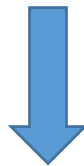


## Microsoft MCSE Certification 70-473 Exam



- **Vendor: Microsoft**
- **Exam Code: 70-473**
- **Exam Name: Designing and Implementing Cloud Data Platform Solutions**

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**QUESTION 1**

Drag and Drop Question

You have four Microsoft Azure SQL databases. You need to configure cross-database queries. Which four statements should you use in sequence? To answer, move the appropriate statements from the list of statements to the answer area and arrange them in the correct order.

Statements	Answer Area
CREATE EXTERNAL DATABASE	
CREATE MASTER KEY	
CREATE EXTERNAL TABLE	
CREATE EXTERNAL DATA SOURCE	
CREATE DATABASE SCOPED CREDENTIAL	
CREATE SHARD MAP	

**Answer:**

Statements	Answer Area
CREATE EXTERNAL DATABASE	CREATE MASTER KEY
CREATE MASTER KEY	CREATE DATABASE SCOPED CREDENTIAL
CREATE EXTERNAL TABLE	CREATE EXTERNAL DATA SOURCE
CREATE EXTERNAL DATA SOURCE	CREATE EXTERNAL TABLE
CREATE DATABASE SCOPED CREDENTIAL	
CREATE SHARD MAP	

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-elastic-query-overview/>

**QUESTION 2**

Your company has two offices located in London and New York. The London office has a public IP of 131.107.1.1 and a private IP subnet of 192.168.4.0/24. The New York office has a public IP of 131.107.15.1 and a private IP subnet of 192.168.8.0/24. You have a Microsoft Azure SQL database. Currently, only the users in the London office use the database. You plan to provide the users in the New York office with access to the database. You need to ensure that the New York office users can access the database. Which command should you execute?

- A. EXECUTE sp\_set\_database\_firewall\_rule N'NewYork','131.107.15.1','255.255.255.255';
- B. EXECUTE sp\_set\_database\_firewall\_rule N'NewYork','192.168.8.0','192.168.8.255';
- C. EXECUTE sp\_set\_database\_firewall\_rule N'NewYork','192.168.8.0','255.255.255.0';
- D. EXECUTE sp\_set\_database\_firewall\_rule N'NewYork','131.107.15.1','131.107.15.1';

**Answer: B**

**Explanation:**

<http://azure.patrickkeisler.com/2015/11/configuring-the-azure-sql-database-firewall/>

<https://msdn.microsoft.com/en-gb/library/dn270010.aspx>

**QUESTION 3**

You have an application that uses a Microsoft SQL Server database on a Microsoft Azure virtual machine. The application experiences performance issues, which you suspect are related to the connection pooling. The issues are prevalent only when there are more than 150 concurrent connections. You need to identify whether the performance issues are related to the connection pooling. Which dynamic management view should you query?

- A. sys.dm\_os\_memory\_pools
- B. sys.dm\_exec\_requests
- C. sys.dm\_exec\_connections
- D. sys.dm\_exec\_sessions

**Answer: D**

**Explanation:**

[https://blogs.msdn.microsoft.com/sql\\_pfe\\_blog/2013/10/08/connection-pooling-for-the-sql-server-dba/](https://blogs.msdn.microsoft.com/sql_pfe_blog/2013/10/08/connection-pooling-for-the-sql-server-dba/)

**QUESTION 4**

You have a hybrid Microsoft SQL Server environment that has multiple servers and services that run in both Microsoft Azure and on-premises. If the network fails, you need to ensure that users can authenticate and connect to the resources available in Azure. Which two server roles should you deploy to Azure? Each correct answer presents part of the solution.

- A. Active Directory Federation Services
- B. Active Directory Certificate Services
- C. DHCP Server
- D. Active Directory Domain Services
- E. DNS Server

**Answer: AD**

**QUESTION 5**

You have an on-premises Microsoft SQL Server 2014 database in an AlwaysOn availability group. You are planning a backup solution for the database. Backups will run on a secondary replica. You need to create a backup procedure for the database. The solution must ensure that the backups are stored on-premises and in Microsoft Azure Blob storage. Which two actions should you perform? Each correct answer presents part of the solution.

- A. Run the BACKUP DATABASE statement and use the TO DISK clause.
- B. Run the CREATE DATABASE statement and use the AS COPY OF clause.
- C. Run the BACKUP DATABASE statement and use the TO URL clause.
- D. Run the BACKUP DATABASE statement and use the MIRROR clause.

**Answer: C**

**Explanation:**

<https://msdn.microsoft.com/en-us/library/dn435916.aspx>

**QUESTION 6**

You have a report that runs against a Microsoft Azure SQL database. The report takes more time to return results than expected. You add an index to a table in the database. You need to identify whether adding the index improves the performance issue. What should you use?

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- A. Database Engine Tuning Advisor
- B. Index Tuning Wizard
- C. Azure Throughput Analyzer
- D. Azure SQL Database Index Advisor

**Answer: D**

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-advisor/>

**QUESTION 7**

Your company has two offices. The offices are located in London and New York. The London office has a public IP of 131.107.1.1 and a private IP subnet of 192.168.4.0/24. The New York office has a public IP of 131.107.15.1 and a private IP subnet of 192.168.8.0/24. You have a Microsoft SQL Server database that is hosted on a Microsoft Azure virtual machine. Currently, only the users in the London office use the database. You need to create a new firewall rule to provide the users in the New York office with access to the database. The solution must protect the database from being accessed by users on the public Internet. What should you do?

