



Exam : 070-441

Title : Designing Database Solutions by Using □□□

Microsoft® SQL Server®, 2005

Ver : 09-18-07

Topic 1, Bilco, Scenario

OVERVIEW:

Background

Bilco started off as an Insurance Provider. Bilco is currently a dual purpose company after a decision was taken by the Bilco management to diversify. The services on offer from Bilco thus also include pay rolling for small companies.

Physical locations

The Bilco head quarters is situated in Chicago. The company has 50 branch offices in different cities all around the United States of America.

Customer Services

The current customer count at Bilco totals 10,000. This figure is expected to increase two-fold over the next three fiscal years. Each of these Bilco customers is different and their numbers of employees range from five to five-hundred employees per customer.

The service that Bilco offers to these customers involves pay rolling their employees. Since all the customers are separate companies on their own and thus different from each other, some customers pay their employees weekly, while others pay their employees fortnightly. At present the checks are mailed to the customers. Included in this mail package is a packing slip that contains a document that shows the payroll liability as well as a report on per-employee earnings.

The necessary tax forms for federal and local taxes are also prepared by Bilco. There are four benefits packages on offer currently. Though, not all customers provide benefits to their employees. Bilco currently accepts insurance forms by mail and enters them into a database for tracking. The original forms are sent to the appropriate insurance companies on a weekly basis.

Since not all customers are the same with the same needs, they all require different services from Bilco. Several customers want to be able to take out custom deductions and thus requested this service. These custom deductions include retirement deductions, stock option deductions as well as other types of deductions. These deductions would be handled on a per-employee basis.

Concerns

Currently the number of working hours per person is frequently transposed this leads to the current system falling victim to data entry error frequently.

The administration of the benefits and payroll processes requires more efficiency improvement since Bilco management is concerned that they might not be able to scale to meet their anticipated growth.

TECHNICAL ENVIRONMENT:

The Chicago office

The Chicago office is responsible for writing the paychecks and mailing it directly to employees.

The Chicago office network consists of a single Active Directory domain named bilco.com. All servers, including the database server and all client computers enjoy domain membership. There is a single database server named BILCO-DB01 that runs Microsoft SQL Server 2000.

Payroll data is faxed to the Chicago office. This payroll data is entered manually by

payroll administrators. A third party application is used for this purpose.

Benefits administrators belong to a global group named BenefitsAdmins.

At present the Benefits administrators handle all tasks manually. They provide the Payroll administrators with a list of employees who are enrolled for each benefits package and the appropriate paycheck deduction.

Payroll administrators belong to a global group named PayrollAdmins.

At present the Payroll administrators must manually enter the deductions.

The Branch offices

There are between 10 and 15 computers per branch office. These computers run Microsoft Windows XP Professional and are all workgroup members.

BUSINESS REQUIREMENTS:

Bilco customers requested to be allowed to enter payroll data online. Between the time the payroll data is entered and the time paychecks are available to print, a payroll administrator will check each paycheck to ensure that the appropriate deductions are taken out and that there are no obvious data entry errors. The payroll administrator will contact the customer for clarification in the event of finding a suspected error.

Bilco customers must also be allowed to change employee deductions, salary, and company-specific deductions online. The procedure involved in a salary change is as follows: an e-mail must be sent to the customer, the customer must verify the change by clicking a link in the e-mail and logging on to the Web site. Then only will the salary change be committed.

A decision was taken to decentralize certain operations. The checks are thus to be printed in the branch offices and delivered by courier to each customer company.

A monthly report showing each employee's pay, the total pay, and details about deductions must be sent to each customer company. The customers want the ability to view the report as a summary, as well as the ability to drill down through the detailed information.

Social security numbers are used to track employees. It does occur that some employees are employed by more than one company. In such a case, their payroll data and personal information must be tracked separately.

Employees, even those within the same company are either paid a salary, or a HourlyRate. The HourlyRate employees earn time-and-a-half for overtime and double-time for holiday hours.

There is a need to keep up to date with state and federal tax tables as these tend to change often. To this end Bilco plans to subscribe to a Web service that will make provision for updated tax table information. The Web service has two methods.

1. One method will accept a state and pay amount and returns the amount that should be deducted for state taxes.
2. The other methods will accept the pay amount and the number of deductions and returns the amount that should be deducted for federal taxes.

Since the customer needs all vary, some customers prefer that their withholding reports must be generated monthly, while others prefer this service on a quarterly basis. All companies must have annual reports generated also. Some companies

have different withholding schedules for state than for federal taxes. A withholding report must be accurate as of the end of the period and must be consistent even if it is regenerated at a later date. The federal and state governments require the report to be submitted in a specific Extensible Markup Language (XML) format or printed and mailed. Companies want to be able to retrieve the information in XML, Microsoft Excel, or HTML.

Changes are often being made to the benefits package deductions. Bilco wants a more automated way to make effect these changes. Bilco also wants employees to be able to enter insurance form information online and to transfer insurance forms to the insurance providers electronically. The insurance providers can all accept documents using the Simple Object Access Protocol (SOAP). All insurance provider forms are different and require different data.

Following is a partial schema as envisaged by Bilco management:

Paychecks		OtherDeductions		SalaryInfo	
PK	PaycheckID	PK	Other Deductions ID	PK	EmployeeID
	CustomerID EmployeeID Date FullRemuneration FederalTax StateTax MedicalAid SSI OtherDeductionsID		Employee ID DeductionAmount DeductionType		Salary HourlyRate

TECHNICAL REQUIREMENTS:

The main concern and consideration for Bilco is Security. Highly confidential data like employee payroll and benefits form an integral part of the business information. The new system must ensure that all sensitive data is protected from unauthorized access. Sensitive data includes:

1. Employee social security number
2. Address
3. Phone number
4. Salary
5. Full Renumeration
6. Net Renumeration
7. Insurance information

All access to insurance form data must be logged. The information must include the user name of the person who attempted to access the data and the table the user accessed.

Only a single computer will be available to run SQL Server 2005. You must accomplish the tasks using the fewest possible instances of SQL Server. Performance should always be optimized, and disk space should always be conserved.

A period of 7 years after the end of the financial year marks the period that tax and withholding data must be kept.

The database design must adhere to the third normal form (3NF).

Topic 1, Bilco (13 Questions)

QUESTION 1

You are designing the schema of the SalaryInfo table for Bilco. To this end you need to design a schema that will simplify the logic required to calculate pay checks. You thus need to take a decision as to which default constraint and which nullability option you must use for the Salary attribute.
What should you do?

- A. Set the default constraint at 0 and use Null as the nullability option.
- B. Set the default constraint at 0 and use Not Null as the nullability option.
- C. Set the default constraint at 1 and use Null as the nullability option.
- D. Set the default constraint at No Default and use Not Null as the nullability option.

Answer: B

Explanation: By setting the column as Not Null and setting the default constraint at 0, you will be able to use a simple calculation that will be required to accommodate both the salaries and hourly rate paid employees. Because the Salary will be 0 if the employee is not paid on a salary basis, the hourly rate calculation will be accurate.

1. Employees, even those within the same company are either paid a salary, or a HourlyRate. The HourlyRate employees earn time-and-a-half for overtime and double-time for holiday hours.

Incorrect answers:

A: This option is only partly correct in that you need to set the default constraint to 0, however, you should not allow NULL, if you do you will have to include special logic to test for nulls.

C: If you set the default constraint to 1, then the hourly employees will receive \$1 more per pay period than they should. In addition you should not allow nulls as the nullability options.

D: If there is no default then an error will be generated if a salary is not specific unless the column allows nulls.

QUESTION 2

You are designing the data distribution aspects of the Bilco database. You need to design the strategy required to allow the companies to receive the monthly payroll data on a secure Web site.

What should you do? (Each correct answer presents part of the solution. Choose THREE.)

- A. Enable Reporting Services.
- B. Disable Reporting Services.
- C. Use Report Builder to create a report template.
- D. Use Report Builder to create a report.
- E. Use Report Designer to create a report.
- F. Render the report as HTML.
- G. Render the report as an Excel spreadsheet.
- H. Render the report as XML.

Answer: A, E, F

Explanation: Report Designer can be used to create a report and render the report as HTML. HTML reports will allow the summary data to be displayed as well as allow the user to drill down to more detailed data.

1. A monthly report showing each employee's pay, the total pay, and details about deductions must be sent to each customer company. The customers want the ability to view the report as a summary, as well as the ability to drill down through the detailed information.

Incorrect answers:

B: You need to enable Reporting Services.

C: Using a Report Builder report template will allow users to generate ad hoc reports without understanding the underlying data, but this is not a requirement in this case.

D: Creating a report with Report Builder is not required in this case.

G: Rendering the report as an Excel spreadsheet will display all the columns and rows in the report, but it will not allow the drill-down capability.

H: The XML format will display all data but will not make allowance for Drill-down capabilities.

QUESTION 3

You are designing the data retrieval aspects of the Bilco database. Part of this functionality includes allowing companies to view and change data for their employees, their addresses, their respective deductions and their salary information over the Internet. To this end the Web developer needs to retrieve a table that lists the relevant information. This table must however, only return the data for the specified CustomerID.

You need to implement the best object to create to meet the requirements. You must ensure that your solution does not require that the Web developer has to know the underlying data structure.

What should you do?

A. Use a partitioned view.

B. Use a Common Language Runtime (CLR) aggregate.

C. Use a stored procedure that uses Common Language Runtime (CLR).

D. Use a table-valued user-defined function that uses Transact-SQL.

Answer: D

Explanation: The table you must return will require a join from multiple tables. It also requires that a parameter must be used to filter the query so that it includes only the records for one company. Thus a table-valued user-defined function that uses Transact-SQL would be the most appropriate.

1. Bilco customers requested to be allowed to enter payroll data online. Between the time the payroll data is entered and the time paychecks are available to print, a payroll administrator will check each paycheck to ensure that the appropriate deductions are

taken out and that there are no obvious data entry errors. The payroll administrator will contact the customer for clarification in the event of finding a suspected error.

2. Bilco customers must also be allowed to change employee deductions, salary, and company-specific deductions online. The procedure involved in a salary change is as follows: an e-mail must be sent to the customer, the customer must verify the change by clicking a link in the e-mail and logging on to the Web site. Then only will the salary change be committed.

Incorrect answers:

A: Partitioned views are used to create tables that include data from multiple tables that are partitioned horizontally. The tables are not partitioned in this scenario.

B: Using a CLR aggregate is not required since you are retrieving data and not aggregating data.

C: A CLR stored procedure cannot return a table. Also you would not want to make use of CLR to create the function because the function will be performed better with a Transact-SQL function.

QUESTION 4

You must extend the functionality of the Bilco server for the design of the functionality that will be used to calculate the state tax deductions. To this end you must determine which type of object would be appropriate to create. You must ensure that the most up-to-date tax table is being used for the appropriate state. What should you do?

- A. Use a Common Language Runtime (CLR) user-defined function that will return the tax deduction.
- B. Use an extended stored procedure that updates the state tax tables on a regular basis.
- C. Use a scheduled batch file that will update the state tax tables on a regular basis.
- D. Use a Transact-SQL stored procedure that will return the tax deductions.

Answer: A

Explanation: A CLR user-defined function can call a Web service.

- 1. There is a need to keep up to date with state and federal tax tables as these tend to change often. To this end Bilco plans to subscribe to a Web service that will make provision for updated tax table information. The Web service has two methods.
- 2. One method will accept a state and pay amount and returns the amount that should be deducted for state taxes.
- 3. The other methods will accept the pay amount and the number of deductions and returns the amount that should be deducted for federal taxes.

Incorrect answers:

B: You should not make use of an extended stored procedure that updates state tax tables. The business requirements state that the company decided to a Web service. This Web service does not download tax tables, it accepts a state and pay amount and returns the amount of the deduction.

C: There is no need to create a schedules batch file to updates tax tables. The business requirements state that the company decided to a Web service. This Web service does not

download tax tables, it accepts a state and pay amount and returns the amount of the deduction.

D: A Transact-SQL stored procedure cannot call a Web service.

QUESTION 5

The data distribution functions of the Bilco database must make provision for customer companies to change their respective employee's salaries when required. You must decide on how to implement the e-mail to the person responsible for payroll at a specific company. In your solution you must minimize the attack surface of BilcoBD-01.

What should you do?

- A. Install Microsoft Outlook and create an UPDATE trigger on the SalaryInfo table that calls sp_send_dbmail.
- B. Enable Database Mail and create an UPDATE trigger on the SalaryInfo table that calls xp_sendmail.
- C. Enable Database Mail and create an UPDATE trigger on the SalaryInfo table that calls sp_send_dbmail.
- D. Enable SQL Mail and create an UPDATE trigger on the SalaryInfo table that calls xp_sendmail.

Answer: C

Explanation: Database Mail is more secure than SQL Mail because it does not depend on an e-mail client on the SQL server; it simply makes use of SMTP and not Extended Messaging Application Programming Interface (MAPI). Also the stored procedure for sending mail via Database Mail is sp_send_dbmail.

1. Bilco customers must also be allowed to change employee deductions, salary, and company-specific deductions online. The procedure involved in a salary change is as follows: an e-mail must be sent to the customer, the customer must verify the change by clicking a link in the e-mail and logging on to the Web site. Then only will the salary change be committed.

Incorrect answers:

- A: This option is only partly correct, but you should not make use of Microsoft Outlook because Database Mail does not require Outlook.
 - B: xp_sendmail stored procedure is used to send an e-mail that uses SQL Mail and SQL Mail requires an Extended Messaging Application Programming Interface (MAPI) that will increase the BilcoBD-01 attack surface unnecessarily.
 - D: Using SQL Mail requires a MAPI client, much like Outlook and thus increases the server's attack surface necessarily. You also should not use xp_sendmail.
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QUESTION 6

Bilco requires an application solution that will be used to store insurance forms. You thus need to design an extensible schema capable of supporting changes to insurance provider forms and the addition of different insurance providers at a later stage.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. Create a table for each insurance provider.
- B. Create a single table named InsForms.
- C. Store insurance form data as typed Extensible Markup Language (XML).
- D. Store insurance form data as untyped Extensible Markup Language (XML).
- E. Store insurance form data in a varchar(max) column.
- F. Store insurance form data in a varbinary(max) column.

Answer: B, D

Explanation: Since the insurance form data will be transmitted to insurance providers using SOAP, the best solution would be to store the data as XML because XML allows for untyped XML and not typed XML.

1. Changes are often being made to the benefits package deductions. Bilco wants a more automated way to make effect these changes. Bilco also wants employees to be able to enter insurance form information online and to transfer insurance forms to the insurance providers electronically. The insurance providers can all accept documents using the Simple Object Access Protocol (SOAP). All insurance provider forms are different and require different data.

Incorrect answers:

A: Creating a separate table for each insurance provider would work but then it would not be an extensible solution.

C: Making use of typed XML would work, but it would not be extensible because if an insurance provider would change their forms, the column will need a different SML schema and the existing data would not match the new schema. You would also require modification of the application be creating a new table and adding routing logic to send the new provider's form to that table if a provider has to be added.

E: The data should not be stored as varchar(max) because varchar(max) type stores unstructured text data which is not appropriate to send using SOAP.

F: The data should not be stored as binary because varbinary(max) type stores bits which is not appropriate to send using SOAP.

QUESTION 7

You are in the beta testing process of the application for Bilco. You then discover that the Web service takes several seconds to return. You also notice that a large number of transactions are held on the Bilco-DB01 when a large payroll is processed.

A script that iterates through a company's employees and inserts a paycheck for each employee into the paychecks table is currently used to process the paychecks. The script is initiated when the customer clicks on the Submit Payroll button on the Web site. A trigger on the Paychecks table retrieves deduction information. The trigger has a single transaction to ensure that if any deduction is incalculable, an error is logged and the transaction is rolled back.

A SQL Profiler trace reveals that Bilco-DB01 waits for the GetFederalTax

procedure to return before calling the GetStateTax procedure. Bilco want the payroll processing performance to be optimized. What should you do?

- A. Change the trigger to send messages to Service Broker queues.
- B. Change the trigger to use distributed transactions.
- C. Change the isolation level to serializable.
- D. Make use of implicit transactions and not explicit transactions.

Answer: A

Explanation: The trigger should be changed to send messages to Service Broker Queues. By creating a queue for handling the GetFederalTax and a queue for handling the GetStateTax procedures, you will allow for asynchronous handling of messages thus reducing the transaction locks that are held on the data.

1. Only a single computer will be available to run SQL Server 2005. You must accomplish the tasks using the fewest possible instances of SQL Server. Performance should always be optimized.

Incorrect answers:

B: Since only a single server namely Bilco-DB01 is involved in the transaction, you should not change the trigger to use distributed transactions. Although the Web services might be implemented by a SQL Server, you are not using distributed queries to access it.

C: A Serializable isolation level will result in isolating each transaction, thus preventing data from being accessed until the transaction commits.

D: Implicit transactions do not require one to begin a transaction, but you must still either commit it or roll it back. It also will not reduce the number of transaction locks or make provision for asynchronous messaging.

QUESTION 8

Bilco requires a solution that will allow a user to retrieve and print paychecks. You need to develop the security for this solution. There are thus a few necessary changes that have to be made on the client computers and on the SQL server. Your solution must meet the business and technical requirements.

What should you do on the client computers?

- A. Enable trust for the certification authority.
- B. Enable C2 audit mode.
- C. Enable Force Encryption.
- D. Install a certificate.

Answer: A, C

Explanation: Since all data on the network must be encrypted, you need to have the server installed with a certificate and the client computers will need to have trust for the certification authority enables. You also need to enable Force Encryption on the client computers.

1. A decision was taken to decentralize certain operations. The checks are thus to be printed in the branch offices and delivered by courier to each customer company.

Incorrect answers:

B: Enabling C2 audit mode will not cause data to be encrypted.

D: The certificate should be installed on the server BILCO-DB01.

QUESTION 9

Bilco requires a solution that will allow a user to retrieve and print paychecks. You need to develop the security for this solution. There are thus a few necessary changes that have to be made on the client computers and on the SQL server. Your solution must meet the business and technical requirements.

What should you do on BILCO-DB01?

A. Enable Force Encryption.

B. Enable C2 audit mode.

C. Enable trust for the certification authority.

D. Install a certificate.

Answer: A, D

Explanation: BILCO-DB01 can be configured to encrypt data on the network using Secure Sockets Layer (SSL). You thus need to install a certificate on BILCO-DB01 and you also need to enable Force Encryption.

1. A decision was taken to decentralize certain operations. The checks are thus to be printed in the branch offices and delivered by courier to each customer company.

Incorrect answers:

B: Enabling C2 audit mode will not cause data to be encrypted.

C: The enable trust for the certification authority should be done on the client computers.

QUESTION 10

You are designing the security for the Bilco database. A developer has created two objects to return state and federal tax deductions. You must identify the required steps to allow the function to run in a secure fashion. You must ensure that your solution does not grant the function any unnecessary permissions.

What should you do?

A. Use an assembly with the EXTERNAL_ACCESS permission set.

B. Use an assembly with the SAFE permission set.

C. Add statements to grant Execute permission to the PayrollAdmins group in the script used to create each object.

D. Change the owner to the same schema as that used for the Paychecks table in the script used to create each object.

Answer: A

Explanation: Because a Web service must be accessed, the objects that return state

and federal tax deductions are Common Language Runtime (CLR) functions. CLR functions have to be added to an assembly to run on SQL Server 2005. Furthermore the assembly must belong to the EXTERNAL_ACCESS permission set. This permission set allows a function to access resources outside the SQL server.

1. There is a need to keep up to date with state and federal tax tables as these tend to change often. To this end Bilco plans to subscribe to a Web service that will make provision for updated tax table information. The Web service has two methods.
2. One method will accept a state and pay amount and returns the amount that should be deducted for state taxes.
3. The other methods will accept the pay amount and the number of deductions and returns the amount that should be deducted for federal taxes.

Incorrect answers:

B: The SAFE permission does not make provision for the allowance of access outside SQL Server. Thus it will not allow the functions the required permissions to run.

C: The Execute permission is not required by the PayrollAdmins group. A CLR user-defined procedure is executed using the SQL Server service account's security context.

D: Objects require an assembly. And it will not be necessary for functions to be owned by the same schema as the Paycheck table. Functions will be called from a trigger on the Paychecks table or from queries that populate the Paychecks table. They will thus not directly access the Paychecks table.

QUESTION 11

You are busy designing the attributes that must be used in the Bilco database. To this end you are evaluating the proposed database schema against application requirements and found that you need to add a NetRenumeration column to the Paychecks table. There are however some changes that must be made to the database so as to support the NetRenumeration column since the NetRenumeration column must be a computed column that subtracts all deductions from gross pay.

What should you do?

- A. An OtherDeductionsAmount computed column should be added to the Paychecks table.
- B. An OtherDeductionsTotal computed column should be added to the MiscDeductions table.
- C. Use a function that will retrieve the total miscellaneous deductions for that employee from the MiscDeductions table.
- D. Use an insert trigger on the Paychecks table.

Answer: C

Explanation: Since a computed column cannot include a subquery, you must create a function that queries the MiscDeductions table for the total deductions per employee. A computed column can use values in the same table, values returned from functions, and constants in its calculations.

Incorrect answers:

A: There is not need to add a computed column for OtherDeductionsAmount to the Paychecks table because it will not solve the problem unless you also created a function

that will retrieve the totaled data from MiscDeductions.

B: There is no need to add a computed column to the MiscDeductions table because a computed column cannot include a subquery, even from rows in the same table.

D: A Computers column does not require in insert trigger. The computation should occur automatically.

QUESTION 12

You are designing the database for Bilco. You must design the feature that will allow customers the ability to change an employee's salary and HourlyRate. You need to decide where the requested salary change will be stored. What should you do?

- A. Have SQL Server store the information in the inserted table
- B. Have SQL Server store the information in the deleted table
- C. Store the information in the Salary and HourlyRate columns of the SalaryInfo table.
- D. Use ProposedSalary and ProposedWage columns in the SalaryInfo table.

Answer: D

Explanation:

You have to store the information in persistent columns since the requested salary change must not be made permanent until after the person in charge of salary changes at the customer company confirms it with an e-mail response. You will thus have to create two new columns.

1. The procedure involved in a salary change is as follows: an e-mail must be sent to the customer, the customer must verify the change by clicking a link in the e-mail and logging on to the Web site. Then only will the salary change be committed.

Incorrect answers:

A: Although the information will be stored temporarily in the inserted table, the inserted table is stored in memory and the data will be lost when the trigger ends.

B: The deleted table will temporarily store old data during an UPDATE trigger. This means that there will not be new values. Furthermore the deleted table is stored in memory and the data will thus not be persistent.

C: You should not store the information in the Salary and HourlyRate columns of the SalaryInfo table. If so, then the change would be made immediately and then your solution will not meet the business requirements.

QUESTION 13

You must design the applications to support the Bilco reporting requirements. To this end you need to design a solution that will be resilient to accidental data modification after the end of a reporting period. In your solution you need to conserve disk space on BILCO-DB01.

What should you do?

- A. At the required reporting period create report snapshots for each customer.
- B. Create monthly, quarterly and annual database snapshots.

Generate reports against the appropriate database snapshot.

C. Replicate the reporting information to a named instance of SQL Server using snapshot replication.

Then back up the named instance monthly, quarterly and annually.

D. At the required reporting period create report snapshots for each customer.

Then save the reports in HTML, XML and Microsoft Excel format.

Answer: A

Explanation:

Report snapshots include query results accurate to the time the report snapshot is taken. These report snapshots do not change when the underlying data changes. But these reports are not rendered to a file format until requested.

1. Only a single computer will be available to run SQL Server 2005. You must accomplish the tasks using the fewest possible instances of SQL Server. Performance should always be optimized, and disk space should always be conserved.

Incorrect answers:

B: There is no need to create a monthly, quarterly and annual database snapshot. Though it does meet the consistency requirements, it will use more disk space than creating report snapshots. Furthermore a database snapshot has to be stored on the local computer which means that archiving for later retrieval would be impossible.

C: The use of snapshot replication as suggested in this option will require that you restore a period from backup if you needed to generate a report.

D: Saving snapshots in all possible formats would be superfluous since report snapshots are rendered on request.

Topic 2, TestLabs, Inc.

OVERVIEW:

TestLabs, Inc. is the leading manufacturer which produces specially brewed high octane racing fuels and prototype high performance accessories for several companies and customers in the racing industries. TestLabs, Inc. mission is to provide the best racing fuels which meet precise manufacturing standards. TestLabs, Inc. distributes the racing fuels all across the world. TestLabs, Inc. has most of their customers located in the United States.

TestLabs, Inc. makes use of fully automated manufacturing procedures which is used to create the prototype high performance accessories and high octane racing fuels.

TestLabs, Inc. has all their manufacturing equipment controlled by proprietary systems which can be programmed manually through a control interface program or automatically by uploading a process file to the control computer. TestLabs, Inc. has the capability to switch production lines between components by loading a different XML process file.

TestLabs, Inc. has four manufacturing lines which are responsible for operating at any time, each making a single component. TestLabs, Inc. has recently decided to stop the production line for an hour each day for inspection, cleaning, and calibration. TestLabs, Inc. makes use of a rolling schedule for taking down the production lines meaning no more than one production line is down for scheduled maintenance at a time. TestLabs,

Inc. shuts down each production line at the same time each day. TestLabs, Inc. takes one day in a month to shutdown all production lines for major maintenance activities. TestLabs, Inc. has the manufacturing line running 24×7 except for the shut down. TestLabs, Inc. has recently decided to have all manufacturing tolerances for each component specified by the manufacturing contract. TestLabs, Inc. uses a unique serial number that includes an embedded batch number for identifying each component. TestLabs, Inc. decided to create the serial number as each component is started and applied during the manufacturing process. TestLabs, Inc. has the batch numbers updated daily based on the year and Julian date. All serial numbers used by TestLabs, Inc. conforms to a standard format including a series of numbers and letters. TestLabs, Inc. has decided to sell their prototype high performance accessories and high octane racing fuels only to contracting customer. The customers of TestLabs, Inc. want to have the inventory on hand to minimize for the accessories to be scheduled for just-in-time delivery. TestLabs, Inc. requires that the customers provide at least 48 hours warning when requesting a change in delivery schedule. TestLabs, Inc. has all the raw materials that they receive based on just-in-time delivery schedules. TestLabs, Inc. also generates to the vendor purchasing the accessories 24-hours before expected delivery. TestLabs, Inc. additionally generates daily internal-mail to the warehouse management listing orders expected for receipt that day. TestLabs, Inc. has recently decided to take the next step in the company evolution by automating most of its quality control (QC) procedures. TestLabs, Inc.'s currently makes use of a proprietary network-based collection program named KingQuality with a limited reporting component. TestLabs, Inc. knows that the proprietary network-based collection programs reporting component has the capability to generate a raw dump of sensor data to a comma-delimited file. TestLabs, Inc. makes use of the latest sensors which are used to measure the exact weigh and diameter of the components verifying they are within manufacturing tolerance. TestLabs, Inc. has the information reported to a specific IP address.

TECHNICAL ENVIRONMENT:

TestLabs, Inc. currently makes use of a computer running Microsoft Windows Server 2003 Standard Edition for storing the XML process files. TestLabs, Inc. has the Microsoft Windows Server 2003 Standard Edition computer running an XML Web service to support the process control computers.

TestLabs, Inc. has loaded the Process files into the control systems as XML files containing the manufacturing steps and specifications. TestLabs, Inc. has configured the process computer to submit an identifying code to the Web service when reset. TestLabs, Inc. has configured the Web service to return the XML process file contains a seed value for the component serial number which is used as the starting serial number for the day's batch.

TestLabs, Inc. was deployed originally with only three Microsoft SQL Server 2005 Enterprise Edition computers running Windows Server 2003 Enterprise Edition.

TestLabs, Inc. has ensured that their deployment plan allows for more instances of SQL to be installed in the future if required to meet business or technical requirements.

TestLabs, Inc. makes use of the SQL Server named TL-SR01 to maintain accounting and personnel records. The second SQL Server named TL-SR02 is used to maintain the manufacturing line production, inventory, and shipping records. TestLabs, Inc. has

planned to have TL-SR02 host the XML process files whilst maintaining both current and historic process files. The third SQL Server named TL-SR03 will be used to collect and monitor quality control information when the automated quality control system goes live. TestLabs, Inc. will deploy more servers in the future if it is required.

BUSINESS REQUIREMENTS:

TestLabs, Inc. knows that this type of business has several time-sensitive reporting requirements. TestLabs, Inc. requires having the Managers have daily reports on current inventory, daily output, and projected shipments. TestLabs, Inc. wants to have all the reports e-mailed automatically to managers. The Managers have recently requested that they be able to recall previous day's reports. The Managers of TestLabs, Inc. additionally requires the daily QC summary reports describing any variations from optimum tolerance and when they occurred. TestLabs, Inc. considers it very critical that reporting should not be allowed to interfere with operational requirements.

1. TestLabs, Inc. has identified other reporting requirements which include general production and sales reports, business-related expenses due to problems such as down time or raw materials delays, and general accounting reports.
2. TestLabs, Inc. maintains all their purchase and sales records in US dollars. The Orders are generated automatically at TestLabs, Inc. when the components are shipped and the sale posted at that time. TestLabs, Inc. also generates invoices for customers of other countries in their local currency.
3. TestLabs, Inc. requires having the customers receive inventory and shipment schedule information by e-mail only. TestLabs, Inc. wants to have their customers able to request shipment records for components already shipped throughout the life of the manufacturing contract. TestLabs, Inc. wants to have the Managers to be able to request projected shipments for the next 30 days.

TestLabs, Inc. wants to have their maintenance personnel generate detailed ad hoc QC tracking reports in chart and table report formats. The TestLabs, Inc. maintenance staff should be able to filter the report by manufacturing line, specific QC sensors, and time of day range. TestLabs, Inc. requires having the maintenance team to be able to generate these reports at any time accurate to the latest five minutes.

