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SQL Server DBA Interview Questions

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Frequently Asked SQL Server DBA Interview Questions - Updated 2020

- What purpose does the Model Database Server?
- Explain about your SQL Server DBA Experience?
- What is DCL?
- What is Replication?
- What is Transparent Data Encryption?
- What are Patches and Hotfixes?
- What are the different ways you can create Databases in SQL Se

Q1) MS SQL Server Vs MySQL

MS SQL Server Vs MySQL		
Name	MS SQL Server	MySQL
Define	Microsoft Relational DataBase Management System	Wide usage of Relational DataBase Management system
Primary DB Model	Relational DB Management System	Relational DB Management System
Secondary DB Model	Graph DBMS, Document & Value store	Document & Key-Value store
Developer	It is developed by Microsoft	It is developed by Oracle
Server OS	It supports Windows, Linux	It supports Linux, Solaris, Windows, OS X
Supporting	Java, PHP, Ruby, C#, C++, R etc	Python, TCL, Scheme, Haskell, Javascript, Ruby, C, C++,

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Languages		C# few more
FK(Foreign Key)	Yes they support	Yes they support
API's	JDBC, ODBC, OLE DB, TDS	ODBC, ADO.NET, JDBC
License Permit	Only Commercial	OpenSource (Free)

Q2) What purpose does the model database serve?

The model database, as its name implies, serves as the model (or template) for all databases. If the model database is modified, all subsequent databases created on that instance will pick up the changes. However, existing databases will not. Note that TEMPDB is also created from model every time SQL Server starts.

Q3) How do you trace the traffic hitting a SQL Server?

SQL profiler is the SQL Server utility you can use to trace the traffic on the SQL Server instance. It captures all the transactions that are captured and reducing the overhead incurred for the trace. It can be turned on and off, and even replayed to facilitate troubleshooting.

Q4) What types of replication are supported in SQL Server?

[SQL Server](#) has three types of replication: Snapshot, Merge, and Transaction. Snapshot replication creates a snapshot of the data (point-in-time picture of the data) to deliver to the subscribers. This is a good type to use when the data changes infrequently, there is a small amount of data to replicate, or large changes occur over a small period of time.

Merge replication uses a snapshot to seed the replication. Changes on both sides of the publication are tracked so the subscriber can synchronize with the publisher when connected. A typical use for this type of replication is in a client and server scenario. A server would act as a central repository and multiple clients would independently update their copies of the data until connected. At which time, they would all send up their modifications to the central store.

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Transaction replication also begins with a snapshot only this time changes are tracked as transactions (as the name implies). Changes are replicated from publisher to subscriber the same as they occurred on the publisher, in the same order as they occurred, and in near real-time. This type of replication is useful when the subscriber needs to know every change that occurred to the data (not point-in-time), when the change volume is high, and when the subscriber needs near real-time access to the changes.

Q5) Why would you use SQL Agent?

SQL Agent is the job scheduling mechanism in SQL Server. Jobs can be scheduled to run at a specific time or when an event occurs. Jobs can also be executed on demand. SQL Agent is most often used to schedule a

Q6) What happens on checkpoint?

Checkpoints, whether scheduled or manually executed, cause the transaction log to be truncated. The oldest open transaction (the active portion of the log). That is, the dirty pages from the buffer pool that have been written to the database. This process provides a performance gain for SQL Server. However, the log should not get too big because it might consume too many resources and, should your database fail, it could be a problem for the database.

One important thing to note here is that SQL Server can only truncate up to the oldest open transaction. If you are seeing the expected relief from a checkpoint, it could very well be that someone forgot to commit. It is very important to finalize all transactions as soon as possible.

Q7) What is DBCC?

DBCC statements are Database Console Commands and come in four flavors: Maintenance, Informational, Validation, and Miscellaneous. Maintenance commands are those commands that allow the DBA to perform maintenance activities on the database such as shrinking a file. Informational commands provide feedback regarding the database such as providing information about the procedure cache. Validation commands include commands that validate the database such as the ever-popular CHECKDB. Finally, miscellaneous commands are those that obviously don't fit in the other three categories. This includes statements like DBCC HELP, which provides the syntax for a given DBCC command.