- A. Modify the endpoint from the Azure portal.
- B. Use the `sp_set_database_firewall_rule` stored procedure.
- C. Disable the Windows Firewall on the Azure virtual machine.
- D. Run the `New-AzureSqlDatabaseServerFirewallRule` Azure PowerShell cmdlet.
- E. Use the Set Firewall Rule REST API.

**Answer: A**

**Explanation:**

This Microsoft SQL Server database is hosted on a Microsoft Azure virtual machine. Therefore, remote access will be provided via the endpoint rather than a database level firewall rule.

**QUESTION 8**

You have Microsoft SQL Server installed on a Microsoft Azure virtual machine. The virtual machine is on the Standard D3 service tier. All of the data files for the databases on the virtual machine are located on a single volume that is mounted as drive E. The virtual machine experiences performance issues. You view the wait statistics and discover a high number of `GEIOLATCH_SH` waits associated to the tempdb data files. You need to resolve the performance issues. What should you do?

- A. Move the tempdb data files to drive D.
- B. Move the tempdb data files to drive E.
- C. Change the service tier of the virtual machine to Standard D12.
- D. Change the service tier of the virtual machine to Standard DS3.

**Answer: A**

**Case Study 1 - A.Datum Corporation (QUESTION 9 - QUESTION 16)**

**Overview**

**General Overview**

A.Datum Corporation is a real estate firm that has offices throughout North America. A.Datum has a main office and four branch offices. The main office is located in Seattle. The branch offices are located in New York, Montreal, Denver, and Vancouver.

**Existing Environment**

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### Network Infrastructure

The network contains one Active Directory domain named A.Datum.com. Each office contains one domain controller. Each office has a 100-Mbps connection to the Internet that is 20 percent saturated on average. The offices connect to each other through the Internet by using VPN appliances. A.Datum uses the public IP addresses shown in the following table.

Office	Public IP address
Seattle	131.107.1.6
New York	131.107.2.6
Montreal	131.107.3.6
Denver	131.107.4.6
Vancouver	131.107.5.6

### SQL Server Infrastructure

In the main office, A.Datum hosts a Microsoft SQL Server instance on a server named SQL1. SQL1 has a 400-GB database named Listings. Log-shipped copies of Listings are present in each branch office. The copies are used for reporting. Currently, all of the SQL Server instances run SQL Server 2014 Enterprise edition. Each branch office has an application server that hosts an application named App1. App1 is configured to connect to the Listings database on each local SQL Server instance for reporting and to connect to the SQL Server instance in the main office for any updates to property listings. The main office also has an application server that hosts App1. The application server connects to the local Listings database for reporting and for any updates to the property listings. Historic activity of the Listings database shows a maximum of 475 concurrent requests from as many as 200 concurrent connections.

### User Issues

Users report that, frequently, they are disconnected from the Listings database when they run reports. Users also report that there is an unacceptable delay between when a property listing is updated and when the updated listing appears in the listings reports. Developers report concerns about the lack of a testing environment in which code changes can be validated before being deployed to the production Listings database.

### Requirements

#### Business Requirements

A.Datum identifies the following business requirements:

- Minimize costs, whenever possible.
- Ensure that confidential data is encrypted at all times.
- Ensure that the primary database is hosted in Microsoft Azure.
- Ensure that all production databases maintain 99.9 percent availability.
- Ensure that all of the data between the offices and Azure is encrypted.

### Planned changes

A.Datum plans to implement the following changes:

- Move the primary database to Azure.
- Implement a data warehouse for reporting to offload reporting from the transactional Listings database.

### Technical Requirements

A.Datum identifies the following technical requirements:

- A test environment that has a 200-GB subset of data from the Listings database must be implemented. The new database will be named ListTest. The new test environment will have a maximum of 10 concurrent connections.
- The migration of the Listings database must be completed in less than 60 minutes. During the migration, data must be prevented from being modified.
- The firewall settings of the Azure SQL databases must be configured to provide access to the main office only.
- Changes to the settings and the properties of the Listings database must be audited at all times.
- Access to the Clients table must be audited and data from the audit must be queryable.
- The query performance of the ListTest database must be monitored at all times.
- Reporting must be offloaded from the transactional Listings database.

### High-Availability and Recovery Requirements

A.Datum identifies the following high-availability and recovery requirements:

- All production databases must support automatic failover.
- Backups for the Listings database must be stored in Azure.
- The database must be recoverable if a major data loss occurs.
- A weekly backup of the ListTest database must be maintained on-premises.
- SQL1 must be integrated into the high-availability solution as a reporting server.

### QUESTION 9

You need to recommend a backup solution for the ListTest database. What should you include in the recommendation?

- A. Extract a data-tier application (DAC).
- B. Use the bcp command.
- C. Use the SQL Server Migration Assistant (SSMA).
- D. Export a data-tier application (DAC).

**Answer: D**

### QUESTION 10

Drag and Drop Question

You need to configure auditing to meet the technical requirements. Which three actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Actions	Answer Area
Create and start a server audit.	
Configure a database audit specification.	
Enable auditing for failed and successful logins.	
Read the audit file.	⤵
Enable C2 audit mode.	⤴

**Answer:**



**Actions**

- Create and start a server audit.
- Configure a database audit specification.
- Enable auditing for failed and successful logins.
- Read the audit file.
- Enable C2 audit mode.

**Answer Area**

- Create and start a server audit.
- Enable auditing for failed and successful logins.
- Configure a database audit specification.