TECHNICAL REQUIREMENTS:

TestLabs, Inc. makes use of the QC sensors to provide real-time data updated for each component manufactured. TestLabs, Inc. has configured each component with a separate QC tracking table. TestLabs, Inc. wants to have a new tracking table created before the start of each new batch run. TestLabs, Inc. has the date encoded in the table name. A list of data to be tracked with each entry is shown in the table below:

Data	Description
Line	The line is identified by the process control computer serial number.
Sensor	The numeric identifier of the sensor providing the data.
Value	The numeric value. Potential range varies by sensor.
Time	The time recorded to millisecond. The Value is supplied by the sensor.
ComponentSerial	The component serial number. This is determined by the computer by comparing the serial number of the last component for which data was reported by the same sensor.

TestLabs, Inc. wants to have each sensor return a single value for each component. TestLabs, Inc. considers it to be imperative that all QC data is collected and reported accurately.

1. TestLabs, Inc. does not want the data to be changed manually, and any attempts to

change the data must be tracked and reported. TestLabs, Inc. wants to have the QC data maintained online for a minimum of one year. TestLabs, Inc. wants to have all the older QC data archived to offline storage which should be retrievable for reference.

2. TestLabs, Inc. wants to have the QC records monitored on a real-time basis as any time QC values exceeding the tolerances specified on the contract are detected; the manufacturing line must be shut down immediately.

3. TestLabs, Inc. wants to have this initiated automatically by sending a coded message through the network. TestLabs, Inc. will configure the manufacturing control system to monitor a specified TCP port for the message. TestLabs, Inc. wants to be able to configure the port value individually for each control system through its internal maintenance application.

4. The initial testing of TestLabs, Inc. has shown that QC data collection and monitoring will be resource intensive, with disk resources a special area of concern.

5. TestLabs, Inc. has one key concern for any development relating to QC collection, monitoring, or reporting which should not be allowed to interfere with data collection and monitoring and extraneous activity on TL-SR03 must be kept to a minimum.

Topic 2, TestLab Inc (14 Questions)

QUESTION 14

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named TestLabs, Inc. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to design an application solution for SQL Server 2005. You have recently started designing Reporting Services applications to meet the reporting requirements of TestLabs, Inc. The application you are busy designing will be used by the maintenance personnel to generate QC reports.

During the course of the day you decided to use a database snapshot from a separate instance as the data source for reporting. You are required to identify the most appropriate source for creating the database snapshot. The solution you design should require minimum administration effort to maintain.

What should you do? (Choose TWO.)

- A. The new server should be configured as a Windows cluster with QC.
- B. A new named instance of SQL Sever should be deployed on QC.
- C. A new default instance should be configured for database mirroring with QC.
- D. A new named default instance of SQL Server should be deployed on the new server.
- E. The new server should be configured for log shipping with QC.

Answer: C, D

Explanation: In the scenario you should try and avoid interfering with QC operations by creating the new SQL Server instance on a new computer rather than a named instance. By making use of database mirroring you ensure that the

currency requirement for ad hoc reporting are met and places a minimal load on the primary server TL-SR03.

1. TestLabs, Inc. wants to have their maintenance personnel generate detailed ad hoc QC tracking reports in chart and table report formats
2. TestLabs, Inc. has one key concern for any development relating to QC collection, monitoring, or reporting which should not be allowed to interfere with data collection and monitoring and extraneous activity on TL-SR03 must be kept to a minimum

Incorrect Answers:

A: A Windows cluster server could have its advantages if deployed but should not be used because both servers share the same disk resources so snapshot generation and reporting would interfere with data collection.

B: You should not consider deploying a new named instance of SQL Server on TL-SR03 as this would cause additional load on all system resources which should be avoided as stated in the case study.

E: You should not consider making use of log shipping in the scenario because this has a high latency and the maintenance personnel should be able to generate ad hoc reports which include data up to the last five minutes.

QUESTION 15

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named TestLabs, Inc. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to develop applications that use SQL Server Support Services. You have recently started developing applications that use Reporting Services. The reporting solution you are developing will be used by the Managers for the daily reports. The solution that you design should have minimum storage requirements.

What should you do?

- A. You should design a solution that uses OLAP cubes.
- B. You should design a solution that uses daily database snapshots.
- C. You should design a solution that uses report definition files.
- D. You should design a solution that uses report snapshots.

Answer: D

Explanation: In the scenario you should remember that making use of the report snapshots the daily report requirements of the managers are met. You can also configure Reporting Services to generate the snapshots automatically. The report snapshot used is maintained making it possible to retrieve past report snapshots which supports e-mail delivery.

1. TestLabs, Inc. requires having the Managers have daily reports on current inventory, daily output, and projected shipments. TestLabs, Inc. wants to have all the reports e-mailed automatically to managers. The Managers have recently requested that they be able to recall previous day's reports.

2. The initial testing of TestLabs, Inc. has shown that QC data collection and monitoring will be resource intensive, with disk resources a special area of concern.
3. TestLabs, Inc. has one key concern for any development relating to QC collection, monitoring, or reporting which should not be allowed to interfere with data collection and monitoring and extraneous activity on TL-SR03 must be kept to a minimum.

Incorrect Answers:

A: You should not consider making use of OLAP cubes in the scenario because the OLAP cubes are used to generate reports from Analysis Service data. In the scenario the daily management reports do not have detailed analysis or data mining requirements.

B: In the scenario you should not consider designing a solution that uses daily database snapshots to provide historic data sources as the solution will not meet the data storage requirements of TestLabs, Inc. You should remember that the disk space consumed by the daily summary reports is significantly less than required for full copies of the source databases.

C: You should not consider making use of a report definition file because the report definition file is used to provide information used to create a report from a data source and does not store report data. In the scenario by running a report from a report definition file would reflect current data unless historic data sources are provided.

QUESTION 16

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named TestLabs, Inc. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start designing database objects. You have recently started to design database objects that perform actions. During the course of the day you completed developing the objects that will be used to support the auditing requirements of TestLabs, Inc.

You have finally created an Audit table to track events in the QC database which is designed to receive general information about different types of events. You have recently received additional instruction to audit and record any attempt made to manually change the data stored in the QC tables by creating a table to track these attempts. You are required to detect and record the attempt to the Audit table.

What should you do?

- A. You should make use of SQL Server Agents.
- B. You should make use of DDL triggers.
- C. You should make use of SQL Server Profiler.
- D. You should make use of DML triggers.

Answer: D

Explanation: In the scenario you will be intercepting a data manipulation event which is best achieved by creating a data manipulation language (DML) INSTEAD OF trigger on each on the QC tracking tables. Making this configuration ensures when an attempt is made to modify the table causing the trigger to fire, the trigger

can be used to record information about the attempt in the Audit table and roll back the modification attempt.

1. TestLabs, Inc. makes use of the QC sensors to provide real-time data updated for each component manufactured. TestLabs, Inc. has configured each component with a separate QC tracking table. TestLabs, Inc. wants to have a new tracking table created before the start of each new batch run

2. TestLabs, Inc. does not want the data to be changed manually, and any attempts to change the data must be tracked and reported

Incorrect Answers:

A: You should not consider making use of SQL Server Agents in the scenario because the SQL Server Agent would not be the best solution for auditing data manipulation attempts as you can not have alerts respond to this type of event.

B: In the scenario you should not consider making use of the Data definition language (DDL) triggers because the DDL triggers are used to audit attempts to modify database object and not the data stored in the object.

C: This option could be used in the scenario but is not the best solution because you will be able to audit attempts to modify the data. The information can be persisted about saving the trace file or trace table created. The drawback about storing data in the Audit table requires selecting the proper data fields and requires a separate procedure to write data to the table.

QUESTION 17

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named TestLabs, Inc. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start designing an application solution for SQL Server 2005. You have recently started designing an application solution that uses appropriate database technologies and techniques.

You have recently received instruction from the network CIO expressing concerns about availability and reliability of the QC database. The solution you are designing should provide a minimum down time in case of server disk subsystem failure.

What should you do?

- A. You should make use of database mirroring.
- B. You should make use of failover clustering.
- C. You should make use of log shipping.
- D. You should make use of database snapshots.

Answer: A

Explanation: In the scenario you are required to keep the down time to a minimum which is best achieved by making use of database mirroring. You should remember that database mirroring makes use of a hot standby server and transaction based updates. The servers have their own independent hardware so failover is possible.

1. TestLabs, Inc. does not want the data to be changed manually, and any attempts to change the data must be tracked and reported. TestLabs, Inc. wants to have the QC data maintained online for a minimum of one year. TestLabs, Inc. wants to have all the older QC data archived to offline storage which should be retrievable for reference

Incorrect Answers:

B: You should not consider making use of failover clustering in the scenario as failover clustering is based on multiple nodes with shared disk storage meaning failover is possible in event of hardware failure except shared disk subsystem failure.

C: In the scenario you should not consider using log shipping because this procedure makes use of two servers with dedicated hardware with the drawback being that the log shipping updates are based on transaction log backups rather than individual transaction causing a greater chance of data loss.

D: You should not consider making use of database snapshots in the scenario even though they are able to reliably protect database data but not the database server as the snapshot is a copy of a specific database not a copy of the server.

QUESTION 18

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named TestLabs, Inc. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start designing database testing and code management procedures. You have recently started designing a unit test plan for a database of TestLabs, Inc. TestLabs, Inc. has recently deployed an additional database server named TL-SR04 on the network. TL-SR04 has the same hardware configuration used on TL-SR03.

TestLabs, Inc. are in the process of using TL-SR04 for testing the potential impacts in different use and load scenarios on TL-SR03 after going live. You are required to create a test plan that is based on queries that run against TL-SR03 including ad hoc queries whilst you capture and extract query text used in ad hoc queries.

What should you do?

- A. You should make use of Reporting Services.
- B. You should make use of Integration Services.
- C. You should make use of Windows System Monitor.
- D. You should make use of SQL Server Profiler.

Answer: D

Explanation: You should remember in the scenario when you use SQL Server Profiler to capture and report information required like the daily activity and creating a trace file it is possible to make use of the `sp_create_plan_guide` stored procedure to retrieve exact query text strings. You additionally include the Showplan XML event type in the capture when capturing the trace.

1. TestLabs, Inc. makes use of the SQL Server named TL-SR01 to maintain accounting and personnel records. The second SQL Server named TL-SR02 is used to maintain the

manufacturing line production, inventory, and shipping records. TestLabs, Inc. has planned to have TL-SR02 host the XML process files whilst maintaining both current and historic process files. The third SQL Server named TL-SR03 will be used to collect and monitor quality control information when the automated quality control system goes live. TestLabs, Inc. will deploy more servers in the future if it is required

Incorrect Answers:

A: You should remember that you are not able to make use of Reporting Services to capture queries or any other live system activity because Reporting Services generates reports from defined data sources.

B: You should not make use of SQL Server Integration Services (SSIS) in the scenario because SSIS is used as a platform for data integration and work flow solutions and can not be used to retrieve the query text required for the test plan.

C: You should not consider making use of the Windows System Monitor just because the installation of SQL Server 2005 added additional counters related to SQL to System Monitor, it can not be used to capture text queries that run and does not log the data collected.

QUESTION 19

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to deploy a SQL Server 2005 computer for the QC department for detailed analysis. The SQL server computer will be used for loading data from the most recent month's QC tracking tables for online analytical processing (OLAP).

TestLabs, Inc. knows that the QC tracking table is similar for all the components with some differences in the type and quantity of data collected. There will be potential differences in the data that should be collected from related tables depending on the component and the type of sensor monitored.

You are required to develop a solution that can be used to quickly transform the data to allow for other maintenance activities whilst ensuring that processing continues if errors are detected during transfer. The solution you develop should validate the data before and after transformation.

What should you do?

A. An SQL Server Integration Services (SSIS) package template should be created as the basis for creating a custom transform and load package.

B. CLR user-defined functions should be created to perform data transformations.

C. You should make use of SQL Server Integration Services (SSIS) Wizards to transfer the data.

D. A SQL Server script should be created to transform and load the data. You should then modify the script for each load.

Answer: A

Explanation: In the scenario you are required to transform data and continue processing even if errors are protected which is achieved by making use of an SQL Server Integration Services package as the scenario states the tracking tables are similar and this is the fastest way to create transform packages by using a package template.

1. The initial testing of TestLabs, Inc. has shown that QC data collection and monitoring will be resource intensive, with disk resources a special area of concern.
2. TestLabs, Inc. does not want the data to be changed manually, and any attempts to change the data must be tracked and reported.
3. TestLabs, Inc. uses a unique serial number that includes an embedded batch number for identifying each component.

Incorrect Answers:

B: This option could be used as a solution but should not be considered in the scenario because the Common Language Runtime (CLR) user-defined function (UDF) functions on their own are not enough as you would require a method of loading the data.

C: This option should not be used in the scenario because you could make use of the wizards but they are design for simple data copy and transformation. If you used this option you would require creating a new package for each transfer.

D: You should not consider taking this action in the scenario because a SQL Server script could be used for the operation but it is not efficient as using Integration Services which is designed for this particular purpose and is more difficult to program in error handling as there are no built-in validation functions.

QUESTION 20

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start developing an application solution for SQL Server 2005. You are in the process of selecting and designing SQL Server services to support the business needs for the managers standard daily required reports.

You have received additional instruction from the network CIO to ensure the reports have a consistent format and data is accurate to the most recent period. You should have the reports generated automatically without user interaction whilst ensuring you create the application using minimal developer effort.

What should you do?

- A. You should make use of Reporting Services.
- B. You should make use of an HTTP endpoint.
- C. You should make use of Integration Services.
- D. You should make use of Notification Services.

Answer: A

Explanation: You should remember in the scenario you are required to use minimal developer effort. By making use of Reporting Services because it has tools which are provided to define the necessary data sources, queries used to retrieve data and content and format of the reports which can be designed to be generated automatically.

1. The initial testing of TestLabs, Inc. has shown that QC data collection and monitoring will be resource intensive, with disk resources a special area of concern.
2. TestLabs, Inc. does not want the data to be changed manually, and any attempts to change the data must be tracked and reported.
3. TestLabs, Inc. uses a unique serial number that includes an embedded batch number for identifying each component.

Incorrect Answers:

B: This option should not be considered for use in the scenario because an HTTP endpoint provides the means which HTTP clients can use to query SQL Server. An HTTP endpoint might be used when for the creation of stored procedures and the data will be delivered as XML using SOAP instead of a formatted report.

C: This option should not be used in the scenario because SQL Server Integration Services (SSIS) is meant for data integration and workflow solutions and is not used for generating reports.

D: This option should not be considered in the scenario because Notification Services is used to send notification to subscribers which can be sent in response of a triggering event based on a predefined schedule. This tool can be used but it does not minimize the effort required to generate standard reports.

QUESTION 21

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start designing database objects. The objects you design define data for the Ship Date which is the only attribute which allows null values during data entry.

You are required to decide which of the following table designs best suite the need of TestLabs, Inc.?

InventoryTracking1		InventoryTracking2		InventoryTracking3		InventoryTracking4	
PK	Serial Number	PK	ManufactureDate	PK	Contact ID	PK	ShipDate
	ManufactureDate	PK	ContactID		SerialNumber	PK	ManufactureDate
	ShipDate		SerialNumber		ManufactureDate		SerialNumber
	ContactID		ShipDate		ShipDate		ContactID

Answer:

InventoryTracking1		InventoryTracking2		InventoryTracking3		InventoryTracking4	
PK	Serial Number	PK	ManufactureDate	PK	Contact ID	PK	ShipDate
	ManufactureDate	PK	ContactID		SerialNumber	PK	ManufactureDate
	ShipDate		SerialNumber		ManufactureDate		SerialNumber
	ContactID		ShipDate		ShipDate		ContactID

Explanation:

In the scenario the only choice which correctly defines the primary key is the table

design which uses the Serial Number column as the only primary key as the primary key is intended to enforce entity integrity and should contain a unique value for each row.

1. TestLabs, Inc. has recently decided to have all manufacturing tolerances for each component specified by the manufacturing contract. TestLabs, Inc. uses a unique serial number that includes an embedded batch number for identifying each component. TestLabs, Inc. decided to create the serial number as each component is started and applied during the manufacturing process. TestLabs, Inc. has the batch numbers updated daily based on the year and Julian date. All serial numbers used by TestLabs, Inc. conforms to a standard format including a series of numbers and letters.
2. TestLabs, Inc. makes use of the QC sensors to provide real-time data updated for each component manufactured. TestLabs, Inc. has configured each component with a separate QC tracking table. TestLabs, Inc. wants to have a new tracking table created before the start of each new batch run.
3. TestLabs, Inc. has loaded the Process files into the control systems as XML files containing the manufacturing steps and specifications. TestLabs, Inc. has configured the process computer to submit an identifying code to the Web service when reset. TestLabs, Inc. has configured the Web service to return the XML process file contains a seed value for the component serial number which is used as the starting serial number for the day's batch.

Incorrect Answers:

TestLabs, Inc. stated in the case study that they manufacturer several components daily which could ship on the same date so placing primary keys there should not be considered. You should also remember that the manufacturer date value is encoded into the serial number.

QUESTION 22

DRAG DROP

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start designing database testing and code management procedures. You are in the process of designing a unit test plan for a database. You have recently received additional instruction to test the procedures and applications written to support the QC database in preparation for live collection and analysis.

You have created the QC database and the initial database objects and plan to use a mix of automated and manual testing to test reporting and data analysis. You have loaded and enabled all the custom applications you wrote. You are going to make use of an isolated subnet from the production network available in the test lab with connectivity from the lab to the production network.

You are required to complete testing as quickly as possible whilst having a minimal impact on the existing procedures and cannot interrupt manufacturing processes or data collection. You are required to place the appropriate steps to take in the correct order.

What should you do?

Actions, select from these	Actions, place here
Deploy QC on the production network.	Place step first here.
Import data from TL-SR04 into TL-SR03.	Place step second here, if any.
Shut down manufacturing lines.	Place step third here, if any.
Dump QC data from TL-SR04.	Place step fourth here, if any.
Configure TL-SR03 and sensors for live capture.	Place step fifth here, if any.
Deploy QC on an isolated subnet.	Place step sixth here, if any.
Disable TL-SR04	Place step seventh here, if any.

Answer:

Actions, select from these	Actions, place here
Deploy QC on the production network.	Deploy QC on an isolated subnet.
	Dump QC data from TL-SR04.
Shut down manufacturing lines.	Import data from TL-SR04 into TL-SR03.
	Place step fourth here, if any.
Configure TL-SR03 and sensors for live capture.	Place step fifth here, if any.
	Place step sixth here, if any.
Disable TL-SR04	Place step seventh here, if any.

Explanation:

In the scenario you should remember when preparing for testing that you should deploy TLR-SR03 on an isolated subnet and a design requirement for database applications is to shutdown the manufacturing lines automatically when TLRSR-03 data is out of tolerance. By dumping the QC data from TLR-SR04 you are then able to import the data from TL-SR04 into TL-SR03 using either bulk-load or an Integration Services project.

1. TestLabs, Inc. makes use of the SQL Server named TL-SR01 to maintain accounting and personnel records. The second SQL Server named TL-SR02 is used to maintain the manufacturing line production, inventory, and shipping records. TestLabs, Inc. has planned to have TL-SR02 host the XML process files whilst maintaining both current and historic process files. The third SQL Server named TL-SR03 will be used to collect and monitor quality control information when the automated quality control system goes live. TestLabs, Inc. will deploy more servers in the future if it is required

Incorrect Answers:

In the scenario you should remember that you are specifically told not to shut down the production lines. You should not deploy on the production network because you would be taking a chance of accidentally shutting down the manufacturing lines during testing. You should also be aware that you are not able to configure TL-SR03 for live capture as the sensors are designed to deliver data to specific ports.

QUESTION 23

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start developing application that uses SQL Server Support Services. The application you are developing is for Reporting Services.

You are required to provide a solution to support the current QC departments reporting requirements. You should ensure that the QC personnel have full control of the report content and are able to create reports as quickly as possible with minimal instruction.

What should you do?

- A. You should make use of the Report Builder.
- B. You should make use of the Report Snapshot.
- C. You should make use of the Report Definition File.
- D. You should make use of the Report Project.

Answer: A

Explanation:

You should remember in the case study that the members of the QC department are required to build ad hoc chart and table reports which is best achieved using Report Builder which is specifically designed for the creation of ad hoc chart, table and matrix reports and is intended for use if you do not understand complex programming.

1. TestLabs, Inc. wants to have their maintenance personnel generate detailed ad hoc QC tracking reports in chart and table report formats. The TestLabs, Inc. maintenance staff should be able to filter the report by manufacturing line, specific QC sensors, and time of day range. TestLabs, Inc. requires having the maintenance team to be able to generate these reports at any time accurate to the latest five minutes.

Incorrect Answers:

B: This option should not be considered in the scenario because the Report Snapshot is a specific completed report which is available for viewing and redistribution which cannot be modified.

C, D: These options should not be considered for use in the scenario because they are features of the Report Designer and is not intended for providing an ad hoc reporting environment.

QUESTION 24

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start

developing application that uses SQL Server Support Services. The application you are developing is for Notification Services. You are in the process of evaluating if Notification Services can help support shutting down the production lines through automatic QC analysis.

You recently created the CRL triggers for each QC tracking table which fire when information is inserted into the table. The trigger will compare the values submitted to a value of an acceptable range. You are required to identify which application programming interface (API) event would support Notification Services application event collection from the trigger if an out-of-range value is detected.

What should you do?

- A. You should make use of .NET API.
- B. You should make use of COM API.
- C. You should make use of XML API.
- D. You should make use of SQL Server API.

Answer: A

Explanation: In the scenario you should always remember that Notification Services applications will have one or more event providers for gathering events. All mentioned the event APIs are supported by Notification Services but the best choice is using the .NET API as you are writing a CRL trigger which is in the .NET Framework 2.0.

1. TestLabs, Inc. wants to have the QC records monitored on a real-time basis as any time QC values exceeding the tolerances specified on the contract are detected; the manufacturing line must be shut down immediately.
2. TestLabs, Inc. wants to have this initiated automatically by sending a coded message through the network. TestLabs, Inc. will configure the manufacturing control system to monitor a specified TCP port for the message. TestLabs, Inc. wants to be able to configure the port value individually for each control system through its internal maintenance application.
3. TestLabs, Inc. wants to have each sensor return a single value for each component.

Incorrect Answers:

B: You should not consider making use of the COM API in the scenario because this API exposes Event Objects and Event Collector classes and is not an efficient way to design the application.

C: You should not consider making use of the XML API in the scenario as it is supposed to be used with bulk-load operations and we are not working with a document or XML data stream.

D: You should not make use of the SQL Server API as the API will make use of a query to load data from database objects and you are required to have the event driven by the detected data.

QUESTION 25

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All

servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You are responsible for administering a SQL Server 2005 database server named TL-SR03. You have recently received instruction from the TestLabs.com network CIO to start designing database testing and code management procedures. You are in the process of creating a performance baseline and benchmarking strategy for a database.

You are required to monitor the database server's performance and inform the Information Technology (IT) supervisor and in-house maintenance if hardware platform performance develops bottlenecks. You should collect baseline performance data when the server is under minimal load and under a simulated data collection load whilst creating a record for the statistics collected for comparison with the live performance data.

What should you do?

- A. You should make use of SQL Server Agent Alerts.
- B. You should make use of SQL Server Profiler.
- C. You should make use of System Monitor.
- D. You should make use of Windows Performance Counter logs.

Answer: D

Explanation: You should make use of the Windows Performance Counter Logs to perform the required operations in the scenario because the Counter Logs allows you to specify the counters which will be used to gather the required information as you would most likely focus on disk, processor and memory performance data.

1. TestLabs, Inc. has one key concern for any development relating to QC collection, monitoring, or reporting which should not be allowed to interfere with data collection and monitoring and extraneous activity on TL-SR03 must be kept to a minimum.
2. The initial testing of TestLabs, Inc. has shown that QC data collection and monitoring will be resource intensive, with disk resources a special area of concern.

Incorrect Answers:

- A: You should not even consider making use of SQL Server Agents Alerts in the scenario because the Agents can not be used to log performance data but they could be configured to use an alert when the processor exceeds the predetermined level.
- B: You should not make use of SQL Server Profiler in the scenario because SQL Server Profiler is used to capture SQL Server activity for analysis or playback and you are required to capture hardware platform performance information.
- C: You should not make use of the Windows System Monitor in the scenario because the System Monitor would work but it does not log any performance data and you are required to capture hardware platform performance information.

QUESTION 26

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client

computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start designing a database. The database you are designing will make use of design entries. You are in the process writing a SQL Server script that will be used for the creation of a new QC tracking table for each batch run.

The table created by the script you wrote should include data columns for all the required data whilst you identify the best column or column to use as the primary key.

What should you do?

- A. You should make use of the ComponentSerial and Sensor columns as the primary key.
- B. You should make use of the Line and Sensor columns as the primary key.
- C. You should make use of the Line and ComponentSerial as the primary key.
- D. You should make use of the Time column as the primary key.

Answer: A

Explanation: You should remember in the scenario that each of the sensors will return a single value for each component and the combination of sensor and the component serial number will resolve as a unique value which is required for creating primary keys.

1. TestLabs, Inc. makes use of the QC sensors to provide real-time data updated for each component manufactured. TestLabs, Inc. has configured each component with a separate QC tracking table. TestLabs, Inc. wants to have a new tracking table created before the start of each new batch run. TestLabs, Inc. has the date encoded in the table name.

2. TestLabs, Inc. uses a unique serial number that includes an embedded batch number for identifying each component.

Incorrect Answers:

B: You should not consider making the Line and Sensor columns as your primary key because multiple entries will be made for each component one for each sensor and this will not produce a unique value.

C: You should not consider taking the actions in this option because multiple entries will be made for each component one for each sensor.

D: You should not consider making the Time column as your primary key as there is no way to guarantee that two different sensors will not return values at the same time.

QUESTION 27

You work as the network database administrator at TestLabs, Inc. The TestLabs, Inc. network consists of a single Active Directory domain named testlabs.com. All servers on the TestLabs, Inc. network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the TestLabs.com network CIO to start developing application that uses SQL Server Support Services. The application you are developing is for Reporting Services.

You have recently received instruction from the network CIO that the QC personnel should be able to report on more detailed trend analysis to try and

identify common factors and potential performance concerns. You are planning to move data from TL-SR03 to a different SQL Server for this purpose. You are required to provide an appropriate data source for this reporting. What should you do?

- A. You should make use of an indexed view built from the existing tables.
- B. You should make use of the existing data table structure.
- C. You should make use of a partitioned table built from the existing tables.
- D. You should make use of an Analysis Services cube built from the existing tables.

Answer: D

Explanation: In the scenario you should remember that the type of trend analysis required for reporting applications you should make use of Analysis Services as you would be able to mine the data for performance and failure trends and build cubes that present the data as a reporting source.

1. TestLabs, Inc. has one key concern for any development relating to QC collection, monitoring, or reporting which should not be allowed to interfere with data collection and monitoring and extraneous activity on TL-SR03 must be kept to a minimum.
2. The initial testing of TestLabs, Inc. has shown that QC data collection and monitoring will be resource intensive, with disk resources a special area of concern.

Incorrect Answers:

A, B, C: You should remember in the scenario that the existing tables, partitioned table or indexed view of all the data are valid sources but they are not the appropriate type of data analysis required as they can be used to present data depending on how reports are structured.

Topic 3, Stanford Finance, Scenario

BACKGROUND:

Company overview

Stanford Finance is a private company that specializes in the provision of investment and asset management services for its clients. Stanford Finance has 8 offices located in New York, Boston, Chicago, Atlanta, London, Manchester, Madrid, and Lisbon. Each office is currently responsible for maintaining its own customers. Stanford Finance offers its customers a number of investment services, including investment in real estate, equities, and private share listing.

Planned Changes

The company wants to create an online investment tracking system that will centralize investment portfolios at the eight offices. The company also wants to implement automated investment through its public Web site.

EXISTING ENVIRONMENT:

The Stanford Finance network consists of a single Windows Server 2003 Active Directory domain. The domain controller for the network is named SF-DC01 and is located in New York.

Each office currently maintains its own database for investors and investments in a single

Microsoft Access table.

Each office is also has its own Accounting Department that is responsible for auditing and billing at that office. The accounting application can export data from the Microsoft Access table as a comma-delimited file. The file has the following format:

InvestorName, CreditCard, ExpireDate, Commission, AdminCharges, Total

Account administration charges are calculated manually at the end of each month while commission is calculated manually when the customer cashes out his or her investments.

Stanford Finance maintains its own Web site that runs on a Microsoft Windows Server 2003 Web server named SF-SR03. Internet Information Service (IIS) 6.0 is running on SF-SR03. The company plans to add a SQL Server 2005 database server named SF-DB04 to host the investment tracking database.

BUSINESS REQUIREMENTS:

General Requirements

Each office offers four different kinds of investments: real estate, equities, private share listing, and derivatives. Each type of investment can be either fixed deposit or monthly deposit fixed term. Investors must specify the type of investment they want when applying online. If the type of investment they want is not available, the other types of investments that are available should be displayed. Investors must also be able to search for investments by city.

Investors must provide a credit card, address, e-mail, and phone number when applying online. This information must be kept confidential at all times. Only employees in the Stanford Finance Accounting department should have access to the investors' credit card information. Also, when an investor provides his or her credit card number, the credit card number must be verified using a third-party Component Object Model (COM) component. The guest should be sent an e-mail when the credit card is verified or declined.

The administrator at each office must be able to continue to access investment data for the local investors.

Commission on investments differs from one city to the other and the company often offers special rates at specific offices. When an investor cashes out his or her investment, the commission must be based on the initial commission charged when the investor signed up. Only the manager of the Investment departments can change commission rates, but only for the office they work at. All rate changes must be logged to a separate database table. The before rate, after rate, the manager's name, and the reason for the price change must be logged.

When an investor makes an investment, they need to leave their emergency contact information and beneficiary name. They must also make a deposit by check or by cash. Monthly administration fees are charged against their credit card.

Investors must be able to request a tax invoice up to 90 days after the cash out. After that time the detailed information must still be archived for accounting purposes.

When an investor cashes out, they can pay commission by cash, check, or credit card. Commission should not be deducted from the investment pay out. If they cash out online, they must pay by credit card. The online system should provide five questions about investor satisfaction but investors can choose not to respond to these questions. The investor's response to the questions must be saved to the database.

