

### Overview

### Models

PDC/O5000 9i W2K Cluster Kit

252478-B24

### Introduction

The HP Parallel Database Clusters (PDC) for Windows® are multi-node shared storage clusters, specifically designed, tested and optimized for Oracle Real Application Cluster (RAC) databases. These platforms have evolved through years of joint engineering work with Oracle. HP customers worldwide in a variety of application environments have successfully deployed them.

The PDC Cluster Kits are a set of tools and configuration support specifically packaged to reduce the complexity and time to deployment of Oracle RAC cluster environments. The PDC Cluster Kits include detailed documentation of best practices for the implementation of RAC, installation scripts (Linux version only) and utilities, test scripts and processes for validating your installation and entitlement to specialized PDC support should you encounter any issues during installation. The PDC program includes on-going testing of the PDC configurations to ensure compatibility with Oracle, and Operating System updates over time.

The PDC family of products are available in a full range of deployment options from 'do-it-yourself' to fully 'pre-installed', each specifically designed to reduce complexity and minimize time to deployment while reducing overall solutions cost.

The HP Parallel Database Cluster for Windows RAC Model O5000-EVA is a multi-node shared storage cluster optimized for Oracle Real Application Clusters running in the Windows environment. This solution delivers high availability and scalability for Oracle database environments, at a much lower total cost of ownership than traditional mid-range Unix solutions.

### Description

The HP Parallel Database Cluster (PDC) for Windows RAC Cluster Kits support multi-node clusters of HP ProLiant servers running Oracle Real Application Clusters. PDC for Windows clusters are comprised of:

- Select HP ProLiant Servers with the high availability and scalability features demanded by scale-out, shared-storage environments like Oracle Real Application Clusters.
- HP StorageWorks MSA1000 or Enterprise Virtual Array (EVA 3000 or EVA 5000) Fiber Channel SAN environments for entry level to high end performance and scalability.
- StorageWorks Secure Path (included in Windows Kits only, purchased separately for Linux) for no-single-point-of-failure I/O redundancy.
- Ethernet or Gigabit Ethernet dedicated cluster Interconnects utilizing the HP ProCurve family of Network switches.

For details refer to the PDC for Windows Support Matrix for details at: [www.hp.com/solutions/highavailability/oracle](http://www.hp.com/solutions/highavailability/oracle)

The HP Parallel Database Cluster (PDC) for Windows RAC Cluster Kit includes:

- User Installation and Administrators Guide for cluster specific components
- Test tools and processes for validating your installation
- SecurePath for Windows Workgroup licenses (2) and software
- Installation and configuration support entitlement from PDC Support specialists

The PDC family of products are available in a full range of deployment options from 'do-it-yourself' to fully 'pre-installed', each specifically designed to reduce complexity and minimize time to deployment while reducing overall solutions cost.

- 'Do-it-Yourself' installation is enabled and support through the HP Parallel Database Cluster Kit. The kit accumulates the knowledge necessary and provides specialized tools and scripts that simplify the process. Should you have any issues completing an installation, the kit entitles the owner to escalated phone by PDC specialists.
- Fully 'Pre-configured' solutions are available from select HP integration Partners in North America and Western Europe and through HP Custom Systems in Asia Pacific.
- Between these two deployment extremes HP offers flexible Service packages from basic install. Utilize the PDC Cluster Kit HP Services will implement a sample database RAC environment on site or provide a custom deployment configured to your specific database environment up to and including a back up and recovery environment.

# QuickSpecs

## HP Parallel Database Cluster for Windows Oracle9i Real Application Clusters Model PDC/O5000-EVA

### Product Highlights

#### Maximum Availability, Minimum Cost

The Parallel Database Cluster for Windows Model PDC/O5000-EVA combines the features of the industry leading ProLiant and StorageWorks product lines into a tightly integrated solution. With five years of experience developing solutions for Oracle shared storage clustering (initially Oracle Parallel Server (OPS) and now Oracle Real Application Clusters (RAC)) we have identified a select set of hardware and software configurations ideally suited for the RAC environment.

The PDC for Windows recommends ProLiant DL servers in 2, 4 or 8 processor models which incorporate all of the advanced high availability features of ProLiant - hot plug power, fans, PCI and now even memory can be added dynamically.

The StorageWorks Enterprise Virtual Array (EVA) is the newest generation of the StorageWorks Disk Array that is enabled by VersaStor technology. EVA is a high performance, high capacity and high availability "virtual" RAID storage solution for the high-end enterprise class marketplace that removes the time, space and cost boundaries of traditionally architected storage. EVA is designed for the data center where there is a critical need for improved storage utilization and scalability while meeting application specific demands for consistently high transaction I/O and MB data rate performance, seamless capacity expansion, instantaneous replication, and simplified storage administration.

