

## Intel® Cluster Ready— Making HPC Simpler

Boost productivity. Solve tough challenges. The Intel® Cluster Ready program makes it simpler to capture the power of high-performance computing.

### Program Brief

Intel Cluster Ready  
High-Performance  
Computing



High-performance computing (HPC) is a key differentiator and productivity engine for business. With the Intel® Cluster Ready program, businesses can exploit the power of high-performance computing more rapidly, easily, and cost-effectively.

Developed collaboratively with hardware and software vendors, the Intel Cluster Ready program makes it simpler to buy, deploy, and manage an HPC cluster. Intel Cluster Ready helps ensure application and component interoperability—from the minute you first power up the cluster through the lifetime of the system.

And, with an Intel Cluster Ready system powered by the new Intel® Xeon® processor 5500 series, you can unleash even more parallel processing performance. Simulate, analyze, and visualize more complex models faster, and accelerate your data-intensive applications—all in a smaller, denser, and more energy-efficient footprint. The net impact: Faster time to value, lower total cost of ownership (TCO), and greater business impact.

**“UniCluster  
minimizes  
both our initial  
and long-term  
investments  
in HPC.”**

Ljubomir Buturovic,  
Chief Scientist,  
Pathwork Diagnostics



## Why Intel Cluster Ready?

- **Find the right configuration, right away.** Intel Cluster Ready takes the complexity out of purchasing an HPC cluster. Choose a certified Intel Cluster Ready system and reduce the time and risk of selecting a collection of independent hardware components for your applications. Certified Intel Cluster Ready systems have been thoroughly tested to ensure component interoperability.
- **Know that it works.** With a certified Intel Cluster Ready system and registered Intel Cluster Ready applications, you can be confident that all the components will work together, right out of the box. Software tools such as Intel® Cluster Checker help ensure those components continue to work together, delivering a high level of quality and low TCO over the course of the cluster's lifetime.
- **Solve new problems.** Capitalize on the power of an Intel processor-based HPC cluster to enhance productivity and solve new problems. Intel Cluster Ready helps you realize HPC benefits faster by ensuring application and system interoperability.

## Industry Cooperation to Accelerate HPC Use

### Built and Tested for Interoperability

To lay a foundation for interoperable HPC clusters, Intel teamed up with leading HPC vendors and defined the Intel Cluster Ready Specification. This specification—which includes requirements for hardware, software, manageability, and functionality—provides a common basis for building clusters and registering applications for HPC.

## Tools to Make Cluster Configuration Even Easier

- **Protecting one of your most precious commodities: Time**  
Univa's ICR-certified cluster products allow users to get their HPC cluster up and running faster. By reducing manual tasks and streamlining acquisition, installation, configuration, and setup, we reduce overall time to value.
- **Making life easier for cluster users**  
Simplify the process of getting your cluster up and running. ICR-certified UniCluster products reduce time-intensive manual tasks and make it easier to detect, determine, and resolve performance faults. So cluster users and administrators can put their attention back where it belongs: on the work at hand, not the technology that runs it.
- **Saving money**  
With ICR-certified products from Univa UD, cluster users eliminate unnecessary investments, reduce time-intensive DIY activities, and reduce costly job scheduling maintenance by 75% or more.
- **Increasing efficiency**  
With ICR-certified products from Univa UD, cluster users can simplify processes to optimize personnel bandwidth and can quickly detect, determine, and resolve performance faults.

## Intel® Cluster Ready Program

### Intel® Cluster Ready Is:

- A program to make it easier for end users to buy, deploy, and maintain clusters

### End User HPC Cluster Needs:

- To Get Their Job Done
- Cluster Server with Enterprise Characteristics

Platform Solutions Provider

ISV Application

OEM Hardware and Component HW

+

### Intel Cluster Ready:

- Platform Specifications
- Reference Designs
- HW Certification
- Application Registration
- Tools, Labeling, and Marketing

