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| **ms163987** |
| **To resolve any *SQL Server Backup Failure* issue.** |
| SQL Server Scheduled Job ***\_SQL\_BackupAll*** has failed. |
| SQL Server Scheduled Job ***\_SQL\_BackupTranAll*** is in failed state. |
| SQL Server Scheduled Job ***\_SQL\_BackupDiffAll*** is in failed state. |
| This problem occurs when a SQL Server database backup has been invoked and the dependent resources are not available or they are corrupt. |

**Error Samples**

**Sample 1**

The backup folder does not exist.Check job documentation at "http://sharepoint/sites/smdsql/Shared Documents/SQLOps\_JobSuite/SqlOpsJobSuite\_v2\_UserManual.docx" for more details [SQLSTATE 42000] (Error 50000). The step failed

.**Sample 2**

**The backup data at the end of "EDS3DControl\_Compressed.bak"" is incorrectly formatted.**

**Sample 3**

BackupDiskFile::CreateMedia: Backup device 'o:\mssql\bak\BIData.bak' failed to create. Operating system error 5(Access is denied.)

**Sample 4**

**For the issue described above in Symptom 4 [Backup process is unresponsive and appears to be hung], when you examine the job history for the backup job, you may notice an error similar to the following :**

**Backing Up DB: NGSDataExchange [SQLSTATE 01000] (Message 0)  Backup, file manipulation operations (such as ALTER DATABASE ADD FILE) and encryption changes on a database must be serialized. Reissue the statement after the current backup or file manipulation operation is completed. [SQLSTATE 42000] (Error 3023)  The backup or restore was aborted.**

**Sample 5**

**This is applicable only to SQL Server 2012 – AlwaysOn enabled servers.**

***Log backup for database "XXX" on a secondary replica failed because the last backup LSN (0x00096e02:000004a9:0001) from the primary database is greater than the current local redo LSN (0x00096e02:000004a8:0002). No log records need to bebacked up at this time. Retry the log-backup operation later. [SQLSTATE 42000] (Error 35295)  BACKUP LOG is terminating abnormally. [SQLSTATE 42000] (Error 3013)  BACKUP LOG successfully processed 72525 pages in 13.293 seconds (42.623 MB/sec). [SQLSTATE 01000] (Error 3014)***

**Resolution**

**1.      Get the timing of the exact error from alert generated. Or execute SELECTtop 20 \*FROMSQLOPSDB.dbo.Tbl\_proc\_errorsWHEREErrorProcedure='<<Proc Name>>'**

**orderbyErrorDatedesc.**

***<<Proc Name>> is usp\_backupAll – full backup; usp\_backuptran – Tran backup; usp\_backupDiff – Diff Backup***

**2.      Most of the times the generic error message was recorded in this table for backup jobs, this is due to the default error reporting / handling mechanism in SQL Server.**

**3.      Check if the last run for the job \_SQL\_BackupAll was successful**

**4.      If yes go to step 8**

**5.      If no, get the database(s) names for which the backup was failed.**

**a.      Identify database names with backupstatus = -1 using the below query.   
SELECT \* FROM SQLOPSDB.dbo.Tbl\_SQLBackupcommands/ Tbl\_SQLBackupTrancommands / Tbl\_SQLBackupDiffcommands**

**6.      Get the permission from Customer to run the backup command ( Full and Diff backup job only) and copy backupCommand column value from the above query and execute it from SSMS to get the exact error message..**

**7.      Check the SQL Server Error log for the exact cause for failure**

**a.      Space Issue in backup drive (error 112):*check if there are any old backup files or any other non-backup files and inform the customer to move or delete them and create some space in the drive or ask customer to create some space on the drive.***

**b.      FORMAT error (sample 2): Rename the existing backup file. Ensure there is enough space to hold 2 backup files or as ask customer to move / delete the files.**

c.      **Access id denied Error (Sample 3):** Check if SQL Server account have full permissions on the backup drive/folders.

