



# HPCVL

## KEY HIGHLIGHTS

**Company**  
HPCVL

**Industry/Market**  
Education

### Applications/Solutions

- Sun high performance computing environment containing 192 UltraSPARC® III processors and many other Sun hardware and software products

### Products/Services

- 4 Sun Fire™ 6800 servers (24 CPUs each), soon to be expanded to 8
- 1 Sun Blade™ 1000 workstation
- 3 Sun Blade 100 workstations
- 1 Sun Enterprise™ 220R server
- Sun StorEdge™ T3 disk arrays (3.9 TB, soon to be expanded to 6.5 TB)
- Solaris™ 8 Operating Environment
- Sun HPC ClusterTools™ 3.1 software
- Forte™ Developer 6, Update 1
- Sun Grid Engine 5.2.2 software
- Solaris Resource Manager™ v1.2 software
- Sun Management Center 3.0
- Solstice DiskSuite™ software
- Veritas Volume Manager

### Key Business Challenges

- Implement HPC environment capable of satisfying the most demanding applications of four universities
- Provide secure remote access from any browser-equipped device
- Establish strong, multi-faceted partnership with an HPC industry leader

### Key Business Solutions

- Powerful Sun HPC environment in production, reliably serving the needs of 150 users
- System growth on track to become one of the world's top 100 HPC environments
- Rich relationship with Sun including chair and fellowship funding, HPC workshops, and Centers of Excellence

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*Dr. Kenneth Edgecombe  
Executive Director  
HPCVL*

HPCVL, a consortium serving the high performance computing (HPC) needs of four Canadian universities, has deployed a massive HPC environment based on technology from Sun Microsystems, Inc. Highlights of the environment include four Sun Fire™ 6800 servers totaling 96 processors and 3.9 TB of storage on Sun StorEdge™ T3 disk arrays, with much more soon to be added.

Sun was selected over a number of vendors to satisfy the demands of HPCVL's computationally demanding applications because of Sun's innovative technology and its equally innovative proposal to partner closely with HPCVL. As computing demands grow, the system will be expanded to the point that by mid-2002 HPCVL hopes it will be among the top 100 high performance computing environments in the world.

## Four Universities Team to Establish World Class HPC Facility

HPCVL, the High Performance Computing Virtual Laboratory, was formed in 1998 by a consortium of four universities located in eastern Ontario – Queen's University, Carleton University, The Royal Military College of Canada, and the University of Ottawa - as a centralized resource for HPC.

To better access funding for a new HPC solution, HPCVL had to perform extensive

due diligence and provide substantial justification for its chosen computer system vendor. HPCVL wanted not just a supplier of leading edge HPC technology, but a partner that would collaborate closely in creating and running a world-class center of high performance computing. An initial cut narrowed the field to Sun and IBM. After a detailed examination of the two finalists' proposals, even though the incumbent platform was a 32 processor IBM SP computer, HPCVL chose Sun.

## Innovation in Technology and Partnering Distinguish Sun

“Why did we select Sun? In a word, innovativeness,” said Dr. Kenneth Edgecombe, Executive Director of HPCVL. “Sun proposed highly innovative technology, which was very important of course, but what really distinguished Sun was the innovative partnering proposal they made. Other factors were Sun's well-deserved reputation for robustness and reliability, price/performance, and the wide range of Sun products that run a common operating system – the highly regarded Solaris™ Operating Environment. We'd had positive experiences with Sun, and developed strong relationships with Sun people. We also felt good about Sun's future directions based on a blueprint Sun shared with us under their blueprints program.”

The order was placed in spring of 2001 and equipment deliveries began shortly afterward. The system entered production use on July 3. Within three months research projects consumed 100 percent of its resources, and so HPCVL placed an order for additional servers and storage in October of 2001 to more than double its capability.

**“By summer of 2002, we hope to be one of the top 100 HPC computing environments in the world. I expect our partnership with Sun to expand as well. From both a technology and a partnering perspective, the only word to describe Sun is excellent. We’re very pleased with the choice we made, and looking forward to even greater collaboration in the future.”**

*Dr. Kenneth Edgecombe  
Executive Director  
HPCVL*

As of November 1, 2001, four Sun Fire 6800 servers with 24 CPUs each provide the bulk of HPCVL’s computing power. The system also contains a total of 3.9 TB of storage on Sun StorEdge T3 disk arrays, three Sun Blade™ workstations, and a Sun Enterprise™ 220R server. Sun HPC ClusterTools™ software unites the Sun Fire servers such that large computing tasks can be divided up among them, and Sun Grid Engine software balances their loads and provides for batch administration. All development of HPCVL’s applications is performed using Forte™ Developer tools. The entire system runs on the Solaris™ 8 Operating Environment.

The new order adds four more Sun Fire 6800 servers with 24 new 900 MHz CPUs, more than doubling computing capacity. It also adds 2.6 TB of Sun StorEdge T3 storage, for a total of 6.5 TB.

Over 150 users count on the Sun HPC environment for their most computationally intensive applications. Among the disciplines that use it most extensively are computational chemistry, physics, psychology, economics, mechanical engineering, and computer science. These users require flexibility and power to ensure they are able to execute complex applications without impacting the overall system performance. With Solaris Resource Manager™ software, HPCVL is able to easily allocate the system resources as needed.

## Sun Comes Through on All Fronts

“We’re very pleased with the system’s performance, reliability, and scalability,” reported Edgecombe. “We’ve tested scalability across as many as 40 processors, and we found that some programs scale almost linearly. The overall feel of the system is one of maturity and stability, which I credit to the Solaris 8 Operating Environment and the fact that it spans the entire Sun product line. The Forte development tools deserve special mention. They’re excellent and extremely important to us.” In addition, HPCVL has found that Sun Management Center 3.0 software has provided them with a simplified way of monitoring and managing the Sun system.

“From a relationship viewpoint Sun has proven to be the true partner we hoped they’d be,” Edgecombe continued. “We’re one of only three universities in the world with an on-site Sun system engineer, and we receive high quality account management at two levels in Sun’s hierarchy. Sun is funding chairs at our member universities as well as graduate student fellowships, and has HPC workshops for our researchers scheduled. Most significantly, Sun is about to make us a Sun Center of Excellence in Grid and Portal Computing.”

The plan for a Grid and Portal Computing Center of Excellence is a result of a joint project currently underway to migrate the remote usage model from today’s telnet sessions to tomorrow’s true portal computing. Any authorized user will be able to access the system from any location using any browser-equipped device, with total security.

HPCVL expects usage of the system to continue growing rapidly, and already has further expansion in the plan. “By summer of 2002, with Sun’s scalability and the increases in computational power demands that we forecast, we hope to be one of the top 100 HPC computing environments in the world with as many as 300 processors in place,” said Edgecombe in closing. “I expect our partnership with Sun to expand as well into more research interactions, co-sponsored events, and perhaps other Center of Excellence areas. From both a technology and a partnering perspective, the only word to describe Sun is excellent. We’re very pleased with the choice we made, and looking forward to even greater collaboration in the future.”

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