



Oracle9i Real
Application
Clusters on
OpenVMS

example
configuration

ORACLE

HP AlphaServer parallel database cluster

parts for 2 racked systems: AlphaServer ES45

description	quantity	part #
• HP AlphaServer ES45 68/1000 M2B 1GB UNIX	2	DA-68DBA-BA
• HP AlphaServer ES45 model B 1085W power supply	4	3X-H7514-AA
• HP AlphaServer ES45 rack kit, M-series (carbon)	2	BA61R-CR
• CSS hardware integration and test per cabinet	1	YT-CSSIT-01
• M-series cabinet (black)	1	H9A15-ME
• M-series cabinet power strip assembly	2	3X-H7601-AB
• rear external kit rear, (black)	1	H9C15-ZE
• front door kit	1	H9C15-ZF
• power distribution unit, 240V, 16A, C13, L6-20P	1	H7600-EB
• blank bezel kit (black), 1U-6U	3	H3400-AE
• cable assembly power cords (3 COND,SPT-2)	20	17-04285-04
• virtual keyboard cable for UNIX	2	2T-H7085-GU
• KVM console cable, 12	2	3R-A0719-AA
• 4-port switch box	1	3R-A0716-AA
• 1U TFT5600RKM 15" monitor, international	1	3R-A3498-AA
• 330-001/158649-001KYB keyboard	1	3R-A2928-AA
• 1U keyboard drawer	1	3R-A0632-AA
• 1U keyboard shelf mounting kit	1	2T-1UKBD-01
• rail extension kit, 3U	3	2T-QH915-03
• label, REGUL, UL/CSA series H9A1	1	36-45536-15
• SCSI drive cage, 6 slot @ 1.0	2	BA610-6D
• 18GB 10K U3 UNI HP hard disk drives	3	3R-A0585-AA
• two channel Ultr3 SCSI adapter	2	3X-KZPEA-DB
• PCI to dual 10/100 UTP ethernet	4	3X-DE602-BB
• 3DLab Oxyen VX1 32MB PCI graphics card	2	SN-PBXGF-AB
• PCI MC 2 controller	4	CCMAB-AA
• cable assembly, 100COND,RND,SHLD,28AW	2	17-04563-02
• PCI-Fibre Channel Host Bus Adapter (HBA) 2GB	4	DS-KGPSA-DA
• cable assembly, UTP stranded 24 A	4 pair	17-03212-04
• alternate: cable assembly, 4STP,24AWG, shielded, 8	4	17-03194-04
• trunking 25x80 ref 21165 (2 meters)5	5	2P-438SA-05
• black bowl tire 113002101	100	2P-438UA-01
• plastic rivet rf 113000269902	12	2P-438WA-02
• grommet RICHCO	1	2P-4109A-00
• SW LC/SC FC cable (5 meters)	4	3R-A2977-AA

parts for HP StorageWorks

description	quantity	part #
• HP StorageWorks 2200 ECB	2	DS-SE2CS-CB
• G80 DRM ALL 8.xP-8.6-4P ALL	2	QB-6BUAA-SD
• G80 SW U/A LIC/MCD/DOC V8.6B	1	QB-65RAB-SE
• 4354R US ULT3 RKMT DU bus	3	DS-SL13R-BA
• SW SAN switch 2/16, 2 power supplies	2	DS-DSGGD-BA
• 36GB 10K U3 UNI HP hard disk drives	4	3R-A0919-AA
• 2GB SFF-SW kit	8	3R-A2973-AA
• cable assembly shielded, 34 TWP,6	6	17-04377-03
• M2 shelf	1	DS-SE2ZS-C8
• controller without ECB cable kit	2	DS-HSG80-BK
• 251MB cache upgrade (2X128MB)	2	DS-HSDIM-AC

cluster interconnect

description	quantity	part #
• Cisco Systems C3508G XL	2	2T-C3508-01
• bracket, DECNISUNIF, support	2	74-61314-01
• 1000BaseSX SW GBIC	4	2T-A0311-RL
• PCI to GbE SX adapter	4	DEGPA-SA
• SC-SC DUAL FO CBL, MM, PP, 4.5M	4	BN34B-4E

HP OpenVMS operating environment and documentation

description	quantity	part #
• HP OpenVMS cluster V/A traditional license	2	QL-MUZAE-AA
• HP HP OpenVMS/AlphaServer CD-ROM and documentation kit	1	QA-MT1AA-H8
• SW LP PKG V/A CD-ROM and documentation kit	1	QA-03XAA-H8
• HP AlphaServer ES40 instruction/configuration guide for Oracle9i Real Application Clusters	1	EK-EBC45-IG

Oracle9i Real Application Clusters

The Oracle9i Real Application Clusters is a computing environment that harnesses the processing power of multiple, interconnected computers, and unites the processing power of each component to become a single, robust computing environment. A cluster generally comprises two or more computers, or nodes.

In Real Application Clusters environments, all nodes concurrently execute transactions against the same database. Real Application Clusters coordinate each node's access to the shared data to provide consistency and integrity of the data. Harnessing the power of multiple nodes offers obvious advantages. A large task when divided into subtasks and distributed among multiple nodes can be completed faster than if only one node did the work. Cluster database processing is clearly more efficient than sequential processing. It also provides increased performance for processing larger workloads and for accommodating growing user populations.

Real Application Clusters can effectively scale the application to meet increasing data processing demands. As resources are added, Real Application Clusters can exploit them and extend their processing powers beyond the limits of the individual components. The multiple instances of the Oracle9i Real Application Clusters act as a single logical database, reducing the administrative costs associated with complex distributed data management. Multiple nodes can provide application availability while scaling beyond the capabilities of one server.

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Oracle9i Real Application Clusters Guard

Oracle9i Real Application Clusters Guard is a tested, off-the-shelf solution based on Oracle9i Real Application Clusters technology, and is tightly integrated with the underlying clustering technology provided by HP Enterprise Servers. Using Oracle9i Real Application Clusters with Oracle9i Application Clusters Guard, a hot secondary database instance running on a secondary host can take over for the primary instance without lengthy startup or data recovery. Oracle9i Application Clusters Guard provides high availability by applying rapid detection and recovery from system faults, and minimizing failover time from the primary to secondary database instance.

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Cache Fusion technology

The technology that enables Oracle9i Real Application Clusters is called Cache Fusion, which extends the 'scale out' capabilities to all applications, without requiring any application modifications. Prior to Oracle9i Real Application Clusters, server farms and clustered configurations treated their respective data caches as local resources, requiring constant synchronization of those caches to ensure system integrity. This approach came with a costly performance penalty and resulted in limited scalability. With Oracle9i Real Application Clusters and today's ubiquitous low-latency, high-speed interconnect technology, the caches of every node in the cluster are fused across the cluster, thus the term *Cache Fusion*. The Cache-Fusion architecture creates a single virtual cache across all the nodes of the cluster that satisfy all database requests from an application. The resulting single view of all buffer caches minimizes disk I/O because any database request can be served by any node in the cluster. This is the key to the transparent scalability that Oracle9i Real Application Clusters provides.

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