Reporting

The Board of Directors wants a monthly report that details the performance of the investments at each office. The report must include information about the customer satisfaction level based on the responses to the online system.

TECHNICAL REQUIREMENTS:

Security

Credit card data must be encrypted at all times and the online investment system must be protected against SQL Injection attacks.

Availability

Communication between offices will take place via a virtual private network (VPN). In the event of a WAN link failure, investment, investment auditing, and accounting information must still be available at each office.

Reporting

Information from the online investment satisfaction questionnaire must be copied to the database server in the New York office for monthly reporting.

Maintenance

The online investment system will be deployed for the New York office first. After a month period, the online investment system will be extended to Boston, Chicago, and Atlanta. The online system will be extended to London and Manchester a month later and to Lisbon and Madrid a month after that. System performance must be monitored at each phase to determine whether additional resources are required. The administrator at each office will be responsible for ensuring that the data from existing systems is imported to the SQL Server 2005 database on the first day of each month.

Each office should store information about their local investors, their investment portfolios, and their investment history locally.

The IT director has mandated that data must be normalized to the third normal form (3NF).

Topic 3, Stanford Finance (13 Questions)

QUESTION 28

You need to design the table that will store the investor's responses to the online investment satisfaction questionnaire. You need to ensure that the table meets Stanford Finance's reporting requirements.

What table should you implement?

SurveyResponse1	
PK	rowID
	officeID
	investmentID
	startDate
	endDate
	response1
	response2
	response3
	response4

SurveyResponse2	
PK	rowID
	investorID
	investmentID
	startDate
	endDate
	response1
	response2
	response3
	response4

SurveyResponse3	
PK	rowID
	officeID
	consultantID
	startDate
	endDate
	response1
	response2
	response3
	response4

SurveyResponse4	
PK	rowID
	investorID
	consultantID
	startDate
	endDate
	response1
	response2
	response3
	response4

- A. SurveyResponse1.
- B. SurveyResponse2.
- C. SurveyResponse3.
- D. SurveyResponse4.

Answer: A

Explanation: The SurveyResponse1 table meets the reporting requirements as it allows the Board of Directors details of the performance of the investments at each office.

Incorrect Answers:

B: The SurveyResponse2 table identifies the respondent rather than the office. The Board of Directors wants a monthly report that details the performance of the investments at each office.

C: The SurveyResponse3 table identifies the consultant rather than the investment. The Board of Directors wants a monthly report that details the performance of the investments at each office.

D: The SurveyResponse2 table identifies the respondent and the consultant rather than the office and the investment. The Board of Directors wants a monthly report that details the performance of the investments at each office.

QUESTION 29

You need to design the functionality for the online investment system. You need to allow users to search for investment opportunities by city. You need to ensure that your solution meets Stanford Finance's technical and business requirements. What should you do?

- A. Create a partitioned view.
- B. Create a Transact-SQL (T-SQL) user-defined function.
- C. Create a stored procedure with the WITH RECOMPILE option.
- D. Create a Common Language Runtime (CLR) user-defined function.

Answer: B

Explanation: A T-SQL user-defined table-type function returns a table to an application and protects against SQL Injection by allowing validation of the input parameters.

Incorrect Answers:

A: You cannot pass parameters to a view. Furthermore, partitioned views have been deprecated in SQL Server 2005.

C: A stored procedure with the WITH RECOMPILE option will be recompiled every time it is executed. This will degrade performance.

D: A CLR user-defined function should be created when T-SQL functions cannot be implemented to achieve the desired results. However, a T-SQL function can be used in this scenario.

QUESTION 30

You need to design a security strategy for the investors' credit card information. You need to ensure that your solution meets Stanford Finance's security requirements.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. Install a Certificate Authority (CA) and issue a digital signature certificate to all SQL Server 2005 database servers.
- B. Install a Certificate Authority (CA) and issue a digital signature certificate to all investors.
- C. Create a stored procedure to return the credit card information. Grant the users in the Accounts department execute permissions to the stored procedure.
- D. Create a master key in SQL Server 2005 to generate an encryption certificate. Use the certificate to encrypt the credit card data.

Answer: C, D

Explanation: SQL Server 2005 can issue self-signed certificates if it has a master key. You can use the CONVERT function to decrypt the data. The easiest way to do this would be through the use of a stored procedure. You can also ensure that only members of the Accounting department has access to the data by ensuring that only they have execute permissions to the stored procedure.

Incorrect Answers:

A, B: SQL Server 2005 can issue self-signed certificates if it has a master key; therefore you do not need a certificate authority. Furthermore, digital signatures do not provide encryption, only integrity.

QUESTION 31

You need to design the database schema for the online investment system. The proposed schema is shown in the Online System exhibit.

Office	
PK	officeID
	city

Investors	
PK	investorID
	name
	CreditCard
	Expiry Date
	address
	zipCode
	phone
	email
	beneficiary

InvestmentType	
PK	typeID
	description

You decide to add an Investments and an Opportunities table to the schema. You need to decide which columns will be referenced as foreign keys in the Investments and Opportunities tables. You need to ensure that your solution meets Stanford Finance's technical and business requirements.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. Configure Office.officeID and InvestmentType.typeID as foreign key on the

Opportunities table.

B. Configure Office.officeID and InvestmentType.typeID as foreign key on the Investments table.

C. Configure Investors.investorID, Office.officeID and InvestmentType.typeID as foreign key on the Investments table.

D. Configure Investors.investorID, Office.officeID and InvestmentType.typeID as foreign key on the Opportunities table.

Answer: A, C

Explanation: You need to reference the Office.officeID and InvestmentType.typeID as foreign key on the Opportunities table because you need to track which types of investments are still available at each office. You also need to reference the Investors.investorID, Office.officeID and InvestmentType.typeID as foreign key on the Investments table because if an investment is declined you need to track the investor who was declined. You also need to be able to make the investment type at the office available for other investors.

Incorrect Answers:

B: You need to reference the Investors.investorID, Office.officeID and InvestmentType.typeID as foreign key on the Investments table because if an investment is declined you need to track the investor who was declined.

D: You do not need to reference the Investors.investorID as foreign key on the Opportunities table.

QUESTION 32

You need to design a table that will store the commission rate for the online investment system. You need to ensure that your solution meets Stanford Finance's technical and business requirements.

What table schema should you use?

InvestmentType	Investment	Offices	Commission
PK typeID	PK investmentID PK officeID	PK officeID	PK officeID PK investmentTypeID
description commission	investmentTypeID commission	city commissionID commission	commission

A. InvestmentType.

B. Investment.

C. Offices.

D. Commission.

Answer: D

Explanation: Because commission rates differ by investment type and office, you must create a separate table and use the investmentTypeID and officeID as the primary key.

Incorrect Answers:

A: Storing the commission rate in the InvestmentType table will not allow office managers to specify a special price for their office.

B: Storing the commission rate in the Investment table will link the commission rate to individual investments. This will not allow office managers to specify a special price for an investment type offered by their office.

C: Storing the commission rate in the Offices table will not allow office managers to specify a special price for different investment types.

QUESTION 33

You need to design the storage and archival solution for the InvestmentCharges table. The InvestmentCharges table is shown in the InvestmentCharges Table exhibit.

InvestmentCharges Table exhibit:

InvestmentCharges	
PK	Charge ID
	officeID
	investorID
	date
	category
	amount
	description

You need to ensure that your solution optimizes the storage and archiving of the table information. Your solution must also meet Stanford Finance's technical and business requirements.

What should you do?

- A. Partition the InvestmentCharges table on the category column and store each partition on a separate filegroup.
- B. Partition the InvestmentCharges table on the category column and store each partition on the same filegroup.
- C. Partition the InvestmentCharges table on the date column and store each partition on a separate filegroup.
- D. Partition the InvestmentCharges table on the date column and store each partition on the same filegroup.

Answer: C

Explanation: Partitioned tables can be stored in separate filegroups which allows for better backup and query performance. However, the table must be partitioned in a logical manner. In this scenario it makes most sense to partition the data by date.

Incorrect Answers:

A, B: The table should be partitioned by date rather than category.

D: Storing the partitioned data in separate filegroups will allow for better backup and query performance.

QUESTION 34

You need to design a solution for the online investment system that will verify the credit card number using a third-party Component Object Model (COM) component. You need to ensure that your solution offers the best security. What should you do?

- A. Create a Transact-SQL stored procedure.
- B. Create an extended stored procedure.
- C. Create a Common Language Runtime (CLR) stored procedure and assembly in the EXTERNAL_ACCESS permission set.
- D. Create a Common Language Runtime (CLR) stored procedure and assembly in the UNSAFE permission set.

Answer: D

Explanation: COM components are unmanaged code. The credit card verification component is a COM component; therefore it is unmanaged code. A CLR stored procedure can run unmanaged code if it is in the UNSAFE permission set.

Incorrect Answers:

- A: T-SQL stored procedures cannot call unmanaged code.
- B: You can use an extended stored procedure to call unmanaged code but extended stored procedures are deprecated in SQL Server 2005 in favor of CLR stored procedures.
- C: A CLR stored procedure can only run unmanaged code if it is in the UNSAFE permission set. It cannot run unmanaged code in the EXTERNAL_ACCESS permission set.

QUESTION 35

You need to design a test plan for developers that will develop the online investment system. Developers must be able to test individual components before deploying them to the production database. You need to ensure that your solution meets Stanford Finance's technical and business requirements. What should you advise the developers to do?

- A. Start a SQL Server Profiler trace using the Standard template and run the query. Then replay the trace.
- B. Start a SQL Server Profiler trace using the Tuning template and run the query. Then replay the trace.
- C. Test each query by running the query with the SET SHOWPLAN_ALL ON statement.
- D. Test each query by running the query with the SET SHOWPLAN ON ALL statement.

Answer: C

Explanation: The SHOWPLAN_ALL statement displays a graphical execution plan of the query without actually running the query.

Incorrect Answers:

- A, B: SQL Server Profiler is used to analyze SQL Server performance. It does not

analyze query execution.

D: SET SHOWPLAN ON ALL is the wrong syntax. It should be SET SHOWPLAN_ALL ON.

QUESTION 36

You need to design a strategy to import data from the old system to the new centralized system. You need to ensure that the local administrator at each office has the minimum permissions necessary to perform the operation. You need to ensure that your solution meets Stanford Finance's technical and business requirements.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. Use BULK INSERT to import the data to SQL Server 2005.
- B. Add the local administrators to the db_datawrite role.
- C. Add the local administrators to the db_dtsltduser role.
- D. Add the local administrators to the db_dtsoperator role.
- E. Use SQL Server Integration Service (SSIS) to create a package.

Answer: D, E

Explanation: The legacy data must be transformed; SSIS allows you to transform and import data to SQL Server 2005. The local administrator needs permission to run the SSIS package; therefore you need to add them to the db_dtsoperator role.

Incorrect Answers:

A: BULK INSERT does not transform data.

B, C: The db_dtsltduser role and db_datawrite role gives the administrator too much permissions.

QUESTION 37

You need to design the online investment system. You need to ensure that an investment is reserved as soon as an investor chooses it. If the investor fails to secure the investment, it must become available to other investors. You need to ensure that your solution meets Stanford Finance's technical and business requirements.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. Create an INSERT trigger on the Investors table.
- B. Create an INSERT trigger on the Investments table.
- C. Create a Service Broker queue.
- D. Create an HTTP endpoint.

Answer: B, C

Explanation: You need to create an INSERT trigger on the Investments table whenever credit card data is added to the table. You should also create a Service

Broker queue to allow the transaction to be committed immediately while a separate asynchronous process verifies the credit card data.

Incorrect Answers:

A: Creating a trigger on the Investors table will fail if the investor uses a different credit card for the online investment system.

D: An HTTP endpoint is used to expose stored procedures as Web services. This is not required.

QUESTION 38

You need to design a solution for the deployment of a local copy of the centralized database system to the offices at Boston, Chicago, and Atlanta. The database contains table, function and stored procedures that support the online investment system and accounting system. You must ensure that data transmission to the separate offices is minimized. You need to ensure that your solution meets Stanford Finance's technical and business requirements.

What should you do?

- A. Use replication to copy the database to the offices for the online investment system and a script to copy the data for the accounting application.
- B. Use replication to copy the database to the offices for the online investment system and the accounting application.
- C. Use a database snapshot to copy the database to the offices for the online investment system and replication to copy the data for the accounting application.
- D. Use a script to copy the database to the offices for the online investment system and the accounting application.

Answer: A

Explanation: Only the tables required for the online investment system must be populated. This data must also remain up to date. Therefore, you should replication to create and populate those tables. The tables for the accounting application will not be populated from the central database as it will be specific to each location.

Therefore, you only need to copy the table schema required for the accounting application. The easiest way to do this is to use a script.

Incorrect Answers:

B: Database replication will create and populate the table with data; but the tables for the accounting application will not be populated from the central database as it will be specific to each location. Therefore, you only need to copy the table schema required for the accounting application. The easiest way to do this is to use a script.

C: A database snapshot can only be created on the local SQL Server; it cannot be created on a remote server in the other offices.

D: You can use a script to create the schema for the tables but not to populate the tables. The tables for the online investment system must be populated; therefore, you cannot use a script for these tables.

QUESTION 39

You need to design the functionality to allow office managers to offer discounted commission rates. You must implement this functionality by using a stored procedure. You need to ensure that your solution meets Stanford Finance's technical and business requirements.

What should you do? (To answer, select the appropriate table schema.)

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- A. Table schema A.
- B. Table schema B.
- C. Table schema C.
- D. Table schema D.

Answer: B

Explanation: You need to create two tables to adhere to the third normal form and to apply permissions at the table level. You need to ensure that only the manager of the office can change the commission rate for that office; therefore, the managers table must reference the officeID and must require a password.

Incorrect Answers:

A, D: Creating a commission rate change table that contains the manager's name will result in duplicate information across two tables and will violate the third normal form. You should create a separate table for the managers.

C: The officeID is not required in the commission rate change table as it can be derived from the managers table.

QUESTION 40

You need to design the procedure that will reserve investments. The procedure must be used by both Web pages that allow potential investors to invest online and Web pages that allow investment consultants to secure investments for their customers. You need to ensure that your solution meets Stanford Finance's technical and business requirements.

What should you do?

A. Start a transaction.

Decrement the investment opportunity availability.

Add the investment reservation.

Call the credit card authorization component.

Commit or rollback the transaction.

B. Start a transaction.

Add the investment reservation.

Decrement the investment opportunity availability.

Send a credit card authorization message to a Service Broker queue.

Commit the transaction.

Write a queue reader that reverses the changes if credit card authorization fails.

C. Decrement the investment opportunity availability.

Start a transaction.

Add the investment reservation.

Call the credit card authorization component.

Commit or rollback the transaction.

D. Send a credit card authorization message to a Service Broker queue.

Write a queue reader that starts a transaction.

Decrement the investment opportunity availability.

Add the investment reservation.

Commit or rollback the transaction.

Answer: B

Explanation: You need to reserve the investment without waiting for credit card authorization. Therefore, you should use a Service Broker queue to allow the transaction to be committed immediately while a separate asynchronous process verifies the credit card data.

Incorrect Answers:

A: You need to commit the transaction without waiting for the credit card authorization component to complete.

C: Performing changes outside of the transaction will prevent you from being able to roll the changes back should the credit card authorization fail.

D: You should use the Service Broker queue to reverse the transaction after it has been committed, rather than use the Service Broker queue to commit the transaction and then reverse it later.

Topic 4, Courseware Publishers, Scenario

BACKGROUND:

Company overview

Courseware Publishers is a major publisher of self-study courseware material for students in the information and technology (IT) field. Courseware Publishers currently sells self-study books through third-party bookstores. Courseware Publishers has a public Web site that is used for marketing purposes.

Planned Changes

The company is in the process of redeveloping its Web site to allow registered members to purchase courseware online and to allow users to view sample chapters of its books online.

Courseware Publishers wants to use SQL Server 2005 to manage the registered membership for the redesigned Web site.

EXISTING ENVIRONMENT:

Courseware Publishers has a single Windows Server 2003 Active Directory domain named courseware.com. All servers on the Courseware Publishers network run Windows Server 2003 and all client computers run Windows XP Professional. The Courseware Publishers network contains a stand-alone server named CP-SR09 that hosts the intranet Web site for the company and a SQL Server 2005 database server named CP-DB04. CP-SR09 is located on a perimeter network while CP-DB04 is located on the internal network. An external firewall is located between the perimeter network and the Internet and allows only incoming traffic on ports 80 and 443. An internal firewall is located between the perimeter network and the internal network and allows only incoming traffic from CP-SR09 to CP-DB04 on ports 80 and 443.

BUSINESS REQUIREMENTS:

General Requirements

Courseware Publishers wants Internet users to register with the courseware.com Web site before they are able to view sample chapters. Registered members should be able to subscribe to a weekly e-mail newsletter that informs them of new books, upcoming books related to sample chapters that they have viewed, or books on a particular topic.

Registered members should not receive more than one e-mail a week.

Registered members will access a custom reader application named CourseReader on the courseware.com Web site. The CourseReader application will display the sample chapter and allow the user to navigate through it. The custom reader will allow users to click on hyperlinks between sections of the sample chapter. The chief editor of the book will determine which chapter will become the sample and will define the hyperlinks as well as concepts and keywords in the text using Extensible Markup Language (XML) tags. The chief editors will use a predefined XML schema to which all sample chapters must adhere. Concepts and keywords can appear anywhere within the <section> element. Whenever an editor makes an update to the sample chapter, that update must be treated as a new version of the document.

Registered members must be able to search for sample chapters based on the defined keywords and concepts. They must also be able to search for books on a particular topic. The title, authors or editors, a short abstract, and the average rating of the book from which the sample chapter that matches the search criteria must be displayed in the search results. The short abstract will be stored in the XML documents. The schema for the Samples table is shown in the Samples Table exhibit.

Samples Table Exhibit:

Samples	
PK	SampleID
	editorID (FK) sampleText

The user accounts of registered members will be retained for three months after the user's

last visit to the web site. Registered members who do not use the Web site for more than three months will have their user accounts deleted from the system. The billing address, credit card number, expiration date, and social security number of registered members who purchase books through the Web site must be accessible only by Courseware Publishers employees in the Accounting department must only be able to retrieve this information using a stored procedure named getPurchaseDetails.

The courseware.com web site will allow registered members who purchased a book to rate the book on a scale of 1 to 10. The ratings are displayed on search pages when users search for publications or when a user selects a publication from the catalog. Editors also use the ratings to identify authors for new courseware material. The ratings are averaged and stored in a table named BookRatingAverage. The BookRatings and StoryRatingSummary tables are shown in the Book Rating Tables exhibit.

Book Ratings Tables Exhibit:

BookRatings		BookRatingAverage	
PK	rating ID	PK	average ID
	book ID (FK) bookRating		book ID (FK) averageRating

Registered members must only provide credit card information when they become customers. This requires that they register as customers. Credit card numbers, expiration dates, e-mail addresses and phone numbers must be in a valid format. The proposed schema for the customer and author data is shown in the Member Data exhibit.

Member Data Exhibit:

Members		Customers	
PK	member ID		
	First name lastName address eMail phone		cust ID (FK) creditCard expireDate billingAddress

Performance

The search function must be able to return search results to the user within 15 seconds. These searches will be performed on only the relational data.

Performance for the search function must not be affected by database reporting requirements. The highest performance priorities are:

1. New registrations.
2. Payment processing.
3. Searching for books based on topic.
4. Searching for sample chapters by sampleIDs.
5. Searching for sample chapters based on concepts and keywords.

Availability

The CourseReader application must be available 24 hours a day, seven days a week but downtime of two hours per month is permitted only for scheduled maintenance.

TECHNICAL REQUIREMENTS:

Security

Some personal information about the customers, registered members, and prospective authors are stored in the database. Only Courseware Publishers employees in the Accounting department should be able to access this information and registered members and prospective authors should be able to modify their own personal information. The personal information must be encrypted at all times, including when they are stored and when they are transferred.

Reporting

Courseware Publishers employees in the Accounting department must be able to produce reports of monthly sales data for individual books. This information must be made available as an Excel spreadsheet. Editors also want a monthly report that indicates the number of times each sample chapter was viewed online.

Maintenance

Currently the storage requirements and expected traffic for the new system are not known. For this reason, the existing servers will be used. When available disk storage on CP-DB04 is less than 25 percent, an event must be logged to the event log. The database administrator must also be notified if performance issues cause transactions to time out and if syntax errors are encountered on the database server.

The IT director has mandated that data must be normalized to the third normal form (3NF).

Topic 4, Courseware Publishers (14 Questions)

QUESTION 41

You need to design the security for the Samples table. You need to ensure that the principle of least privilege is implemented when you assign permissions. You create two database uses named editors and members.

What should you do? (Choose all that apply.)

- A. Assign the SELECT and UPDATE permissions to the editors database user.
- B. Assign the SELECT and INSERT permissions to the editors database user.
- C. Assign the SELECT permission to the members database user.
- D. Assign the UPDATE permission to the members database user.
- E. Assign the INSERT permission to the members database user.

Answer: B, C

Explanation: The chief editors need access to the sample chapter. Therefore they need SELECT permissions. They must also be able to apply keywords and hyperlinks to the sample chapters. Therefore they need INSERT permissions.

Incorrect Answers:

A: Editors do not need UPDATE permissions as updated documents must be treated as new versions.

D, E: Registered members need only SELECT permissions to view the sample chapters. They are not required to insert keywords and will not update the documents.

QUESTION 42

You need to design the system that will allow registered members to subscribe to a weekly e-mail newsletter that informs them of new books, upcoming books related to sample chapters that they have viewed, or books on a particular topic. You need to ensure that your solution meets Courseware Publisher's technical and business requirements.

What should you do?

- A. Create a Notification Services application. Enable multicast delivery and DatabaseMail for the application.
- B. Create a Notification Services application with a scheduled subscription. Enable digest delivery for the application.
- C. Create a Service Broker application with a scheduled subscription. Enable multicast delivery for the application.
- D. Create a Service Broker application. Enable digest delivery and DatabaseMail for the application.

Answer: B

Explanation: A Notification Services application can be created to allow subscribers to be notified when an event occurs or on a scheduled basis. You need to use the scheduled basis to send e-mail messages once a week; therefore you need to create a scheduled subscription. Users must only receive one e-mail a week; therefore you must use digest delivery. Digest delivery allows multiple notifications to be included in a single e-mail.

Incorrect Answers:

A: You need to send messages on a scheduled basis once a week; therefore you need to create a scheduled subscription. Multicast delivery is used to send notifications that match multiple e-mail addresses at once. You should use digest delivery instead to include multiple notifications in a single e-mail. Furthermore, Notification Services does not require DatabaseMail.

C, D: Service Broker is used to create applications that execute synchronously. They are not used to enroll subscribers to a newsletter.

QUESTION 43

You need to design the schema for the Samples table. The proposed schema for the Samples table is shown in the Samples Table exhibit. You need to ensure that your solution meets Courseware Publisher's business requirements. You want to use the minimum amount of programming in your solution.

What should you do?

- A. Store the sample in a sampleText column that accepts the nvarchar(max) data type and create a check constraint.
- B. Store the sample in a sampleText column that accepts the ntext data type and create a check constraint.
- C. Store the sample in a sampleText column that accepts the XML data type and

associate the XML schema with the column.

D. Store the sample in a sampleText column that accepts a Common Language Runtime (CLR) user-defined data type and create a CLR AFTER constraint.

Answer: C

Explanation: The chapter samples must adhere to an XML schema; therefore you should create the sampleText column as an XML column and associate the XML schema with the column.

Incorrect Answers:

A, B: The nvarchar(max) and ntext data types do not allow you to ensure that the data adheres to the XML schema.

D: A CLR user-defined data type should be created to support data types that are not supported in SQL Server 2005. However, SQL Server 2005 does support the XML data type.

QUESTION 44

You need to design the reporting functionality for the Accounting Department. You need to provide all Courseware Publisher employees in the Accounting Department with the same data. You need to ensure that your solution meets the technical and business requirements of the company.

What should you do?

- A. Create a SQL Server Integration Service (SSIS) package with an Excel destination.
- B. Create a SQL Server Integration Service (SSIS) package with a Flat File destination.
- C. Create a SQL Server Reporting Services (SSRS) report that runs a snapshot report.
- D. Create a SQL Server Reporting Services (SSRS) report that includes query parameters.

Answer: C

Explanation: Courseware Publishers employees in the Accounting department must be able to produce reports of monthly sales data for individual books. This information must be made available as an Excel spreadsheet. This can best be achieved by using a SQL Server Reporting Services (SSRS) report. Furthermore, you need to provide all Courseware Publisher employees in the Accounting Department with the same data. This means that you should use SSRS to run a snapshot report. This will ensure consistency and provide the best performance.

Incorrect Answers:

A, B: SQL Server Integration Service (SSIS) is used to handle disparate data sources. It is not used for reporting purposes.

D: Reports with parameterized queries must be run every time a new parameter value is required. This will affect database and reporting performance.

QUESTION 45

DRAG DROP

You need to design a secure method of sending payment data from the Web application to the database. You want to use the most secure method. You need to ensure that your solution meets Courseware Publisher's technical and business requirements. You will use a stored procedure named sendPayment in your solution.

What should you do? (To answer, select the appropriate actions from the pane on the left and drag it to the pane on the right.)

Actions, select from these	Actions, place here
Create an application role.	Place step here.
Create a SQL Server login.	Place step here, if any.
Grant Execute permission to the sendPayment stored procedure.	Place step here, if any.
Grant Connect permissions on the endpoint	Place step here, if any.
Create an TCP endpoint.	Place step here, if any.
Define sendPayment as a Web method.	Place step here, if any.
Use ADO.NET to call the sendPayment stored procedure	Place step here, if any.
Create an HTTP endpoint with a secure Sockets Layer (SSL) port.	Place step here, if any.
Create a Server user.	Place step here, if any.

Answer:

Actions, select from these	Actions, place here
Create an application role.	Create an HTTP endpoint with a Secure Sockets Layer (SSL) port.
	Create a SQL Server login.
Grant Execute permission to the sendPayment stored procedure.	Grant Connect permissions on the endpoint.
	Define sendPayment as a Web method.
Create an TCP endpoint.	Place step here, if any.
	Place step here, if any.
Use ADO.NET to call the sendPayment stored procedure	Place step here, if any.
	Place step here, if any.
Create a Server user.	Place step here, if any.

Explanation:

Courseware Publishers has a firewall that only permits incoming traffic on ports 80 and 443. Port 80 is used for HTTP and port 443 is used for HTTPS. You can only use these protocols to communicate with the database server. This means that you must create a HTTP endpoint. You need to ensure that personal information is always secure; therefore you must use an SSL port. You need to create a SQL Server login for the endpoint and grant it Connect permissions.

Incorrect Answers:

You cannot use a TCP endpoint because TCP endpoints use a Tabular Data Stream to transmit data; however, the firewall only permits HTTP and HTTPS.

QUESTION 46

You need to design the indexing strategy for the Sample table. The schema for the Samples table is shown in the Samples Table exhibit. You need to ensure that your solution meets Courseware Publisher's technical and business requirements.

What should you do? (Choose all that apply.)

- A. Create a VALUE secondary XML index on the sampleText column.
- B. Create a PATH secondary XML index on the sampleText column.
- C. Create a nonclustered index on the editorID column.
- D. Create a clustered index on the sampleID column.
- E. Create a nonclustered index on the sampleID column.
- F. Create a primary XML index on the sampleText column.

Answer: A, D, F

Explanation: The sampleID column is the primary key column and will be used to locate chapter samples. You should create a clustered index on this column to improve search performance.

Keywords and concepts are stored in sampleText column which must hold XML data as the chapter samples must adhere to an XML schema. You need to use a VALUE secondary XML index as users will search for an attribute with a value such as <keyword> and <concept>. However, before you can create a secondary XML index, you must first create a primary XML index.

Incorrect Answers:

B: You can use a PATH secondary XML index when you know the location of an attribute. In this scenario, editors will insert keyword and concept attributes through out the sample text. Therefore you the <keyword> and <concept> attributes will appear anywhere in the document.

C: No searches are run against the editorID column; therefore you don't need to index the editorID column.

E: You should create a clustered index on the sampleID column as this provides better performance.

QUESTION 47

You need to design a notification system no notify the database administrator when performance issues cause transactions to time out. You need to ensure that your solution meets Courseware Publisher's technical requirements.

What should you do? (Choose all that apply.)

- A. Enable SQL Server Agent Mail.
- B. Enable SQL Server Reporting Services (SSRS).
- C. Enable SQL Server Notification Services (SSNS).
- D. Enable SQL Server Agent.

- E. Enable Database Mail.
- F. Enable SQL Mail.

Answer: A, D, E

Explanation: You need to enable SQL Server Agent Mail if you want to implement e-mail notification to alerts. The SQL Server Agent must be running to use SQL Server Agent Mail. The SQL Server Agent uses Database Mail to send the e-mail message; therefore, you need to enable Database Mail.

Incorrect Answers:

B: SQL Server Reporting Services (SSRS) is used for reporting purposes. It is not used for notification to alerts.

C: SQL Server Notification Services (SSNS) is used to send notifications of events to subscribers. However, it does not have an Event Provider that monitors for alerts.

F: The SQL Server Agent can use SQL Mail to send the e-mail message but this has been deprecated in favor of Database Mail.

QUESTION 48

You need to design the security for the application. You need to ensure that your solution meets Courseware Publisher's business requirements for the billing address, credit card number, and social security number of registered members who purchase books through the Web site. You create a database user named accUser and grant accUser the Execute permission on the getPaymentDetails stored procedure. You then add the login of the Windows Accounting group to accUser. What should you do next? (Each correct answer presents part of the solution. Choose TWO.)

- A. Use the CONVERT function to decrypt the data in the getPaymentDetails stored procedure.
- B. Encrypt the getPaymentDetails stored procedure with a password. Give the password to the appropriate users in the Accounts Department.
- C. Use an asymmetric key to encrypt the appropriate data.
- D. Use a symmetric key to encrypt the appropriate data.