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Q8) How can you control the amount of free space in your index pages?

You can set the fill factor on your indexes. This tells SQL Server how much free space to leave in the index pages when re-indexing. The performance benefit here is fewer page splits (where SQL Server has to copy rows from one index page to another to make room for an inserted row) because there is room for growth built into the index.

Q9) Why would you call Update Statistics?

Update Statistics is used to force a recalculation of query optimization statistics for a table. Statistics are automatically recomputed, but in some cases, a query may benefit from updated statistics. Beware though that re-computing the query statistics causes queries to be recompiled, so you may lose the performance gains you might have achieved by calling update statistics. In fact, it could have a negative impact depending on the characteristics of the system.

Q10) What is a correlated sub-query?

A correlated sub-query is a nested query that is linked to the outer query. For instance, suppose I want to find employees who have not entered their time for the week. I could query the Employee table to get their IDs and then query the TimeEntry table to see if they've entered their time or not. I can't do a straight join because of the absence of time data, so I'll do a correlated sub-query similar to this:

```
SELECT FirstName, LastName
FROM EMPLOYEE e
WHERE NOT EXISTS (SELECT 1 FROM TimeEntry te
WHERE te.EmpID = e.EmpID
AND te.WeekID = 35)
```

Notice that the inner query relates to the outer query on the employee ID, thus making it a correlated sub-query. The inner query will be evaluated once per outer query row.

Q11) What authentication modes does SQL Server support?

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SQL Server supports Windows Authentication and mixed-mode. Mixed-mode allows you to use both Windows Authentication and SQL Server Authentication to log into your SQL Server. It's important to note that if you use Windows Authentication, you will not be able to log in as sa.

Q12) Explain about your SQL Server DBA Experience.

This is a generic question often asked by many interviewers. Explain what are the different instances you have worked on, what kind of administration of those instances has been done by you. Your role in those earlier projects that would be of significance to the potential employer. This is the answer you should give. The suitable are you for the position to which you are being interviewed.

Q13) What are the different SQL Server Versions you have worked on?

The answer would be depending on the versions you have worked on, I would say I have worked on SQL Server 2000, 2005 and 2008. If you have worked only some version be honest in saying that. If you are working on all versions, it varies from individual to individual.

Q14) What are the different types of Indexes available in SQL Server?

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The simplest answer to this is "Clustered and Non-Clustered Indexes". There are other types of Indexes what can be mentioned such as Unique, XML, Spatial and Filtered Indexes. More on these Indexes later.

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Q15) What is the difference between Clustered and Non-Clustered Index?

In a clustered index, the leaf level pages are the actual data pages of the table. When a clustered index is created on a table, the data pages are arranged accordingly based on the clustered index key. There can only be one Clustered index on a table.

In a Non-Clustered index, the leaf level pages do not contain data pages instead it contains pointers to the data pages. There can be multiple non-clustered indexes on a single table.

Q16) What are the new features in SQL Server 2005 when compared to SQL Server 2000?

There are quite a lot of changes and enhancements in SQL Server 2005. Few of them are listed below:

- Database Partitioning
- Dynamic Management Views
- System Catalog Views
- Resource Database
- Database Snapshots
- SQL Server Integration Services


Support for Analysis Services on a Failover Cluster.

1. Profiler being able to trace the MDX queries of the Analysis Server.
2. Peer-to-peer Replication
3. Database Mirroring

Q17) What are the High-Availability solutions in SQL Server and differentiate them briefly.

Failover Clustering, Database Mirroring, Log Shipping, and Replication are the High-Availability features available in SQL Server. I would recommend reading this blog of mine which explains the differences between these 4 features.

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Q18) How do you troubleshoot errors in a SQL Server Agent Job?

Inside SSMS, in Object Explorer under SQL Server Agent look for Job Activity Monitor. The job activity monitor displays the current status of all the jobs on the instance. Choose the particular job which failed, right-click and choose view history from the drop-down menu. The execution history of the job is displayed and you may choose the execution time (if the job failed multiple times during the same day). There would information such as the time it took to execute that job and details about the error occurred.

