

Migrating from Solaris 9 Enterprise Edition on Sun Fire V440 with Oracle 9i to Solaris 10 Enterprise Edition on Dell PowerEdge R900 with Oracle 10g R2 (summary)

The Dell™ PowerEdge™ R900 is an excellent server for upgrading critical database applications from Oracle® 9i running on Solaris™ 9 to Oracle 10g R2, the latest release of Oracle's data management platform, running on Solaris 10.

This document summarizes the approach that Principled Technologies® (PT) and Dell recommend for a tested and validated migration of Oracle 9i databases to Oracle 10g R2 on the Dell PowerEdge R900 server and Solaris 10. For a full discussion of this approach and step-by-step instructions on this process, see our Migration Guide.

As this summary illustrates, and as the complete Migration Guide shows in detail, a basic migration is not difficult. Starting with a bare Dell PowerEdge R900, we were able to install Solaris 10 and Oracle 10g R2 and migrate a sample database in less than a day.

As a migration solution, the PowerEdge R900 provides a much more expandable and capable platform. For example, it can support 256 GB of RAM, as opposed to 32 GB in the Sun Fire v440, and eight internal drives instead of four. It also provides a much more capable RAID controller.

The PowerEdge R900 will also deliver far greater performance. In some of our testing, the PowerEdge R900 delivered over 14 times the performance of the Sun Fire V440.

Migrating applications

You are likely to face several types of application challenges when moving from Solaris 9 on SPARC-based systems to Solaris 10 on x86 (64-bit) systems.

Java-based applications. These applications should run as is.

When you have the source code for applications. All you will likely need to do is recompile using Sun Studio. See

http://developers.sun.com/solaris/articles/amd64_migration.html

When you do not have the source code for applications. For applications available in an x86 (64-bit) version, you have the option of moving to the native version. If the vendor of your commercial legacy application provides an x86 version but does not support it on Solaris 10 (x86 [64-bit]), you can use Solaris Containers to run it using an older version of Solaris. When Solaris containers are not appropriate for your situation, you may be able to use QuickTransit from Transitive (<http://www.transitive.com>).

Transitive also offers QuickTransit Legacy for applications older than Solaris 8.

Migrating Oracle databases

We used the export-and-import method as a safe and effective way to move the database across different processor architectures, versions of Solaris, and versions of Oracle.

Installing and setting up Solaris 10 and Oracle 10g R2

Our legacy server was a Sun Fire™ V440 with 4 x UltraSparc™ IIIi 1.59 GHz processors, 32 GB of RAM, and four Fujitsu® Ultra320 SCSI, 73GB disks. It ran Solaris 9 9/05

Operating System for SPARC-based systems (64-bit) and Oracle 9i Enterprise Edition Release 9.2.0.1.0 for Solaris on SPARC-based systems (64-bit).

Our destination server was a PowerEdge R900 with 4 x 6-Core E7450 Intel® Xeon® 2.4 GHz processors, with 64 GB of RAM, and eight Seagate® SAS, 15K RPM, 73GB disks. It ran Solaris 10 5/08 Operating System for x86-based systems (64-bit) and Oracle 10g R2 Enterprise Edition Release 10.2.0.1.0 for Solaris on x86_64-based systems.

Configuring the RAID drives

We had eight internal disk drives in our PowerEdge R900. We configured them as four RAID 1 arrays of two drives each. The first array holds the OS and Oracle software. We used the next two RAID's to create an Automatic Storage Management, or ASM, disk group. Oracle 10g R2's ASM can take much of the responsibility for allocating and managing the storage. We reserved the remaining RAID to hold the dump file from our Oracle 9i server. After importing our 20GB database into an Oracle 10g R2 database, we added the array to the ASM diskgroup.

Installing Solaris 10

This section provides an overview of the operating system installation process. We include approximate wait times for each step. We downloaded the operating system from <http://www.sun.com/software/solaris/get.jsp> and burned DVDs from which we installed.