Answer: A, D

Explanation: The billing address, credit card number, expiration date, and social security number of registered members who purchase books through the Web site must be accessible only by Courseware Publishers employees in the Accounting department must only be able to retrieve this information using a stored procedure named getPurchaseDetails. The information must also be encrypted at all times, including when they are stored and when they are transferred. This means that you must encrypt the data when it is stored. Symmetric keys provide the best performance for encrypting data. The data can then be decrypted by using the CONVERT function with DecryptByKey.

Incorrect Answers:

B: Encrypting the stored procedure with a password will ensure that only user with the password will be able to view the Transact-SQL statements that the stored procedure executes. You need to protect the data that the stored procedure accesses rather than the stored procedure itself.

C: Using asymmetric key to encrypt the appropriate data will impact on performance. You should use symmetric keys as they provide the best performance.

QUESTION 49

You need to design a notification system to notify the database administrator whenever a syntax error event occurs on the database but you want to keep the number of e-mails to a minimum. You need to ensure that your solution meets Courseware Publisher's technical requirements.

What should you do? (Each correct answer represents part of the solution. Choose THREE.)

- A. Make the database administrator an operator and assign the alert to the database administrator.
- B. Create an alert for error number 170 on the database server.
- C. Configure the alert to Net Send the database administrator.
- D. Configure the alert to e-mail the database administrator.
- E. Create an alert for messages that contain the name 'CP-DB04'.

Answer: A, B, D

Explanation: You need to create an alert for error number 170 on the database server. Error number 170 denotes a syntax error. The alert needs to be assigned to one or more operators and must be configured to notify the database administrator by e-mail.

Incorrect Answers:

C: You want the alert to notify by e-mail not by Net Send.

E: An alert for messages that contain the name of the database server would trigger for all events on the database server. You only want to be notified of syntax error events.

Reference:

Microsoft SQL Server 2005 Books Online (2006), Index: alerts [SQL Server], about alerts

QUESTION 50

You need to design an interface that will be used by a new accounting application to access the database. The accounting application requires read and write access to the following columns in the Members and Customers tables:

1. firstName
2. lastName
3. billingAddress
4. eMail
5. phone

Your solution must not interfere with other applications that may access the data.

You need to ensure that your solution meets Courseware Publisher's technical requirements.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. Create a view named MemberCustomers that joins the Members table and the Customers table.
- B. Create a new table named MemberCustomers.
- C. Create an INSTEAD OF trigger on MemberCustomers.
- D. Create a user-defined function to populate MemberCustomers.
- E. Create an AFTER trigger on MemberCustomers.

Answer: A, C

Explanation: A view can be used to join the data. A view will allow other applications to continue accessing the data. You then need to use INSTEAD OF triggers to update the underlying data because the data is in two different tables.

Incorrect Answers:

B: The IT director has mandated that data must be normalized to the third normal form. Creating a new MemberCustomers table will violate this mandate as data will be stored in redundant locations.

D: You do not need a user-defined function to populate a view. You can use a JOIN query instead.

E: An AFTER trigger fires after changes to a table have been made. It cannot be used to make changes to multiple underlying tables.

QUESTION 51

You need to design a system that will allow prospective authors to submit course material. The submitted material must be placed into a folder that can be accessed by Courseware Publishers editors. You need to ensure that your solution meets Courseware Publisher's technical and business requirements.

What should you do? (Choose all that apply.)

- A. Create an event-driven subscription.
- B. Configure a Server Broker queue.
- C. Use the File protocol as the delivery channel.
- D. Configure Event Notification.
- E. Create a custom event provider.

Answer: A, C

Explanation: You need to use Notification Services to accomplish this task. To use Notification Services, you must create an event-driven subscription and use the File protocol as the delivery channel.

Incorrect Answers:

B: Service Broker is used to create applications that execute synchronously.

D: Event Notification is used to respond to data definition language (DDL) events such as creating tables. It cannot be used to respond to data manipulation language (DML) events, such as data insertions.

E: You do not need to create a custom event provider.

QUESTION 52

You need to design the aggregate function for the book rating system using the BookRatings and BookRatingAverage tables. The BookRatings and BookRatingAverage tables are shown in the Book Ratings exhibit. You need to ensure that the averageRating column is updated when a user enters a rating. Your solution must provide the best performance.

What should you do?

- A. Call a Common Language Runtime (CLR) user-defined function from a CHECK CONSTRAINT on the BookRatingAverage table.
- B. Call a Transact-SQL (T-SQL) user-defined function from an INSTEAD OF UPDATE trigger on the BookRatingAverage table.
- C. Call a Transact-SQL (T-SQL) user-defined function from an AFTER INSERT trigger on the BookRatings table.
- D. Call a Common Language Runtime (CLR) user-defined function from an INSTEAD OF UPDATE trigger on the BookRatings table.

Answer: C

Explanation:

You need to create a Transact-SQL (T-SQL) user-defined function that uses the AVG function to aggregate the rating data. You need the function to execute every time a new rating is inserted into the BookRatings table. To do this you need to create an AFTER INSERT trigger on the BookRatings table.

Incorrect Answers:

A: A CLR user-defined function should be created when T-SQL functions cannot be implemented to achieve the desired results. However, a T-SQL function with a simple calculation can be used in this scenario. Furthermore, a CHECK CONSTRAINT is used data verification. It is not used to aggregate values.

B: You need to execute the function after an INSERT occurs and not in place of an UPDATE.

D: A CLR user-defined function should be created when T-SQL functions cannot be implemented to achieve the desired results. However, a T-SQL function with a simple calculation can be used in this scenario. Furthermore, you need to execute the function when an INSERT and not an UPDATE occurs.

QUESTION 53

You need to design the search function for the Web application. You need to ensure that search response time fulfills Courseware Publisher's the business and technical requirements.

What should you do?

- A. Create indexes on the columns used in the search queries.
- B. Create a table-valued function to returns the columns used in the search queries.
- C. Create a stored procedure with the WITH RECOMPILE option that will perform the search query.
- D. Create a partitioned view that includes the columns used in the search queries.

Answer: A

Explanation: The performance of search queries can be improved by creating the appropriate index or indexes on the columns that are used in the searches.

Incorrect Answers:

- B: A table-valued function is a user-defined scalar functions return a single data value; however, search queries usually return result sets with multiple rows of data values.
- C: A stored procedure with the WITH RECOMPILE option will be recompiled every time it is executed. This will degrade performance.
- D: Partitioned views have been deprecated in SQL Server 2005.

QUESTION 54

You need to design a logging system that will log an event must to the event log when the database server has less than 25 percent disk space free. You need to ensure that your solution meets Courseware Publisher's technical requirements. You want to accomplish this task using the least amount of administrative effort. What should you do?

- A. Create a job that runs the sp_spaceused stored procedure. Schedule the job to run daily.
- B. Configure the SQL Server Agent to notify you when database file exceeds 75% growth.
- C. Use the Performance utility to create an alert that runs Disk Cleanup when free space falls under 25%.
- D. Use the Performance utility to create an alert that writes an entry to the application log when free disk space falls under 25%.

Answer: D

Explanation: In the scenario you should make use of the Performance utility to create and send the alert to you as a network message and notifies you.

Incorrect Answers:

- A: The sp_spaceused stored procedure reports disk space used by the database. It does not check free space and does not log events to the event log.
- B: This option does not take into account the initial size of the database file.
- C: Disk Cleanup can be used to free up disk space but it does not log events to the event log.

Topic 5, City Central Utilities

OVERVIEW:

City Central Utilities is a supply and demand company which sells hardware appliances as well as home décor and every day utilities required by many industries. City Central Utilities owns 20 retail locations throughout the central United States. City Central Utilities will make use of a business plan which calls for gradual expansion, no more than two locations per year, until the company is nation-wide. City Central Utilities has its headquarters in Philadelphia and is in the process of opening their newest location in Miami.

City Central Utilities has recently started letting the primary business rent its items from tools, to wedding supplies, to heavy equipment and everything in between. City Central Utilities makes use of the primary revenue source is mid-to-long-term with local contractors. City Central Utilities has ensured that each location has an inventory of items for retail sale, mostly targeted at construction, landscaping, home improvement, and home repair. City Central Utilities has made the additional move to have both the rental and sales inventories customized to meet the needs of local customers.

City Central Utilities has grown through acquisition of locally-owned independent rental companies and by opening new stores where none are available for acquisition. City Central Utilities wants to make certain that the business plan calls for growth through acquisition whenever possible. City Central Utilities has ensured when they acquired another company they also acquire its business assets, including inventory and customer lists.

TECHNICAL ENVIRONMENT:

City Central Utilities want to have all business-wide and centralized records maintained in a computer running SQL Server 2005 located at the company headquarters. City Central Utilities wants to have this include a combined customer list, employee list, all rental contracts, and all sales invoices.

The City Central Utilities local network makes use of two Windows Server 2003 Routing and Remote Access Service (RRAS) servers configured to support dial-in access. City Central Utilities has ensured that all locations have Internet access with a firewall isolating the internal network from the Internet. City Central Utilities wants to have all offices have e-mail support provided by their local Internet service provider (ISP).

City Central Utilities knows that the computer environments in the remote locations vary widely whilst the long term plan is to deploy a computer running SQL Server 2005 in each location to manage local data needs. City Central Utilities is in the process of upgrading the remote locations and have upgraded most locations but some are still using Access databases to manage customer, inventory, sales, and rental records.

BUSINESS REQUIREMENTS:

City Central Utilities has recently started upgrading their Remote offices using a two-step process to make the transition easier on employees. City Central Utilities will have the all the locations currently continuing to use hard copy contracts and invoices. City Central Utilities has posted it in the back office to the invoice tables after the invoice is written. City Central Utilities will make use of invoice tables which make use of identical columns in each location making it easier to consolidate information in the main office. The City Central Utilities Invoice tables are shown in the CCUInvoice and CCUDetail Tables exhibit below:

CCUInvoice		CCUDetail	
PK	Invoice Number	PK	Invoice Number
	Office ID	PK	Item Number
	CustomerID		PartNumber
	EmployeeID		PreferredPrice
	Date		ActualPrice
			Quantity

City Central Utilities knows in addition to the Primary Key constraints shown in the exhibit; the CCUInvoice table has a Unique constraint on the InvoiceNumber column. City Central Utilities wants to ensure that all the employees need be able to quickly look up customer and inventory records. City Central Utilities is in the process of optimizing lookup query performance as this is a critical concern. City Central Utilities makes use of the business name for business customers when the names are looked up. City Central Utilities also additionally makes use of the customer's last name when looking up individuals. The City Central Utilities Customer table is shown in the CCUCustomer table exhibit below:

CCUCustomer	
PK	Customer ID
	FirstName
	PrimaryLocation
	Address1
	Address2
	City
	State
	PostalCode
	PreferredPriceCode
	Status
	ContactName
	Phone

City Central Utilities requires to have the Inventory queries initially return only a part number, category, description, quantity on hand, and price information. City Central Utilities ensures that their Inventory table is updated frequently throughout the day. City Central Utilities will make use of the Retail sales inventory records which include item part number, category, cost, quantity on hand, vendor information, on order information and the selling price. City Central Utilities does not want the network

personnel to be capable of changing inventory table column definitions. City Central Utilities standard Inventory table is shown in the CCUInventory and CCUTracking Tables exhibit below:

CCUInventory	
PK	Part Number
	OnOrder
	OnOrder
	VendorID
	Description
	Category
	CurrentCost
	ListPrice
	SellA
	SellB
	SellC

CCUTracking	
PK	Office ID
PK	Date
	TotalValue

The City Central Utilities vendors periodically sends updates which use various electronic formats as e-mail attachments as most will make use of Microsoft Excel spreadsheets or Extensible Markup Language (XML). City Central Utilities wants the updates that are used to include new part numbers, part number changes, and cost and list price changes. City Central Utilities will not automatically have new items added because the items should first be evaluated to determine if the items should be added to the Inventory and manually apply the appropriate items. City Central Utilities receives most of the updates that are acquired sent to the main office and should be distributed to the remote locations.

City Central Utilities makes use of rental inventory records which includes the item number, serial number, original purchase cost (if known), security deposit amount, and rate information as required. City Central Utilities rents items at multiple rental rates which include renting the items hourly, daily, and weekly. City Central Utilities makes use of four statuses for each item which are Available, Rented, Repair, and Unknown. City Central Utilities does not consider it important to keep track of historic status information. The City Central Utilities CCURentalInventory is shown in the CCURental table exhibit with the item numbers a simple one-up count assigned internally to rental items as shown below:

CCUInventory	
PK	ItemNumber
	Contact ID
	SerialNumber
	Description
	Status
	OriginalCost
	Deposit
	HourRate
	DayRate
	WeekRate

City Central Utilities will make use of separate tables for tracking rental contracts, rental history, and repair history which will be updated when the item is returned and the rental contract closed. City Central Utilities makes use of the same information as it is also stored in the rental contract and rental history. City Central Utilities wants to ensure that when contracts are moved to the CCURentalHistory table that they are deleted from the CCURentalContract table.

City Central Utilities currently makes use of manual posting which has accuracy problems with duplicate customer records. City Central Utilities wants to have the Customer list periodically cleansed as a result of the manual posting to generate a list of potential duplicates. City Central Utilities will require checking for potential duplicates which should then be checked and deleted manually. City Central Utilities wants to have the back office users to be capable of referring to the duplicate list and make the required changes when time allows as this activity is a lower priority activity. City Central Utilities wants to ensure that when duplicate records are found back office members should be able to delete the duplicate customers and merge contract and invoice information into one custom record.

City Central Utilities has recently decided to have the main office analyze the rental records to improve profitability. City Central Utilities wants to have most of their least profitable rentals, project repairs and replacement costs and seasonal trends identified. City Central Utilities wants to have the analysis performed by each individual location and the company as a whole.

TECHNICAL REQUIREMENTS:

1. City Central Utilities has recently found that space is a potential problem. City Central Utilities wants to try and avoid upgrading the hard disk in any servers until least one year's worth of data has been collected after the offices have been upgraded.

1. City Central Utilities wants to have the database staff instructed to keep table and index sizes to a minimum. City Central Utilities will require making use of a standard database server configuration to deploy SQL Server 2005 in all offices.

1. City Central Utilities considers it a prerequisite that the configuration includes the

database engine, Notification Services, Reporting Services, and Integration Services. The City Central Utilities SQL Server does not currently have Analysis Services installed whilst no database servers has a named instance installed.

1. City Central Utilities wants to continue having the remote locations maintain their own retail and sales inventory records. City Central Utilities only wants the remote locations to be capable of transferring the weekly inventory summaries to the main office.

1. City Central Utilities requires having the summary report the total inventory value by cost as these will be applied at the main office to a consolidated tracking table shown in the CCUInventory and CCUTracking Tables exhibit above which is used for company accounting and financial reporting and contains no master inventory list

1. City Central Utilities has recently decided that the new rental contracts, completed rental contracts, and customer invoices be sent to the main office every Friday. City Central Utilities wants to have each location as well as the main office to maintain rental and invoice records whilst purging local records after two-years whilst main office local records are purged after six-years

1. City Central Utilities will have all the customer records updated every Wednesday through updates from the remote locations. City Central Utilities will in turn provide the remote locations with a new, up-to-date customer list each weekend. City Central Utilities wants to have most of the office print hard copy customer lists for counter use, multiple copies listing local customers, and one master list with all customers

1. The database is normalized to the third normal form (3NF)

Topic 5, City Central Utilities (14 Questions)

QUESTION 55

DRAG DROP

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start designing a new database for network use. The database you are designing will make use of design attributes. You are in the process of designing the CCURentalContract table which should be capable of running queries required to retrieve information about the customer, rental dates and total charges.

You have recently received additional instruction from the network CIO informing you that an internally generated contract number will be used as the table's primary key. You are required which of the columns should be placed in the rental contract table.

What should you do? (Below is a list available columns, choose carefully.)

Columns, select from these	Columns, place here
DateRented	Place column here, if any.
Customer.Phone	Place column here, if any.
TotalCharge	Place column here, if any.
RentalInventory.Status	Place column here, if any.
RentalInventory.ItemNumber	Place column here, if any.
Customer.ContactName	Place column here, if any.
DateReturned	Place column here, if any.
RentalInventory.Serial Number	Place column here, if any.
ExpectedReturn	Place column here, if any.
Customer.CustomerID	Place column here, if any.
ContractNumber	Place column here, if any.
RentalInventory.OfficeID	Place column here, if any.

Answer:

Columns, select from these	Columns, place here
	ExpectedReturn
Customer.Phone	Customer.CustomerID
	RentalInventory.ItemNumber
RentalInventory.Status	DateReturned
	TotalCharge
Customer.ContactName	ContractNumber
	RentalInventory.OfficeID
RentalInventory.Serial Number	DateRented
	Place column here, if any.
	Place column here, if any.
	Place column here, if any.
	Place column here, if any.

Explanation:

You should remember in the scenario that the solution you are designing should conform to normalization to 3NF whilst including any information which is unique to the rental contract. In the scenario you should make use of the ContractNumber as it is specified as a table's primary key. Making use of both the rental contract tables to create a foreign key constraint is a good idea as it is required.

1. City Central Utilities will make use of separate tables for tracking rental contracts, rental history, and repair history which will be updated when the item is returned and the rental contract closed. City Central Utilities makes use of the same information as it is also stored in the rental contract and rental history
2. The database is normalized to the third normal form (3NF)

Incorrect Answers:

You should not consider adding the other columns to the table in the scenario because

you already have a relationship with the CCURentalInventory table which requires no need to store the information that will be acquired from the unnecessary columns.

QUESTION 56

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design for the database objects of City Central Utilities. The solution that you are designing will make use of design objects which extends the functionality of a server. You are required to generate inventory value summaries based on cost as part of a solution to update the main office inventory database server's summary tracking table.

City Central Utilities will make use of an application at the main office for retrieving the information from an HTTP endpoint at each remote office for entry into the Inventory Tracking. The solution you design requires having the performance and resource requirements minimized.

What should you do? (Choose TWO.)

- A. You should make use of indexed views.
- B. You should make use of distributed partitioned view.
- C. You should make use of user-defined functions.
- D. You should make use of ad hoc queries.
- E. You should make use of stored procedures.

Answer: C, E

Explanation: In the scenario you best choice is making use of the user-defined functions (UDF) in your solution because the HTTP endpoint will expose the stored procedures and UDF's as Extensible Markup Language (XML) Web service method which returns the result to the calling application.

1. City Central Utilities will make use of separate tables for tracking rental contracts, rental history, and repair history which will be updated when the item is returned and the rental contract closed. City Central Utilities makes use of the same information as it is also stored in the rental contract and rental history
2. City Central Utilities requires having the summary report the total inventory value by cost as these will be applied at the main office to a consolidated tracking table shown in the CCUInventory and CCUTracking Tables exhibit above which is used for company accounting and financial reporting and contains no master inventory list

Incorrect Answers:

A: You should not consider making use of an indexed view in your solution because the information in the inventory is changed throughout the day and are only effective when the data is stable and rarely changes.

B, D: You should not consider making use of the ad hoc queries in the scenario

because the solution in itself is inefficient and requires a way to query the indexed view or mechanism for receiving and executing ad hoc queries.

QUESTION 57

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design for the database objects of City Central Utilities. The solution that you are designing will make use of design objects which are used to perform actions. You are required to create the database objects required to support manual deletion of duplicate customer records.

You are required to ensure that none of the sales or rental records is left orphaned and that historic information is managed properly whilst your solution should only require minimal resources and is easy to implement.

What should you do?

- A. You should make use of a DML trigger to fire on DELETE events.
- B. You should make use of Integration Services application.
- C. You should enable cascading deletes.
- D. You should make use of a stored procedure for the deletion of duplicates.

Answer: D

Explanation: You should consider making use of a stored procedure to take the necessary actions required because the deletion of duplicate records requires several actions like retrieving any sales or rental records that are associated with the duplicate records.

1. City Central Utilities will require checking for potential duplicates which should then be checked and deleted manually. City Central Utilities wants to have the back office users to be capable of referring to the duplicate list and make the required changes when time allows as this activity is a lower priority activity. City Central Utilities wants to ensure that when duplicate records are found back office members should be able to delete the duplicate customers and merge contract and invoice information into one custom record

Incorrect Answers:

A: You should not consider making use of this trigger even though it seems the obvious choice it has inherent problems. The trigger could do all the processing but does not have a way of identifying the customer account to which information should be posted.

B: You should not consider making use of SQL Server Integration Services for this operation as the Integration Services is intended for using when data integration and workflow solutions are concerned. SSIS requires more resources.

C: You should not consider taking the actions in this option because you would be responsible for deletion of all the City Central Utilities sales and history information as cascading deletes automatically deletes all related rows in referencing tables.

QUESTION 58

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design of an application solution for SQL Server 2005. The application solution you are designing makes use of appropriate database technologies and techniques. You are required to ensure that updates are made appropriate to each offices local CCURentalHistory table whilst ensuring your solution minimizes processing overhead.

What should you do?

- A. You should make use of a DML trigger.
- B. You should configure cascading updates.
- C. You should make use of a CLR stored procedure that runs from a SQL Server Agent alert.
- D. You should make use of Integration Services package which runs from a SQL Server Agent job.

Answer: A

Explanation: You should remember in the scenario that making use of a DML INSTEAD OF trigger intercepts the action the trigger caused to fire executing the statements in the trigger which can be used to verify and update for a rental return and write data to the CCURentalHistory table as well as delete data from the CCURentalContract table.

1. The City Central Utilities vendors periodically sends updates which use various electronic formats as e-mail attachments as most will make use of Microsoft Excel spreadsheets or Extensible Markup Language (XML). City Central Utilities wants the updates that are used to include new part numbers, part number changes, and cost and list price changes

2. City Central Utilities receives most of the updates that are acquired sent to the main office and should be distributed to the remote locations

Incorrect Answers:

B: You should not consider taking this action in the scenario because this action needs you to configure a foreign key to enable ON UPDATE CASCADE to have the changes to key values in the referenced table automatically made.

C, D: You should not consider making use of the Integration Services or CLR stored procedures in the scenario because the problem lies with the way SSIS and the stored procedure executes and updates should be made when the rentals are returned as stated in the case study.

QUESTION 59

You work as the network database administrator at City Central Utilities. The City

Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional. You have recently received instruction from the City Central Utilities network CIO to start the design for the database objects of City Central Utilities. The solution that you are designing will make use of design objects which extends the functionality of a server. You are required to audit any attempt made by users to change columns in the Inventory table. You recently created an inventory audit table in each office to track the attempts including the user attempting to make the change and when. What should you do?

- A. You should make use of Notification Services.
- B. You should make use of a CLR user-defined function.
- C. You should make use of a DML trigger.
- D. You should make use of a DDL trigger.

Answer: D

Explanation: In the scenario you should remember that the DDL trigger fires in response to a data definition event which includes changing column definitions. Making use of a DDL trigger is the best choice suited for your needs.

1. City Central Utilities will make use of separate tables for tracking rental contracts, rental history, and repair history which will be updated when the item is returned and the rental contract closed
2. City Central Utilities does not consider it important to keep track of historic status information
3. City Central Utilities makes use of a rental inventory records which includes the item number, serial number, original purchase cost (if known), security deposit amount, and rate information as required

Incorrect Answers:

- A: You should not consider making use of Notification Services to stop the users from making changes to the column definitions as Notification Services is intended for use of sending notifications to subscribers.
- B: You should not consider making use of a CLR user-defined function in the scenario because the CLR user-defined function requires a way of detecting the event and executing the function.
- C: You should not consider making use of a DML trigger in the scenario as you are required to stop the users making changes to the table schema, DML triggers are fired in events like data inserting, updating or deleting.

QUESTION 60

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design of an application solution for SQL Server 2005. The application solution you are designing is for data distribution. City Central utilities have recently decided to make use of SQL Server profiler to audit the sales and rental contract posting.

City Central Utilities wants to have the auditing performed at the main office and should include detailed transactions. The remote offices of City Central Utilities connect to the main office to update the rental information with the connections scheduled to prevent conflicts between offices. You are required to design a replication solution to support consolidating sales and rental information at the main office whilst the solution supports only the offices that upgraded to SQL Server 2005.

What should you do?

- A. You should configure transactional replication with the main office as the publisher.
- B. You should configure merge replication with each remote office as a publisher.
- C. You should configure merge replication the main office as the publisher.
- D. You should configure transactional replication with each remote office as a publisher.

Answer: D

Explanation: In the scenario the only choice that is capable of meeting the requirements of the scenario is making use of and configuring transactional replication with each remote office as a publisher. The use of transactional replications ensures that the main office receives the individual transactions from the remote offices meeting the update and auditing requirement.

1. City Central Utilities has recently decided that the new rental contracts, completed rental contracts, and customer invoices be sent to the main office every Friday. City Central Utilities wants to have each location as well as the main office to maintain rental and invoice records whilst purging local records after two-years whilst main office local records are purged after six-years.
2. City Central Utilities wants to continue having the remote locations maintain their own retail and sales inventory records. City Central Utilities only wants the remote locations to be capable of transferring the weekly inventory summaries to the main office.

Incorrect Answers:

A: You should not consider configuring the main office as the transactional replication publisher because you are required to transfer the updated from the remote offices not the main office.

B, C: You should not consider making use of merge replication in the scenario because this replication type is used to send changes to tables not the transaction which resulted in the changes therefore this solution is not sufficient.

QUESTION 61

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows

Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start designing a database for City Central Utilities. The database you are designing will make use of design attributes. You have received additional instruction requiring you to validate postal codes by customer address while entering the customer records.

City Central Utilities has ensured that all the offices have access to an Extensible Markup Language (XML) Web service returning the correct postal code for mailing address in the United States.

What should you do?

- A. You should make use of a CLR trigger.
- B. You should make use of a CLR user-defined type.
- C. You should make use of a check constraint.
- D. You should make use of a T-SQL trigger.

Answer: A

Explanation: In the scenario you are required to perform validation of postal codes by customer address which can best be achieved when making use of a CLR trigger because the XML Web service is capable of being called by a CLR trigger.

1. The City Central Utilities vendors periodically sends updates which use various electronic formats as e-mail attachments as most will make use of Microsoft Excel spreadsheets or Extensible Markup Language (XML).
2. City Central Utilities wants to have the database staff instructed to keep table and index sizes to a minimum. City Central Utilities will require making use of a standard database server configuration to deploy SQL Server 2005 in all offices.

Incorrect Answers:

- B: You should not consider making use of a CLR trigger in the scenario because the CLR trigger is mostly intended for computed values and you are not required to compute a value.
- C: You should not consider making use of a check constraint in the scenario because this is used only for simple data validation and can not be used as the functionality required for this type of validation is not supported.
- D: You should not make use of a T-SQL trigger in the scenario because the T-SQL trigger can not be used to accept return values or call a Web service using a T-SQL trigger.

QUESTION 62

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design for the database objects of City Central Utilities. The solution that you are designing will make use of design objects which are used to perform

actions. City Central Utilities have most of their inventory items structured according to a variable price based on preferred price information stored with the customer record.

City Central Utilities makes use of SellC for the selling price by default for new customers whilst SellB and SellA are reserved for established customers. You have to ensure that the preferred selling price amount is entered for the customer invoice detail items with the actual selling price recorded on the hard copy invoice for tracking purposes.

City Central Utilities wants to have the preferred selling price entered automatically using minimal processing overhead whilst the person posting the invoice record to the database will not see the preferred price information.

What should you do?

- A. You should apply a DDL trigger to the CCUDetail table.
- B. You should change the data type for CCUDetail.PreferredPrice to a CLR user-defined type (UDT).
- C. You should make the CCUDetail.PreferredPrice a computed column.
- D. You should apply a check constraint to CCUDetail.PreferredPrice column.
- E. You should apply a DML trigger to the CCUDetail table.

Answer: E

Explanation: In the scenario the best choice for the information that is required is making use of a DML trigger which is used for firing triggers when data manipulation events occur and can also be used to retrieve the CustomerID from the CCUHead table as well as the preferred price from the CCUInventory table.

1. City Central Utilities will make use of the Retail sales inventory records which include item part number, category, cost, quantity on hand, vendor information, on order information and the selling price. City Central Utilities does not want the network personnel to be capable of changing inventory table column definitions.
2. City Central Utilities wants to ensure that all the employees need be able to quickly look up customer and inventory records. City Central Utilities is in the process of optimizing lookup query performance as this is a critical concern.

Incorrect Answers:

A: You should not consider making use of a DDL trigger in the scenario because you are not required to check for data definition events, you are required to have the server respond to data manipulation events.

B, C: You should not consider making use of a CLR trigger in the scenario because the CLR trigger is mostly intended for computed values and you are not required to compute a value.

D: You should not consider making use of a check constraint in the scenario because this is used only for simple data validation.

QUESTION 63

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named

citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design for the database objects of City Central Utilities. The solution that you are designing will make use of design objects which retrieve data. The City Central Utilities counter personnel make use of a third-party application which builds ad hoc reports to retrieve the inventory records.

The City Central Utilities counter personnel do not have direct access to the CCUInventory table. You have received additional instruction to create a data source for the queries which requires ensuring the counter personnel are not able to view the Inventory cost column whilst keeping processing overhead to a minimum. What should you do?

- A. You should create a stored procedure.
- B. You should create an indexed view.
- C. You should create a user-defined function.
- D. You should simply create a view.

Answer: D

Explanation: In the scenario the best choice would be making use of a view and having the third-party application used for querying the view as its data source because the most common view is used to control access to the underlying table.

1. City Central Utilities will make use of the Retail sales inventory records which include item part number, category, cost, quantity on hand, vendor information, on order information and the selling price. City Central Utilities does not want the network personnel to be capable of changing inventory table column definitions.
2. City Central Utilities wants to ensure that all the employees need be able to quickly look up customer and inventory records. City Central Utilities is in the process of optimizing lookup query performance as this is a critical concern.

Incorrect Answers:

- A: You should not consider making use of a stored procedure in the scenario even though it could be used the stored procedure and a table-based UDF will have to much processing overhead.
- B: You should not consider making use of an indexed view in your solution because the information in the inventory is changed throughout the day and are only effective when the data is stable and rarely changes.
- C: You should not consider making use of a CLR trigger in the scenario because the CLR trigger is mostly intended for computed values and you are not required to compute a value.