Q19) What is the default Port No on which SQL Server listens?

1433

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**Q20) How many files can a Database contain in SQL Server? How many types
How many of those files can exist for a single database?**

1. A Database can contain a maximum of 32,767 files.
2. There are Primarily 2 types of data files Primary data file and Secondary data file(s)
3. There can be only one Primary data file and multiple secondary data files as long as they

Q21) What is DCL?

DCL stands for Data Control Language.

Q22) What are the commands used in DCL?

GRANT, DENY and REVOKE.

Q23) What is Fill Factor?

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Fill Factor is a setting that is applicable to Indexes in SQL Server. The fill factor value determines the index page when it is created/rebuilt.

Q24) What is the default fill factor value?

By default, the fill factor value is set to 0.

Q25) Where do you find the default Index fill factor and how to change it?

The easiest way to find and change the default fill factor value is from Management Studio. In the Server Properties, choose Database Settings, you should see the fill factor section. You can change to the desired value there and click OK to save the changes.

The other option of viewing and changing this value is using

Q26) What is a system database and what is a user database?

System databases are the default databases that are installed when the SQL Server is installed. Basically, there are 4 system databases: Master, MSDB, TempDB, and Model. It is highly recommended that these databases are not modified or altered for the smooth functioning of the SQL System.

A user database is a database that we create to store data and start working with the data.

Q27) What are the recovery models for a database?

There are 3 recovery models available for a database. Full, Bulk-Logged and Simple are the three recovery models available.

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Q28) What is the importance of a recovery model?

Primarily, the recovery model is chosen keeping in view the amount of data loss one can afford to. If one expects to have minimal or no data loss, choosing the Full recovery model is a good choice. Depending on the recovery model of a database, the behavior of database log file changes. I would recommend you read more material on log backups and log file behavior and so on to understand in depth.

Q29) What is Replication?

Replication is a feature in SQL Server that helps us publish database objects and data at multiple destinations. It is often considered as one of the High-Availability options. One of the advantages is that it can be configured on databases which are in simple recovery model.

Q30) What the different types of Replication and why are they used?

There are basically 3 types of replication: Snapshot, Transactional and Merge Replication. The choice of replication depends on the requirements and/or the goals one is trying to achieve. For example, Snapshot Replication is useful when the data inside the tables does not change frequently and the amount of data is not too large, such as a product list table etc. Transactional Replication would be useful when maintaining a copy of a table or a set of tables etc. Merge Replication is more useful in case of remote / distributed systems where there are multiple sites, for example, sales done at a promotional event which might not be connected to the central servers always.

Q31) What the different components of Replication and what is their use?

The 3 main components in Replication are Publisher, Distributor, and Subscriber. The publisher is the data source of a publication. The distributor is responsible for distributing the database objects to one or more destinations. The subscriber is the destination where the publisher's data is copied/replicated.

Q32) What are the different Topologies in which Replication can be configured?

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Replication can be configured in any topology depending keeping in view of the complexity and the workload of the entire Replication. It can be any of the following:

- Publisher, Distributor, and Subscriber on the same SQL Instance.
- Publisher and Distributor on the same SQL Instance and Subscriber on a separate Instance.
- Publisher, Distributor, and Subscriber on individual SQL Instances.

Q33) If you are given access to a SQL Server, how do you find if the SQL Instance is the default instance?

I would go to the SQL Server Configuration Manager. In the left pane of the tool, I would click on SQL Server Services. The right side pane displays all of the SQL Server Services/components that are installed on that machine. If MSSQLSERVER is listed (MSSQLSERVER), then it indicates it is a default instance, else there will be the Instance Name.

Q34) What are the different authentication modes in SQL Server and how do you configure them?

SQL Server has 2 Authentication modes; Windows Authentication and SQL Server Authentication. The combination of both is referred to as Mixed Mode.

Q35) What are the differences in Clustering in SQL Server 2005 and 2008 or 2008 R2?

On SQL Server 2005, installing SQL Server failover cluster is a single step process whereas on SQL Server 2008 or above it is a multi-step process. That is, in SQL Server 2005, the Installation process itself installs on all of the nodes (be it 2 nodes or 3 nodes). In 2008 or above this has changed, we would need to install separately on all the nodes. 2 times if it is a 2 node cluster or 3 times in a 3 node cluster and so on.

