



Oracle 10g Storage Supplement for Configuring Dell™ EqualLogic® PS Series iSCSI Storage for Microsoft® Windows® - Version 4.1

EqualLogic Terminologies

EqualLogic PS series storage arrays include storage virtualization technology. To better understand how these arrays operate, it is helpful to be familiar with some of the terminology used to describe these arrays and their functions:

- **Member** — a single PS series array is known as a member.
- **Group** — a set of one or more members that can be centrally managed. Host servers access the data through a single group IP address.
- **Pool** — a RAID that can consist of the disks from one or more members.
- **Volume** — a LUN or virtual disk that represents a subset of the capacity of a pool.

Cabling EqualLogic iSCSI Storage System

You can attach the host servers to the Dell™ EqualLogic PS5000XV iSCSI array through an IP storage area network (SAN) industry-standard Gigabit Ethernet switch.

Figure 1 shows the recommended network configuration for a dual control module PS5000XV array. This configuration includes two Dell PowerConnect® 6200 Gigabit Ethernet switches to provide highest network availability and maximum network bandwidth. It is recommended that you use two Gigabit Ethernet switches because if the switch fails in a single Ethernet switch environment, all hosts lose access to the storage until you physically replace the switch and restore the configuration. In such configuration, there should be

multiple ports with link aggregation providing the inter-switch or trunk connection. Additionally, from each of the control modules, connect one Gigabit interface to one Ethernet switch and connect the other two Gigabit interfaces to the other Ethernet switch.

Figure 1. Recommended Network Configuration

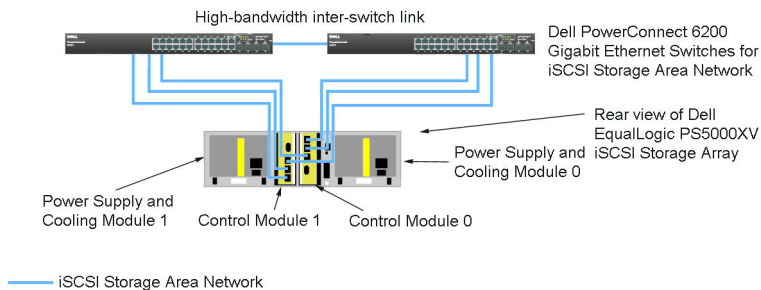
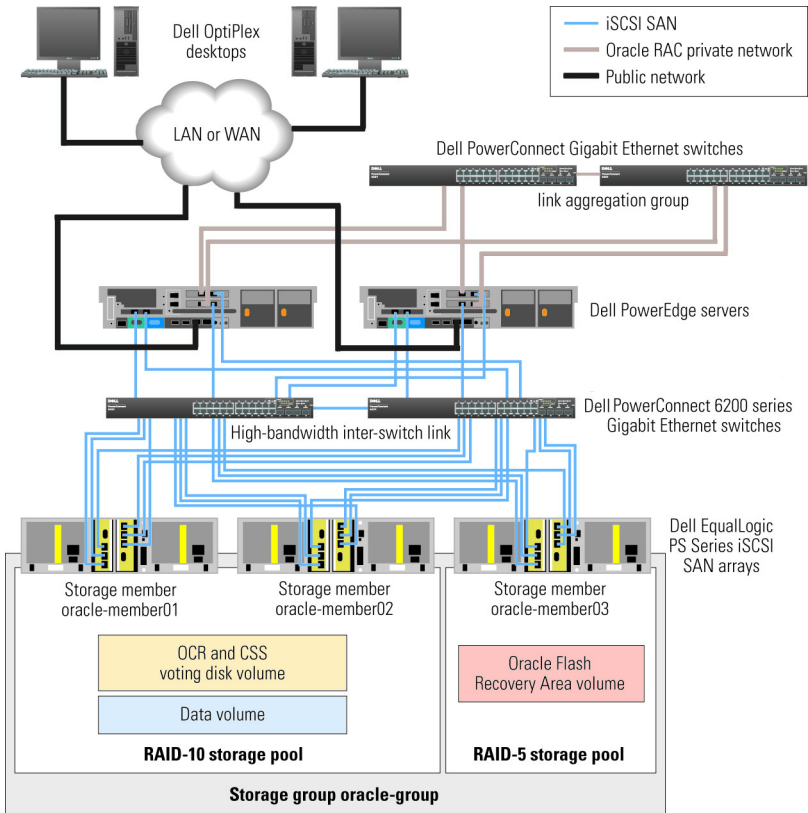


Figure 2 is an architecture overview of a sample Oracle™ RAC configuration with 3 PS5000XV arrays. The blue colored cables denote the iSCSI SAN. The gray colored cables denote the Oracle RAC private interconnect network. The black colored cables denote the public network. The PS5000XV storage arrays provide the physical storage capacity for the Oracle RAC database.