QUESTION 64

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start designing a database for City Central Utilities. The database you are designing will make use of design entities. City Central Utilities has designed the counter sales application to run a query for customer records based on a string of one or more characters entered by the counter sales personnel. You are required to have the query return all matching records grouped by the office the customer usually rents from.

What should you do?

- A. You should create a clustered index on the LastOrBusinessName and PrimaryLocation columns.
- B. You should create a clustered index on the CustomerID and PrimaryLocation columns.
- C. You should create a non-clustered index on the LastOrBusinessName and PrimaryLocation columns.
- D. You should create a non-clustered index on the CustomerID and PrimaryLocation columns.

Answer: A

Explanation: You should consider making use of a clustered index in the scenario because the solution requirements all meet the recommended uses for clustered indexes as there is a high level of uniqueness on the index values and records are required in the order for frequent queries.

1. City Central Utilities wants to ensure that all the employees need be able to quickly look up customer and inventory records. City Central Utilities is in the process of optimizing lookup query performance as this is a critical concern.
2. City Central Utilities will make use of the Retail sales inventory records which include item part number, category, cost, quantity on hand, vendor information, on order information and the selling price. City Central Utilities does not want the network personnel to be capable of changing inventory table column definitions.

Incorrect Answers:

B: You should not consider making use of the clustered index this way because you should not add the CustomerID into the query and this solution will not improve query performance.

C, D: You should not consider making use of a non-clustered index or a unique index as you are not specified which type of unique index to create and the non-clustered index will improve performance but not provide optimal performance.

QUESTION 65

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional. You have recently received instruction from the City Central Utilities network CIO to start developing applications that use SQL Server Support Services. You have

recently started designing packages for Integration services. City Central Utilities has recently decided to check the CCUCustomer table for duplicate customer records each week after the new customer records are consolidated at the main office.

You are required to develop a solution that will meet the cleansing requirements of the CCUCustomer table whilst limiting the list to probable duplicates as possible using the least amount of administrative effort to implement and maintain the solution, disk and processor resources needed to execute the solution.

What should you do?

- A. You should make use of an Integration Services and tracking table that is created each week.
- B. You should make use of a stored procedure with correlated subqueries and temporary table.
- C. You should make use of a DML trigger and add a column to the CCUCustomer table to track possible duplicates.
- D. You should make use of an online analytical processing (OLAP) cube and Reporting Services.

Answer: A

Explanation: In the scenario you are required to check for probable duplicate customer records which would be best achieved making use of SQL Server Integration Services because Integration Services makes use of comparisons based on fuzzy logic which is the preferred method of locating of this type.

1. City Central Utilities will require checking for potential duplicates which should then be checked and deleted manually. City Central Utilities wants to have the back office users to be capable of referring to the duplicate list and make the required changes when time allows as this activity is a lower priority activity. City Central Utilities wants to ensure that when duplicate records are found back office members should be able to delete the duplicate customers and merge contract and invoice information into one custom record.

2. City Central Utilities has recently decided that the new rental contracts, completed rental contracts, and customer invoices be sent to the main office every Friday.

3. City Central Utilities will make use of invoice tables which make use of identical columns in each location making it easier to consolidate information in the main office.

Incorrect Answers:

B: You should not consider making use of this particular stored procedure in the scenario even though a subquery uses fewer resources than SSIS the stored procedure is limited in the comparisons that you are able to perform requiring you to build your own comparison logic.

C: You should not consider making use of the DML trigger in the scenario as this trigger is intended to fire in response to data manipulation events and you are required to check the table after posting not during posting.

D: You should not consider making use of an OLAP cube in the scenario because the

scenario states that you should keep resources and administrative effort to a minimum to implement and maintain the solution.

QUESTION 66

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start developing applications solutions that will be used for SQL Server 2005. The Application you are developing will support reporting. City Central Utilities prepares customer lists each weekend for printing purposes on Monday.

You are required to ensure that customer lists are prepared automatically at all offices whilst identifying the data source for reporting. Your application solution requires minimizing communication requirements between offices and administrative effort to implement and maintain.

What should you do?

- A. You should make use of all the office's production database as the data source.
- B. You should make use of an OLAP cube built from all the office's CCUCustomer table.
- C. You should make use of a database snapshot of each office's production database as a data source.
- D. You should make use of an OLAP cube built from the main office CCUCustomer table.

Answer: D

Explanation: In the scenario you are required to produce an application using the least amount of communication requirements and administrative effort to implement and maintain which is best achieved making use of all the office's production database as the CCUCustomer table is local to the office and requires no additional communication.

1. City Central Utilities will have all the customer records updated every Wednesday through updates from the remote locations. City Central Utilities will in turn provide the remote locations with a new, up-to-date customer list each weekend. City Central Utilities wants to have most of the office print hard copy customer lists for counter use, multiple copies listing local customers, and one master list with all customers

Incorrect Answers:

A, B, C: You should not consider making use of the main office database in the scenario except for printing purposes. There is no reason for using a database snapshot or OLAP cube as the report source because both of the technologies require more administrative effort.

QUESTION 67

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named

citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional. You have recently received instruction from the City Central Utilities network CIO to start designing a database that will be used by City Central Utilities. The database you are designing will make use of design attributes. The City Central Utilities Vendor inventory update information is used to provide current cost. List price and the price used as SellC. City Central Utilities has used the formulas below for the values of SellB and SellA.

$SellB = Cost + .85(SellC - Cost)$

$SellA = Cost + .63(SellC - Cost)$

You are required to produce a solution that will enable City Central Utilities to automatically enter values into SellA and SellB with minimal processing overhead ensuring your solution uses the minimal administrative effort. What should you do?

- A. You should make use of check constraints.
- B. You should make use of CLR user-defined types (UDTs).
- C. You should make use of the default definitions.
- D. You should make the columns computed columns.

Answer: D

Explanation: In the scenario you should consider having the value computed automatically for City Central Utilities which is best achieved making use of computed columns because we need to use a simple formula to calculate the column value and computed columns depend on columns in the same table only.

1. City Central Utilities will make use of the Retail sales inventory records which include item part number, category, cost, quantity on hand, vendor information, on order information and the selling price

Incorrect Answers:

A: You should not consider making use of a check constraint in the scenario because this is used only for simple data validation.

B: You should not consider making use of a CLR trigger in the scenario because the CLR trigger is mostly intended for computed values and you are not required to compute a value.

C: You should not consider making use of the default definition in the scenario because the default definition will only enter a specific value when none is specified by data entry and you are required to have a value computed.

QUESTION 68

You work as the network database administrator at City Central Utilities. The City Central Utilities network consists of a single Active Directory domain named citycentral.com. All servers on the City Central Utilities network run Windows Server 2003 and all client computers run Windows XP Professional. You have recently received instruction from the City Central Utilities network CIO to start designing an application solution for SQL Server 2005. The solutions you

are designing will make use of SQL Server services to support business needs. You have are in the process of developing the plan to apply inventory update information received from Vendors.

You are required to have the solution you develop apply the changes only to part numbers already on file whilst ensuring that updates are made accurately. You should additionally be able to easily modify the solution if a Vendor makes minor format changes.

What should you do? (Choose TWO.)

- A. You should make use of SQL Server Integration Services.
- B. You should forward the updates from the remote offices and apply the updates locally at each office.
- C. You should make use of Notification Services to apply the updates.
- D. You should make use of a CLR stored procedure to apply the updates.

Answer: A, B

Explanation: You should remember in the scenario you should apply the updates locally at each remote office by forwarding the updates to each remote office. When you make use of an SSIS package you ensure you are capable of easily modifying your solution.

1. City Central Utilities will make use of separate tables for tracking rental contracts, rental history, and repair history which will be updated when the item is returned and the rental contract closed. City Central Utilities makes use of the same information as it is also stored in the rental contract and rental history
2. The database is normalized to the third normal form (3NF)

Incorrect Answers:

C: You should not consider making use of Notification Services in the scenario because Notification Services is intended to send notifications and can not be used for ETL applications.

D: You should not consider making use of the CLR stored procedures in the scenario because most of the logic that is required is designed into SQL Server Integration Services.

Topic 6, International Retailers, Scenario

BACKGROUND:

International Retailers operates as an online retailer that specializes in vintage dolls and handmade porcelain dolls. International Retailers makes use of a pre-packaged online store front courtesy of an existing application. They are however experiencing a number of problems with this solution. These problems are:

1. The package does not make provision for keeping track of the stock on hand.
2. Due to merchandise having to be entered manually, the package is time consuming when handling new ranges.

EXISTING ENVIRONMENT:

Currently International Retailers has three Microsoft Windows Server 2003 computers:

1. One serves as the Web server and is named IR-SR03.
2. Another has Microsoft SQL Server 2005 Enterprise Edition installed and stores the database. This server is named IR-DB01.
3. Another has Microsoft SQL Server 2005 Enterprise Edition installed and servers as the database mirror. This server is named IR-DB02

BUSINESS REQUIREMENTS:

Product status and categories

International Retailers receives Category-Details lists of new Range sets for specific dolls. A Category-Details list is a list of dolls, their rarity, and information about what materials were used to manufacture the doll. Each Doll-range Category-Details list has a different format:

1. Some doll manufacturers publish Category-Details lists as text documents.
2. Others publish Category-Details lists as Excel spreadsheets.
3. A few have started using Extensible Markup Language (XML).

Doll manufacturers refer to doll rarity using different standards. You want all rarity to be indicated using the full words; for example, "Rare," "Very Rare," and "Uncommon" and not abbreviated or acronym forms like "R," "VR," and "U".

All Category-Details lists for a specific doll-range use the same format.

The text documents are delimited by tabs and carriage returns.

When a new range is released, the information about the dolls must be entered into the database.

Some information is the same for all ranges and must be stored for all dolls. This information includes: doll, range set, doll type, doll number, rarity, price, number in stock. Other information is doll-specific. This information might include historic period, durability, abilities, color, and manufacturing cost.

Some ranges have dolls with the same title, even within the same range set. Each doll in a range set has a doll number. The doll numbers are guaranteed to be unique within a range set, but are not guaranteed to be unique across range sets. Some doll numbers are numeric. Others contain non-numeric characters.

The RangeID column will contain the range set number for the doll. The first set for a doll will have RangeID = 1. The second set for a doll will have RangeID = 2, etc.

An initial price based on rarity will be entered.

Pricing and initial inventory information will be updated manually.

The price of a doll will depend on its condition. Dolls are rated as Mint, Near Mint, Excellent, Good, and Poor. The company employs doll raters to rate doll condition. The company needs the ability to track inventory based on the number of dolls in stock and their condition.

Customer involvement and service to customers

In the initial release, users must be able to search on dolls based on doll, doll-range set, and doll title. Searches based on doll-specific attributes will be enabled at a later date.

The most common search is for a doll with a specific title that belongs to a specific range. A search should return the doll title, the doll rarity, and the doll price for each condition rating in stock. Only condition ratings for dolls in-stock should be listed. If the doll is not in stock, an "Out of stock" message should be returned to the application. Users can click a Details button to retrieve specific attributes for a doll.

If a customer tries to order a doll that is not in-stock, that customer should be able to

register to receive an e-mail when that doll becomes available. The same customer often searches for the same doll. As soon as a doll becomes available, all customers searching for it should be notified.

Company Involvement and service to customers

Pricing information is updated weekly. An analyst bases the price of a doll on the number of sales, the rarity of the doll, the industry standard price for the doll, how difficult the doll is to obtain, and a sales projection report provided by the Acquisitions Agent for the range. Industry standard prices are published monthly by four different sources. The standard price listings are sent out in XML documents. The analyst sets the price for a doll in Mint condition. Prices for other conditions are derived as a percentage of the Mint condition price. However, the analyst must be able to manually override the calculated price based on the demand for a doll.

The company also wants to build a DollSeeker application that will locate dolls on auction sites. In the event of a user requests notification for an out-of-stock doll, the application will actively go out to search for the doll. It will search for the doll continuously until it finds it. When the application finds the doll for auction, it will e-mail the Acquisitions Agent for the doll. The doll request will go into a waiting state until the Acquisitions Agent restarts the process or deletes the doll request.

Acquisitions Agents also need to run daily reports to analyze sales trends for the specific dolls. The report must include sales information for the previous day, sales information for the previous month, and sales information for each of the past six months. Sales information includes the number of sales for a specific doll and price for the doll on the previous day. Acquisitions Agents use this information to determine the value of a collection based on the likelihood that the dolls will sell and their anticipated price.

The Finance department requires a monthly and annual report that shows summarized sales information by doll. They need to be able to access the monthly reports for three years and the annual report for seven years. The Finance department needs these reports rendered as Microsoft Excel spreadsheets. The Executive committee needs access to the annual information, but rendered as HTML.

TECHNICAL REQUIREMENTS:

1. Data must be normalized to third normal form (3NF).
2. Null columns should be avoided where possible.
3. Above all reporting requirements must not impact customer performance.

Topic 6, International Retailers (14 Questions)

QUESTION 69

You are busy designing the SQL Services to support the International Retailers business needs. To this end you need to make a choice in which strategy you are going to use to accommodate the addition of new Category-Details lists to the database. In your solution you must ensure that the minimum amount of manual data entry and formatting will be performed when a new Category-Details list is released.

What should you do?

- A. The data must be formatted as a comma-delimited file. Then import the data using

bcp.

B. The data must be formatted as a comma-delimited file. Then import the data using BULK INSERT.

C. The data must be formatted as Extensible Markup Language (XML). Then store the data in an untyped XML column.

D. Make use of SQL Server Integration Services (SSIS).

Answer: D

Explanation: SSIS makes provision for the import of disparate data sources, cleaning it and meeting your storage demands, as well as import it into your database tables. This means that SSIS is quite flexible and probably the best choice under the circumstances.

1. International Retailers receives Category-Details lists of new range sets for specific dolls. A Category-Details list is a list of dolls, their rarity, and information about what materials were used to manufacture the doll. Each Doll-range Category-Details list has a different format:

2. Some doll manufacturers publish Category-Details lists as text documents.

3. Others publish Category-Details lists as Excel spreadsheets.

4. A few have started using Extensible Markup Language (XML).

Incorrect answers:

A: Formatting the data as comma-delimited and using bcp will require a large amount of manual effort.

B: Formatting the data as comma-delimited and using BULK INSERT will require a large amount of manual effort.

C: You should not format all the data as XML as some data, such as doll name, number, and rarity requires storing in relational database columns.

QUESTION 70

You are busy developing the application service that will provide the International Retailers Finance department and Executive committee with the information they require. In your solution you must ensure that you minimize the amount of data storage required for storing reports.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

A. Make use of a monthly Microsoft Excel report.

B. Make use of an annual Microsoft Excel report.

C. Make use of a monthly HTML report.

D. Make use of an annual HTML report.

E. Make use of a monthly report snapshot.

F. Make use of an annual report snapshot.

Answer: E, F

Explanation: A report snapshot stores data but will not render it until requested. Thus to meet the requirements you will only require monthly and annual report snapshots. When

the respective users request the report, they will select the format Reporting Services will use to render the report.

1. The Finance department requires a monthly and annual report that shows summarized sales information by doll. They need to be able to access the monthly reports for three years and the annual report for seven years. The Finance department needs these reports rendered as Microsoft Excel spreadsheets. The Executive committee needs access to the annual information, but rendered as HTML.

Incorrect answers:

A: There is no need to make use of a monthly Excel report. Instead you should use a snapshot that renders the report in the required format when requested.

B: There is no need to make use of an annual Excel report. Instead you should use a snapshot that renders the report in the required format when requested.

C: The Executive members do not require monthly reports. Even in the event that they do need monthly reports they can rather render the monthly report snapshot in the format of their choice.

D: You do not have to create an annual report in HTML format. A snapshot will store the report and render the report in the appropriate format when requested.

QUESTION 71

You need to design the feature that will allow users to be notified when a doll that they require, or inquired about is in stock. To this end you need to choose the appropriate objects to implement this feature.

What should you do?

A. You should create Subscription, Queue, and Notification objects.

B. You should create EventProvider, Subscription, and Notification objects.

C. You should create Subscription, Notification, and Event objects.

D. You should create Event, Notification, Queue, and Subscription objects.

Answer: C

Explanation: Notification Services will allow users to subscribe to a notification when an event occurs. Thus to create Notification Services applications, you have to create the definition for the Event, the Notification, and the Subscription in the Application Definition File (ADF) or create them programmatically.

1. In the initial release, users must be able to search on dolls based on doll, doll-range set, and doll title. Searches based on doll-specific attributes will be enabled at a later date.

The most common search is for a doll with a specific title that belongs to a specific range. A search should return the doll title, the doll rarity, and the doll price for each condition rating in stock. Only condition ratings for dolls in-stock should be listed. If the doll is not in stock, an "Out of stock" message should be returned to the application. Users can click a Details button to retrieve specific attributes for a doll.

2. If a customer tries to order a doll that is not in-stock, that customer should be able to register to receive an e-mail when that doll becomes available. The same customer often searches for the same doll. As soon as a doll becomes available, all customers searching for it should be notified.

Incorrect answers:

A: This option is partly correct, except that you do not need to create a Queue object because a Queue is used on Service Broker applications; you are creating a Notification Services application instead.

B: This option is partly correct, except that you do not need to create an EventProvider object because you can make use of the standard Transact SQL Event Provider.

D: This option is partly correct, except that you do not need to create a Queue object because a Queue is used on Service Broker applications; you are creating a Notification Services application instead.

QUESTION 72

You need to design the feature that will allow users to be notified when a doll that they require, or inquired about is in stock. To this end you need to design the Application Definition File (ADF). Your solution must ensure that interested users are e-mailed at the same time as when the doll becomes available. You thus need to choose the appropriate elements that should be added to the ADF file to implement this feature.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. <DeliveryChannelName>Email</DeliveryChannelName>
- B. <DeliveryChannelName>SMTP</DeliveryChannelName>
- C. <DigestDelivery>true</DigestDelivery>
- D. <MulticastDelivery>true</MulticastDelivery>
- E. <ProtocolName>File</ProtocolName>
- F. <ProtocolName>SMTP</ProtocolName>

Answer: D, F

Explanation: This scenario requires that an e-mail be sent to subscribers, this means that you should make use of the SMTP protocol. ADF is an Extensible Markup Language (XML) file that contains configuration information for the Notification Services application. You need to specify the protocol that will be used to deliver the notification in the <ProtocolName> element.

You also need to ensure that all interested users are e-mailed at the same time thus you need to enable multicast delivery by setting the <MulticastDelivery> element to true.

1. In the initial release, users must be able to search on dolls based on doll, doll-range set, and doll title. Searches based on doll-specific attributes will be enabled at a later date.

The most common search is for a doll with a specific title that belongs to a specific range. A search should return the doll title, the doll rarity, and the doll price for each condition rating in stock. Only condition ratings for dolls in-stock should be listed. If the doll is not in stock, an "Out of stock" message should be returned to the application. Users can click a Details button to retrieve specific attributes for a doll.

2. If a customer tries to order a doll that is not in-stock, that customer should be able to register to receive an e-mail when that doll becomes available. The same customer often searches for the same doll. As soon as a doll becomes available, all customers searching

for it should be notified.

Incorrect answers:

A: You should not set the <DeliveryChannelName> to Email because this element is added to the Instance Configuration File (ICF) and not the ADF.

B: You should not set the <DeliveryChannelName> to SMTP because this element is added to the Instance Configuration File (ICF) and not the ADF.

C: The <DigestDelivery> element will determine whether all notifications destined for the same address are combined into a single message. It cannot be used with multicast delivery.

E: The File protocol is used to copy the notification to a location in the file system or not a network share. Thus you should not make use of File protocol in this case.

QUESTION 73

You are designing the mechanisms for retrieving data for International Retailers. This mechanism must return data from a customer query to the Web application. Your solution must be of such a nature that the Web developer does not have to understand the underlying structure of the database. The application expects a single table result that includes the doll or dolls that match the customer's search attributes. To this end you need to decide on the appropriate SQL Server object to provide the application with the required functionality. What should you do?

- A. Use a view.
- B. Use an indexed view.
- C. Use an in-line user-defined function.
- D. Use a scalar user-defined function.

Answer: C

Explanation: An in-line user-defined function allows one to return a table that contains the results of a parameterized query. The user will specify the search criteria which will serve as your parameter. Furthermore you will be able to hide the complexity of a query so that the application developer can simply call the function to retrieve the table. Also a user-defined function can also be used in the FROM clause of a query.

1. The most common search is for a doll with a specific title that belongs to a specific range. A search should return the doll title, the doll rarity, and the doll price for each condition rating in stock.

Incorrect answers:

A: A view will require that the application developer filter the result based on search criteria. It cannot include a replaceable parameter in the WHERE clause.

B: An indexed view is a view that is stored persistently as a unique clustered index. Akin to a standard view, it cannot include replaceable parameters in the WHERE clause.

D: A Scalar user-defined function returns a scalar value, not a table.

QUESTION 74

You need to design the tracking inventory table for International Retailers. The

inventory table will be related to the Dolls table. The Dolls table is illustrated below:

Dolls	
	DollID
	RangeID
	DollType
	Rarity
	Description

You need to make a choice of the columns that you will reference in the Inventory Table's foreign key. You need to ensure that your solution must reference only the required columns to enforce referential integrity.

What should you do? (Each correct answer presents part of the solution. Choose ALL that apply.)

- A. Reference the DollID column in the Inventory Table's foreign key.
- B. Reference the Rarity column in the Inventory Table's foreign key.
- C. Reference the Description column in the Inventory Table's foreign key.
- D. Reference the DollType column in the Inventory Table's foreign key.
- E. Reference the RangeID column in the Inventory Table's foreign key.

Answer: A, E

Explanation: DollID is not always a unique value. It is only guaranteed uniqueness within a RangeID. But if you combine RangeID and DollID values, you can guarantee uniqueness. Columns that are referenced by a foreign key constraint must identify a unique row in the referenced table. And in this case you need to use several columns to make up the primary key.

1. Some information is the same for all ranges and must be stored for all dolls. This information includes: doll, range set, doll type, doll number, rarity, price, number in stock. Other information is doll-specific. This information might include historic period, durability, abilities, color, and manufacturing cost.
2. Some ranges have dolls with the same title, even within the same range set. Each doll in a range set has a doll number. The doll numbers are guaranteed to be unique within a range set, but are not guaranteed to be unique across range sets. Some doll numbers are numeric. Others contain non-numeric characters.
3. The RangeID column will contain the range set number for the doll. The first set for a doll will have RangeID = 1. The second set for a doll will have RangeID = 2, etc.

Incorrect answers:

- B: The Rarity column does not have to form part of the foreign key as it does not add to the uniqueness of the key.
- C: The Description column does not have to form part of the foreign key as it does not add to the uniqueness of the key.
- D: The DollType column does not have to form part of the foreign key as it is not guaranteed to be unique even within the same Range.

QUESTION 75

You must design the reporting capabilities that the Acquisitions Agents require. To this end you need to determine the appropriate steps to take so as to configure the server to support this functionality.

What should you do?

- A. Create a daily database snapshot on IR-DB02.
Create a monthly database snapshot on IR-DB02.
Run reports against the database snapshot.
- B. Create a monthly database snapshot on IR-DB02.
Run reports against the database snapshot and the database mirror.
- C. Create a monthly database snapshot on IR-DB01.
Move the database snapshot to IR-DB02 and attach it.
Run reports against the database snapshot and IR-DB01.
- D. Create a daily database snapshot on IR-DB01.
Move the database snapshot to IR-DB02 and attach it.
Run reports against the database snapshot and IR-DB01.

Answer: A

Explanation

: Reporting requirements demands that the data must be consistent if reports are run multiple times, thus you need to create a database snapshot on the mirror to ensure that data is not modified between reports runs. Creating the database snapshot on the mirror servers allows you to offload report processing to this server and thus reduce the impact on performance.

1. Another has Microsoft SQL Server 2005 Enterprise Edition installed and stores the database. This server is named IR-DB01.
2. Another has Microsoft SQL Server 2005 Enterprise Edition installed and servers as the database mirror. This server is named IR-DB02.
3. Acquisitions Agents also need to run daily reports to analyze sales trends for the specific dolls. The report must include sales information for the previous day, sales information for the previous month, and sales information for each of the past six months. Sales information includes the number of sales for a specific doll and price for the doll on the previous day. Acquisitions Agents use this information to determine the value of a collection based on the likelihood that the dolls will sell and their anticipated price.
4. Above all reporting requirements must not impact customer performance.

Incorrect answers:

B: The mirror database IR-DB02 cannot be used to process queries. This it cannot be used for reporting. You cannot use a mirror for reporting.

C: The database snapshot should be stored on the same server as the actual database; therefore you will not be able to create the snapshot on IR-DB01 and then move it to IR-DB02.

D: The database snapshot should be stored on the same server as the actual database; therefore you will not be able to create the snapshot on IR-DB01 and then move it to IR-DB02.

QUESTION 76

You are busy designing the storage solution for International Retailers. Thus you need to define the data types that will be used to store the doll-specific information. The data type must allow for a future version of the program to display a list of doll-specific properties and allow for users to search for those dolls that contain specific values in those fields. In your solution you must ensure that allowance is provided for all new dolls to be added to the system without modifying the database schema

What should you do?

- A. Use a typed Extensible Markup Language (XML) column.
- B. Use an untyped Extensible Markup Language (XML) column.
- C. Use a nvarchar(max) column and enable Full Text Search.
- D. Use a Common Language Runtime (CLR) user-defined type column.
- E. Use an nvarchar data type for each property column and allow for null values in each column.

Answer: B

Explanation: An untyped XML column will allow for the support of new dolls without requiring the need to define a schema for the dolls. It will also make allowance for the implementation of the desired search functionality at a later stage because the xml data type supports the ability to programmatically determine the nodes and their values.

1. In the initial release, users must be able to search on dolls based on doll, doll-range set, and doll title. Searches based on doll-specific attributes will be enabled at a later date. The most common search is for a doll with a specific title that belongs to a specific range. A search should return the doll title, the doll rarity, and the doll price for each condition rating in stock. Only condition ratings for dolls in-stock should be listed. If the doll is not in stock, an "Out of stock" message should be returned to the application. Users can click a Details button to retrieve specific attributes for a doll.

Incorrect answers:

- A: A typed XML column will not make provision for you to store doll-specific information that does not match a defined schema to allow for the support of new dolls without programming changes.
- C: Creating a column using the nvarchar(max) data type will allow you to store any type of information in the field, but it does not support the required functionality of displaying a list of doll-specific properties and allowing the user to search on their values. Furthermore, Full Text Search will also allow you to search for a string within the field, but will not make provision for the extraction of property names to display in the user-interface.
- D: You should not make use of CLR user-defined type as this situation does not call for the calculations or other data modifications making use of managed code. You will just be increasing the complexity and make extensibility to support more new dolls more difficult.

E: You should not use a column for each property as this will require schema changes in the event of a new doll that requires different properties was added.

QUESTION 77

You must design the logical database application for International Retailers. This database application must be able to update doll prices. You thus need to determine how pricing information will be stored and updated in the database. You need to ensure that your solution provides optimal performance for customer queries. What should you do?

A. Create: (i) A separate table for pricing information, and (ii) a separate Price column for each condition.

Add an AFTER UPDATE trigger that modifies the price of each column when the MintPrice column is changed.

B. Create: (i) A separate table for pricing information, and (ii) a Condition column and a Price column.

Add a user-defined Common Language Runtime (CLR) Trigger that modifies the records for that doll's other condition prices when the MintPrice is updated.

C. Add a Price column to the Dolls table. Store the MintPrice.

Create a stored procedure that returns the calculated price for each other condition.

Use the stored procedure for the customer query.

D. Add a Price column to the Dolls table. Store the pricing information as a Common Language Runtime (CLR) user-defined type.

Add the appropriate code to calculate the prices for the other conditions when the MintPrice is set.

Answer: A

Explanation: You need to create separate table to store the pricing information that stores the price for each condition in a separate column. Then use a trigger to modify the price stored in each column when the MintPrice is changed. This will allow for derived prices to be stored for optimal response to customer queries as well as allow analysts to override the calculated price.

1. Pricing and initial inventory information will be updated manually.

2. Pricing information is updated weekly. An analyst bases the price of a doll on the number of sales, the rarity of the doll, the industry standard price for the doll, how difficult the doll is to obtain, and a sales projection report provided by the Acquisitions Agent for the range. Industry standard prices are published monthly by four different sources. The standard price listings are sent out in XML documents. The analyst sets the price for a doll in Mint condition. Prices for other conditions are derived as a percentage of the Mint condition price. However, the analyst must be able to manually override the calculated price based on the demand for a doll.

Incorrect answers:

B: There is no need to make use of a CLR user-defined function for the update when a simple calculation is being performed. You should only make use of a CLR user-defined function when the Transact-SQL cannot meet the requirements and furthermore using

CLR user-defined functions will result in a decrease in performance.

C: This option basically suggests dynamic changing of prices for other conditions during the customer query. This will prevent analysts from overriding the calculated price.

D: You should only make use of a user-defined type when the Transact-SQL cannot meet your requirements. It will also result in a decrease in performance.

QUESTION 78

You are developing the applications that will use Reporting Services for the International Retailers Acquisitions Agents. You need to ensure that your solution does not require that the Acquisitions Agents need an understanding of the underlying database structure or SQL queries. You need to identify the appropriate objects to use.

What should you do?

A. Use a report model and a reporting template. Deploy Report Builder to the Acquisitions Agents.

B. Use a subscription that (i) results in a Microsoft Excel report document and (ii) e-mail's it to the Acquisitions Agents.

C. Use a daily and a monthly report snapshot. Instruct Acquisitions Agents to access them via a Web browser.

D. Use Report Designer to publish an Extensible Markup Language (XML) report. Instruct all Acquisitions Agents to access the report via a Web browser.

Answer: A

Explanation

: You need to create a reporting template to format the report and a report model to abstract the underlying database structure into a business model. The Acquisitions Agents can then make use of the Report Builder to generate ad hoc reports and drill down through them.