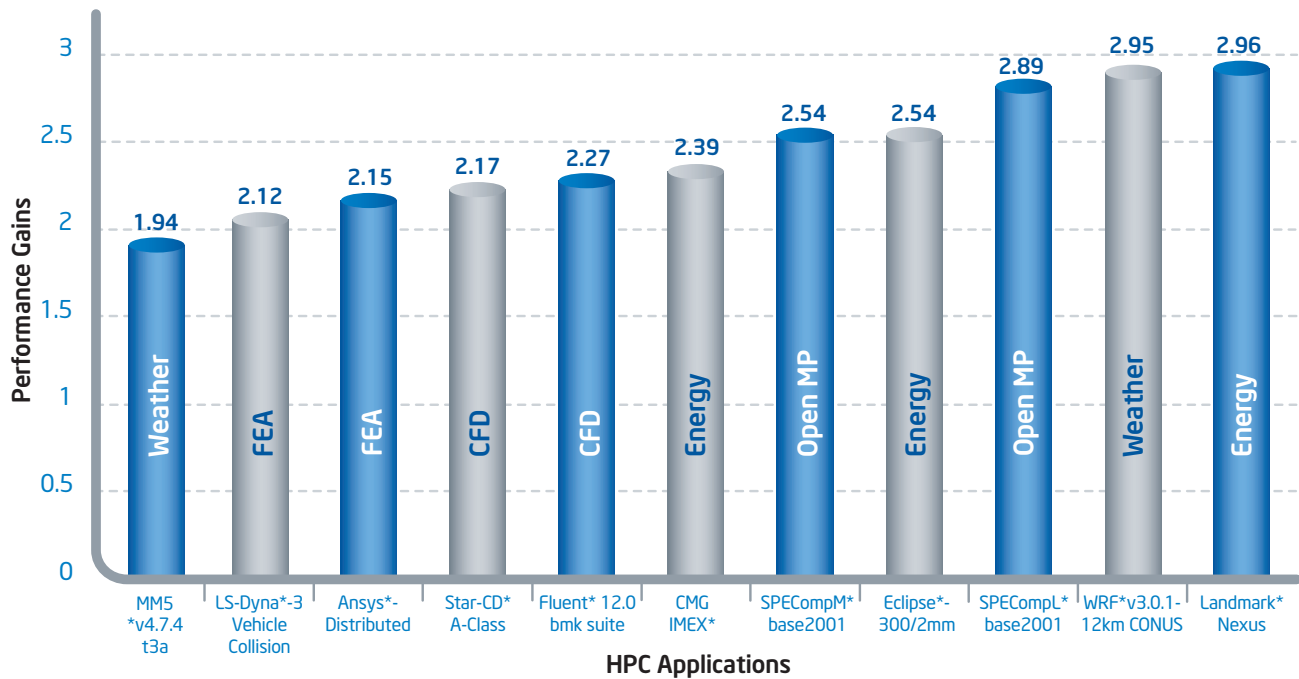
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**Figure 1.** Intel teamed up with leading hardware and software vendors to make it easier to buy, deploy, and maintain HPC clusters—and exploit the high performance of Intel® processor-based high-performance computing.

## Game-Changing HPC Application Performance

Intel® Xeon® processor 5500 series vs. Intel Xeon processor 5400 series



**Figure 2.** Performance gains using the Intel® Xeon® processor 5570 series compared with the Intel Xeon processor 5482 series on HPC applications. Results published, submitted, or approved on March 30, 2009.

The Intel Cluster Ready Specification helps ensure that each cluster component conforms to industry standards or, if no standard exists, best-of-class practices. Intel provides the specification to hardware vendors, software vendors, and systems integrators so they can build certified Intel Cluster Ready clusters and develop registered Intel Cluster Ready applications.

By creating a common basis for clusters, the Intel Cluster Ready Specification helps you maintain interoperability while customizing a cluster to meet your specific needs. Choose from a variety of hardware and software components that conform to the specification, both when you first deploy the cluster and as your requirements change. And enjoy the assurance that certified clusters are built according to the Intel Cluster Ready Specification and rigorously tested for component interoperability.

