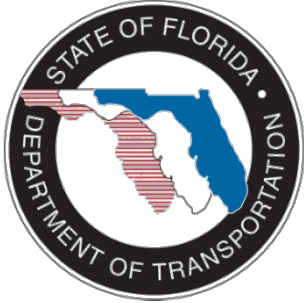




Technical Memorandum

SunGuide® Software System



Database Licensing Analysis

Version 1.0

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List of Acronyms and Abbreviations

SA Software Assurance

VM Virtual Machine

1 Purpose

The purpose of this document is to discuss the various advantages and disadvantages of both Oracle® and Microsoft® SQL Server licensing schemes. A hypothetical system will be used to compare the two licensing schemes as described below.

There are four Windows-based servers labelled A, B, C, and D. These servers have a single eight-core processor. Server A is actively running a database. Server B is a fail over server for A. Server C is an offsite mirror of Server A, but never runs simultaneously with A. Server D is a fail over server for C.

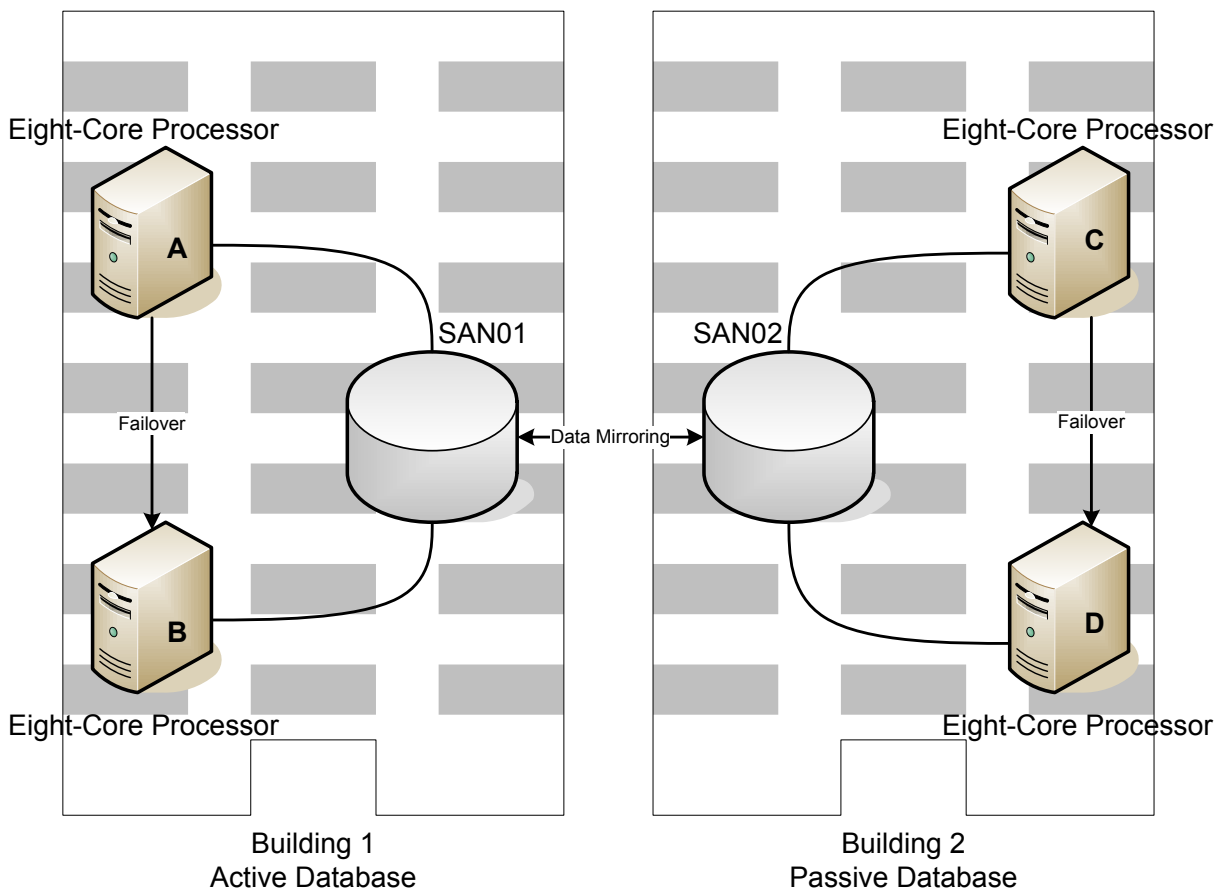


Figure 1.1 – High Availability Database System Architecture

This document explores how each database management system, Oracle and SQL Server, can implement the previously described system reliably and at what cost.

2 Oracle Licensing Scheme

Oracle licensing is on a “per core” basis and is perpetual. For Windows operating systems, there is a 0.5 multiplier for core licensing. This means that one license must be acquired for every two cores capable of running Oracle. The phrase “capable of running Oracle” makes an important distinction. A license must be acquired for any server that may run Oracle regardless of whether or not it is actively running a database instance. This includes all cores in a virtual environment that could possibly be used, even in a failover situation, to run the database.