1. Acquisitions Agents also need to run daily reports to analyze sales trends for the specific games. The report must include sales information for the previous day, sales information for the previous month, and sales information for each of the past six months. Sales information includes the number of sales for a specific doll and price for the doll on the previous day. Acquisitions Agents use this information to determine the value of a collection based on the likelihood the dolls will sell and their anticipated price.

Incorrect answers:

B: A Subscription-driven report is a pre-defined report and not an ad hoc report. Thus you cannot make use of a subscription that generates a Microsoft Excel format report.

C: Using snapshots and instructing Acquisitions Agents to access them via a Web browser will create multiple pre-defined reports. This will not meet the Acquisitions Agents' requirements.

D: XML does not allow drill-down and also you cannot make use of report Designer to create an XML format report. This will still result in a pre-defined report.

QUESTION 79

You are developing the Integration Services packages for the development of the

applications that use SQL Server Support Services. To this end you need to design a strategy for importing data from the Categories-Details lists into the database. This package must represent the steps required to import a single Categories-Details list into the International Retailers database. You thus need to decide on the appropriate design for the package.
What should you do?

- A. Create a Data Flow container and place it in the Control Flow container to make up the package.
- B. Create a Control Flow Container and place it in the Data Flow Container to make up the package.
- C. Create two Data Flow Containers (one for source and the other for destination) and a Control Flow Container to make up the package.
- D. Create two Data Flow Containers (one for source and the other for destination) and a Control Flow Container and place it in a For Each Loop container to make up the package.

Answer: A

Explanation: A SQL Server Integration Services (SSIS) package can be used to meet the requirements for importing and transforming the required data. However, a SSIS package must have a Control Flow. Control Flow is the container that contains the tasks and containers. A Data Flow is but a container in the Control Flow. The Data Flow defines sources, transformations and Destinations. In this case you all the requirements can be met within a Data Flow. A Data Flow can only be added to a Control Flow and not directly to a package. Thus option A is the solution.

1. International Retailers receives Category-Details lists of new range sets for specific dolls. A Category-Details list is a list of dolls, their rarity, and information about what materials were used to manufacture the doll. Each Doll-range Category-Details list has a different format:
2. Some doll manufacturers publish Category-Details lists as text documents.
3. Others publish Category-Details lists as Excel spreadsheets.
4. A few have started using Extensible Markup Language (XML).
5. All Category-Details lists for a specific doll-range use the same format.
6. The text documents are delimited by tabs and carriage returns.

Incorrect answers:

- B: A Data Flow is added to the Control Flow and not the other way around because a Data Flow cannot be added to a package directly.
- C: There is no need to define a separate Data Flow for the source and the Destination. Also Control Flow is not used to define transforms.
- D: There is no need to create a For Each Loop. A For Each Loop is used to iterate events within a Control Flow. It is not required to iterate through rows.

QUESTION 80

You need to design the International Retailers DollSeeker application. You need to take a decision on which service to use to build the application.

What should you do?

- A. Make use of SQL Server Analysis Services.
- B. Make use of Event Notification Services.
- C. Make use of Notification Services.
- D. Make use of Service Broker.

Answer: D

Explanation: Service Broker supports the building of asynchronous applications. You can create a queue and place a doll request message in the queue. The DollSeeker application could then pick the message up and perform the search. When the search is complete, it can place the message in another queue, which is then picked up by a service that takes the appropriate action. In this scenario the DollSeeker application is asynchronous.

1. The company also wants to build a DollSeeker application that will locate dolls on auction sites. In the event of a user requests notification for an out-of-stock doll, the application will actively go out to search for the doll. It will search for the doll continuously until it finds it. When the application finds the doll for auction, it will e-mail the Acquisitions Agent for the doll. The doll request will go into a waiting state until the Acquisitions Agent restarts the process or deletes the doll request.

Incorrect answers:

A: The SQL Server Analysis Services is not used to build asynchronous applications since it is used to perform Online Analytical Processing (OLAP) operations.

B: Event Notification Services will not meet the requirements for the DollSeeker application. It allows one to configure notification for Data Definition Language (DDL) events and some SQL Trace events.

C: Notification Services is not appropriate for asynchronous applications. It is used mainly to allow users to subscribe to be notified when an event occurs or on a scheduled basis.

QUESTION 81

Since you are using a SQL Server Integration Services (SSIS) package, you will require a Control Flow. To this end you are designing the Data Flow elements that will define the importing of data from comma-delimited Category-Details lists into the database. In your solution you need to make a choice regarding the Data Flow elements that should be used in the Source - Data Flow step.

What should you do?

- A. Use the DataReader Data Flow element.
- B. Use the Bulk Insert Data Flow element.
- C. Use the Flat File Data Flow element.
- D. Use the Raw File Data Flow element.
- E. Use the SQL Server Data Flow element.

Answer: C

Explanation: Data Flow defines sources, transformations and destinations. In this case you should make use of the Flat File source element. The Flat File element is used when importing data from a comma-delimited text file.

1. International Retailers receives Category-Details lists of new range sets for specific dolls. A Category-Details list is a list of dolls, their rarity, and information about what materials were used to manufacture the doll. Each Doll-range Category-Details list has a different format:
2. Some doll manufacturers publish Category-Details lists as text documents.
3. Others publish Category-Details lists as Excel spreadsheets.
4. A few have started using Extensible Markup Language (XML).
5. The text documents are delimited by tabs and carriage returns.

Incorrect answers:

A: The DataReader source is used when importing data to an application that makes use of Active Data Objects (ADO.NET). In this scenario there is not need for ADO.NET connectivity.

B: Bulk Insert task can be added to a Data Flow, however, it does not allow for transformations.

D: Raw File is used when importing data to a column and the data does not require formatting. It can only be used as a destination in this case.

E: The SQL Server destination is used when you need to transform data and import it into SQL: Server on the computer where the package is run.

QUESTION 82

Since you are using a SQL Server Integration Services (SSIS) package, you will require a Control Flow. You are designing the Data Flow elements that will define the importing of data from comma-delimited Category-Details lists into the database. In your solution you need to make a choice regarding the Data Flow elements that should be used in the Destination - Data Flow step.

What should you do?

- A. Use the Raw File Data Flow element.
- B. Use the DataReader Data Flow element.
- C. Use the Bulk Insert Data Flow element.
- D. Use the Flat File Data Flow element.
- E. Use the SQL Server Data Flow element.

Answer: E

Explanation: Data Flow defines sources, transformations and destinations. In this case you should make use of the SQL Server destination. The SQL Server destination is used when you need to transform data and import it into SQL: Server on the computer where the package is run.

1. International Retailers receives Category-Details lists of new range sets for specific dolls. A Category-Details list is a list of dolls, their rarity, and information about what materials were used to manufacture the doll. Each Doll-range Category-Details list has a

different format:

2. Some doll manufacturers publish Category-Details lists as text documents.
3. Others publish Category-Details lists as Excel spreadsheets.
4. A few have started using Extensible Markup Language (XML).
5. The text documents are delimited by tabs and carriage returns.

Incorrect answers:

A: Raw File is used when importing data to a column and the data does not require formatting.

B: The DataReader source is used when exporting data to an application that makes use of Active Data Objects (ADO.NET). In this scenario there is no need for ADO.NET connectivity.

C: Bulk Insert task can be added to a Data Flow, however, it does not allow for transformations.

D: The Flat File element is used when importing data from a comma-delimited text file.

Topic 7, WillowBridge, Scenario

OVERVIEW:

Background

Willow Bridge is a company that operates as a service provider the Insurance environment. The company provides secure support services for Insurance Brokers, Agents and accredited professionals that operate in the Insurance environment. Willow Bridge services clients on a world-wide basis.

Products and Services

Willow Bridge provides secure databases.

Willow Bridge also provides technical assistance and support in designing and deploying storage solutions and related applications for Insurances Agencies and Brokers.

Since not all Willow Bridge customers are similar, the services offered to the Willow Bridge customers varies according to the contracted service level agreement (SLA).

The SLA defines items such as availability, transaction throughput, communication bandwidth, and recovery times.

TECHNICAL ENVIRONMENT

Computers and its functions:

Multiple processor computers/servers

The Willow Bridge office at present contains four multiple processor computer that are configured with Windows Server 2003 and SQL Server 2005 Enterprise edition.

These computers are dedicated to supporting customer storage requirements.

Two of the computers are configured as an active/active cluster pair with a fibre channel storage subsystem.

Each of the remaining computers has its own disk storage subsystem.

Additional computers will be deployed as necessary to meet SLA requirements.

Database support

Database support is in the form of two basic models: Hosted Database and Managed Database. Each of these support models requires specific management and support.

Willow Bridge bears the responsibility of maintenance, backups and data restores for both the Hosted Database and the Managed Database models.

Since the customers are different from each other, their database sizes vary accordingly. Some of their databases comprises of thousands of rows while other rank in the millions of rows.

The Hosted Database Model:

The customer bears the responsibility for database management.

This management includes functions like access security, creation and management of databases and database objects, testing database applications, etc.

The Managed Database Model:

Willow Bridge bears the responsibility for database management.

Willow Bridge bears the responsibility of designing and deploying database objects for the customer.

Each customer contract is for a single database.

Access to the database must be strictly limited to the Willow Bridge personnel and other users as explicitly identified by the customer.

A single instance of SQL Server 2005 is run on a Willow Bridge computer named WB-DB01. WB-DB01 is used internally for the Willow Bridge customer relationship management (CRM), accounting, billing, and other internal functions.

Prototyping and testing is done on a computer named WB-TEST. WB-TEST is reconfigured quite regularly.

WB-SRV01 and WB-SRV02 run Microsoft Windows Server 2003 and are both configured with a full set of SQL Server client tools. Both WB-SRV01 and WB-SRV02 are located in the maintenance department.

BUSINESS REQUIREMENTS

General Requirements

Since the customers are different from each other, their business requirements vary accordingly.

The Hosted Database customers who manage and design their own databases require maintenance and physical storage support, but little additional assistance or support.

Hosted Database customers all have the ability to connect to the Willow Bridge network through a virtual private network (VPN) connection over the Internet.

Three sets of internal management reports are generated on a regular schedule: daily, weekly, and monthly. Managers need to be able to request additional copies of these reports at any time.

Connection Requirements

Since the customers are different from each other, their connection requirements vary accordingly.

Connection requirements for Managed Database customers vary by customer.

Most customers are limited to Web and e-mail access.

Other customers do have VPN access available.

Customer Service Requirements

Since the customers are different from each other, their services provided to them vary accordingly.

Typically the services provided to them include Notification Services and Reporting Services in addition to data storage and management.

Managed Database options do not include support for hosted data warehousing databases, but can support updates to Analysis Services hosted locally by customers.

In the event of a serious error occurring customers need to receive notification via a message immediately:

The requirement is specified in each customer's SLA.

The messages should be generated from critical errors written to the event logs.

Customers are allowed to designate who should receive the message.

Customers are also further allowed to choose the method in which they prefer the notifications to be sent to them: either by e-mail, cell phone, or other wireless devices.

Recipients of these messages should not have to be entered as database users.

Notifications regarding disk usage and available storage will be sent to customers on a monthly basis.

Available storage will be checked on a daily basis.

In the event of a customer having less than five percent of its contracted space available the customer will receive a warning e-mail message. The e-mail warning is sent daily until the situation is corrected.

TECHNICAL REQUIREMENTS

Security

Customer database availability and security remains the main priority at all times.

Monitoring of servers:

The servers that host the customer databases are to be monitored on an ongoing basis.

Server performance should not be impacted on by any of the monitoring plans.

Monitoring requirements include all critical system resources, but focus on memory, processor, and disk performance statistics.

Configuration of database servers:

Database server configurations must ensure isolation between different customer's databases.

Encryption is compulsory for all data transfers between databases or between servers.

Databases must be protected against unauthorized disclosure of data or database objects such as stored procedures.

Maintainability

All database server backup plans must allow for point-in-time recovery.

All database server backup plans must leave no more than one hour's data at potential risk at any time.

Backups are run to two file servers physically located in a physically secured server area with the database servers. A different tape set must be used each day, thus the file servers that are backed up daily to tape must have seven generations of tape backup.

Topic 7, WillowBridge (12 Questions)

QUESTION 83

You are developing the application required for Notification Services for Willow Bridge. You must ensure that your solution will result in the customers receiving the error messages as specified in the SLA.

What should you do?

- A. Make use of SQL Server Agent Alerts.
- B. Make use of Reporting Services application.
- C. Make use of a Notification Services application.

- D. Make use of an Integration Services package.
- E. Make use of triggers.

Answer: C

Explanation: Notification Services will be the most appropriate type of application to use since it can be used to generate event-driven notifications based on critical error logged in the event log. Many delivery options like, e-mail, cell-phone, and other wireless device are supported as well.

Since not all Willow Bridge customers are similar, the services offered to the Willow Bridge customers varies according to the contracted service level agreement (SLA).

1.

In the event of a serious error occurring customers need to receive notification via a message immediately:

The requirement is specified in each customer's SLA.

The messages should be generated from critical errors written to the event logs.

Customers are allowed to designate who should receive the message.

Customers are also further allowed to choose the method in which they prefer the notifications to be sent to them: either by e-mail, cell phone, or other wireless devices.

Recipients of these messages should not have to be entered as database users.

Incorrect Answers:

A: SQL Server Agent Alerts will generate an alert when the minimum space threshold is met or exceeded, but not specifically to the event log events. Also alerts will be limited to e-mail, pager or net send.

B: Reporting Services will not be appropriate under the circumstances since it is used to generate reports from a specific data source, not as a mechanism to respond to events.

D: The SQL Server Integration Services (SSIS) serves as a platform for data integration and workflow solutions and allows data extraction, transformation and load. It is not used for event monitoring or for the generation of messages in response to events.

E: Triggers DDL triggers respond to data definition events. Also a Data Modification Language (DML) trigger responds to data manipulation events like INSERT and DELETE. Not required in this case.

QUESTION 84

You are designing the Willow Bridge database with focus on security regarding the Managed Database customers. Your solution must ensure that physical database servers and the number of SQL Server instances are kept to a minimum. What should you do?

- A. Use separate customer databases on a single SQL Server instance.
- B. Use customer tables in a single shared database.
- C. Use a separate SQL Server instance on a shared database server for each customer database.
- D. Use a separate SQL Server instance on its own database server for each customer database.

Answer: A

Explanation:

you need to limit access to the database as well as limit and monitor disk space used by the customer. If you make use of separate customer databases on a single server instance then you will fulfill both these requirements. Depending on the hardware resources, a computer is capable of supporting up to 16 instances. This means that you will also be keeping the number of physical database servers and instances to a minimum.

Database users will be managed at the database level, thus you will be able to specify unique users for each database, and in addition you can control allotted disk space by disabling automatic growth for the database.

1. The Managed Database Model:

Each customer contract is for a single database.

Access to the database must be strictly limited to the Willow Bridge personnel and other users as explicitly identified by the customer.

Notifications regarding disk usage and available storage will be sent to customers on a monthly basis.

Available storage will be checked on a daily basis.

Incorrect Answers:

B: Making use of customer tables in a single shared database will not meet the security management requirements because then you will have to grant all users access to the same database. This is in direct violation of security restrictions.

C: Using a separate SQL Server instance on a shared database server for each customer database means multiple instances and this would not be keeping the number of instances to the minimum.

D: Using a separate SQL Server instance on its own database server will not fulfill requirement of keeping the number of physical database servers to a minimum.

QUESTION 85

A Willow Bridge Manages Database customer is contracted primary for data security and connects to Willow Bridge on a regular schedule throughout the day via a VPN connection. Records are posted locally by this particular customer. This customer requires that the same information be posted to a database created under a managed database contract. You need to design a solution that will meet both the Willow Bridge and the customer requirements. Your solution must ensure that Latency is minimized.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. Audit data changes using triggers
- B. Audit data changes using SQL Profiler.
- C. Perform updates using log shipping.
- D. Perform updates using merge replication.
- E. Perform updates using transactional replication.
- F. Perform updates using Snapshot replication.

Answer: B, E

Explanation: Transactional replication works best when you have either a reliable full-time connection or regular connections. If you make use of transactional replication then you need to configure it to use updating subscribers in order to apply the modifications made locally to the customer. It is possible to schedule transactional updates thus reducing latency. Furthermore you can make use of SQL Profiler to provide auditing functionality that is a customer requirement. SQL Profiler allows one to audit individual transactions and all database access activity. This information can be saved to a file or table. All data updates made to Willow Bridge database must be audited and tracked, thus you require auditing of individual data postings and all access to the database.

Since not all Willow Bridge customers are similar, the services offered to the Willow Bridge customers varies according to the contracted service level agreement (SLA). The SLA defines items such as availability, transaction throughput, communication bandwidth, and recovery times.

The Managed Database Model:

Willow Bridge bears the responsibility for database management.

Willow Bridge bears the responsibility of designing and deploying database objects for the customer.

Access to the database must be strictly limited to the Willow Bridge personnel and other users as explicitly identified by the customer.

Customer database availability and security remains the main priority at all times.

1. Monitoring of servers:

The servers that host the customer databases are to be monitored on an ongoing basis.

Incorrect Answers:

A: Triggers cannot meet all the auditing requirements. Tracking transactions will require creating involved triggers for each database table. Triggers can be used to track database access, but it is not a data modification event neither is it a data design event.

C: Log shipping is a server availability solution and not a data distribution solution. In this case you need two servers with dedicated hardware including disk storage. Updates must be made by applying transaction log updates from the primary server. And log shipping does not allow for the auditing of individual transactions.

D: Merge Replication would not be appropriate because you need to minimize latency and merge replication, by design, has more latency than other types of replication.

F: Snapshot replication is best used in small databases that do not get updated on a regular basis. This will not do under the circumstances.

QUESTION 86

The Willow Bridge Accounting reports are run by quarter, semi-annually and annually. Each quarter you need to integrate that quarter report account records into an online analytical processing (OLAP) database. Most of the required information is maintained in the Accounts table in the ACCOUNTING database.

You need to organize the ACCOUNTING database Accounts table to optimize support for reporting and maintenance activity by each reporting periods. You need

to ensure that your solution requires the minimal activity to maintain.
What should you do?

- A. Make use of a partitioned table
- B. Make use of OLAP cubes
- C. Make use of separate quarterly tables
- D. Make use of a clustered index.

Answer: A

Explanation: One can partition a table based on date, dividing the table into partitions by quarter. Because the data is segregated quarterly, data access for quarterly reports are optimized. Thus performance on other time-limited reports will also be improved because it would be necessary to query only those partitions in the report range. You thus achieve a level of maintenance and management control that is partitioned.

1. WB-DB01 is used internally for the Willow Bridge customer relationship management (CRM), accounting, billing, and other internal functions.
2. Three sets of internal management reports are generated on a regular schedule: daily, weekly, and monthly. Managers need to be able to request additional copies of these reports at any time.

Incorrect Answers:

B: OLAP cubes are used mainly for data retrieval purposes in data analysis. It is not the appropriate mechanism in this case where an OLTP is used.

C: Separate quarterly tables to separate the data will fulfill the requirement for management and maintenance on a quarterly basis. Improved performance will also ensure due to this measure. However, the solution will be less efficient because there are other reporting periods as well and there is also the need to scan multiple separate tables and then join the results.

D: A clustered index will improve performance when collecting data for reports run by date, but it does not segregate data to give a level of autonomy and segregation for management purposes.

QUESTION 87

Willow Bridge has a custom application that collects daily disk usage statistics and writes them to a table that is hosted on WB-DB01. You must design a solution to meet the requirements for reporting user disk storage. Tracking reports should be retained for a year. All reports older than one year will be deleted. Customers need the ability to recall their own reports for the past year. Managers and technical services personnel need to be able to recall any reports from the past year. In your solution you need to ensure that the generation of these reports and minimal disk storage to maintain a year's history requires minimal effort.
What should you do?

- A. Make use of a periodic scheduled-based Notification Services application.
- B. Make use of a monthly database snapshot-based stored procedure run by a SQL Server

Agent job.

C. Make use of Reporting Services and Report Builder.

D. Make use of Reporting Services and a Report Snapshot Application.

E. Make use of SQL Server Integration Services (SSIS).

Answer: D

Explanation:

A Report Snapshot is a completed report that is available for viewing and redistribution. You can store and manage report snapshots in a report history and the processes include recalling and redistributing old reports that will still report the original data. This makes using Reporting Services with a Report Snapshot application the best solution.

Since the customers are different from each other, their services provided to them vary accordingly.

Typically the services provided to them include Notification Services and Reporting Services in addition to data storage and management.

Three sets of internal management reports are generated on a regular schedule: daily, weekly, and monthly. Managers need to be able to request additional copies of these reports at any time.

Incorrect Answers:

A: Notification Services is used for the generation of notifications based on a periodic schedule, but it is not the best solution in this case since the solution also requires distribution and recall of historic information.

B: SQL Server Agent job stored procedure that references database snapshots would not be recommended because of the storage requirements.

C: Reporting Services used with Report Builder is mainly used for user friendly ad hoc report building. This solution will require standard reports that are run on a periodic schedule and made available for redistribution, not ad hoc reports.

E: The SQL Server Integration Services (SSIS) serves as a platform for data integration and workflow solutions and allows data extraction, transformation and load. But in this case you do not need any complicated workflow management. You require an e-mail delivery in reporting services.

QUESTION 88

You are designing the security aspects of the Willow Bridge database. To this end you must provide support for the Managed Database customer applications. Their applications require the ability to encrypt large amounts of data in the shortest time possible.

What should you do?

A. Make use of a symmetric key for data encryption purposes.

B. Make use of an asymmetric key for data encryption purposes.

C. Make use of a database key for data encryption purposes.

D. Make use of a SQL Server-generated certificate for data encryption purposes.

Answer: A

Explanation: It is recommended practice to make use of a symmetric key when encrypting large amounts of data. With symmetric keys the same key is used for both encryption and decryption, thus lowering the overhead on the other types of encryption. In this way you will optimize performance during data encryption. To improve security, the symmetric key should be encrypted with an asymmetric key or certificate.

1. Encryption is compulsory for all data transfers between databases or between servers. Databases must be protected against unauthorized disclosure of data or database objects such as stored procedures.

Incorrect Answers:

B: Asymmetric keys works best when working with small amounts of data. In this case the customers need their applications to encrypt large amounts of data.

C: A database master key is not used directly for data encryption. It merely provides the base for a developer to create certificates or asymmetric keys.

D: A SQL Server generated certificate will work best with small amounts of data, however, the customers in this case are talking about large amounts of data that must be encrypted.

QUESTION 89

You are designing the security aspects of the Willow Bridge database. To this end you must determine how access control will be managed for Hosted Database customers. In your solution you should take care to keep the administrative overhead required for access management to the minimum. Access control should be isolated from the other hosted database customers.

What should you do?

- A. Make use of a one-named instance for each database.
- B. Make use of the Default Server instance only.
- C. Make use of a one-named instance for each hosted database customer.
- D. Make use of a one-named instance for all customers.

Answer: C

Explanation:

Fixed Server role and SQL Server login is managed at the server level. The only way then to provide isolation between customers is to provide each hosted database customer with a separate instance. Depending on the hardware resources, a computer is capable of supporting up to 16 instances.

The Hosted Database Model:

The customer bears the responsibility for database management.

This management includes functions like access security, creation and management of databases and database objects, testing database applications, etc.

The Hosted Database customers who manage and design their own databases require maintenance and physical storage support, but little additional assistance or support.

Hosted Database customers all have the ability to connect to the Willow Bridge network through a virtual private network (VPN) connection over the Internet.

Incorrect Answers:

A: There is no need to have a separate instance for each database; this would include both hosted and managed database customers. What is required is that you should configure security by customer, and the customer can then control access at the database level.

B: The default instance does not provide the required level of isolation between customers.

D: A one-named instance for all customers is akin to server-level access and poses the risk of unauthorized access to other customers' databases and data.

QUESTION 90

You are required to ensure that warnings will be issued with regard to available disk space to the Managed Database customers. To this end you must design an application solution that makes use of the appropriate database technologies and techniques.

What should you do?

- A. Make use of DDL triggers
- B. Make use of DML triggers
- C. Make use of Notification Services.
- D. Make use of SQL Server Agent Alerts.
- E. Make use of Integration Services.

Answer: C

Explanation: Notification Services applications can be event-driven or based on a schedule, in this case a daily schedule.

1. Customer Service Requirements
2. Typically the services provided to them include Notification Services and Reporting Services in addition to data storage and management.
3. Notifications regarding disk usage and available storage will be sent to customers on a monthly basis.
4. Available storage will be checked on a daily basis.
5. In the event of a customer having less than five percent of its contracted space available the customer will receive a warning e-mail message. The e-mail warning is sent daily until the situation is corrected.

Incorrect Answers:

A: DDL triggers respond to data definition events. You need to monitor the status of a resource and thus this is not a specific type of event.

B: You should not make use of a Data Modification Language (DML) trigger in this case. This type of trigger responds to data manipulation events like INSERT and DELETE.

D: SQL Server Agent Alerts will generate an alert when the minimum space threshold is met or exceeded, but it cannot be configured to repeat on a daily basis. In addition, you

will be required to configure each customer as an alert operator and assign them to the appropriate alert.

E: Integration Services is a platform for data integration and workflow solutions. It is not the appropriate utility to use for status monitoring and reporting.

QUESTION 91

A Custom Windows application is used to post the Willow Bridge accounting information. Since you are responsible for designing objects that define data you need to ensure that values are validated for allowed ranges during data posting. Validation is to be performed at the server. In your solution you need to make sure that there is minimal impact on server processes.

What should you do?

- A. Make use of DEFAULT definitions.
- B. Make use of CHECK constraints.
- C. Make use of a CLR trigger.
- D. Make use of a CLR user-defined type.
- E. Make use of a UNIQUE constraint.

Answer: B

Explanation:

Since you need range verification to validate the data values, you should make use of CHECK constraints. This will also meet the requirement of minimal processing overhead on the server.

1. WB-DB01 is used internally for the Willow Bridge customer relationship management (CRM), accounting, billing, and other internal functions.

Incorrect Answers:

A: A Default Definition is used to enter a value into a column automatically when one is not provided during data entry. In this scenario users are entering values, but they require validation of these values. Thus Default definitions are not appropriate.

C: A CLT trigger can be used to examine and validate data that is being entered into data columns. However you will then be violating the one requirement regarding processing overhead on the processor of the server. A CHECK constraint would be more appropriate.

D: A CLR user-defined type s commonly used for computed values such as money and in an environment where encryption or encoding is required. This solution calls for data validation and not a computed value.

E: You cannot use a UNIQUE constraint in this scenario. These constraints are not used for data manipulation.

QUESTION 92

A Managed Database customer provides data updates for the database that is hosted by Willow Bridge as an XML document that must be parsed and loaded. This customer has a database server that runs SQL Server 2005 and makes use of a VPN connection to Willow Bridge on an intermittent basis.

This customer wants to use the data posted to the Willow Bridge database to update the database that the customer deployed locally. The customer plans to make occasional modifications to the local copy of the database which must thereafter be applied to the Willow Bridge copy.

You need to develop a solution that will apply updates to the customer's local database and apply modifications made locally to the Willow Bridge database. Your solution must require minimal maintenance and generate minimal traffic. You need to accommodate this customer and ensure that the customer's local copy of the database must remain fully functional and available for use.

What should you do?

- A. You should configure snapshot replication with Willow Bridge as the publisher.
- B. You should configure merge replication with Willow Bridge as the publisher.
- C. You should configure transactional replication with Willow Bridge as the publisher.
- D. You should configure log shipping with Willow Bridge as the primary server.

Answer: B

Explanation: The autonomy that is inherent in merge replications supports changes at both the publisher and the subscriber. Since the updates are posted by Willow Bridge and updates only being applied locally by the customer, the chances of conflicts are minimized. Under the circumstances as described in the question regarding intermittent connections, the best option would be to make use of merge replication.

Willow Bridge provides secure databases.

Willow Bridge bears the responsibility of maintenance, backups and data restores for both the Hosted Database and the Managed Database models.

Other customers do have VPN access available.

Incorrect Answers:

A: Snapshot replication is best used in small databases that do not get updated on a regular basis. When updates do occur, the full database is sent as an update, this means that traffic between Willow Bridge and the customer will be much higher if this option is used. You can accomplish the task, but you sacrifice on network traffic. The question states explicitly that your solution must require minimal maintenance and generate minimal traffic.

C: Transactional replication works best when you have either a reliable full-time connection or regular connections and not intermittent connections as this customer has. If you make use of transactional replication then you need to configure it to use updating subscribers in order to apply the modifications made locally to the customer.

D: Log shipping is a server availability solution and not a data distribution solution.

QUESTION 93

A Managed Database customer locally hosts an online analytical processing (OLAP) system and requested that Willow Bridge to provide data transformation and load support. They prefer the data load to be scheduled to occur at noon every day. You need to accommodate this customer.

What should you do?

A. Create an Integration Services package to provide data transformation and load support.

Run the package using the D T ExecUI command.

B. Create an Integration Services package to provide data transformation and load support.

Run the package using SQL Server Agent.

C. Create an Integration Services package to provide data transformation and load support.

Run the package using SQL Server Import and Export Wizard.

D. Create an Integration Services package to provide data transformation and load support.

Run the package using Business Intelligence Development Studio.

Answer: B

Explanation: The SQL Server Integration Services (SSIS) will meet the requirements. It is a platform for data integration and workflow solutions. It can be used to extract the data from the purchased lists, transform the data as required, validate against the Customers table, and load the data into the Contacts table.

Further you need to make use of SQL Server Agent to run the package by creating a SQL Server Agent job and then executing the package as a job step. SQL Server Agent jobs can be scheduled for execution. This includes the ability to schedule recurring execution.

1. The Managed Database Model:

Willow Bridge bears the responsibility for database management.

Willow Bridge bears the responsibility of designing and deploying database objects for the customer.

Incorrect Answers:

A: This is possible, but the DT ExecUI command does not make provision for scheduling recurring execution.

C: Though is it possible to make use of SQL Server Import and Export Wizard, it does not allow one to schedule recurring execution.