Q36) What is meant by Active-Passive and Active-Active clustering setup?

An Active-Passive cluster is a failover cluster configured in a way that only one cluster node is active at any given time. The other node, called as the Passive node is always online but in an idle condition, waiting for a failure of the Active Node, upon which the

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Passive Node takes over the SQL Server Services and this becomes the Active Node, the previous Active Node now being a Passive Node.

An Active-Active cluster is a failover cluster configured in a way that both the cluster nodes are active at any given point in time. That is, one Instance of SQL Server is running on each of the nodes always; when one of the nodes has a failure, both the Instances run on the only one node until the failed node is brought up (after fixing the issue that caused the node failure). The instance is then failed over back to its designated node.

Q37) List out some of the requirements to setup a SQL Server failover cluster.

Virtual network name for the SQL Server, Virtual IP address for SQL Server, IP addresses for each node in the failover cluster, shared drives for each node in the failover cluster, shared drives for the Quorum Disk, and MSDTC Disk.

Q38) What is Transparent Data Encryption?

Introduced in SQL Server 2008 Transparent Data Encryption (TDE) is a mechanism through which SQL Server Database files from unauthorized access through encryption. Also, TDE can protect data on which TDE was setup.

Q39) Does Transparent Data Encryption provide encryption when transmitting

No, Transparent Data Encryption (TDE) does not encrypt the data during transfer over a communication channel.

Q40) What are the operating modes in which Database Mirroring runs?

Database Mirroring runs in 2 operating modes High-Safety Mode and High-Performance Mode.

Q41) What is the difference between the 2 operating modes of Database Mirroring (mentioned in the above answer)?

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1. High-Safety Mode is to ensure that the Principal and Mirrored database are synchronized state, that is the transactions are committed at the same time on both servers to ensure consistency, but there is/might be a time lag.
2. High-Performance Mode is to ensure that the Principal database run faster, by not waiting for the Mirrored database to commit the transactions. There is a slight chance of data loss and also the Mirrored database can be lagging behind (in terms being up to date with the Principal database) if there is a heavy load on the Mirrored Server.

Q42) When setting Replication, is it possible to have a Publisher as 64 Bit and Subscribers as a 32 Bit SQL Server.

Yes, it is possible to have various configurations in a Replication environment.

Q43) What is the difference between dropping a database and taking a database offline?

Drop database deletes the database along with the physical files, it is not possible to bring back a backup of the database. When you take a database offline, you the database is not available but it can be brought back online.

Q44) Which autogrowth database setting is good?

Setting an autogrowth in multiples of MB is a better option than setting autogrowth in percentage.

Q45) What are the different types of database compression introduced in SQL Server 2008?

Row compression and Page Compression.

Q46) What are the different types of Upgrades that can be performed in SQL Server?

In-place upgrade and Side-by-Side Upgrade.

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Q47) On a Windows Server 2003 Active – Passive failover cluster, how do you find the node which is active?

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Using Cluster Administrator, connect to the cluster and select the SQL Server cluster. Once you have selected the SQL Server group, on the right-hand side of the console, the column "Owner" gives us the information of the node on which the SQL Server group is currently active.

Q48) How do you open a Cluster Administrator?

From Start -> Run and type CluAdmin (case insensitive) and the Cluster Administrator console will open.
to Start -> All Programs -> Administrative Tools -> Cluster Administrator.

Q49) Due to some maintenance being done, the SQL Server on a failover cluster is down. How do you bring the SQL Server down?

In the Cluster Administrator, right click on the SQL Server Group and from the popup menu it will be available.

Q50) What are the different ways you can create Databases in SQL Server?

- 1.T-SQL; Create Database command.
- 2.Using Management Studio
- 3.Restoring a database backup
- 4.Copy Database wizard

Q51) When setting Replication, can you have a Distributor on SQL Server 2005, Publisher of SQL Server 2008?

No, you cannot have a Distributor on a previous version than the Publisher.

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By Ravindra Savaram



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