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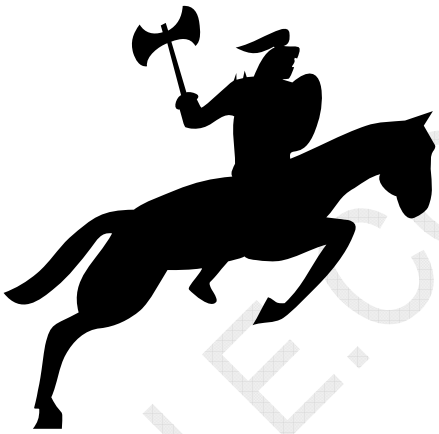

## 70-443

## Designing a Database Server Infrastructure by Using Microsoft SQL Server 2005



Web: http://www.crambible.com/

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**THE TOTAL NUMBER OF QUESTIONS IS 112**

**QUESTION NO: 1 BACKGROUND**

**Company Overview A.Datum Corporation is an independent software vendor that has a worldwide customer base.The company sells its software through a combination of an e-commerce Web site and a telephone-based ordering system. Planned Changes The company plans to upgrade all of its database servers to SQL Server 2005.The BusinessDats database will be redesigned to improve manageability,and a new database named MarketionAnalysis will be created to allow marketing analysts to generate reports from sales data.The most common report that will be generated will retrieve the names of products that are sold and the cities where the customers live.**

**Problem Statements The company wants to improve the security of its data and wants to minimize the risk of unauthorized data access or malicious attack.**

**On several occasions,customers were unable to place an order because the database server was unavailable for na extended period of time.**

**EXISTING DATA ENVIRONMENT**

**Databases The HRData database contains employee data,including sensitive information such as salary and employee reviews**

**The BusinessData database contains product and data.Analysis indicates that each user typically accesses only a subset of the tables in the database.This subset is related to the department in which the works.**

**Business analysis indicates that approximately 4,000 new records are added to the BusinessData database each day,and that 90 percent of records are not modified after they are entered.**

**No managed objects currently exist in any database.**

**Database Servers The company currently has a single default instance of SQL Server 2000 in which the HRData database and the BusinessData database are stored.The SQL Server instance is installed on a server named SQL1.**

**Written company policy to deploy a hardware RAID solution in the next six months.However,no disk redundancy solution is currently implemented.**
**Database Client Computers**
**Data in the HRData database is accessed through an ASP.NET application.The application runs in the**
**security context of a Windows user named HRApp and uses Windows Authentication to connect to SQL**
**Server.**

**The BusinessData database is accessed by users in the sales department,who use Windows Authentication
to connect to SQL Server.In addition ,users in the software development team need to access the
BusinessData database from client computers that run either a Microsoft windows operatingsystem or
another operating system Users on client computers that do not run Windows use SQL Server
Authentication to connect to SQL Server.**

**All client applications are configured to connect to the SQL Server instance.Terefore,users do not need to
browse for a server.**

**EXISTING INFRASTRUCTURE**

**Network Infrastructure**
**All computers are connected to a TCP/IP-based network.The network is configured as shown in the
following diagram(The diagram can also be viewed by clicking the Case Study Exhibit button)
Computers in the sales call center are connected to the network by network cables.All other computers
use 802.11 wireless networking with encryption.**

**Directory Services Infrastructure**
**The company??s network consists of one Active Directory domain,which contains Windows 2000 Server
computers and Windows Server 2003 computers.**

**Most employees use client computers that run Windows XP Professional.Some developers use client
computers that do not run Windows.**

**A domain-level policy is enabled that enforces password complexity and expiration after 30 days.**

**Server Infrastructure**

**In addition to SQL1,there are two unutilized file and print servers that can be used in the proposed
upgrade to SQL Server 2005.The specifications for all database servers are shown in the following table.
All Windows Server 2003 computers have the latest service pack applied.**

**BUSINESS REQUIREMENTS**

**General Requirements
The upgrade project must not require the acquisition of new hardware or servers.However.the
memory,processors,and software in existing servers can be upgraded if necessary.**

**Performance**

**The upqraded HRData database and the redesiqned BusinessData database must or exceed the performance levels of the current implementations,except in cases where new security-related functionality has a negative impact on performance.In these cases,the performance impact that is caused by security-related enhancements must be minimized.**

**To improve query performance,a partitioned table should be used.The table should be named Sales.Orders and it should have three partitions: . one for orders placed in the current month . one for orders placed in the previous month . one for orders placed in the month prior to the previous month Order data that is older than the data in the three partitions should be archived in a second partitioned table named Sales.OrderArchive.This table should have two partitions: . one for archived order data . an empty partition that will be used as a staging area for the archival process At the end of each month,the following procedure must be used to archive the order data. 1.Use a SWITCH operation to move the data in partition 1 of the Sales.Orders table to the empty partition 2 of the Sales.OrderArchive table. 2.Use MERGE and SPLIT operations to reorganize the data in the Sales.Orders table so that last month??s data will be in partition 1,this month??s data will be in partition 2,and partition 3 will be empty and ready for next month??s data. 3.Use MERGE and SPLIT operations to move all archived data to partition l of the Sales.OrderArchive table and to create a new empty partition 2 that will be ready for next month?? s archival process.**

**The new MarketingAnalysis database must provide the fastest possible
query performance when retrieving data for the most commonly generated reports.**

**Availability In the event of server failure,the BusinessData database must be made**

**available as quickly as possible and with a minimum amount of administrative intervention.The company plans to use database mirroring to achieve this goal.**

**In normal operations,there should be no data loss in the event of a server failure.However,in exceptional circumstances a minimal amount of data loss is acceptable.**

**An interim disk-availability solution must be implemented for SQL 1 until the hardware RAID solution is implemented.the interim solution must provide fault tolerance in the event that a single disk containing database data fails.The interim solution must minimize the time needed to recover in the event of a system disk failure,and it must provide the highest possible level of read performance while fulfilling the general application solution requirements.**

**Recoverability**
**The backup and recovery strategy for the BusinessData database must meet the following requirements. . Allow full recovery in the event of total hardware failure. . Minimize performance overhead caused by backup and restore operations. . Allow the database to be restored with a maximum loss of 30 minutes of database activity.**
**Include contingency plans to handle database file corruption.**

**TECHNICAL REQUIREMENTS**

**Security**
**All security credentials that are used in all of the company??s IT systems must use complex passwords**
**that expire after 30 days.**

**In the HRData database,sensitive data must be encrypted so that only the login that encrypted the data**
**can decrypt it. The risk of unauthorized access to encryption keys and passwords within the database**
**server must be minimized.**

**All data that is passed across the network must be encrypted.An HTTP endpoint should be used in the**
**BusinessData database to provide access to two stored procedures named Sales.AddOrder and**
**Sales.GetOrderDetails.The HTTP endpoint must be accessed only by sales employees.who use Windows**
**XP Professional computers in the sales subnet.**

**The risk of security violation must be mitigated by minimizing the attack surface**