D: Though is it possible to make use of Business Intelligence Development Studio, it does not allow one to schedule recurring execution.

QUESTION 94

You are creating the performance baseline and benchmarking strategy for Willow Bridge. You need to develop a plan that will gather current statistics and collect periodic monitoring statistics. You must ensure that your solution makes provision for performance data comparison.

What should you do?

A. On WB-SRV01 use Windows Performance Counter Logs.

B. On each database server use Windows Performance Counter Logs.

- C. On WB-DB01 use SQL Server Profiler.
- D. On each database server use SQL Server Profiler.

Answer: A

Explanation: To collect performance data your monitoring solution must be designed to minimize the impact on server performance. If you launch the Performance utility on one of the maintenance computers in this case the options offer WB-SRV01, and use Performance Counter Logs on that WB-SRV01, then you will meet both requirements. Performance Counter Logs allows one to monitor multiple computers. Processor, memory, and disk resources all resort under the available counters that can be used. Further more monitoring a computer remotely has less impact on server performance than monitoring locally.

1. Monitoring of servers:

The servers that host the customer databases are to be monitored on an ongoing basis. Server performance should not be impacted on by any of the monitoring plans. Monitoring requirements include all critical system resources, but focus on memory, processor, and disk performance statistics.

Incorrect Answers:

B: Setting up Performance Counter logs on each of the database servers is not the best solution though it is possible to accomplish the task in this way. However, though not great, there is still a measurable impact on the server performance.

C: You can make use of SQL Server Profiler to collect database activity that can, in turn, be used for analysis; however, it does not make provision for collecting data regarding system hardware performance statistics.

D: You can make use of SQL Server Profiler to collect database activity that can, in turn, be used for analysis; however, it does not make provision for collecting data regarding system hardware performance statistics.

Topic 8, Mondo Transport, Scenario

OVERVIEW:

Background:

Mondo Transport is an online vehicle database storage depository which is currently in the process of being populated by a number of developers. Mondo Transport has plans to expand in the future by allowing the public to subscribe to build a relationship allowing the customers to add their custom modification data files about their vehicle modifications allowing other subscribers wanting to modify their vehicles the required information the custom part and accessories used.

Mondo Transport has recently decided to start charging a small monthly fee for access to the online database storage depository and requires building its subscriber base and keeping the information in the database up-to-date for the subscribers.

EXISTING ENVIRONMENT:

Mondo Transport currently makes use of a computer running Windows Server 2003 and Internet Information Services for hosting the online vehicle information depository database. Mondo Transport currently uses a computer running Windows Server 2003 and

SQL Server 2005 as the network database server. Mondo Transport has not configured the two servers as domain members. Mondo Transport's database server currently has 1.5 GB of RAM with the database files located on a RAID-5 volume. Mondo Transport has additionally acquired a test computer with identical hardware to the database server which is located on the internal network.

Mondo Transport also has a Web server which is located on the perimeter network and recently configured the database server located on the internal network. Mondo Transport currently makes use of a firewall allowing traffic only on ports 1433, port 80, and port 443.

BUSINESS REQUIREMENTS:

Mondo Transport wants to make the subscribers capable to upload their custom vehicle modifications and technical stats to the online vehicle information depositary database provided the modifications were approved to be valid before making it available to other subscribers. Mondo Transport wants to have the custom modifications to include the information shown in the table named Modification Stats shown below:

Information	Description
Custom Modification name	A string that will be shown in the user interface
Modification animations	A .gif picture that will be used to display the complete product
Still item picture	A .gif picture of all the required parts for the modification
Modification Torque	An Integer that will be used to determine the torque gain
Modification MaxSpeed	An integer that will be used to determine the cars top speed
Modification Total kW	The number of Kilowatts that are produced by the modification

Mondo Transport additionally wants to have the Installation Stats about the Custom Modification to include the information shown in the installation stats table shown below:

Information	Description
Accessory name	A string that will be shown in the user interface
Accessory picture	A .gif picture that will be shown in the grid
Accessory Diameter	Two integers that will be used to represent the width
Accessory power gained	An integer that will represent the number of Horse Power gained
Accessory Installation Difficulty	An integer that will be used to indicate installation difficulty

Mondo Transport currently makes use of a simulation to calculate the amount of power that will be gained making use of the modification.

Mondo Transport wants to have the subscribers be able to specifically choose which grids they will populate or populate the grids randomly. Mondo Transport requires having the subscribers load a simulation that will be used to generate the results that will be achieved when making use of different technical information or Accessory types by performing a complex calculation which will be used to determine the amount of power that will be gained. Mondo Transport also knows that some of the grids being populated will have multiple different custom modifications.

Mondo Transport has recently started inviting the subscribers to weekend practice sessions where the subscribers can show off their cars to other subscribers and race.

Mondo Transport currently allows the subscribers to come alone as the vehicle driver using only one car. Mondo Transport has plans for the future allowing the subscribers to bring additional cars and drivers. The subscriber information stored will require the information shown in the Subscriber Information table shown below:

Information	Description
Subscriber name	The login name used by the subscriber
Subscriber e-mail	The subscriber e-mail (might or might not be the same as subscriber name)
Payment Information	The last date payment was received
Driver nick name	The name that will be used as the drivers nick name

Mondo Transport wants to have the driver information required to include the

information shown in the Driver Information table shown below:

Information	Description
Drive name	A string that will be shown in the user interface
Driver picture	A .gif picture that will be shown on screen when login in
Cars driven	The cars the subscriber has driven with each car showing stats and information
Mondo Ranking	An integer that will be used to represent the ranking Mondo delegates

Mondo Transport has recently decided that the driver and Custom modifications information only be updated by making use of stored procedures which are called by the user interface.

Mondo Transport has recently decided that the subscribers should be capable of creating the simulations and custom modifications by making use of a custom development tool provided by Mondo Transport. The tool will generate Transact-SQL scripts that will create objects and add data to the database. Mondo Transport has configured the custom development tool to generate Extensible Markup Language (XML) file listing the scripts in the package and the subscriber submitting them. Mondo Transport has provided an additional File Transfer Protocol (FTP) site that will be used for submitting script package and XML files.

Mondo Transport wants to ensure that the packages that are submitted by the subscriber belong to the subscriber only by not allowing other subscribers to modify or delete the original object. Mondo Transport wants the subscriber be the only person capable of deleting the objects they own if not used or inactive.

Mondo Transport has recently decided that the Subscriber who wants to submit Custom Modifications should be capable of working with database objects when not connected to the Internet. Mondo Transport wants to ensure that Subscribers tested the Custom Modifications offline before they are uploaded to the server. Mondo Transport considers it critical that the subscribers not be able to make changes to the data in the production database. Mondo Transport wants to have the subscribers not to download information that has not changed since the last time they synchronized with the production server. Mondo Transport is in the process of providing the subscriber who submitted Custom modification to receive monthly reports showing how many other subscribers viewed and used the information. Mondo Transport will have the information on the report containing the value representing the performance of the Custom Modification which will be sent to the subscriber's e-mail address.

Mondo Transport has additionally decided to have the subscribers receive an additional monthly report that will be used to show the subscribers performance over the weekend practice sessions. The report will contain information about the car the subscriber used best time on track and the Mondo Transport Official Ranking which will be sent to the subscriber's e-mail address.

Mondo Transport currently has all the network in-house developers working constantly on ways to enhance functionality. The Mondo Transport developers have recently created user-defined functions and stored procedures on a development computer. Mondo Transport allows the developers to test the functions of the stored procedures and user-defined functions by creating the new objects on the test server. Mondo Transport wants to have the network testers notified immediately when functions are available.

TECHNICAL REQUIREMENTS:

1. Mondo Transport has plans for the company which includes upgrading the existing database server to Microsoft SQL Server 2005.

1. Mondo Transport considers it a potential problem that optimal performance for the

user is a critical concern. Mondo Transport has recently expressed concern about the ability of current resources to handle the expanded load.

1. Mondo Transport requires additional servers to be added only if the utilization of any resource negatively impacts performance, additional servers must be added.

1. Mondo Transport additionally requires a method to determine if it might be subscriber code that is negatively impacting performance. Mondo Transport wants to have the database administrator notified immediately in the event of deadlock conditions occurring.

1. Mondo Transport considers it a priority that all objects added to a database be logged like the name of the object, name of the object owner, name of user who tested and approved the object to be stored in the log.

1. Mondo Transport requires having all the Custom Modification and objects submitted by subscribers to first be tested offline before being made available. Mondo Transport does not want to have the testing must not impact the production database server.

1. Mondo Transport wants all the data to be normalized to third normal form (3NF).

Topic 8, Mondo Transport (13 Questions)

QUESTION 95

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing database objects. You have recently started to design database objects that define data. You have recently started designing the tables that will be used to store the simulations and Custom Modifications data.

You are required to ensure the information about the objects submitted is stored consistently across all tables whilst determining how to store information about the objects submitted. The solution that you design should allow for extensibility when different types of objects that are submitted are added to the system at a later date. What should you do?

- A. You should create a turbo power and damage to engine column in each table and assign the int data type then add a check constraint.
- B. You should create a turbo power table and include a foreign key column and three int columns.
- C. You should make use of an alias data type and assign it to the turbo power column in each table.
- D. You should create a Common Language Runtime (CLR) user-defined type and assign it as the type of the Turbo power column in each table.

Answer: D

Explanation: You should remember that one of the powerful tools of this integration is the ability to create user-defined types which contain three integer values. Making

use of this option in the scenario ensures that you meet the requirements.

1. Mondo Transport considers it a potential problem that optimal performance for the user is a critical concern. Mondo Transport has recently expressed concern about the ability of current resources to handle the expanded load.
2. Mondo Transport requires having all the Custom Modification and objects submitted by subscribers to first be tested offline before being made available. Mondo Transport does not want to have the testing must not impact the production database server.
3. Mondo Transport considers it a priority that all objects added to a database be logged like the name of the object, name of the object owner, name of user who tested and approved the object to be stored in the log.

Incorrect Answers:

A: You should not consider taking this action in the scenario because this would not allow for extensibility when the new types of objects are added later.

B: You should not consider taking this action in the scenario because a foreign key can only be configured to reference a single table not three tables.

C: You should not consider making use of this data type in the scenario because it allows only one data type to be stored and can not be used to store multiple values.

QUESTION 96

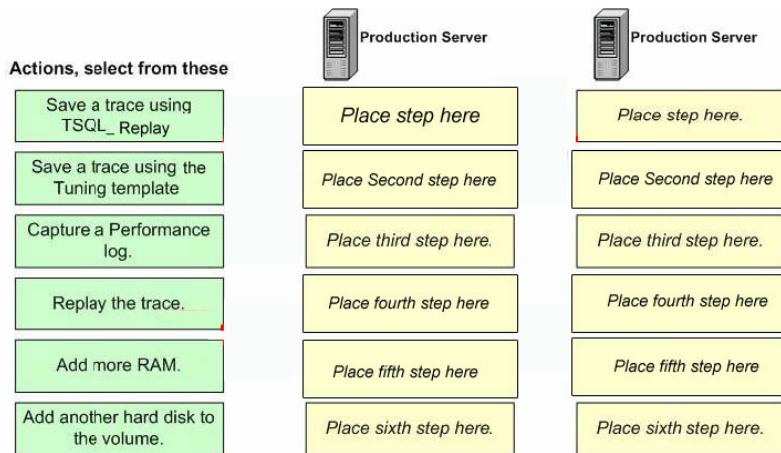
DRAG DROP

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

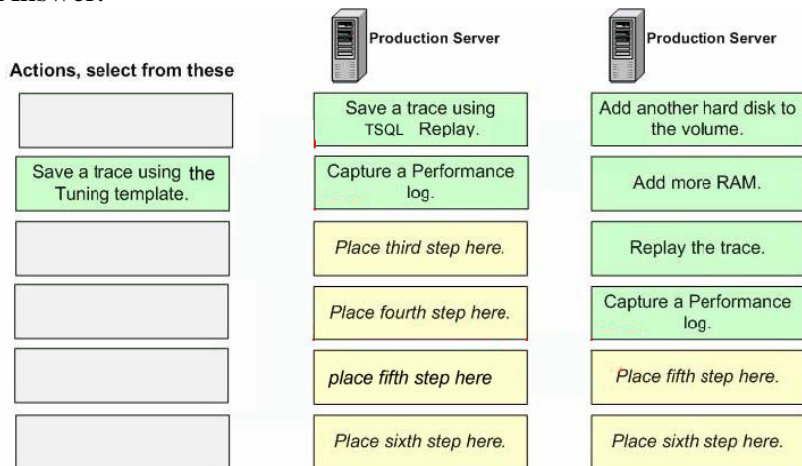
You have recently received instruction from the mondo.com network CIO to start designing a database testing and code management procedures. You have recently started to create a performance baseline and benchmarking strategy for a database. Mondo Transport has recently discovered that the database server is performing very poorly.

You have recently started to suspect that the problem is caused by either a disk or memory bottleneck as both values show are high. You are required to determine what type of hardware upgrade will provide the best performance whilst your solution requires the least amount of downtime on the production server.

What should you do? (To answer, place the appropriate upgrade at the appropriate server.)



Answer:



Explanation:

In the scenario you are required to keep downtime to a minimum which will best be achieved by making use of the test server for testing the hardware upgrades as it has identical hardware. Taking these actions will provide a baseline for analyzing the impact of upgrading hardware.

1. Mondo Transport considers it a potential problem that optimal performance for the user is a critical concern. Mondo Transport has recently expressed concern about the ability of current resources to handle the expanded load.
2. Mondo Transport additionally requires a method to determine if it might be subscriber code that is negatively impacting performance.

Incorrect Answers:

You should not consider making use of the Tuning template in the scenario because the Tuning template was designed to be used with the Database Engine Tuning Advisor and does not save the necessary events to support replay.

QUESTION 97

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start

designing a database testing and code management procedures. You have recently started to control changes to source code that is used. You recently enabled source code control on the test server.

The Mondo Transport network users have recently started complaining about problems on the production server. You are currently unable to reproduce the problem on the test server. You are required to verify that the latest version of the stored procedure has been copied to the production computer and that its source has not been modified.

What should you do? (Choose TWO.)

- A. On the test server open SQL Server Management Studio and select the stored procedure and run the Script function as: CREATE to. Copy the script to the production server and run it.
- B. On the test server open SQL Server Management Studio and compare the function with the last version stored in source code control.
- C. On the production server open SQL Server Management Studio and compare the function with the last version stored in source code control.
- D. On the production server open SQL Server Management Studio and select the stored procedure and run the Script function as: CREATE to. Copy the script to the test server and run it.

Answer: B, D

Explanation: You should remember in the scenario that you are required to generate a copy of the version of the script used on the production server which is best achieved when making use of the CREATE to script function on the production server and executing it on the test server.

1. Mondo Transport allows the developers to test the functions of the stored procedures and user-defined functions by creating the new objects on the test server. Mondo Transport wants to have the network testers notified immediately when functions are available.

Incorrect Answers:

A, C: You should not consider taking the actions mentioned in these options in the scenario because you cannot compare the functions on the production server as source code control has not been configured there and therefore you are not required to create a script for the version on the test server and run it on the production server.

QUESTION 98

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design for the database objects of City Central Utilities. The solution that you are designing will make use of design objects which extends the functionality of a server. You are required to design a solution that will create the

objects provided by the subscribers on the production server.

You are required to determine how the objects will be created whilst your solution meets the business and technical requirements of Mondo Transport.

What should you do?

- A. You should create a Common Language Runtime (CLR) user-defined function.
- B. You should create a Data Modification Language (DML) trigger.
- C. You should create a Data Definition Language (DDL) trigger.
- D. You should create a stored procedure.

Answer: D

Explanation: You should remember in the scenario that the objects will be applied by the tester and we require a way for supplying the SubscriberID of the person who created the object that why we create a stored procedure that will accept the object creator, tester, name and the stored procedure that creates the objects as parameters.

1. Mondo Transport requires having all the Custom Modification and objects submitted by subscribers to first be tested offline before being made available. Mondo Transport does not want to have the testing must not impact the production database server.
2. Mondo Transport has recently decided that the subscribers should be capable of creating the simulations and custom modifications by making use of a custom development tool provided by Mondo Transport. The tool will generate Transact-SQL scripts that will create objects and add data to the database.
3. Mondo Transport wants to have the subscribers be able to specifically choose which grids they will populate or populate the grids randomly. Mondo Transport requires having the subscribers load a simulation that will be used to generate the results that will be achieved when making use of different technical information or Accessory types by performing a complex calculation which will be used to determine the amount of power that will be gained. Mondo Transport also knows that some of the grids being populated will have multiple different custom modifications.

Incorrect Answers:

- A: You should not consider making use of a CLR user-defined function in the scenario because the logging of information to a table is best performed by using Transact-SQL.
- B: You should not consider making use of a DML trigger in the scenario because the trigger can not automate logging the SubscriberID and TesterID information table.
- C: You should not consider making use of DDL triggers in the scenario because the DDL triggers are triggered when SQL Server objects are created, deleted or modified and we are adding rows to tables not creating separate tables.

QUESTION 99

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the City Central Utilities network CIO to start the design for the database objects of City Central Utilities. The solution that you are designing will make use of design objects which extends the functionality of a server. You have recently started to design the application that will be used to populate the Custom Modifications with simulations.

You are required to have the application perform a query that will return all grids that have simulations in them grouped by Custom modification. The results of the query require including random simulations and pre-placed simulations whilst you decide which way is best to obtain simulations for each grid.

What should you do?

- A. You should create a Common Language Runtime (CLR) user-defined aggregate.
- B. You should create a query with a HAVING clause.
- C. You should create a query that uses a INTERSECT clause.
- D. You should create a Transact-SQL user-defined function.

Answer: A

Explanation: In the scenario you should remember that by performing the actions stated in the answer you are optimally performing complex calculations and accumulating the necessary data as the CLR procedures are most suited when performing tasks that can not be easily accumulated using Transact-SQL.

1. Mondo Transport wants to make the subscribers capable to upload their custom vehicle modifications and technical stats to the online vehicle information depositary database provided the modifications were approved to be valid before making it available to other subscribers.

2. Mondo Transport wants to have the subscribers be able to specifically choose which grids they will populate or populate the grids randomly.

3. Mondo Transport requires having the subscribers load a simulation that will be used to generate the results that will be achieved when making use of different technical information or Accessory types by performing a complex calculation which will be used to determine the amount of power that will be gained.

Incorrect Answers:

B: You should not consider creating a query with the HAVING clause in the scenario because the clause would only work if it was used for pre-placed simulations.

C: You should not consider creating a query that uses the INTERSECT clause in the scenario because this clause is used to return a result that contains unique results from two separate queries.

D: You should not consider making use of a T-SQL user-defined function in the scenario because T-SQL is not suitable for being used with complex calculations.

QUESTION 100

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing a database for Mondo Transport. The database that you are designing will make use of design entity relationships (ER). You are required to design the CustomerCars table which has a primary key named CustomCarID.

You are required to have your design strategy allow you to store the cars driven by a specific driver.

What should you do?

- A. You should add a DriverID column to the CustomerCars table and reference the Drivers.DriverID column as the foreign key.
- B. You should create a DriverCars lookup table and create two columns whilst you reference the CustomCars.CustomCarID and SubscriberID columns as foreign keys.
- C. You should create a CustomCarID column to the Drivers table and reference the CustomCars.CustomCarID column as a foreign key.
- D. You should create a DriverCars lookup table and create two columns whilst referencing the CustomCars.CustomCarID and Driver.DriverID columns as foreign keys.

Answer: D

Explanation: You should remember in the scenario that the requirements call for many-to-many relationship and the best way to present the relationship is with a lookup table which references a foreign key in the table involved in the lookup.

1. Mondo Transport considers it a priority that all objects added to a database be logged like the name of the object, name of the object owner, name of user who tested and approved the object to be stored in the log.

2. Mondo Transport requires having all the Custom Modification and objects submitted by subscribers to first be tested offline before being made available. Mondo Transport does not want to have the testing must not impact the production database server.

Incorrect Answers:

A, B: You should not consider taking these actions in the scenario because you should not add a foreign key that references Drivers.DriverID to the CustomCars table as this is appropriate to represent a data model.

C: You should not consider making this move in the scenario because you should not directly reference the CustomCars.CustomCarID in the Drivers table as this is appropriate in a one-to-many relationship.

QUESTION 101

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing a database testing and code management procedures. You have recently started creating a performance baseline and benchmarking strategy for a database. Your strategy that you design will be used to determine if Mondo Transport requires

to deploy an additional database server.

You are required to have the strategy you create allow you to identify a performance bottleneck and determine whether the bottleneck is caused by a specific query or due to server load. You are required to select how to monitor the performance whilst you ensure your solution impacts performance of the production server little as possible.

What should you do? (Choose all that apply.)

- A. You should create a SQL Profiler trace and save it to a table.
- B. You should analyze the results using the Database Tuning Advisor.
- C. You should analyze the results using System Monitor.
- D. You should create a Performance log.
- E. You should create a SQL Profiler trace and save it to a file.
- F. You should analyze the results using SQL Profiler.

Answer: C, D, E

Explanation: You should remember that SQL Profiler is used to allow you to capture SQL event and replay them for analysis which intern allows a Windows Performance log to capture the SQL Server events with the resource usage. To determine if the problem is caused by a specific query you should make use of SQL Profiler.

1. Mondo Transport requires additional servers to be added only if the utilization of any resource negatively impacts performance, additional servers must be added.
2. Mondo Transport considers it a potential problem that optimal performance for the user is a critical concern. Mondo Transport has recently expressed concern about the ability of current resources to handle the expanded load.
3. Mondo Transport additionally requires a method to determine if it might be subscriber code that is negatively impacting performance. Mondo Transport wants to have the database administrator notified immediately in the event of deadlock conditions occurring.

Incorrect Answers:

- A: You should not consider having the SQL Server Profiler trace saved to a table as this would slow down and impact the productions server.
- B: You should not consider making use of the Database Tuning Advisor in the scenario because you are required to determine if it is required to scale up a server.
- C: You should not make use of the Windows System Monitor in the scenario because the Windows System Monitor cannot identify if the bottleneck is caused by a specific query.

QUESTION 102

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start

designing a database testing and code management procedures. You have recently started creating a plan for deploying a database. The strategy you are designing will be used for allowing the Custom Modification developers to build and test their Modifications offline.

Mondo Transport has made it possible for the subscribers to be capable of downloading SQL Server 2005 Express edition. You are required to determine how to allow the subscribers to obtain an up-to-date copy of the database.

What should you do?

- A. You should enable transactional replication.
- B. You should enable peer-to-peer transactional replication.
- C. You should create a database mirror.
- D. You should enable snapshot replication.
- E. You should create a database snapshot.

Answer: A

Explanation: You should remember in the scenario that transactional replication causes a snapshot of the database to be sent to the subscribers when first subscribing to the article and then only send updated records. By making use of transactional replication you ensure that the Custom Modification developers can access the objects in the database to test their simulations without downloading objects which have not changed.

1. Mondo Transport requires having all the Custom Modification and objects submitted by subscribers to first be tested offline before being made available. Mondo Transport does not want to have the testing must not impact the production database server.
2. Mondo Transport has recently decided that the Subscriber who wants to submit Custom Modifications should be capable of working with database objects when not connected to the Internet. Mondo Transport wants to ensure that Subscribers tested the Custom Modifications offline before they are uploaded to the server. Mondo Transport considers it critical that the subscribers not be able to make changes to the data in the production database. Mondo Transport wants to have the subscribers not to download information that has not changed since the last time they synchronized with the production server.

Incorrect Answers:

- B: You should not consider making use of peer-to-peer transactional replication in the scenario because this would allow updates to be received from any peer and the Custom Modifications developers should not be capable of modifying the production database.
- C: You should not consider making use of a database mirror in the scenario as this is meant for fault tolerant solutions not offline access as required in the scenario.
- D: You should not consider making use of snapshot replication in the scenario because snapshot replication will download the entire article each time the database is synchronized.
- E: You should not consider making use of a database snapshot in the scenario

because a database snapshot can only be created on the local disk of the source computer.

QUESTION 103

DRAG DROP

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing a database testing and code management procedures. You have recently started designing a unit test plan for a database. You are in the process of designing the plan which the testers will use to test Custom Modification submitted by the subscriber.

The test plan you are designing should ensure that the Custom Modification does not cause problems when run under typical load conditions. You are required to identify the steps which the tester would take to isolate a deadlock that occurs after enabling a new Custom Modification on the server whilst minimizing the impact on the production server's performance.

What should you do? (To answer, place the appropriate actions by the appropriate server.)

Actions, select from these	Production Server	Production Server
Analyze the log in System Monitor.	place step here	place step here
Capture a Performance log.	Place second step here.	Place second step here.
Capture a SQL Profiler trace.	Place third step here.	Place third step here.
Replay the SQL Profiler trace.	Place fourth step here	Place fourth step here

Answer:

Actions, select from these	Production Server	Production Server
Analyze the log in System Monitor.	Capture SQL Profiler trace.	Replay the SQL Profiler trace.
Capture a Performance log.	Place second step here.	Place second step here.
	Place third step here.	Place third step here.
	Place fourth step here	Place fourth step here

Explanation:

You should remember in the scenario that SQL Profiler can be used as it allows you to capture events which occur on a SQL Server instance and has the capability to save the events to a table or file which can be used to replay events and set breakpoints to isolate where a problem is occurring.

1. Mondo Transport wants all the data to be normalized to third normal form (3NF)
2. Mondo Transport wants to ensure that Subscribers tested the Custom Modifications offline before they are uploaded to the server. Mondo Transport considers it critical that

the subscribers not be able to make changes to the data in the production database.

3. Mondo Transport considers it a potential problem that optimal performance for the user is a critical concern. Mondo Transport has recently expressed concern about the ability of current resources to handle the expanded load

Incorrect Answers:

You should not consider capturing a SQL Profiler trace on the test server as this will not demonstrate normal load conditions, not should you replay a SQL Profiler trace on the production server as the performance will be impacted negatively. You should also not capture a performance log as this will not isolate the cause of the deadlock.

QUESTION 104

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing an application solution for SQL Server 2005. The solution you design will be used for data distribution. You are in the process of designing the solution that will be used to notify the testers when a new user-defined function or stored procedure has been created on the test server. You are required to design an object that meets the requirements.

What should you do?

- A. You should use Database Mail to send the e-mail.
- B. You should create a Data Definition Language (DDL) trigger.
- C. You should use the Simple Mail Transfer Protocol (SMTP) delivery channel.
- D. You should create a Notification Services application.
- E. You should create a Data Manipulation Language (DML) trigger.
- F. You should make use of SQLMail to send the e-mail.

Answer: A, B

Explanation: You should remember in the scenario that you can use a DDL trigger to send an e-mail using Database Mail. Database Mail is new in SQL Server 2005 and can be used in cases like this if required in the scenario.

1. Mondo Transport has recently decided that the Subscriber who wants to submit Custom Modifications should be capable of working with database objects when not connected to the Internet. Mondo Transport wants to ensure that Subscribers tested the Custom Modifications offline before they are uploaded to the server. Mondo Transport considers it critical that the subscribers not be able to make changes to the data in the production database. Mondo Transport wants to have the subscribers not to download information that has not changed since the last time they synchronized with the production server.

2. Mondo Transport currently has all the network in-house developers working constantly on ways to enhance functionality. The Mondo Transport developers have recently created user-defined functions and stored procedures on a development computer. Mondo

Transport allows the developers to test the functions of the stored procedures and user-defined functions by creating the new objects on the test server. Mondo Transport wants to have the network testers notified immediately when functions are available.

Incorrect Answers:

C, D: You should not consider taking this action in the scenario because Notification Services make use of the SMTP channel and there is no need for Notification Services in the scenario.

E: You should not consider taking the action in the option in the scenario even though it could be used the requirements in the scenario are addressed by using DLL triggers.

F: You should not consider making use of SQL Mail in the scenario because SQL Mail is deprecated in SQL Server 2005 and will not be supported in future releases.

QUESTION 105

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing a database testing and code management procedures. You have recently started designing a strategy that will be used to control changes to source code. You are in the process of designing the strategy that will be used to meet the source code control requirements of Mondo Transport.

You are required to configure the test server to meet the source code control requirements.

What should you do? (Choose TWO.)

- A. You should create a schema for each developer.
- B. You should create a Developers database user and add the Developers to the db_datawriter role.
- C. You should configure that System permissions on the folder containing the functions to enable write access only to CREATOR OWNER.
- D. You should install Visual SourceSafe.
- E. You should configure SQL Server Management Studio to enable automatic checkout.

Answer: D, E

Explanation: You should remember that multiple developers require being able to modify the function but only one developer should be allowed to modify a function a particular time. When making use of Visual SourceSafe in the scenario you ensure you meet the requirements in the scenario.

1. Mondo Transport additionally requires a method to determine if it might be subscriber code that is negatively impacting performance. Mondo Transport wants to have the database administrator notified immediately in the event of deadlock conditions occurring.
2. Mondo Transport requires additional servers to be added only if the utilization of any

resource negatively impacts performance, additional servers must be added.

3. Mondo Transport considers it a potential problem that optimal performance for the user is a critical concern. Mondo Transport has recently expressed concern about the ability of current resources to handle the expanded load.

Incorrect Answers:

A: You should not consider taking this action in the scenario because there is no need for it additionally it provides an abstraction from individual users.

B: You should not consider taking these actions in the scenario because this role is used to allow users to write to the database tables not control source code control.

C: You should remember that multiple developers require being able to modify the function but only one developer should be allowed to modify a function a particular time.

QUESTION 106

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing a database for Mondo Transport. The database you are designing will make use of database security features. You have recently started designing the data access security for the Drivers table. You are required to determine how to configure security for the stored procedures which require modifying the Drivers table.

What should you do? (Choose all that apply.)

- A. You should modify the Drivers table in each stored procedure and add the clause EXECUTE AS OWNER.
- B. You should create an application role and grant it Execute permissions on the stored procedures.
- C. You should assign the Driver table and stored procedures to the same schema.
- D. You should modify the Drivers table in each stored procedure and add the clause EXECUTE AS CALLER.
- E. You should grant the guest database user Execute permissions on the stored procedures.
- F. You should create an application role and grant it Execute permission on the stored procedure and grant the application role Select, Insert and Update permissions on the Drivers table.