**Explanation:**

<http://solutioncenter.apexsql.com/how-to-setup-and-use-sql-server-audit-feature/>

**QUESTION 11**

**Drag and Drop Question**

You need to recommend a solution to implement high availability for the Listings database. Which three actions should you recommend be performed in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

**Actions**

- Configure availability groups that have the primary replica on an Azure virtual machine and a secondary read-only replica in the main office.
- Configure mirroring between the Azure virtual machine and the main office in high-safety mode that supports automatic failover.
- Create a failover cluster between SQL1 and an Azure virtual machine.
- Configure a SQL Server instance on an Azure virtual machine as the witness for database mirroring.
- Configure availability groups between two Azure virtual machines in geographically dispersed zones. Place a secondary read-only replica on the second virtual machine.
- Create a VPN tunnel between the main office and the Azure virtual machine.

**Answer Area**



**Answer:**

### Actions

Configure availability groups that have the primary replica on an Azure virtual machine and a secondary read-only replica in the main office.

Configure mirroring between the Azure virtual machine and the main office in high-safety mode that supports automatic failover.

Create a failover cluster between SQL1 and an Azure virtual machine.

Configure a SQL Server instance on an Azure virtual machine as the witness for database mirroring.

Configure availability groups between two Azure virtual machines in geographically dispersed zones. Place a secondary read-only replica on the second virtual machine.

Create a VPN tunnel between the main office and the Azure virtual machine.

### Answer Area

Create a VPN tunnel between the main office and the Azure virtual machine.

Configure mirroring between the Azure virtual machine and the main office in high-safety mode that supports automatic failover.



Configure a SQL Server instance on an Azure virtual machine as the witness for database mirroring.



### QUESTION 12

You need to recommend a solution to migrate the Listings database to the cloud. What should you recommend?

- A. Stage the Listings database on an Azure virtual machine prior to the outage. During the outage, perform a data import from the main office by using SQL Server Management Studio.
- B. Enable mirroring between the main office and the Azure virtual machine. During the planned outage, change the mirroring roles on the Azure virtual machine to become the primary server, and then break the mirror.
- C. Run a full backup during the outage and restore the backup to the Azure virtual machine.
- D. Implement merge replication between the main office and the Azure virtual machine.

**Answer: B**

**Explanation:**

<https://blogs.msdn.microsoft.com/buckwoody/2013/01/08/microsoft-windows-azure-disaster-recovery-options-for-on-premises-sql-server/>

### QUESTION 13

Drag and Drop Question

You need to back up the Listings database to meet the high-availability and recovery requirements. Which three actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.



**Actions**

**Answer Area**

Create a database snapshot.

Create storage keys.

Create a credential.

Back up the database to Azure Blob storage.

Create a database copy.



**Answer:**

**Actions**

**Answer Area**

Create a database snapshot.

Create storage keys.

Create a credential.

Back up the database to Azure Blob storage.

Create a database copy.



Create a credential.

Create storage keys.

Back up the database to Azure Blob storage.

**QUESTION 14**

Drag and Drop Question

You need to implement the monitoring solution for the Listings database. Which three actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

## Actions

## Answer Area

Use the **sys.fn\_get\_audit\_file()** function to review and report on the trapped events.

Execute the following statement.

```
CREATE EVENT SESSION
ListingsDBChange ON DATABASE
ADD EVENT
sqlserver.object_altered ( SET
collect_database_name = (1)
ACTION ( sqlserver.sql_text
,sqlserver.nt_username
,sqlserver.server_principal_name
,sqlserver.client_hostname )
WHERE object_type =
'DATABASE'
AND
sqlserver.database_name =
'Listings'
)
ADD TARGET package0.event_file
( SET filename =
N'C:\Database\XE\ListingsDBChange
WITH (STARTUP_STATE = ON);
```



Execute the following statement.

```
ALTER EVENT SESSION
ListingsDBChange
ON SERVER
STATE = START;
GO
```

Use the  
**sys.fn\_xe\_file\_target\_read\_file()**  
function to review and report on the trapped  
events.

Execute the following statement.

```
CREATE EVENT SESSION
ListingsDBChange ON SERVER
ADD EVENT
sqlserver.object_altered ( SET
collect_database_name = (1)
ACTION ( sqlserver.sql_text
,sqlserver.nt_username
,sqlserver.server_principal_name
,sqlserver.client_hostname )
WHERE object_type =
'DATABASE'
AND
sqlserver.database_name =
'Listings'
)
ADD TARGET package0.event_file
( SET filename =
N'C:\Database\XE\ListingsDBChange
WITH (STARTUP_STATE = ON);
```

**Answer:**

## Actions

Use the **sys.fn\_get\_audit\_file()** function to review and report on the trapped events.

Execute the following statement.

```
CREATE EVENT SESSION
ListingsDBChange ON DATABASE
ADD EVENT
sqlserver.object_altered ( SET
collect_database_name = (1)
ACTION ( sqlserver.sql_text
,sqlserver.nt_username
,sqlserver.server_principal_name
,sqlserver.client_hostname )
WHERE object_type =
'DATABASE'
AND
sqlserver.database_name =
'Listings'
)
ADD TARGET package0.event_file
( SET filename =
N'C:\Database\XE\ListingsDBChange
WITH (STARTUP_STATE = ON);
```

Execute the following statement.

```
ALTER EVENT SESSION
ListingsDBChange
ON SERVER
STATE = START;
GO
```

Use the **sys.fn\_xe\_file\_target\_read\_file()** function to review and report on the trapped events.

