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Troubleshooting automatic failover problems in SQL Server AlwaysOn

Summary:

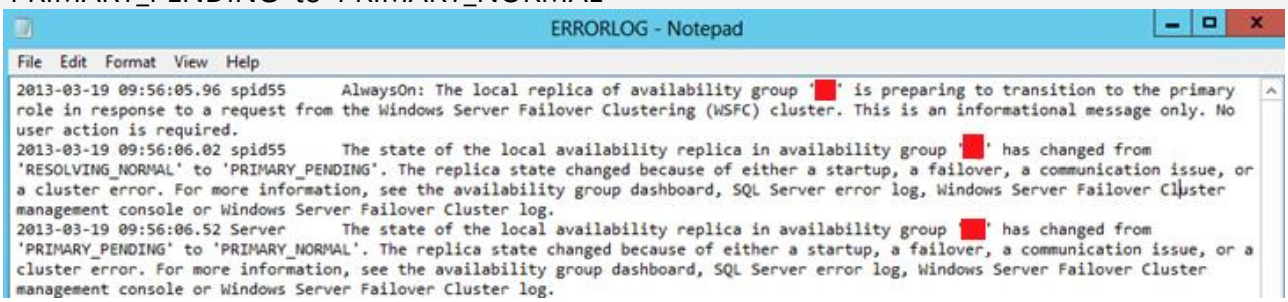
Microsoft SQL Server - AlwaysOn availability groups can be configured for automatic failover. Therefore, if a health issue is detected on the instance of SQL Server that is hosting the primary replica, the primary role can be transitioned to the automatic failover partner (secondary replica). However, the secondary replica cannot always be transitioned to the primary role, instead being transitioned only to the resolving role. Unless the primary replica returns to a healthy state, there is no replica in the primary role. Additionally, the availability databases are inaccessible.

The symptoms when an automatic failover is triggered successfully

When an automatic failover is triggered on the instance of SQL Server that is hosting the primary replica, the secondary replica transitions to the resolving role and then to the primary role. Additionally, you receive error messages in the SQL Server log report that resemble the following:

The state of the local availability replica in availability group '<**Group name**>' has changed from 'RESOLVING_NORMAL' to 'PRIMARY_PENDING'

The state of the local availability replica in availability group '<**Group name**>' has changed from 'PRIMARY_PENDING' to 'PRIMARY_NORMAL'



Note The secondary replica transitions successfully from a RESOLVING_NORMAL status to a PRIMARY_NORMAL status.

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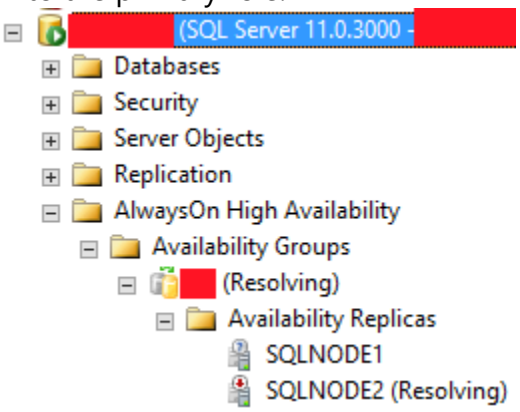
The symptoms when automatic failover is unsuccessful

If an automatic failover event is not successful, the secondary replica does not successfully transition to the primary role. Therefore, the availability replica will report that this replica is in Resolving status. Additionally, the availability databases report that they are in Not Synchronizing status, and applications cannot access these databases.

For example, in the following image, SQL Server Management Studio reports that the secondary replica is in Resolving status because the automatic failover process was unable to transition the secondary replica into the primary role:



This article describes several possible reasons that automatic failover may not succeed, and how to diagnose each cause.

Case 1: "Maximum Failures in the Specified Period" value is exhausted
Case 2: Insufficient NT Authority\SYSTEM account permissions
Case 3: The availability databases are not in a SYNCHRONIZED state.

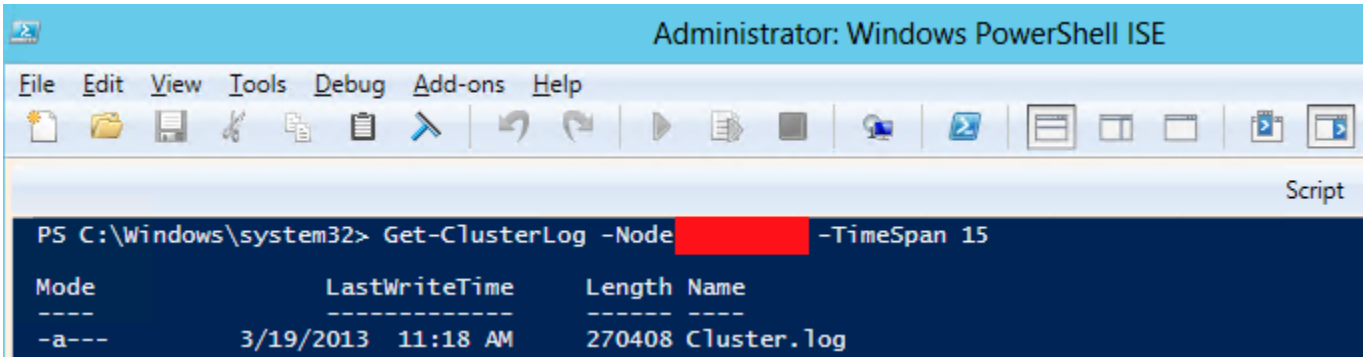
The availability group has Windows cluster resource properties, such as the Maximum Failures in the Specified Period property. This property is used to avoid the indefinite movement of a clustered resource when multiple node failures occur.