Fully redundant I/O is supported through HP Secure Path multi-path management software. By implementing this option a no-single-point-of-failure SAN environment is possible. Two SecurePath licenses and software are included in the Cluster Kit for convenience. Additional licenses for larger configurations are purchased separately.

The PDC for Windows also recommends and documents implementation of a fully redundant Gigabit Ethernet Cluster Interconnect leveraging the cost effective HP ProCurve Gigabit Ethernet switches and HP network interface cards.

The PDC for Windows is an all-HP configuration, which allows optimal integration with HP management tools, and one-call support. It provides significantly improved uptime and lower operating costs than multiple single-server or proprietary database implementations.

#### Reliable and Repeatable

The HP Parallel Database Cluster Program works to:

- Define a repeatable and supportable installation process and then put this through quality control and field testing.
- Develop a set of installation test tools that our customers can utilize to validate each major phase of the installation and ensure on going compatibility with HP and Oracle RAC requirements. (ongoing work)
- Document processes in detail and provide work-arounds or technical notes where standard installation tools do not function as expected.
- Work to automate as much of the process as possible to reduce implementation time.
- Provide investment protection by establishing and on-going road map of testing for component updates

Processes are designed to complete installation as efficiently as possible and result in a known good configuration. At the same time these processes are designed to educate, and provide a model for, end user specific configuration and modification. For more details see the Parallel Database Cluster Product Overviews at

[www.hp.com/solutions/highavailability/oracle](http://www.hp.com/solutions/highavailability/oracle)

#### All-HP solutions backed by PDC Support specialists

Because the Parallel Database Cluster is built exclusively from HP hardware technology, support is simplified. Any issue with the cluster can be directed to HP Support Call Centers Globally. Front line support will look to isolate component failures and basic configuration issues. More complex system or cluster level issues will be escalated to the Parallel Database Cluster Support specialists. The specialists have access to every Parallel Database Cluster configuration for use in replicating issues and diagnostics.

#### Automatic online recovery

Oracle Real Application Cluster (RAC) software provides maximum availability for Oracle environments running on an industry standard platforms - the HP Parallel Database Cluster. In the event of a node failure, the remaining nodes continue to access the database. Users of the failed node can automatically be redirected to another node in the cluster and continue processing. The surviving nodes automatically recover all of the transactions performed by the applications before the failure occurred, ensuring data integrity.

# QuickSpecs

## HP Parallel Database Cluster for Windows Oracle9i Real Application Clusters Model PDC/O5000-EVA

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### *Product Highlights*

#### **Data integrity and database consistency**

Each instance of the Oracle database is allocated its own mirrored, multi-segment redo logs that store transactions not yet written to the database. If a node or an Oracle instance fails, the remaining nodes use the redo log from the failed node to bring the database back to a consistent state. The Oracle Distributed Lock Manager ensures data consistency and supports multi-initiator access to the storage environment.

With Oracle providing all of the clustering software components and HP providing all of the hardware and Operating System support a true one call support model is a reality.

