

## SQLDBA-Pocket Guide and Tips Gambit

#	Question/Problem	Answer/Solution
76	What are the places one has to look for diagnosing performance issues	<ul style="list-style-type: none"><li>➤ Check if somebody has done index maintenance with a Fill Factor of the previous index maintenance activity, which was only suitable at that time.</li><li>➤ Check the processes running using sp_who2</li><li>➤ Check slow running queries, queries in blocking sessions , check the isolation level used in those queries.</li><li>➤ Check Index fragmentation</li><li>➤ Check page splits (especially reads get slowed down due to them)</li><li>➤ Index structure (like absence of INCLUDE on the non-clustered index)</li><li>➤ Database partitioning on that table(s)</li><li>➤ Check any network issues by involving Infrastructure team</li><li>➤ Check the database files and file groups are created properly (especially for large databases)</li><li>➤ If everything is fine , then check the Setting Collation s , which are most likely to be different from the legacy systems (if migration has been recently done)</li></ul>
77	What are the solutions that can be applied for	<p>Query Tuning</p> <ul style="list-style-type: none"><li>➤ Index Defragmentation</li><li>➤ Database Partitioning</li></ul>

	improving performance.	<ul style="list-style-type: none"> <li>➤ Choosing appropriate 'isolation level' in the T-SQL code.</li> <li>➤ Introducing Fillfactor to reduce page splits</li> <li>➤ Introduce Identity column to almost totally remove page splits.</li> <li>➤ Index Rebuild or Reorganize</li> <li>➤ Make the collation same as the old system (if migration has been done)</li> <li>➤ Remove indexes that are not required</li> </ul>
78	What is isolation level ?	<p>An isolation level is a T-SQL-transaccional-level data read-consistency control mechanism. It spans the T-SQL session unless changed to a different isolation level.</p> <p>Command to set an isolation level in a query session</p> <p><b>SET TRANSACTION ISOLATION LEVEL</b></p> <p>Types of Isolation levels :</p> <p><b>READ UNCOMMITTED</b> : A query in current transaction can read data that is written by another transaction even though not yet committed.</p> <p>Causes <b>dirty reads</b> as the current transaction can read data that is updated, deleted but never committed.</p> <p>As the data being accessed by the current transaction can be modified by the other transaction, it can cause <b>non-repeatable reads or phantom reads</b>.</p>

		<p>Causes <b>dirty reads, non-repeatable reads or phantom reads</b>.</p> <p><b>READ COMMITTED</b> : A query in current transaction cannot read data being modified by another transaction that is not yet committed.Can see only committed data.</p> <p><b>Avoids - dirty reads</b></p> <p><b>Non-repeatable reads, phantom reads</b> still possible as other transactions between issuing statements in the current transaction can still modify the data committed.</p> <p><b>READ COMMITTED is the default isolation used by SQL server.</b></p> <p><b>REPEATABLE READ</b></p> <p>Query in current transaction cannot read data being modified by other transaction which is not yet committed which <b>avoids dirty reads</b>. Moreover, no other transaction can modify the data being read by the current transaction , <b>eliminating the non-repeatable reads</b>.However , if a query in between the issuing statements in the current transaction has to do a second read with a matching search condition , <b>it may cause phantom reads</b> .</p> <p><b>SERIALIZABLE</b></p> <p>Query in current transaction cannot read data being modified by other transaction which is not yet committed which <b>avoids dirty reads</b>. Moreover, no other transaction can modify the data being read by the current transaction ,</p>
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		<p><b>eliminating the non-repeatable reads.</b>Also no other transaction , that has a matching search condition same as that of the current transaction , can modify the data until the current transaction completes , <b>eliminating the phantom reads</b> . This isolation level has biggest impact on performance than any other level.</p> <p><b>SNAPSHOT</b></p> <p>Snapshot isolation works with a snapshot of the data set</p> <p>Being read by the current transaction , by keeping completely isolated from other until completion. Other transactions can modify the original data and cannot work with data set of the current transaction and neither can the current transaction read the modifications on the original recordset . This too eliminates all the three issues above. However, it is susceptible to concurrent update errors. (not ANSI/ISO SQL standard)</p> <p>Suggested reading</p> <p><a href="https://www.simple-talk.com/sql/t-sql-programming/questions-about-t-sql-transaction-isolation-levels-you-were-too-shy-to-ask/">https://www.simple-talk.com/sql/t-sql-programming/questions-about-t-sql-transaction-isolation-levels-you-were-too-shy-to-ask/</a></p>
79	What is a resource database ?	<p>From SQL server 2005 onwards, Microsoft introduced an <b>invisible , read-only system database called Resource Database</b>. Resource database physically contains all system objects like sys objects table , but these objects are</p>

		<p>only logically present in the sys schema of all the other databases. It's a very critical system database as SQL server service is dependent on it.</p> <p><b>Advantages</b></p> <ol style="list-style-type: none"> <li>1. Enables rollback of system objects upgrades. Prior to 2005 , if upgrades to system objects had to be rolled back , the only was to uninstall SQL server and reinstall it , and then recover the databases.From 2005 onwards, the backup of the resource database's data (mssqlsystemresource.mdf) and log files (mssqlsystemresource.ldf)are enough to rollback the upgrade.Just replicate the copied versions prior to the upgrades will do the job.</li> <li>2. Enables fast upgrade . If many instances of SQL have to be upgraded with the same service pack , the DBA has to upgrade one instance and then copy the latest files of the resource database from this instance and simply replace the older files in all other instances to upgrade all the instances.</li> </ol> <p>Other information</p> <p>sp_helpdb doesn't list the resource database</p> <p>It cannot be backed up using the backup database command . only way is to copy its mdf and ldf and use if required.</p> <p>If the resource db files are missing or renamed , sql server will not start.</p>
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80	Difference between restore and recover DB?	<p>Restoration is a physical act of copying backup files to the system and registering them with sql server .Example , restoring a database from a fullbackup , and apply any trans logs and restore to a point in time.</p> <p>Recovery is the operation of Rolling Forward or Rolling Back any transactions to get the database to a consistent state from No-Recovery mode to a Recovery mode in which the database becomes online and accepts connection.</p> <p>Recovery is also done by SQL server instance when it restarts after a brutal shutdown and then recovers the database to a consistent state by rolling forward committed transactions and rolling back those uncommitted.</p>