Answer: A, B, C

Explanation: You should remember in the scenario that creating an application role and granting the required permissions will allow the stored procedures to execute when called using the role and assigning the required tables and stored procedures to the same schema causes a consistent ownership chain.

1. Mondo Transport considers it a priority that all objects added to a database be logged like the name of the object, name of the object owner, name of user who tested and

approved the object to be stored in the log.

2. Mondo Transport has additionally decided to have the subscribers receive an additional monthly report that will be used to show the subscribers performance over the weekend practice sessions. The report will contain information about the car the subscriber used best time on track and the Mondo Transport Official Ranking which will be sent to the subscriber's e-mail address.

Incorrect Answers:

D: You should not consider taking this action in the scenario as taking the action will cause them to execute under the context or role that called the stored procedure.

E: You should avoid making use of this option in the scenario because this will allow the stored procedures to be executed ad hoc not only from within the application.

F: You should not consider taking this action in the scenario as taking the action will allow users the ability to directly modify the table.

QUESTION 107

You work as the network database administrator at Mondo Transport. The Mondo Transport network consists of a single Active Directory domain named mondo.com. All servers on the Mondo Transport network run Windows Server 2003 and all client computers run Windows XP Professional.

You have recently received instruction from the mondo.com network CIO to start designing an application solution for SQL Server 2005. The solution that you are designing will be used to support SQL Server Services to support business needs. You are in the process of designing the feature that allows the testers to be capable of sending an e-mail when a new Custom Modification is uploaded.

You are required to select the Microsoft SQL Server 2005 service that you will use to meet the requirements of Mondo Transport.

What should you do?

- A. You should create a Notification Services application.
- B. You should create a HTTP endpoint.
- C. You should create an Integration Services (SSIS) package.
- D. You should create a Service Broker queue.

Answer: A

Explanation: You should remember in the scenario that Notification Services can be used and configured to monitor a file system folder for XML documents and supports e-mail. Making use of this option in the scenario ensures that you meet the requirements.

1. Mondo Transport currently has all the network in-house developers working constantly on ways to enhance functionality. The Mondo Transport developers have recently created user-defined functions and stored procedures on a development computer. Mondo Transport allows the developers to test the functions of the stored procedures and user-defined functions by creating the new objects on the test server. Mondo Transport wants to have the network testers notified immediately when functions are available.

Incorrect Answers:

B: You should not consider making use of an HTTP endpoint in the scenario as it is used to access stored procedures as a Web service.

C: You should not consider making use of the SSIS package in the scenario as it is used to transform, import data from disparate data sources.

D: You should not consider making use of this in the scenario as it is intended for use in asynchronous processes.

Topic 9, Certkiller .com, Scenario

BACKGROUND

Certkiller .com builds custom kitchens to customer specifications, customizes appliances, and sells parts for both restoring and customizing existing appliances in the customer's kitchens. Certkiller .com services clients on a world-wide basis.

Physical Locations

The company has ten locations around the United States. The company headquarters is located in New York and branch offices are located in Chicago, Miami, Indianapolis, Detroit, Seattle, Dallas, Phoenix, Washington and Los Angeles.

Products and Services on offer

In any one year Certkiller .com builds up to 240 custom kitchens per year and completes up to 300 customized appliances. Each technician works on multiple appliances during the year and each appliance are worked on by multiple technicians. This is due to the fact that one technician might do all the wiring on the appliances, the other might do the design, the other might do the color coordination, etc. For each appliance parts and labor are tracked. Technicians are paid based on tracked labor hours.

Business Procedure:

1. Most of the custom appliances sold by Certkiller .com are bought from other manufacturers and resold by Certkiller .com.
2. Orders can be placed by either phone or via the Certkiller .com Web site.
3. A verification e-mail is sent after the order is placed in the event of Web orders.
4. Inventory totals are updated when items are pulled for shipment.
5. All Certkiller .com locations are open for business everyday except for Sundays.
6. To broaden the customer-base, Certkiller .com purchases qualified potential customer lists from publications that caters for the customized domestic and light commercial market. These lists are normally supplied as a comma separated file.

Following is an exhibit illustrating the Inventory table:

Inventory	
PK	ManufacturerID
PK	Location
	QuantityonHand
	QuantityonOrder
	Description
	Color
	Status
	AlternativeSKU
	Manufacturer
	CostPrice
	ListPrice
	Category

TECHNICAL ENVIRONMENT

Information is currently tracked using Microsoft Access and Microsoft Excel spreadsheets maintained in each of the Certkiller .com offices. A proprietary application is used for the purposes of inventory control and sales records. The inventory control application can export inventory records as a comma-separated data file or an XML file. Certkiller .com plans on deploying a computer running Microsoft Windows Server 2003 and SQL Server 2005 in each of its offices. Following are the factors that you should keep in mind when designing your solution for Certkiller .com:

Office - Work Designation:

1. All data should be consolidated in the head office.
2. Copies of the appropriate data must be deployed to the other offices.
3. Each office will maintain its own work, service, and inventory transactions.
4. Each office keeps a full copy of the Inventory, Customer, and Appliance tables.
5. Remote/branch offices are not authorized to make schema changes.

The Customer and Appliance tables are illustrated in the Customer and Appliance Tables exhibit.

Customer	
PK	CustomerID
	CustomerName
	Address1
	Address2
	City
	State
	ZIP
	Phone
	Extention
	Contact

Appliance	
PK	ApplianceID
	Make
	Model
	SKU
	Description

1. Each office keeps only its own work and services records, except the head office in New York.
2. The New York office will be responsible for maintaining consolidated work and

service records.

3. All the information in the consolidated records must be kept up to date as in up to the end of the previous business day.
4. These updates must not impact on normal daily operations.
5. Status information is tracked individually for each line item on customer orders in the Order Details table.
6. Each line item can be identified as On Order, On Backorder, Shipped, or Canceled.
7. Only the current status information is maintained for items on customer orders.

The OrderDetails table is shown in the following exhibit:

OrderDetails	
PK	OrderNumber
PK	ItemNumber
	ManufacturerSKU
	Location
	QuantityonOrder
	QuantityonBackOrder
	QuantityShipped
	ShipDate
	Status
	RetailPrice

Custom appliances:

1. A new project can be a new appliance or an appliance that is brought in for customization.
2. Whenever a new project is initiated, it is assigned an appliance identification number.
3. The appliance identification number is used for internal tracking.
4. After the appliance identification number assignment, a record is added to the Project Head table.
5. Once assigned the appliance identification number does not change.
6. In the event of an appliance being brought in for additional work, a new record is added to the Project Head table.
7. All data regarding custom appliances are maintained for a total of five years.
8. This data includes detailed information on each custom appliance, including all parts, labor, and status history.
9. The tables used for this purpose id the Project Head and Project Details tables respectively.
10. After the five year period all information is transferred to an archive table.
11. In the Archive table details about the original customer, parts list and the technicians involved with the appliance is included.
12. Transfer of data to the Archive table should occur automatically.

Communication between offices:

1. Links between offices are established through virtual private network (VPN) end-points over the Internet. These VPN connections are established on an as needed basis.
2. Each remote office can connect with the main office.
3. Remote offices cannot connect directly with each other through VPN connections.
4. Each office has a full-time high-bandwidth connection to the Internet.

5. All communications between offices must be encrypted.

BUSINESS REQUIREMENTS

General Requirements

The company wants the ability to increase its online sales and its customer service.

Customers should receive notifications when an order is processed and, for parts, when the order ships.

These notifications should be sent automatically.

Customers also need to be able to query order status information.

Performance

Managers should be able to generate a report listing current project and status information. They need to be able to select the qualifying criteria for the report, including appliance, customer, status, and technician. Managers must also be able to query the current labor cost on any appliance, which must be accurate as of the end of the previous business day.

Availability

Managers need to be able to generate reports that include all technicians who worked on each appliance, no matter when the appliances are built or customized. The report must differentiate between current and former employees.

On custom appliance orders, the customer should be able to request the appliance status online. Current status and projected completion date should be e-mailed to the customer automatically upon request.

TECHNICAL REQUIREMENTS

Security

The database design calls for permanent storage of archive records relating to a custom appliance. Reports run against these records must identify whether an employee is a current or former employee.

There have been some attempts to bypass the Certkiller .com security safeguards that are built into the database design. To negate these attempts the database must:

1. Ensure that users at the branch office are unable to modify or create database objects.
2. Audit any attempts to modify database objects and create an archival record of the attempts.
3. Be able to manage the solution and retrieve information about these modification attempts with the least amount of effort.

Maintainability

The database must be normalized to the third normal form (3NF).

Each office needs a way of directly querying current inventory records in any other office to retrieve current price and inventory information, which must be current as of the time of the query. Managers must be able to query the current labor cost on any appliance.

This value must be accurate as of the end of the previous business day.

Topic 9, Certkiller .com (13 Questions)

QUESTION 108

You need to design an application Solution for SQL Server 2005. In your solution you need to ensure that you provide support the security that Certkiller .com wants. These concerns include auditing, archiving and retrieval of information.

What should you do?

- A. Use an Event Notification. And then use a DML trigger on each of the remote servers.
- B. Use a table to contain auditing entries in the database at the New York office.
Then configure a DDL trigger on each of the remote servers.
- C. Use a table to contain auditing entries in the database in each of the branch offices.
Then configure a DDL trigger on each of the remote servers.
- D. Use a table to contain auditing entries in the database at the New York office.
Then configure a DML trigger on each of the remote servers.
- E. Use a data folder at the Database Server in the New York office.
Then configure a DDL trigger on each of the remote servers.

Answer: B

Explanation: There are two basic actions that need to be taken. First you need a table in the database at the New York office and second you should use a Data Definition Language (DDL) trigger on each of the remote servers. A DDL trigger will write information about the action taken to a table and then prevent the change by executing a ROLLBACK statement to roll back the action. Also creating a single table at the New York office will minimize the number of objects you need to maintain and simplify retrieval of information.

There have been some attempts to bypass the Certkiller .com security safeguards that are built into the database design. To negate these attempts the database must:

1. Ensure that users at the branch office are unable to modify or create database objects.
2. Audit any attempts to modify database objects and create an archival record of the attempts.
3. Be able to manage the solution and retrieve information about these modification attempts with the least amount of effort.

Incorrect Answers:

A: An event notification could respond to the event, but it will not block, or roll back the action. As such it does not meet the requirements of preventing modifications.

C: It is possible to make use of a table in the database at each of the branch offices. But this would not be efficient and would make managing the data generated due to the DDL trigger unnecessarily complicated. It would result in you having to query data from all of the offices to collect audit data.

D: You should not make use of a Data Modification Language (DML) trigger in this case. This type of trigger responds to data manipulation events like INSERT and DELETE. It does not respond to data definition events.

E: A data folder is unnecessary when supporting any of the action that needs to be taken.

QUESTION 109

You are currently busy designing database objects that retrieve data. You need to design the tools that the managers will require for data retrieval purposes. You thus need to create a database object to return the requested data with the least amount of resource overhead.

What should you do?

- A. Use a CLR scalar user-defined function.
- B. Use a view.
- C. Use a T-SQL stored procedure.
- D. Use a DDL trigger.

Answer: A

Explanation: A user-defined function can be designed in such a way to return either a table value or a scalar value. Because you would want a single value returned, you could create a scalar value user-defined function. You can design the function to let the manager specify the ProjectID and the format in which the value would be returned. There is a need to perform a monetary conversion, thus you need to be able to retrieve a CurrencyInfo value from the customer record that can be used for conversion rate information.

1. Certkiller .com services clients world-wide.
2. Managers must also be able to query the current labor cost on any appliance, which must be accurate as of the end of the previous business day.
3. Managers must be able to query the current labor cost on any appliance.

Incorrect Answers:

B: Views can be used to view specific data, computed values, or data combine from multiple tables. Views are normally used to provide access to selected data, but you require the ability to retrieve scalar calculates values which makes a view inappropriate.

C: A T-SQL stored procedure is more difficult and will require additional processing to perform the requested conversions.

D: Data Definition Language (DDL) triggers fire in response to data definition events like creating or changing database or server objects. It is not suitable to use for data retrieval

QUESTION 110

You need to design a solution that will allow Certkiller .com to incorporate data that was purchased from publications. In your solution take care not to duplicate any items in the Customers table.

What should you do?

- A. Create a CLR user-defined function.
- B. Create a Reporting Services application.
- C. Create an Integration Services package.
- D. Create a Notification Services application.

Answer: C

Explanation: The SQL Server Integration Services (SSIS) will meet the requirements. It is a platform for data integration and workflow solutions. It can be used to extract the data from the purchased lists, transform the data as required, validate against the Customers table, and load the data into the Contacts table.

1. To broaden the customer-base, Certkiller .com purchases qualified potential customer lists from publications that caters for the customized domestic and light commercial market. These lists are normally supplied as a comma separated file.

Incorrect Answers:

A: Language Runtime (CLR) UDF is used when the additional functionality of a .NET Framework programming language is required. In itself, it is not used to data load applications.

B: Reporting Services allows one to build reports, to draw on data from a variety of sources and reports can be viewed in several ways. But it does not allow one to perform the data transformation and load activities that are required.

D: Notification Services is used to send notifications to subscribers, it cannot be used to perform the extraction, translation and loading of the data purchased.

QUESTION 111

You need to create a performance baseline and benchmarking strategy for the Certkiller .com database. You have collected baseline hardware performance statistics when the database server was initially deployed. A decision was taken on the accepted variations from the baseline values. In your solution you must ensure that you receive an e-mail notification in the event of performance falling or a monitored resource falls out of tolerance.

What should you do?

- A. Make use of Database Mail.
- B. Make use of SQL Server Profiler.
- C. Make use of SQL Server Agent Alerts.
- D. Make use of Windows System Monitor.
- E. Make use of Performance Logs and Alerts.

Answer: C

Explanation:

You should designate yourself as an operator in SQL Server Agent and use SQL Server Agent Alerts to generate the e-mail notifications. Alerts can be defined for performance counters and allows you to specify the boundary beyond which the alert fired. One option that can be selected amongst the available actions is to generate an e-mail message when the alert fires.

Incorrect Answers:

A: You can make use of Database Mail to send an e-mail from inside the stored procedure. However, in itself it does not have a mechanism to generate the mail messages based on counter activity.

B: The SQL Server Profiler is used to capture SQL Server activity but it is incapable of capturing Windows performance counters or to generate messages based on performance counter values.

D: The Windows System Monitor allows one to monitor values for performance counters, but the System Monitor component of the Windows Performance utility does not allow one to define alerts.

E: It is possible to define alerts under the Performance Logs and Alerts, but in this case you would be better served using the SQL Server Agent.

QUESTION 112

You have just created a stored procedure to retrieve custom appliance status information for the Certkiller .com customers. You need to create a solution that will service the general business requirements. In your solution take care to minimize processing requirements and ensure that the effort required to deploy is solution is kept to the minimum.

What should you do?

- A. Make use of Reporting Services.
- B. Make use of a CLR user-defined function.
- C. Make use of Database Mail.
- D. Make use of an HTTP endpoint.

Answer: C

Explanation: Since the question mentions that you already created a stored procedure to retrieve custom appliance status information, you can make use of Database Mail to send an e-mail to the customer from inside the stored procedure.

1. Customers also need to be able to query order status information.
2. The company wants the ability to increase its online sales and its customer service.
3. Customers should receive notifications when an order is processed and, for parts, when the order ships.
4. These notifications should be sent automatically.
5. A verification e-mail is sent after the order is placed in the event of Web orders.

Incorrect Answers:

A: Reporting Services will allow you to build reports, drawing on data from a variety of resources, but it is not an appropriate solution if you want to send simple data values as an e-mail message.

B: A CLR user-defined function can be used to retrieve the required information instead of a stored procedure, but since there is no reason to create an additional object; this would be superfluous since the stored procedure can meet the requirements.

D: An HTTP endpoint is used to set up SQL Server as a Web service to listen for HTTP SOAP requests. It can also be used to export one or more stored procedures as well as be a secure method for delivering data, but not as an e-mail message.

QUESTION 113

You are designing the Contacts table to contain the records from the lists that Certkiller .com purchased from publications. Queries will be run against the table to return name and address information for mass mailings. Query results will always be grouped by ZIP code and sorted in ZIP code order. Following is the initial table:

Contacts	
	FirstName LastName Address1 Address2 City State ZIP

The data contained in this table is not necessarily unique. You need to define a primary key for the table and create indexes to optimize data retrieval you thus need to complete the initial design.

What should you do? (Each correct answer presents part of the solution. Choose TWO.)

- A. You must add an identity column and create a clustered primary key on the identity column.
- B. You must add an identity column and create a nonclustered primary key on the identity column.
- C. Use a nonclustered index on the ZIP column.
- D. Use a nonclustered primary on the ZIP, LastName, and FirstName columns.
- E. Use a clustered index on the ZIP column.
- F. Use a clustered primary key on the ZIP, LastName, and FirstName columns.

Answer: B, E

Explanation: Since there is no column that has unique values, and you do not know if any column combination will generate a unique value, you require an additional identity column and then you should create the primary key with the identity columns as the key column. This will ensure that normalization requirements are met. Since you will be retrieving data in the ZIP column order, you need to create a clustered index on the ZIP column, and because a table can have only one clustered index, you must create the primary key as nonclustered.

1. To broaden the customer-base, Certkiller .com purchases qualified potential customer lists from publications that caters for the customized domestic and light commercial market. These lists are normally supplied as a comma separated file.

Incorrect Answers:

A: The identity column creation would be correct, but you need to create a non-clustered primary key on it, because a table can have only one clustered index.

C: You need a clustered index on the ZIP column.

D, F: You cannot create a primary key using the ZIP, LastName, and FirstName columns as key columns because they do not guarantee a unique value. You need to create the primary key as nonclustered because a table can have only one clustered index.

QUESTION 114

You must design the application solution that uses the appropriate database technologies and techniques for Certkiller .com you create a stored procedure that is scheduled to execute every Saturday by a SQL Server Agent job. The stored procedure queries the OrderDetails table and returns information regarding individual line items that have a status of On Backorder. You must change the stored procedure to rather send a brief e-mail message to each customer who has backordered items, listing the items and quantity on backorder instead. What should you do?

- A. Make use of Reporting Services.
- B. Make use of a CLR user-defined function.
- C. Make use of Database Mail.
- D. Make use of an HTTP endpoint / Web Service.
- E. Make use of Notification services.
- F. Make use of Integration Services.

Answer: C

Explanation: You can make use of Database Mail to send an e-mail to the customer from inside the stored procedure. The stored procedure is already created and you can thus change the stored procedure in such a way so as to process the result set and send e-mail messages to the customers based on the result set.

1. Customers also need to be able to query order status information.
2. The company wants the ability to increase its online sales and its customer service.
3. Customers should receive notifications when an order is processed and, for parts, when the order ships.
4. These notifications should be sent automatically.

Incorrect Answers:

A: Reporting Services allows one to build reports, to draw on data from a variety of sources and reports can be viewed in several ways, but it is not an appropriate solution if you want to send simple data values as an e-mail message.

B: A CLR user-defined function can be used to retrieve the required information instead of a stored procedure, but since there is no reason to create an additional object; this would be superfluous since the stored procedure can meet the requirements.

D: An HTTP endpoint is used to set up SQL Server as a Web service to listen for HTTP SOAP requests. It can also be used to export one or more stored procedures as well as be a secure method for delivering data, but not as an e-mail message. It is thus not appropriate in this case.

E: Notification Services is used to send notifications to subscribers, it cannot be used as part of the stored procedure.

F: The SQL Server Integration Services (SSIS) serves as a platform for data integration and workflow solutions and allows data extraction, transformation and load. But in this case you do not need any complicated workflow management, rather you can accomplish the task with simple processing that can be managed easily through a stored procedure.

QUESTION 115

You need to design the inventory and customer order tracking solution for Certkiller .com. The status values in the Inventory table are defined as follow:

1. A - Active item; item is in stock.
2. I - Inactive Item, Item not available from manufacturers anymore.
3. X - Cross referenced item, refer to Alterna CertK U for the correct SKU number.

The manufacturer SKU and Location columns in the OrderDetails table define a foreign key that references the primary key in the Inventory table. You must ensure that in the event of the Status column of an item in the Inventory table is changed to that:

1. The QuantityOnOrder and QuantityOnBackOrder values are changed to 0
2. The Status value is changed to "Cancelled"

happens in the OrderDetails table automatically. You thus need to design actions that will perform the required automatic changes.

What should you do?

- A. Use an event notification.
- B. Use a DML trigger.
- C. Enable cascading deletes.
- D. Use a stored procedure.
- E. Use a DDL trigger.

Answer: B

Explanation: A DML trigger fires in response to a data manipulation event. The data manipulation event in this case would be the UPDATE event on the Inventory table you can write the trigger to locate each occurrence of the combined ManufacturerSKU and the Location value in the OrderDetails table and make the necessary changes.

Incorrect Answers:

A: An event notification will not meet the "automatic" requirements. Event notifications are used to inform one when the change is made and not to modify the table.

C: Cascading deletes, when enabled, then in the event of a row being deleted in the referenced (Inventory) table, then all corresponding rows will automatically be deleted in the referencing (OrderDetails) table. But this solution is not relevant in this case since you are not deleting rows from the Inventory table.

D: A stored procedure can be used to make changes to the OrderDetails table, but you would either have to manually execute the stored procedure or have a trigger execute the stored procedure. This solution does not require the "automatic" requirement.

E: A DDL trigger fires in response to data definition events. These include creating or modifying database of server objects. Thus this is not the correct solution since you need the server to respond to a data manipulation event and not data definition event.

QUESTION 116

You need to design the objects that extend the functionality of the database server for Certkiller .com especially with the view to extend services over the Internet. You

want to add a column to the OrderDetails table so as to enable you to record the Selling price both in USD and the local currency at the current exchange rate. You thus need to take a decision as to which method you can use to store the localized selling price. In your solution you need to simplify the localization of other values and the solution should be applicable to object types other than tables, should it be required in future.

What should you do?

- A. Make the additional column a CLR user-defined type.
- B. Make the additional column a T-SQL user-defined type.
- C. Make the additional column a decimal type and apply a CLR trigger.
- D. Make the additional column a money type and apply a constraint.

Answer: A

Explanation:

you need to code the user-defined type by using your preferred .NET Framework language. Then you will be able to perform the calculations required. Monetary conversions require two fields: a string field to contain the CurrencyInfo value and a decimal field to contain the monetary value. You need to build the user-defined type assembly, then register the assembly in SQL server, then create the type in SQL Server. The user-defined type would be local to the database, but it can be used in any table in the database should the need arise in future.

1. Certkiller .com service clients on a world-wide basis.
2. Orders can be placed by either phone or via the Certkiller .com Web site.

Incorrect Answers:

B: The T-SQL user-defined type can also be described as type aliases based on standard SQL Server data types. They do not provide the required flexibility and functionality that would be required.

C: Though it is possible to make use of a CLR trigger that fires on the INSERT or UPDATE on the OrderDetails to perform the calculation, and a decimal type to store the localized selling price data, this solution will not scale well because the trigger is written to the characteristics of that specific table and would thus not apply in other situations.

D: You should not use a constraint to perform the data conversion because constraints are used to perform relatively simple data validations.

QUESTION 117

You need to design a solution for Certkiller .com to ensure that the Project Head and Project Detail table information is archived in the desired manner. Your solution should require the minimal amount of effort to maintain and must ensure that the tables are checked on the first Saturday of each month and data should be archived as required.

What should you do?

- A. Create the archive solution using Integration Services. Then configure SQL Server Agent job to execute the package.

- B. Create the archive solution using Notification services. Then configure the application to run monthly.
- C. Create the archive solution using a SQL Server script that uses bulk copy. Then configure a SQL Server Agent job to run the script.
- D. Create the archive solution using a CLR stored procedure. Then run the stored procedure manually every month.

Answer: A

Explanation: SQL Server Integration Services (SSIS) can be used for data integration and workflow solutions. Data archiving that requires data transformation as part of the process is well within the SSIS ambit.

1. All data regarding custom appliances are maintained for a total of five years.
2. This data includes detailed information on each custom appliance, including all parts, labor, and status history.
3. The tables used for this purpose is the Project Head and Project Details tables respectively.
4. After the five year period all information is transferred to an archive table.
5. In the Archive table details about the original customer, parts list and the technicians involved with the appliance is included.
6. Transfer of data to the Archive table should occur automatically.

Incorrect Answers:

- B: A Notification Services application is not a suitable solution. It is used to send notifications in response to events or based on a schedule, not for asynchronous response and secure delivery that is a requirement in this case.
- C: You should not make use of bulk copy as it is not an appropriate solution because the data needs to be transformed. Bulk copy is handy when you need to quickly import or export a large amount of data, but it is not suitable for this situation.
- D: A CLR stored procedure can be used to perform archiving, but the solution must run automatically not manually.

QUESTION 118

You need to design the data retrieval mechanisms for Certkiller .com. You must ensure that technician will be able to retrieve the required information from the Inventory table. Your solution should have the minimal impact on data storage requirements. Following are the aspects that you should keep in mind in designing your solution:

1. Technicians should not have direct access to the Inventory table.
2. Technicians should not be able to view values in the QuantityonOrder, Cost, or List Price columns.
3. A Query must return data based on the inventory warehoused at a specific branch office. This should be defined by the location column.
4. The technician must be able to specify the location for which the inventory information is displayed.

What should you do?

- A. Use a table value user-defined function.
- B. Use a view based on the local branch office Inventory table.
- C. Use a distributed partitioned view.
- D. Use a separate table that is based on the Inventory table and that contains all columns except the QuantityonOrder, Cost, or List Price columns for the branch offices.

Answer: A

Explanation: A user-defined function can be designed to return either a table-value or a scalar value. The benefit here would be that it can accept a parameter value to limit the data returned. In this case the limitation must be location specific. You do not need to grant user rights to the underlying table to enable the technician to access data through a user-defined function.

Incorrect Answers:

B: Views are normally used to retrieve data without granting access to the underlying tables. However a single view on the branch office inventory will not meet the stated requirements. You will also require creating a separate view for each location. This would amount to unnecessary impact on the data storage requirements.

C: A Distributed partitioned view is normally used to combine data from member tables in a distributed partitioned table into a single view. In this scenario, inventory data is not stored as a distributed partitioned table, but as a single table that is copied to each branch office.

D: Creating a separate table for each branch office does not meet the requirement of minimizing storage requirements. Also it would require much more overhead insofar as keeping the tables current is concerned.

QUESTION 119

You are deploying the Certkiller .com database and thus need to create a distribution solution to ensure that the database is distributed to the branch offices. The initial data load in the New York office had been completed and validated.

In your solution you need to ensure that network traffic regarding incremental updates must be kept to a minimum.

What should you do?

- A. Configure the initial load with snapshot replication.
Filter the tables relating to service and work records horizontally.
Use Notification Services for updates.
- B. Configure the initial load and updates using merge replication.
Filter the tables relating to service and work records horizontally.
- C. Configure the initial load and updates using transactional replication.
Filter the tables relating to service and work records horizontally.
- D. Configure the initial load with snapshot replication.
Filter the tables relating to service and work records horizontally.
Use database mail for updates.

Answer: B

Explanation: Merge replication is capable of sending a snapshot as the initial data load and then use merge replication to handle the daily incremental updates. Due to data being filtered horizontally you do not need to be concerned about conflicts.

And you can schedule updates to occur whenever required.

1. Each office keeps only its own work and services records, except the head office in New York.
2. The New York office will be responsible for maintaining consolidated work and service records.
3. All the information in the consolidated records must be kept up to date as in up to the end of the previous business day.
4. These updates must not impact on normal daily operations.
5. All data should be consolidated in the head office.

Copies of the appropriate data must be deployed to the other offices.

Incorrect Answers:

A: It is possible to use snapshot replication with horizontal filtering of tables to perform the initial load. But Notification Services cannot support the necessary updates. And it also cannot be used to distribute database updates.

C: Transactional replication can be used for the initial upload and for updates, but it will involve additional overhead and additional network traffic

D: It is possible to use snapshot replication with horizontal filtering of tables to perform the initial load. But database mail cannot support the necessary updates. You cannot use database mail to distribute updates.

QUESTION 120

You are selecting and designing the SQL Server services to support the Certkiller .com business needs. In your solution you need to ensure that the project manager assigned to an appliance customization project receives an e-mail reminder seven days before the projected delivery date, and each day after the delivery date until the project status is changed to "Delivered".

What should you do?

- A. Generate these reminders using Reporting services.
- B. Generate these reminders using Database Mail.
- C. Generate these reminders using a CLR DML trigger.
- D. Generate these reminders using Notification services.
- E. Generate these reminders using Integration services.
- F. Generate these reminders using Web services.

Answer: D

Explanation: Notification Services is used to send notifications to subscribers. It can generate a notification in response to an event and then send the notification through a number of supported methods, including e-mail.

1. Customers should receive notifications when an order is processed and, for parts, when the order ships. These notifications should be sent automatically.

2. On custom appliance orders, the customer should be able to request the appliance status online. Current status and projected completion date should be e-mailed to the customer automatically upon request.

Incorrect Answers:

A: Reporting Services allows one to build reports, to draw on data from a variety of sources and reports can be viewed in several ways, however, it is not designed to support automatic notifications based on a system event as described in the question.

B: Database Mail provides a way for SQL Server database engine to send e-mail messages, but it does not include the required functionality needed to respond to event and creating the necessary notification.

C: A CLR DML trigger responds to data manipulation events. In this situation the date has been established already and the data in the tables used to track projects is not modified, so there is no event that will cause the trigger to fire.

E: The SQL Server Integration Services (SSIS) serves as a platform for data integration and workflow solutions and allows data extraction, transformation and load. But in this case you do not need any complicated workflow management.

F: An HTTP endpoint is used to set up SQL Server as a Web service to listen for HTTP SOAP requests. It can also be used to export one or more stored procedures as well as be a secure method for delivering data, but not as an e-mail message. It is thus not appropriate in this case.