Figure 2. Sample Oracle RAC Configuration with three PS5000XV arrays



As illustrated in Figure 2, the group named oracle-group includes three PS5000XV members: oracle-member01, oracle-member02, and oracle-member03. When a member is initialized, it can be configured with RAID 10, RAID 5, or RAID 50. For more information on how to initialize an EqualLogic array, see the *Dell EqualLogic User's Guide*.

A PS Series storage group can be segregated into multiple tiers or pools. Tiered storage provides you with greater control over how disk resources are allocated. A member can be assigned to only one pool at any one time. You can easily assign a member to a pool or move a member between pools with no impact to data availability. You can organize pools according to different criteria, such as disk types or speeds, RAID levels, application types.

In Figure 2, pools are organized by member RAID levels - one pool with the name RAID-10 consists of RAID 10 members; one pool with the name RAID-5 consists of RAID 5 members.

Creating Volumes

You must configure the PS5000XV physical disks into usable components, known as volumes, before you store data. A volume represents a portion of the storage pool with a specific size, access controls, and other attributes. A volume can be spread across multiple disks and group members and is seen on the network as an iSCSI target. Volumes are assigned to a pool and can be easily moved between pools with no impact on data availability. Additionally, based on the overall workload of the storage hardware resources within the pool, automatic data placement and automatic load balancing occurs.

Table 1 shows a sample volume configuration.

Table 1. Volumes for Oracle RAC Configuration

Volume	Minimum Size	RAID	Number of Partitions	Used For	OS Mapping
First Area Volume	1024 MB	10	One extended partition with two logical drives - 50 MB for Voting Disk and 120 MB for OCR	Voting disk and Oracle Cluster Registry (OCR)	One extended partition with two logical drives: 1 x Voting Disk, 1 x OCR
Second Area Volume(s)	Larger than the size of your database	10	One	Data	ASM disk group DATABASEDG
Third Area Volume(s)	Minimum twice the size of your second area volume(s)	5	One	Flash Recovery Area	ASM disk group FLASHBACKDG

Create volumes in PS5000XV array and create access list to allow all host iSCSI network interfaces to access the volumes.

Configuring iSCSI Networks

It is recommended that you configure the host network interfaces for iSCSI traffic to use Flow Control and Jumbo frames for optimal performance.

To set Flow Control and Jumbo frame, perform the following steps:

- 1 Click **Start**→**Settings**→**Network Connections**.
- 2 Right click on the iSCSI network interface and click **Properties**.
- 3 Click the **Configure** button.
- 4 Click **Advanced**.
- 5 Highlight **Jumbo Packet** and set its value to **9014 Bytes**.
- 6 Highlight **Performance Options** and click **Properties**. This opens the **Performance Options** window.
- 7 In this window, highlight **Flow Control** and set its value to **Rx & Tx Enabled**.
- 8 Repeat step 2 to step 7 for all other network interfaces used for iSCSI traffic.

Configuring Host Access to Volumes

Installing and Configuring Dell EqualLogic Host Integration Tool (HIT) Kit

- 1 Download the HIT tool kit version 3.1.2 on your database server.
- 2 Double click **Setup64.exe** to launch the installation window.
- 3 In the **Welcome to the Host Integration Tools 3.1.2 update program** window, click **Next**.
- 4 In the **License Agreements** window, select **I accept the terms of all the license agreements**, and click **Next**.
- 5 In the **Installation Type** window, click **Next**.
- 6 In the **Ready to install the components** window, click **Install**.
- 7 The **Installation Status** window and the **Software Update Installation Wizard** window appear.
- 8 In the **Installation Complete** window, click **Finish**.