Execute the following statement.

```
CREATE EVENT SESSION
ListingsDBChange ON SERVER
ADD EVENT
sqlserver.object_altered ( SET
collect_database_name = (1)
ACTION ( sqlserver.sql_text
,sqlserver.nt_username
,sqlserver.server_principal_name
,sqlserver.client_hostname )
WHERE object_type =
'DATABASE'
AND
sqlserver.database_name =
'Listings'
)
ADD TARGET package0.event_file
( SET filename =
N'C:\Database\XE\ListingsDBChange
WITH (STARTUP_STATE = ON);
```

```
ADD EVENT
sqlserver.object_altered ( SET
collect_database_name = (1)
ACTION ( sqlserver.sql_text
,sqlserver.nt_username
,sqlserver.server_principal_name
,sqlserver.client_hostname )
WHERE object_type =
```

Execute the following statement.

```
ALTER EVENT SESSION
ListingsDBChange
ON SERVER
STATE = START;
GO
```

Use the **sys.fn\_xe\_file\_target\_read\_file()** function to review and report on the trapped events.

## QUESTION 15

You are evaluating whether an Azure SQL Database elastic database pool suits your workload and usage patterns. What are two possible ways to identify the elastic database transaction units (eDTUs)? Each correct answer presents a complete solution.

- A. Aggregate data from sys.dm\_os\_wait\_stats.
- B. Run the Database Engine Tuning Advisor.
- C. Run the Service Tier Advisor.
- D. Aggregate data from sys.dm\_db\_resource\_stats.
- E. Aggregate data from sys.dm\_os\_performance\_counters.

**Answer: DE**

**QUESTION 16**

You need to recommend a solution to migrate the Listings database to the cloud. What should you recommend?

- A. Stage the Listings database on an Azure virtual machine prior to the outage.  
During the outage, perform a data import from the main office by using SQL Server Management Studio.
- B. Implement log-shipping between the main office and an Azure virtual machine prior to the migration date.  
During the planned outage, perform a final log backup, restore the backup to the secondary, and then switch the secondary to the primary role.
- C. Run a full backup during the outage and restore the backup to the Azure virtual machine.
- D. Implement merge replication between the main office and the Azure virtual machine.

**Answer: B**

**Case Study 2 - Contoso, Ltd. (QUESTION 17 - QUESTION 21)**

**Overview**

**General Overview**

Contoso, Ltd. is a national scientific research company that has sales, marketing, and research departments. Contoso has a main office in Dallas and more than 20 satellite offices across the United States. Some employees work off-site at customer locations. Contoso is expected to double in size during the next two years.

**Existing Environment**

The Microsoft SQL Server environment contains the servers configured as shown in the following table.

Server name	Role	Application name
SQL01	Online Transaction Processing (OLTP) primary database	One Sale
SQL02	A mirror of SQL01 and used for ad hoc reporting	One Report
SQL03	A data warehouse	One Data
Research01	A database server used by the research department	Research Gen II

Contoso currently uses SQL Server 2008 R2 on all of the database servers. SQL01 currently requires six cores and 50 GB of memory. Once a day, database snapshots are taken on the mirror to provide ad hoc reporting and to load the data warehouse. One report is used for ad hoc reporting

by using the mirrored copy of the OLTP database. Research Gen II is a Windows application that users currently access by using Remote Desktop.

### Requirements

#### Business Goals

Contoso identifies the following business goals:

- Minimize the costs associated with purchasing hardware and software.
- Prevent any negative impact on performance when moving database platforms to the cloud.
- Audit user access to and query execution on all of the databases in the research department.

#### Planned Changes

Contoso plans to implement the following changes:

- Upgrade SQL03 from SQL Server 2008 R2 to SQL Server 2014 on Windows Server 2012 R2.
- Migrate SQL01 and SQL02 to Infrastructure as a Service (IaaS) on SQL Server 2014.
- Leverage cloud services for a disaster recovery location and for high availability.
- Replace Research Gen II with a cloud-based application named One Research. The database for this application will be migrated to a cloud service.

#### Departmental Requirements

Senior research project leaders must be able to upload databases to the cloud. Initially, the databases will be less than 3 GB. Some databases may grow to 50 GB. The databases must be recoverable to any point during the past two weeks. The research project leaders must monitor the performance of their databases. They must view statistics, such as query performance and overall database performance. The marketing department plans to use cloud services to host web applications for marketing campaigns. The databases for the web applications have the requirements shown in the following table.

Marketing campaign	Database size	Number of users	Recovery point objective (RPO)	High-availability requirement
Campaign 1	1 GB	10	2 weeks	Failover
Campaign 2	200 GB	100	2 weeks	Failover and read-only
Campaign 3	200 GB	100	3 weeks	Failover

#### Technical Requirements

Contoso identifies the following technical requirements:

- OLTP will be offloaded to Microsoft Azure virtual machines.
- The data for One Report must not be more than 15 minutes old.
- All of the databases for the OLTP system must be implemented on solid state drives (SSDs).
- A solution for the OLTP system must be created to provide disaster recovery and reporting between SQL01 and SQL02.
- All databases, except for the research and marketing databases, must be recoverable to any point during the last 30 days.
- A solution for the data warehouse system must be created to provide disaster recovery between SQL03 and an Azure virtual machine named SQL04.

### QUESTION 17

A solution for the data warehouse system must be created to provide disaster recovery between SQL03 and an Azure virtual machine named SQL04. You are designing the data warehouse. You need to recommend a solution that meets the business goals and the technical requirements. What should you recommend?

- A. Create an AlwaysOn availability group between SQL03 and SQL04.
- B. Host the data warehouse on an Azure virtual machine.
- C. Create an Azure HDInsight cluster.
- D. Create an Azure DocumentDB database.