### Components

|  |   |
|--|---|
| <b>Servers</b>                                     | <p>The PDC for Windows cluster supports select ProLiant servers. Please refer to the PDC for Windows Certification Matrix for supported ProLiant Server models in the PDC for Windows configurations. The following limitations and recommendations apply when selecting server nodes:</p> <ul style="list-style-type: none"><li>● Each server should have a minimum of 2 processors to ensure stable performance under load</li><li>● Each ProLiant server in the PDC for Windows Cluster is recommended to have a minimum of 2 GB of memory.</li><li>● Combinations of the supported PDC server models can be used to accommodate future cluster expansion etc. It is highly recommended that matched servers be used wherever possible as additional tuning and load balancing complexities will result from seriously unbalanced configurations.</li></ul>  |
| <b>Storage</b>                                     | <p>The PDC for Windows Model PDC/O5000-EVA configuration has been certified with HP StorageWorks Enterprise Virtual Array (EVA3000 and EVA5000) as shared storage.</p> <p>The EVA solutions are built with new storage assembly enclosure packaging. The packaging consists of a 3U FC Vraid dual controller assembly; the HP StorageWorks Enclosure and 14-bay FC drive enclosures. The controller and drive enclosures are independent of each other to allow a wide range of configuration options. The EVA pre-defined models are designed to address medium to high capacity needs as well as high performance options in commercial environments. The EVA's redundant architecture and value added software eliminates single points of failure from server to storage in clustered or single server configurations with multi-pathing.</p> <p>For additional information on the StorageWorks Enterprise Virtual Array (EVA3000 and EVA5000) please see: <a href="http://h18006.www1.hp.com/storage/array systems.html">http://h18006.www1.hp.com/storage/array systems.html</a></p> <p>The PDC for Windows includes HP StorageWorks Secure Path software which enables multi-path management and automatic failover and recovery resulting from controller, HBA, switch or cabling failures.</p> |
| <b>Cluster Interconnect</b>                        | <p>The PDC for Windows supports single-path or fully redundant fast Ethernet or Gigabit Ethernet cluster interconnects and/or public LAN connections.</p>   |
| <b>Cluster Kits</b>                                | <p>The HP PDC/O5000-EVA Cluster Kit (Part # 252478-B24) contains:</p> <ul style="list-style-type: none"><li>● User Installation and Administrators Guide for cluster specific components, including site preparation information best practices</li><li>● Hp RAC Installation Test Tool to validate installation and configuration</li><li>● HP SecurePath MultiPath software - two licenses and software</li></ul> <p>In addition, purchase of the PDC for Windows cluster kit entitles you to specialized PDC Support should you encounter any issues during installation.</p>  |
| <b>Supported Operating Systems</b>                 | <p>The PDC/O5000-EVA supports the Windows Advanced Server Operating System for the latest versions and Support Packs supported for use with the PDC see the PDC Support/Certification Matrix.</p>   |
| <b>Oracle Real Application Clusters</b>            | <p>Oracle Real Application Clusters are implemented using the standard Oracle Enterprise Server product and the Real Application Clusters option. Separate licensing is required for each, contact your Oracle representative or the Oracle On-Line Store for details. No other clustering software components are necessary. For the latest version of Oracle RAC verified for use with the HP Parallel Database Cluster see the PDC Support Matrix.</p> <p>Other valuable options include the use of the Oracle Cluster File System or a third party cluster file system for improved manageability and flexibility. The Oracle Cluster File System (OCFS) is an optional component on the standard Oracle distribution. It is important to note that OCFS is only to be used for Oracle files. No other application or file sharing is allowed.</p>  |
| <b>PolyServe Matrix Server cluster file system</b> | <p>The PolyServe Matrix Server cluster file system has also been tested on the HP Parallel Database Cluster and has proven to be a stable and valuable addition to many RAC installations. Matrix Server is particularly valuable where a larger Linux infrastructure beyond the Oracle environment is involved. Matrix Server is a general purpose file sharing environment for Linux versus the special purpose cluster file system developed by Oracle for RAC. HP offers direct support for the PolyServe cluster file system option.</p>   |

### Components

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#### Service and Support

HP Customer Services organization has participated in the definition and delivery of supporting services for the PDC for Windows product. The HP Oracle RAC Express Service provides design consultation, Installation, and customization of Oracle RAC on ProLiant. Additional information about the Oracle RAC Express Service (part number H9147A) is available at [http://www.hp.com/hps/partners/pa\\_oracle.html](http://www.hp.com/hps/partners/pa_oracle.html) or call 1-800-289-9052.

HP servers and storage systems are protected by HP Services including a three-year limited warranty<sup>1</sup>, 7 x 24 hardware technical phone support and on-line support through CompuServe, Prodigy, America Online and the Internet. For more information on support offerings for your HP hardware, contact your HP Authorized Service Provider.

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#### HP Oracle9i RAC express service (US and Canada only) HP P/N H9147A

HP Oracle9i RAC express service should be purchased en lieu of SAN Solution Service. As part of the HP Oracle9i RAC solution service, the install and configuration normally provided by the SAN Solution Service is performed by HP's solution architects and consultants in addition to the following tasks:

- Evaluate the business objectives for the Oracle9i RAC solution and make recommendations for additional platform clustering software as applicable given your availability requirements
  - Tailor the service to your exact needs
  - Evaluate the application environment for compatibility and best performance with the Oracle9i RAC solution
  - Evaluation and examination of the application and data model for scalability and performance
  - Architect and design the Oracle9i RAC database cluster
  - Install, configure and customize Oracle9i RAC software per the design
  - Optionally provide integration with enterprise management solutions such as HP OpenView using the Oracle SPI
  - Optionally provide integration with enterprise backup solutions for HP (Data Protector), Legato (Networker) and VERITAS (Netbackup)
  - Optionally provide integration with HP's market leading partitioning and resource and workload management tools (PRM and WLM)
  - Optionally provide performance tuning or capacity planning, including tuning of the database parameters, transactions, operating system and storage devices
  - Test the implemented environment against predefined failure scenarios
  - Provide engagement management for coordination of HP consultants
  - Provide mentoring and documentation for the new high availability environment
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