- 9** In the **System Restart Required** window, select **Yes, I want to restart my computer now**, and click **OK**.
- 10** Once the server is up, a **Remote Setup Wizard** window appears.
- 11** Select **Configure MPIO settings for this computer**, then click **Next**.
- 12** Move the iSCSI network subnets under **Subnets included for MPIO**. Move all other network subnets under **Subnets excluded from MPIO**. Check the box beside **Load balance across paths**. Click **Finish**.
- 13** Repeat step 1 to step 12 on all other hosts in the cluster.

Installing Microsoft® iSCSI Initiator

- 1** Start **Add or Remove Programs**.
- 2** Select **Microsoft iSCSI Initiator**, click **Remove**. This is to remove the initiator 2.0.7 which is packaged with the current HIT 3.1.2.
- 3** In the **Software Update Removal Wizard** window, click **Next** and then click **Finish**.
- 4** Once the server is up, download the Microsoft iSCSI initiator 2.0.8 on your database server.
- 5** Double click **Initiator-2.08-build3825-x64fre.exe** to launch the installation window.
- 6** In the **Software Update Installation Wizard**, click **Next**.
- 7** In the **Microsoft iSCSI Initiator Installation** window, select **Initiator Service**, **Software Initiator**, and **Microsoft MPIO Multipathing Support for iSCSI**. Click **Next**.
- 8** In the **License Agreement** window, click **I Agree**, and click **Next**.
- 9** In the **Completing the Microsoft iSCSI Initiator Installation Wizard** window, click **Finish**. This will restart the server.
- 10** Repeat step 1 to step 9 on all other hosts in the cluster.

Configuring Microsoft iSCSI Initiator

- 1** Double click the **Microsoft iSCSI Initiator** icon on the desktop.
The **iSCSI Initiator Properties** window appears.
- 2** On the **Discovery** tab, the IP address of the EqualLogic group address should already be populated by the HIT tool kit.
- 3** On the **Targets** tab, click on one volume that was created for the Oracle database and click **Log On**.
- 4** In the **Log On to Target** window, check the two boxes by **Automatically restore this connection when the system boots**, and **Enable multi-path**. Click **Advanced**.
The **Advanced Settings** window appears.
- 5** On the **General** tab, perform the following configurations:
 - a** Choose **Microsoft iSCSI Initiator** in the **Local adapter** pull down menu.
 - b** Choose an iSCSI initiator IP address in the **Source IP** pull down menu.
 - c** Choose **EqualLogic group IP** address in the **Target Portal** pull down menu.
 - d** Check the **CHAP logon information** checkbox.
 - e** Enter the CHAP user name, defined in EqualLogic storage, in the **User name** box.
 - f** Enter the CHAP password, defined in EqualLogic storage, in the **Target secret** box.
 - g** Click **OK**.
- 6** In the **Log On to Target** window, click **OK**.
- 7** In the **iSCSI Initiator Properties** window→**Targets** tab, the status of the logged on volume should be **Connected**.
- 8** Repeat step 3 to step 7 to log on to the same volume for every other iSCSI initiator IP addresses.
- 9** Repeat step 3 to step 8 to log on to all other volumes created for the database.
- 10** Repeat step 1 to step 9 on all other hosts in the cluster.

Verifying the Storage Assignment to the Nodes

Follow the steps in section "Verifying the Storage Assignment to the Node" of the *Oracle 10g Deployment Guide*.

Preparing the Disks for Oracle Clusterware

Follow the steps in section "Preparing the Disks for Oracle Clusterware" of the *Oracle 10g Deployment Guide*.

Removing the Assigned Drive Letters

Follow the steps in the section "Removing the Assigned Drive Letters" in the *Oracle 10g Deployment Guide*.

Information in this document is subject to change without notice.

© 2009 Dell Inc. All rights reserved.

Reproduction of these materials in any manner whatsoever without the written permission of Dell Inc. is strictly forbidden.

Trademarks used in this text: *Dell*, the *DELL* logo, *Optiplex*, *PowerEdge*, *PowerConnect* and *EqualLogic* are trademarks of Dell Inc.; *Microsoft*, *Windows* is either a trademark or registered trademark of Microsoft Corporation in the United States and/or other countries; *Oracle* is a trademark of Oracle Corporation and/or its affiliates.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

Rev. A01