**Answer: A**

**QUESTION 18**

A solution for the data warehouse system must be created to provide disaster recovery between SQL03 and an Azure virtual machine named SQL04. You are evaluating the use of active geo-replication for one of the research department databases. You need to identify which service tier to use for the database. The solution must meet the department requirements and the business requirements. What should you identify?

- A. Premium 1
- B. Premium 14
- C. Standard S0
- D. Basic

**Answer: C**

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-service-tiers/>

**QUESTION 19**

A solution for the data warehouse system must be created to provide disaster recovery between SQL03 and an Azure virtual machine named SQL04. You need to recommend an auditing solution that meets the business goals. Which three events should you include in the recommendation? Each correct answer presents part of the solution.

- A. Transaction Management
- B. Stored Procedure
- C. Plain SQL
- D. Login
- E. Failed Connections

**Answer: ABD**

**QUESTION 20**

A solution for the data warehouse system must be created to provide disaster recovery between SQL03 and an Azure virtual machine named SQL04. You need to ensure that the performance statistics for the research department are collected. What should you enable?

- A. Query Performance Insight
- B. Scale and Configuration
- C. Dynamic Data Masking
- D. Index advisor

**Answer: A**

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-query-performance/>

**QUESTION 21**

A solution for the data warehouse system must be created to provide disaster recovery between SQL03 and an Azure virtual machine named SQL04. You need to tell the research project leaders how to migrate their databases. Which task should you instruct the leaders to use from SQL Server Management Studio?



- A. Extract Data-tier Application
- B. Deploy Database to a Microsoft Azure VM
- C. Deploy Database to a Microsoft Azure SQL Database
- D. Copy Database

**Answer: C**

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-cloud-migrate-compatible-using-ssms-migration-wizard/>

### **Case Study 3 - Proseware, Inc. (QUESTION 22 - QUESTION 29)**

#### **Overview**

##### **General Overview**

Proseware, Inc. is a software engineering company that has 100 employees. Proseware has sales, marketing, accounts, human resources IT, and development departments. The IT department has one team dedicated to managing the internal resources and one team dedicated to managing customer resources, which are located in the company's hosting environment. Proseware develops websites, basic web apps, and custom web apps. The websites and the apps are hosted and maintained in the hosting environment of Proseware.

##### **Physical Locations**

Proseware has two offices located in Seattle and Montreal. The Seattle office contains all of the hardware required to host its customers' websites, web apps, and databases. The Seattle office contains the IT team for the hosting environment. The Montreal office contains all of the hardware required to host the company's internal applications, databases, and websites. Each office connects directly to the Internet. Testing reveals that the minimum latency from the offices to Microsoft Azure is 20 ms.

##### **Existing Environment**

###### **Internal Microsoft SQL Server Environment**

Proseware uses a custom customer relationship management (CRM) application. The internal Microsoft SQL Server environment contains two physical servers named CRM-A and CRM-B. Both servers run SQL Server 2012 Standard and host databases for the CRM application. CRM-A hosts the principal instance and CRM-B hosts the mirrored instance of the CRM database. CRM-A also hosts databases for several other applications that are used by the company's internal applications. CRM-A has a quad core processor and 12 GB of RAM. CRM-B has a dual core processor and 8 GB of RAM.

###### **Custom Web Applications Environment**

Some Proseware customers request custom web-based applications that require more than just databases, such as SQL Server Integration Services (SSIS) and CLR stored procedures. Proseware uses a Hyper-V server named Host1. Host1 has four instances of SQL Server 2014 Enterprise in the host operating system. The instances are mirrored on a server named Host2. Host1 also hosts four virtual machines named VM1, VM2, VM3, and VM4. VM1 has SQL Server 2005 Standard installed. VM2 has SQL Server 2005 Enterprise Edition installed. VM3 has SQL Server 2008 Standard Edition installed. VM4 has SQL Server 2008 R2 Standard Edition installed. Host1 uses a SAN to store all of the data and log files for the four SQL Server instances and the four virtual machines.

###### **Websites and Basic Web Apps Environment**

Proseware has two physical servers named WebServer1 and WebData1. WebServer1 hosts basic web apps and websites for its customers. WebData1 has a database for each website and each basic web app that Proseware hosts. WebData1 has four cores and 8 GB of RAM. Each website database contains customer information for billing purposes. Proseware generates a consolidated report that contains data from all of these databases. The relevant databases on WebData1 are:

- CWDB: Currently 60 GB and is not expected to exceed 100 GB. CWDB contains a table named Personallinfo.
- MovieReviewDB: Currently 5 GB and is not expected to exceed 10 GB.

### Marketing Department

Proseware has a web app for the marketing department. The web app uses an Azure SQL database. Managers in the marketing department occasionally bulk load data by using a custom application. The database is updated daily.

### Problem Statements

Proseware identifies the following issues:

- Lack of planning and knowledge has complicated the database environment
- Customers who have web apps hosted on Webserver1 report frequent outages caused by failures on WebData1. The current uptime is less than 90 percent.
- Internally users complain of slow performance by the CRM application when the databases fail over to CRM-B.
- WebData1 has no high availability option for the databases or the server.
- An internal licensing audit of SQL Server identifies that Proseware is non compliant. Host1, CRM-A, and CRM-B are licensed properly. VM1 VM2, VM3, VM4, and WebData1 are unlicensed.

