beyond what can be expected from traditional commercially available graphics adapters.

|               | <b>IntelliStation Z Pro Z20</b>   | <b>IntelliStation A Pro A10</b> |
|---------------|-----------------------------------|---------------------------------|
| Processors    | Dual Nocona 3.6 GHz               | Dual AMD Opteron 2.2 GHz        |
| Graphics      | NVIDIA GeForce FX3400 PCI-Express | NVIDIA GeForce FX3000(g) AGP 8X |
| Memory        | Up to 12GB ECC DDR2 SDRAM         | Up to 16GB ECC DDR1             |
| Storage       | up to 380GB Ultra 320 SCSI        | up to 380GB Ultra 320 SCSI      |
| Interconnects | Gigabit Ethernet and InfiniBand   | Gigabit Ethernet and InfiniBand |

### **A flexible, scalable open solution**

IBM Deep Computing Visualization solution is built on rack-mounted IBM® IntelliStation® A Pro or Z Pro workstations with NVIDIA graphics adapters providing OpenGL rendering capability. Running on Linux® with a Gigabit Ethernet or InfiniBand cluster interconnect, DCV 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.

### **IntelliStation workstations for performance**

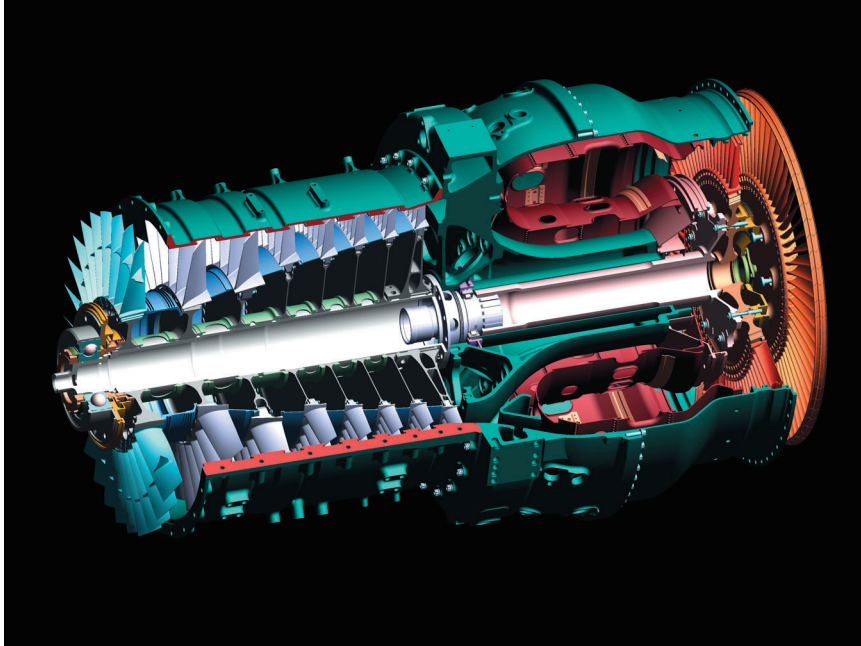
The essential hardware enabler of the solution is a cluster of IBM IntelliStation workstations that function as application hosts and rendering nodes. The IntelliStation Z Pro and A Pro workstations are high-performance graphical workstations based on industry-leading technology. With Intel® EM64T processors (Z Pro Z20) or AMD Opteron processors (A Pro A10), and NVIDIA GeForce FX graphics, the IntelliStation nodes provide the computing and graphics processing power of the DCV cluster.

Either workstation model offers plenty of memory and storage capability for expansion and connectivity. And because the solution is based on modular industry-standard technology, the implementation can be scaled up by adding nodes and updated by swapping out components such as network and graphics adapters as technology evolves.

### **The open standards advantage**

DCV is based on the Linux operating system and uses OpenGL 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.

#### **DCV: the unique infrastructure choice**

DCV employs a unique middleware that manages the graphics resources of the clustered nodes. The middleware virtualizes the computing, graphics processing, memory and storage, alleviating bottlenecks 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 DCV 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.

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

#### **For more information**

Contact your IBM representative or IBM Business Partner or visit:

**ibm.com**/servers/deepcomputing/visualization



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