Reason For Integrity Check Failures During DB Backup

Overview

Sometimes when backing up the RDS Intranet database using the SQL Server maintenance plan, an error is reported that the backup failed the integrity check step. The error does not occur all the time, and does not appear to prevent the backup from successfully finishing.

Reason for Errors

In most cases, the integrity check step failed because the SQL Server software encountered a minor error that could not be repaired. In those cases, it could not be repaired because the database was not in single user mode. That mode is not the standard RDS Intranet operating mode and RDS Intranet will not operate in it.

Single User Mode Invoked by SQL Server

When minor errors are encountered, SQL Server needs to switch to single user mode to execute the repair. However, if any other user is logged onto the database, it won't be able switch into this mode. That causes the aforementioned error.

Error Feedback

The maintenance plan executes the SQL command DBCC CHECKDB that performs integrity checks and makes repairs. By invoking that command directly from the SQL Analyzer, detailed information about the errors is made available.

Maintenance Plan Selections

If index repair is selected in the maintenance plan, DBCC CHECKDB is called using one of the parameters in table 1 (content obtained from Microsoft's website). More details about DBCC CHECKDB can be found at http://msdn.microsoft.com.

Parameter	Action
Repair_Fast	Performs minor, non time-consuming repair actions such as repairing extra keys in non-clustered indexes. These repairs can be done quickly and without risk of data loss.
Repair_Rebuild	Performs all repairs done by Repair_Fast and includes time-consuming repairs such as re-building indexes. These repairs can be done without risk of data loss.

Table 1 – DBCC CheckDB Command Parameters

Resolution

Several solutions are available if errors are encountered. Here are three, including comments about each:

1) Modifying the maintenance plan to disable the option to "Attempt to repair any minor problems" will prevent the error from occurring, but also prevents the database from repairing itself.

2) Making sure that everyone is logged out of the database during the backup prevents errors, but is difficult to implement in normal situations, and almost impossible in a 24/7 operation.

3) When errors are encountered, the integrity check and repair step can be run at a time no one is using the database. That is, the database can be taken offline and single user mode invoked for repairs.

Reedholm believes that option three is the most practical to assure database quality and reliability. Of course, operating policies need to invoke corrective action when errors occur that are not automatically fixed. The policy could include running DBCC CHECKDB to report severity of errors.