### Requirements

#### Business Requirements

Proseware identifies the following business requirements:

- Upgrade the infrastructure to address the issues reported by the internal users and customers.
- Minimize upgrade costs associated with purchasing hardware and software.
- Ensure that all software is licensed properly.
- Minimize the complexity of the database environment.
- Consolidate the instances of SQL Server that support the custom web app environment.
- Implement a service level agreement (SLA) of 99.95 percent uptime for the website and basic web app environment.
- Implement a disaster recovery environment in Azure for the CRM application.
- Ensure that any changes to the SQL Server environments either maintain or increase overall performance.
- Migrate all web front ends to Azure.
- Reuse licenses, whenever possible.
- Minimize the administrative effort required to generate the internal reports from the website databases.

### Security Requirements

Proseware hosts a database for a company named Contoso, Ltd. Currently, all of the employees at Contoso can access all of the data in the database. Contoso plans to limit user access to the CWDU database so that customer service representatives can see only the data from the PersonallInfo table that relates to their own customers.

### QUESTION 22

You are evaluating moving the data from WebData1 to an Azure SQL database. You need to recommend a solution to generate the consolidated report for billing. The solution must meet the business requirements. What should you include in the recommendation?

- A. SQL Server Integration Services (SSIS)
- B. SQL Server Analysis Services (SSAS)
- C. an elastic database job
- D. an elastic query

**Answer: D**

### QUESTION 23

You are planning the consolidation of the databases from Host1. You need to identify which methods to use to back up the data after the consolidation completes. What are two possible methods that achieve this goal? Each correct answer presents a complete solution.

- A. BACKUP TO URL
- B. AlwaysOn failover clustering

- C. a maintenance plan
- D. AlwaysOn Availability Groups

**Answer: AC**

**QUESTION 24**

You need to recommend a disaster recovery solution for the CRM application that meets the business requirements. What should you recommend?

- A. backup and restore by using Windows Azure Storage
- B. log shipping
- C. AlwaysOn Availability Groups
- D. database mirroring

**Answer: A**

**QUESTION 25**

You are evaluating whether to replace CRM-B with an Azure virtual machine. You need to identify the required virtual machine service tier to replace CRM. The solution must meet the following requirements: Which virtual machine service tier should you identify?

- A. Standard DS3
- B. Standard A6
- C. Standard GS2
- D. Standard D3

**Answer: A**

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/virtual-machines-windows-sizes/>

**QUESTION 26**

Drag and Drop Question

A marketing department manager reports that the marketing department database contains incorrect data. The manager reports that the data was correct yesterday. You need to recommend a method to recover the data. Which three actions should you recommend be performed in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

**Actions**

**Answer Area**

- Perform a point-in-time restore.
- Modify the firewall rules.
- Rename the database.
- Enable Change Tracking.
- Create a new Azure SQL database server.
- Delete the database.
- Migrate the database to an on-premises instance.



**Answer:**

Actions	Answer Area
Perform a point-in-time restore.	Rename the database.
Modify the firewall rules.	Perform a point-in-time restore.
Rename the database.	Delete the database.
Enable Change Tracking.	
Create a new Azure SQL database server.	
Delete the database.	
Migrate the database to an on-premises instance.	

**QUESTION 27**

Drag and Drop Question

You plan to implement row-level security for the CWDB database. You create the fn\_limitusers function under the restriction schema. You need to create the policy. How should you complete the policy? To answer, drag the appropriate elements to the correct locations. Each element may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

Code elements	Answer area
ADD BLOCK PREDICATE restriction.fn_limitusers (CRS)	CREATE SECURITY POLICY CSRFILTER
ADD FILTER PREDICATE restriction.fn_limitusers (CRS)	Code element
ON CWDB	Code element
ON PersonalInfo	Code element
WITH (STATE = ON)	
WITH SCHEMABINDING	

**Answer:**

**Code elements**

ADD BLOCK PREDICATE restriction.fn\_limitusers (CRS)

ADD FILTER PREDICATE restriction.fn\_limitusers (CRS)

ON CWDB

ON PersonalInfo

WITH (STATE = ON)

WITH SCHEMABINDING

**Answer area**

CREATE SECURITY POLICY CSRFILTER

ADD FILTER PREDICATE restriction.fn\_limitusers (C

ON PersonalInfo

WITH (STATE = ON)

**Explanation:**

<https://msdn.microsoft.com/en-us/library/dn765131.aspx>

**QUESTION 28**

Hotspot Question

You need to identify which methods to use to migrate MovieReviewDB and CWDB. Which method should you identify for each database? To answer, select the appropriate options in the answer area.

**Answer Area**

CWDB:

Azure Import and Export Service  
Azure ExpressRoute  
the bcp utility

MovieReviewDB:

Azure ExpressRoute  
the BACKUP and RESTORE statements  
the Deploy Database to Microsoft Azure Database task

**Answer:**

**Answer Area**

CWDB: 

▼

Azure Import and Export Service

Azure ExpressRoute

the bcp utility

MovieReviewDB: 

▼

Azure ExpressRoute

the BACKUP and RESTORE statements

the Deploy Database to Microsoft Azure Database task

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-cloud-migrate-compatible-using-ssms-migration-wizard/>

**QUESTION 29**

Hotspot Question

You are evaluating the migration of the databases from Host1 and WebData1 to Azure. You need to recommend the most cost-effective solution for storing the database in Azure. The solution must meet the business requirements. In the table below, recommend the most cost-effective storage solution for Host1 and WebData1. NOTE: Make only one selection in each column.