To investigate and diagnose whether this is the cause of unsuccessful failover, review the Windows cluster log (Cluster.log), and then check the property. To do this, follow these steps:

Step 1: Review the data in the Windows cluster log (Cluster.log)

1. Use Windows PowerShell to generate the Windows cluster log on the cluster node that is hosting the primary replica. To do this, run the following cmdlet in an elevated PowerShell window on the instance of SQL Server that is hosting the primary replica:

   ```
   Get-ClusterLog –Node <SQL Server node name> –TimeSpan 15
   ```

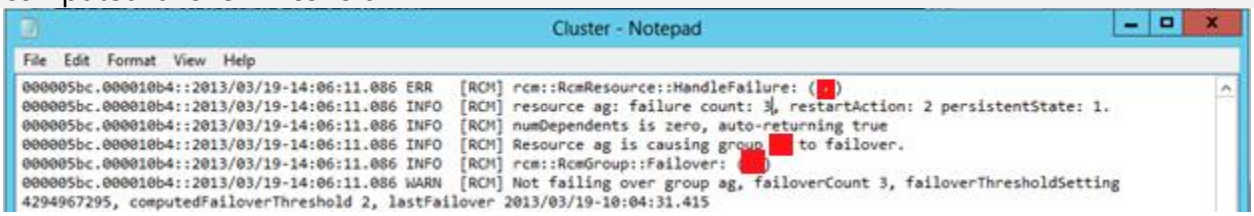


Notes

- The -TimeSpan 15 parameter in this step is used under the assumption that the issue being diagnosed occurred in the previous 15 minutes.
- By default, the log file is created in %WINDIR%\cluster\reports.

2. Open the Cluster.log file in Notepad in order to review the Windows cluster log.
3. Click **Edit** in Notepad, and then click **Find**, and search for the string "failoverCount" at the end of the file. Review the results, and you should find a message that resembles the following:

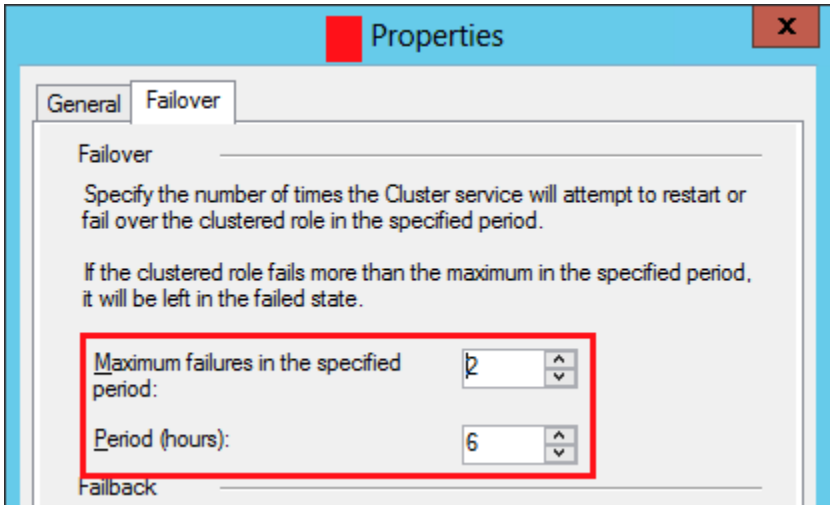
Not failing over group <**Resource name**>, failoverCount 3, failoverThresholdSetting <**Number**>, computedFailoverThreshold 2



Step 2: Check the Maximum Failures in the Specified Period property

1. Start Failover Cluster Manager.
2. In the navigation pane, click **Roles**.
3. In the **Roles** pane, right-click the clustered resource, and then click **Properties**.

4. Click the **Failover** tab, and check the **Maximum Failures in the Specified Period** value.



Note The default behavior specifies that if the clustered resource fails three times in a six hour period, it should remain in the failed state. For an availability group, this means the replica is left in the RESOLVING state.

Conclusion

After you analyze the log, you find that the failoverCount value of 3 is greater than the computed Failover Threshold value of 2. Therefore, Windows cluster cannot complete the failover operation of the availability group resource to the failover partner.

Resolution

To resolve this issue, increase the **Maximum Failures in the Specified Period** value.

Note Increasing this value may not resolve the issue. There may be a more critical issue that causes the availability group to fail many times in a short period, which is 15 minutes by default. Increasing this value may only cause the availability group to fail more times before remaining in a failed state. We recommend an aggressive troubleshooting effort to determine why automatic failover keeps occurring.