**“Migration to the UniCluster environment was easy, because Univa UD has simplified the process of installing, configuring, and managing the cluster.”**

*– Top 20 Global Pharma*

### Intelligent Performance to Accelerate Innovation and Discovery

Intel® Cluster Ready systems powered by the Intel® Xeon® processor 5500 series deliver intelligent performance for today’s most complex HPC challenges. By providing dynamic performance capabilities, energy efficiency advances, and more than triple the memory bandwidth of Intel’s previous-generation dual-socket architecture, the new Intel® Core™ microarchitecture can increase your total HPC application performance up to threefold without requiring added investment in software development or greater power and cooling support for your data center. Key enhancements include:

- Dynamic management of cores, threads, cache, interfaces, and power for performance when you need it
- Intel® Turbo Boost Technology for automatic increases in processor frequency of up to 400 MHz
- Integrated memory controller, delivering up to 18.11GB/sec of memory bandwidth per socket
- Intel® QuickPath Architecture to unleash memory-bound applications

## Registered, Validated Applications

Registered Intel Cluster Ready applications have been validated on a certified Intel Cluster Ready cluster. To register an application, Intel or a participating vendor demonstrates that the software can run real-world workloads successfully on a certified cluster. When the software passes the test, Intel issues the Intel Cluster Ready registration to the software vendor and posts the application version and requirements on a public Web page.

Because registered applications are developed to run on clusters with the same base specification, you can run multiple registered applications on the same certified Intel Cluster Ready cluster without having to rebuild the software stack or reconfigure the hardware. Run different applications on different days. By taking advantage of this enhanced flexibility, you can optimize your HPC resources and enhance productivity without adding costs or complexity.

## Ready to Grow

Systems integrators have created reference designs or recipes with certified Intel Cluster Ready clusters and registered software. When you need to expand your HPC infrastructure or deploy a cluster for another business group, you can use the appropriate recipe to create an exact copy of your cluster. Because the new system is Intel Cluster Ready, you can be confident that hardware and software will work together as they should.

**“Intel® Cluster Ready establishes a baseline specification that dramatically reduces the time-to-value for cluster technology users. The program simplifies the critical first stages of HPC life cycle management, from acquisition and testing through deployment, so cluster users can more quickly reach the stage they care about most: utilization and growth.”**

*– Gary Tyreman, Univa UD Vice President and General Manager of High Performance Computing*

## Simpler Management

Intel Cluster Checker is an essential software management tool that helps make sure system components continue to work together over the cluster's lifetime. Provided free with all certified Intel Cluster Ready clusters, Intel Cluster Checker analyzes the cluster's configuration to be certain it remains within certification. If a software update causes software conflicts or a cable comes loose, Intel Cluster Checker identifies the problem quickly and provides detailed diagnostic information.

Use Intel Cluster Checker to reduce the time spent troubleshooting and minimize the need for specialized support skills. Run Intel Cluster Checker regularly to enhance system reliability and ensure optimal performance.

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**Learn more. Visit [www.intel.com/go/cluster](http://www.intel.com/go/cluster) to see which applications are Intel Cluster Ready and where to buy a certified Intel Cluster Ready system.**

**For more information on UniCluster HPC products, visit [www.univaud.com/hpc/products](http://www.univaud.com/hpc/products), and see for yourself how Univa UD's Intel Cluster Ready certified products can benefit you.**

**Tap into the power of high performance computing and get more out of your Intel Cluster Ready system. Join [ClusterConnection.com](http://ClusterConnection.com), a resource for the Intel Cluster Ready community.**

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\*Intel internal measurement (Feb. 2009). STREAM-Triad benchmark. Red Hat Enterprise Linux\* Server 5.3. Intel® Xeon® processor E5472, 3.0 GHz, 2x6MB L2 cache, 1600MHz system bus, 16GB memory (8x2GB FB DDR2-800) vs. Intel Xeon processor X5570, 2.93 GHz, 8MB L3 cache, 6.4QPI, 24GB memory (6x4GB DDR3-1333).

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