**Answer Area**

Solutions	Host1	WebData1
SQL Server 2014 Standard edition installed on an Azure virtual machine	<input type="radio"/>	<input type="radio"/>
SQL Server 2014 Enterprise edition installed on an Azure virtual machine	<input type="radio"/>	<input type="radio"/>
a single Azure SQL database on the Basic service tier	<input type="radio"/>	<input type="radio"/>
an Azure SQL Database elastic database pool on the Basic service tier	<input type="radio"/>	<input type="radio"/>
a single Azure SQL database on the Standard service tier	<input type="radio"/>	<input type="radio"/>
an Azure SQL Database elastic database pool on the Standard service tier	<input type="radio"/>	<input type="radio"/>

**Answer:**



**Answer Area**

Solutions	Host1	WebData1
SQL Server 2014 Standard edition installed on an Azure virtual machine	<input type="radio"/>	<input type="radio"/>
SQL Server 2014 Enterprise edition installed on an Azure virtual machine	<input checked="" type="radio"/>	<input type="radio"/>
a single Azure SQL database on the Basic service tier	<input type="radio"/>	<input type="radio"/>
an Azure SQL Database elastic database pool on the Basic service tier	<input type="radio"/>	<input type="radio"/>
a single Azure SQL database on the Standard service tier	<input type="radio"/>	<input type="radio"/>
an Azure SQL Database elastic database pool on the Standard service tier	<input type="radio"/>	<input checked="" type="radio"/>

**QUESTION 30**

You deploy a Microsoft SQL Server instance on a Microsoft Azure virtual machine by using a template. You plan to deploy a PHP-based app in an Azure web app. The web app will use a database on the virtual machine. The web app and the virtual machine will be on the same Azure virtual network. You need to ensure that the web app can access the SQL Server database. Which three actions should you perform? Each correct answer presents part of the solution.

- A. Change the SQL Server authentication to mixed mode.
- B. Use sp\_configure to enable remote access.
- C. From the Azure portal, add an endpoint for TCP port 1434.
- D. On the virtual machine, enable the inbound connections on TCP port 1433 from Windows Firewall.
- E. Restart the SQL Server service.

**Answer: BDE**

**QUESTION 31**

Drag and Drop Question

You have four Microsoft Azure SQL databases located on the same database server. You need to configure the databases to be in an elastic database pool. Which four actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

**NOTE: More than one order of answer choices is correct. You will receive credit for any of the correct orders you select.**

### Actions

### Answer Area

- Select the databases to add to the elastic database pool.
- Redeploy the databases by using Microsoft SQL Server Data Tools.
- Configure the performance characteristics of the elastic database pool.
- Select the service tier.
- Create an elastic database pool on the server.
- Install the elastic database tools.
- Modify the firewall rules of the database server.



### Answer:

### Actions

### Answer Area

- Select the databases to add to the elastic database pool.
- Redeploy the databases by using Microsoft SQL Server Data Tools.
- Configure the performance characteristics of the elastic database pool.
- Select the service tier.
- Create an elastic database pool on the server.
- Install the elastic database tools.
- Modify the firewall rules of the database server.



- Create an elastic database pool on the server.
- Select the service tier.
- Configure the performance characteristics of the elastic database pool.
- Select the databases to add to the elastic database pool.

### Explanation:

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-elastic-pool-create-portal/>

### QUESTION 32

#### Drag and Drop Question

You hire a new employee to assist in the management of a Microsoft Azure SQL database. You need to ensure that the employee can query dynamic management views. Which three actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

### Actions

### Answer Area

- Create a database user.
- Add the new user to the dbmanager database role.
- Add the new user to the loginmanager database role.
- Connect to the database by using a server-level principal.
- Grant VIEW SERVER STATE to the new login.
- Grant VIEW DATABASE STATE to the new user.



**Answer:**

Actions	Answer Area
Create a database user.	Connect to the database by using a server-level principal.
Add the new user to the dbmanager database role.	Create a database user.
Add the new user to the loginmanager database role.	Grant VIEW DATABASE STATE to the new user.
Connect to the database by using a server-level principal.	
Grant VIEW SERVER STATE to the new login.	
Grant VIEW DATABASE STATE to the new user.	

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-database-monitoring-with-dmvs/>

### QUESTION 33

You plan to implement a Microsoft Azure SQL database. You need to create and manage the new database on a new server. Which three cmdlets should you use? Each correct answer presents part of the solution.

- A. New-AzureSqlDatabaseServer
- B. New-AzureSqlDatabaseServerFirewallRule
- C. New-AzureSqlDatabaseServerContext
- D. New-AzureVM
- E. New-AzureSqlDatabase

**Answer: ACE**

**Explanation:**

<https://msdn.microsoft.com/en-us/library/dn546722.aspx>

### QUESTION 34

You have a Microsoft Azure SQL data warehouse. During peak usage, you discover that the data warehouse fails to meet performance expectations. You need to provide additional resources to the data warehouse. What should you do?

- A. Create an additional storage pool.
- B. Create an elastic database pool.
- C. Increase the number of Database Throughput Units (DTUs).
- D. Increase the number of Data Warehouse Units (DWUs).

**Answer: D**

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-data-warehouse-manage-compute-overview/>

### QUESTION 35

You have several SQL Server instances on Microsoft Azure virtual machines. Periodically, one of the virtual machines runs more slowly than expected. The issue typically persists for up to 30 minutes. You investigate the issue and discover that when the issue occurs, there is high CPU usage on the virtual machines. You need to be notified automatically when the performance issue occurs. You want to achieve this goal by using the minimum amount of administrative effort. What

should you configure?