The Oracle Failsafe module reduces the licensing costs in systems where a passive failover is all that is required. This free utility allows a user to have an unlicensed, passive Oracle server for the purposes of fail over. The only caveat being that the fail over server may not run for more than ten days per year without purchasing additional licenses. This may seem restrictive, but ten days is usually more than enough time to handle the failover needs of the average production environment.

Hard partitioning of central processing unit cores can be accomplished with the free Oracle Virtual Machine (VM) software. This software allows a user to license only a subset of a server’s cores by partitioning them for use within a virtual machine. No other virtualization software is recognized by Oracle for the purposes of licensing. Oracle VM can be used to avoid costly implementation on high core systems.

If these Oracle licensing rules are applied to a high availability database system, as shown in Figure 1.1, then servers A and C would each require two licenses. If Oracle Failsafe is used for servers B and D, then additional licenses would not be required. If Oracle VM were used to partition off two cores from all of the servers, then only two licenses would be required to implement the entire deployment, rather than four. In order to mirror information to the second database Oracle DataGuard is required. This software must be purchased in addition to the Oracle licenses for the same number of licenses that are used on either side of the mirroring relationship.

Oracle licenses are sold separately from Oracle support and necessary add-ons. Support is purchased for each license annually. Three major benefits of Oracle support are free software upgrades, live phone support, and Oracle’s trouble ticketing system. Documentation describing other Oracle support benefits can be found at <http://www.oracle.com/us/support/library/oracle-premier-support-brochure-069189.pdf>.

3 SQL Server Licensing Scheme

The most cost-effective SQL Server licensing is on a per core basis. This shares similarities with the Oracle licensing scheme, but some nuances set them apart. It should be noted that the “per core licensing scheme” is only available with the enterprise version of Microsoft SQL Server.

An advantage of SQL Server is that each active server can have one unlicensed passive server. The passive server may not perform any production workloads other than receiving the mirrored updates and waiting for the primary server to fail. This allows cost-effective implementation of passive failover servers. As long as the user does not exceed the number of licensed cores actively running SQL Server, SQL Server may be run on the secondary server with no additional licenses. Microsoft representatives recommended that training servers use an MSDN user license rather than licensing by cores. This is a significant cost saving, but the server cannot be used for production purposes under any circumstances. Alternate licensing rules exist for virtual servers, but the core licensing scheme applies for the most part. Microsoft representatives recommend Hyper-V, the Microsoft virtualization solution, which is available at no additional cost with purchase of SQL Server, but they also stated that VMware is an acceptable solution.

SQL Server Software Assurance (SA) has several benefits in common with Oracle support, such as free upgrades and 24/7 support. Furthermore, SA allows more flexibility in using licenses in a server farm environment, such that licenses can be transferred to different physical servers dynamically rather than requiring all servers in the server farm to be licensed. A chart of Microsoft SA benefits is available at http://download.microsoft.com/download/e/0/7/e073ed43-1cd8-40b8-9ee5-afddb9b575d7/SA_Benefits_Interactive_Chart.pdf.

SQL Server Premier Support is Microsoft's solution for delivering additional, optional, active support. This support is provided by their field engineers and can be in response to issues or even planning, training, or other general active support needs. SQL Server Premier Support offers "pay as you go" support options, so unused support hours that may be included in a more expensive pricing model can be avoided. SQL Server Premier Support scales well with increased licenses. SQL Server allows all support to be routed through one central support account, providing a substantial savings from an account with many licenses. SA will grant some premier support hours, but is otherwise completely separate.

4 Pricing

The system described in section 1 is a representative system for SunGuide software deployments and includes high availability failover, disaster recovery mirroring, and sufficient processing capacity to run SunGuide software in a production environment. This system can be implemented in either Oracle or SQL Server. Table 4.1 shows a comparison of pricing of such a system implemented using Oracle and SQL Server database products. In this example, both Oracle and SQL Server would require the same number of licenses, – eight "2-core" licenses.

One of the key differences is how the two database applications license database mirroring capabilities. Oracle requires Data Guard licenses to be purchased additionally for database mirroring, while SQL Server includes database mirroring and many other modules in the Enterprise Edition of the software at no additional cost.

Table 4.1 – Price Comparison of Oracle and SQL Server

	SQL Server 2012 Enterprise w/SA (8 “2-Core” Licenses)	Oracle Enterprise w/ Data Guard and Support (8 “2-Core” Licenses)
Perpetual Licenses Only	\$62,242.48	\$171,084.32
Support	\$20,203.28 per year	\$37,638.56 per year

Table 4.1 provides the cost comparison of SQL Server and Oracle for a new deployment. However, many SunGuide® software users have already acquired Oracle licenses for their deployment. Therefore, the cost analysis was conducted for the initial license purchase cost and continuing support cost of SQL Server in comparison with only the ongoing support cost of Oracle. We concluded that if FDOT switches from the existing Oracle installation to an SQL Server identical to the example system, it would take four years to recoup the costs. This analysis takes into account the initial purchase of SQL Server licenses and the cost for SA for Microsoft SQL Server Enterprise in comparison to the support costs alone for Oracle enterprise database.