1. Insert the Solaris 10 DVD into the DVD drive, and reboot the system. Using the GNU GRUB screen, edit the boot command line. Add the `-kd` switch to cause the system to boot into the kernel debugger. Turn off the Computer Module Implementation (CMI) checking and continue with the boot process.
2. Apply the PERC 6/i RAID controller drivers.
3. Select English as the language, and respond to the tests for screen legibility. Then configure your network information, as well as time and date.
4. Set the root password, then verify and confirm all your information. Accept the license agreement, and choose to perform an initial, custom install. Select the character set and products you want to install.
5. Select and customize your disk layout. When you are done, review your information, and start the installation.
6. During the reboot, remember to edit the GRUB command line and enter the Kernel debugger again to disable CMI checking, then continue with the boot.
7. Log on as root, and select your desktop. Edit the `/etc/system` file so that you no longer have to edit the GRUB command line.
8. Apply the drivers for the Broadcom NICs, and configure your networking.

Oracle pre-installation tasks

Before you can install Oracle, you must first perform a number of preliminary tasks. For further details, see *Oracle® Database Installation Guide 10g Release 2 (10.2) for Solaris Operating System (x86-64)*, Chapter 2, Preinstallation tasks at

http://download.oracle.com/docs/cd/B19306_01/install.102/b15704/pre_install.htm#BHC GG EFF.

1. Use the UNIX xhost command to make sure that the oracle utilities can use X Windows for their GUI output.
2. Install operating system packages that were not part of the default install.
3. Verify that that networking is working correctly.
4. Create the Oracle account and its related groups.
5. Create the Oracle home directory and login script.
6. Create the Oracle project and increase the amount of shared memory it can have.

Configuring the data drives

The next step is to prepare the data drives for Oracle to use. We used the Solaris format utility to do the following to each disk:

1. Create a Solaris partition on the disk.
 2. Edit the partition table. Note: We gave slice 6 all of the disk's available space.
 3. Label the disk to make the changes permanent.
- Give the Oracle account rights and ownership to slice 6 on each disk, so the Oracle account controls of all the space on the disk.

Installing Oracle 10g R2 on the PowerEdge R900 running Solaris 10

We downloaded the 10201_database_solx86.zip file from <http://www.oracle.com/technology/software/products/database/index.html>, copied it to the R900, and unzipped it locally.

1. Working as the Oracle user, go to the directory where you unzipped the Oracle 10g R2 distribution and type `./runInstaller` to start the Oracle Universal Installer. The command is case-sensitive, and the `./` prefix is necessary. You are doing an Advanced installation, but you are not creating a starter database.
2. Accept the defaults on the next few screens.
3. Configure Automatic Storage Management (ASM), enter the ASM password, and configure your diskgroup.
4. Review your settings and start the installation. (15 minutes)
5. When the progress bar completes, Oracle asks you to run two scripts as root. Open a terminal as root, then cut and paste the paths to the scripts into the command line terminal.
6. The three configuration assistants should start, and you will automatically advance to the next screen. At the End of Installation screen, click Exit.

Creating an empty database

1. Set your Oracle environment variables. Type `dbca` to launch the Database Configuration Assistant.
2. When the Welcome screen appears, click Next. Create a custom database and give it a name.

3. Accept the defaults for the Management Options, enter a password for the database, and select ASM for the storage. Enter the ASM password, and then select the diskgroup you selected earlier.
4. Accept the remaining defaults and then click Finish. The Database Configuration Assistant screen will show a progress bar. (30 minutes)
5. When the Database creation complete screen appears, click Exit.

Migrating to Oracle 10g R2

Exporting your Oracle 9i database

Oracle refers to the user data and its associated metadata as a schema. Using the Sun Fire V440 server, export the schema using the command line utility exp. Export times vary. Exporting our 20GB schema on our Sun Fire V440 took 42 minutes.

Importing the database into Oracle 10g R2 server

On the Solaris 10, PowerEdge R900 server, do the following steps:

1. In the empty database you created earlier, create the database user for the schema you will import.
2. Create the tablespaces, using ASM managed storage.
3. Run the command line import utility, imp. Import times vary. Importing our 20GB schema on our Dell PowerEdge 900 took 75 minutes.

Post-migration considerations

After you have completed your side-by-side migration, you will typically need to perform some additional tasks. Your specific list of post-migration tasks will depend heavily on your pre-migration research and planning. For more information, see http://download.oracle.com/docs/cd/B19306_01/server.102/b14238/afterup.htm

Backing up your database

Having successfully migrated to Solaris 10 and Oracle 10g R2, you should make a full backup of your production database. This will ensure that you not have to repeat the import should any problems occur. It will also serve as a baseline for all future backups.



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