- A. extended events to monitor the Processor:%Privileged Time of the virtual machine and SQL Server Agent alerts to notify the operator by sending an email message
- B. Azure Diagnostics for the logs on the virtual machine and a rule in Management Services to send you an email message when the CPU usage is more than 80 percent
- C. extended events to monitor the Processor:%User Time of the virtual machine and SQL Server Agent alerts to notify the operator by sending an email message
- D. an alert rule in the Azure portal to send you an email message when the CPU usage is more than 80 percent for five consecutive minutes

**Answer: D**

**Explanation:**

<http://msdn.microsoft.com/en-us/library/azure/dn306639.aspx>

**QUESTION 36**

You have a Microsoft SQL Server instance on a Microsoft Azure virtual machine. The members of an Active Directory group named HelpDesk can log in to the SQL Server instance. You need to ensure that the members of HelpDesk can query dynamic management views and gather performance metrics from the SQL Server instance. Which three actions should you perform? Each correct answer presents part of the solution.

- A. Add HelpDesk to the db\_owner role for all of the databases.
- B. Add HelpDesk to the new role.
- C. Grant VIEW ANY DATABASE to the new role.
- D. Grant VIEW SERVER STATE to the new role.
- E. Create a database role.
- F. Create a server role.

**Answer: BDF**

**Explanation:**

<https://msdn.microsoft.com/en-us/library/ms188754.aspx>

**QUESTION 37**

Drag and Drop Question

You have an AlwaysOn availability group between several Microsoft Azure virtual machines. You need to ensure that the databases meet the following requirements: The solution must prevent any disruption to replication. Which four actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Actions	Answer Area
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Back up the certificate on the primary replica.</div>	
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Enable backup encryption on the primary replica.</div>	
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Enable BitLocker Drive Encryption on the primary replica.</div>	
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Create a service master key, a database encryption key, and a certificate on the primary replica.</div>	<div style="border: 1px solid #ccc; padding: 2px; text-align: center;">⬆</div>
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Enable BitLocker Drive Encryption on the secondary replica.</div>	<div style="border: 1px solid #ccc; padding: 2px; text-align: center;">⬇</div>
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Restore the certificate on the secondary replica.</div>	
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Enable transparent data encryption (TDE) on the primary replica.</div>	

**Answer:**

Actions	Answer Area
Back up the certificate on the primary replica.	Create a service master key, a database encryption key, and a certificate on the primary replica.
Enable backup encryption on the primary replica.	Back up the certificate on the primary replica.
Enable BitLocker Drive Encryption on the primary replica.	Restore the certificate on the secondary replica.
Create a service master key, a database encryption key, and a certificate on the primary replica.	Enable transparent data encryption (TDE) on the primary replica.
Enable BitLocker Drive Encryption on the secondary replica.	
Restore the certificate on the secondary replica.	
Enable transparent data encryption (TDE) on the primary replica.	

**Explanation:**

<https://blogs.msdn.microsoft.com/alwaysonpro/2014/01/28/how-to-enable-tde-encryption-on-a-database-in-an-availability-group/>

### QUESTION 38

You have an organizational data mart that contains 3.5 TB of uncompressed data. The size of the data is expected to grow 2 annually. Reporting is performed only during business hours. You plan to move the data to the cloud. You need to design a cloud architecture for the data mart. The solution must minimize costs and administrative overhead. What is the best design to achieve the goal? More than one answer choice may achieve the goal. Select the BEST answer.

- A. a Microsoft Azure SQL data warehouse
- B. a Microsoft SQL Server virtual machine
- C. a Microsoft Azure HDInsight cluster
- D. a Microsoft Azure SQL database

**Answer: A**

**Explanation:**

<https://azure.microsoft.com/en-gb/documentation/articles/sql-data-warehouse-overview-what-is/>

### QUESTION 39

You have Microsoft SQL Server 2014 installed on a Microsoft Azure virtual machine. One of the databases on the virtual machine supports a highly active Online Transaction Processing (OLTP) application. Users report abnormally long wait times when they submit data in the application. Which two tools can you use to identify the longest running queries? Each correct answer presents a complete solution.

- A. the Job Activity Monitor
- B. Database Engine Tuning Advisor
- C. dynamic management views
- D. SQL Server Extended Events
- E. SQL metrics in Azure Diagnostics for the virtual machine

**Answer: CD**

### QUESTION 40

You have Microsoft SQL Server installed on a Microsoft Azure virtual machine named VM1. VM1

is provisioned by using the classic deployment model and is on the Standard GS5 service tier. The virtual machine is used for testing purposes only. You need to minimize the costs associated with VM1 when the virtual machine is unused. Which command should you use?

- A. Update-AzureVM
- B. Stop-AzureVM
- C. Suspend-VM
- D. Stop-VM

**Answer: B**

**Explanation:**

<https://msdn.microsoft.com/en-us/library/azure/dn495269.aspx>

**QUESTION 41**

You have a Microsoft SQL Server 2014 instance on a Microsoft Azure virtual machine. You need to ensure that all SQL Server audits are written to the Windows Security log. Which two actions should you perform? Each correct answer presents part of the solution.

- A. Configure the Audit policy change policy.
- B. Assign the Generate security audits user right.
- C. Configure the Audit object access policy.
- D. Assign the Log on as a service user right.
- E. Configure the Audit the access of global system objects policy.

**Answer: BC**

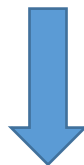
**Explanation:**

<https://msdn.microsoft.com/en-us/library/cc645889.aspx>

**QUESTION 42**

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