**d.      Backup Folder does not exists (Sample 1) : The following are the default backup folders  
Full Backup – E:\MSSQL\BAK  
Diff Backup – E:\MSSQL\BAK\Diff  
Log Backup – F:\MSSQL\Tran  
Get the backup folder details from customer and insert the details in Tbl\_ParamBackup table.(refer v2.0 documentation for more details ). There is no need to insert folder details in parameter table, if customer wants to take the backup in default folder. Create the default folders in the server.  
  
use the script from** [**\\TK5SQLOPSCOR01\S$\Tools\scripts\CreateBackupDir.sql**](file:///\\tk5sqlopscor01\S$\Tools\scripts\CreateBackupDir.sql) **to create the backup folders and set the permissions.**

**e.      *Log backup failed on secondary replica (Sample 5) : Check if Transaction Log backups were configured on both Primary and Secondary Replicas, if so ask customer to disable the Transaction Log backup on one of the replicas or help customer to set the Backup job parameters properly.***

**8.      Open the SQL Server Error logs and search for the failure cause and document it in the Incident Ticket.**

**9.      To rerun the backup. Update the backupstatus from -1 to 0 and run STEP 2 in the backup job.**

***\*\* involve customer before you kill the long running backup job or run the backup job after fixing the issue.***

***Some Additional details.***

***1.  Run the below query and check the startdate and enddate columns to identify the duration of the backup on particular database or how long the backup job is running.*SELECT\*FROMSQLOPSDB.dbo.Tbl\_SQLBackupcommands**

***2.* To find the progress of the backup  
  
selectpercent\_complete,\*fromsys.dm\_exec\_requestswherecommandlike'%BACKUP%'**

**ms164922**

Top of Form



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| **To Troubleshoot with SQL Job Failures** | | | |
| SQL Server 2005 | | | |
| SQL Server 2008 | | | |
| SQL Server 2012 | | | |
| A SQL job failed to complete successfully. | | | |
| 61001: 'There were some execution errors while running usp\_xxx , check SQLOPSDB.dbo.Tbl\_Proc\_Errors for more details | | | |
| Background or cause  A red circle with an X inside of it indicates that the job is failing. If the \_SQL\_ jobs fail with any non-critical errors, the job history don’t show them as failures. Check details section in job history window and query Tbl\_proc\_Errors table and check ERRORLOGS for more details related to job failures.    Job failures error is raised by all \_SQL\_ jobs when the jobs encounter with some non-critical errors. The errors will be captured by Try….Catch Block in the code and raise an error.  **Alerts**  *Job failure Error*  61001: 'There were some execution errors while running usp\_xxx , check SQLOPSDB.dbo.Tbl\_Proc\_Errors for more details...'  usp\_xxx is the name of the stored procedure related to the \_SQL\_ jobs. The stored procedure names are self-explanatory and procedure names are similar to Job names.  Refer to the SQLOps job manual, if you need any additional details.  Troubleshooting Steps  The additional details related to the failure are available in SQLOPSDB.dbo.Tbl\_Proc\_Errors table.  '2012-09-23 22:40:33.603: There were some execution errors while running usp\_DiffBackupAll01, check SQLOPSDB.dbo.Tbl\_Proc\_Errors for more details...  Query SQLOPSDB.dbo.Tbl\_Proc\_Errors table with timestamp available from the alert.You can find the error message related to the failures for all the jobs except backup jobs, a generic error message will be recorded for backup job failures.  SELECT\*FROMSQLOPSDB.dbo.Tbl\_Proc\_ErrorsWHEREErrorDate='2012-09-23 22:40:33.603'  OR  SELECT \*FROMSQLOPSDB.dbo.Tbl\_Proc\_Errors order by ErrorDate desc  And see the latest errors. If you find the job is frequently failing i.e. failed more than once time during last 7 days.  Please contact L3 for further troubleshooting.    Top of Form     |  |  |  |  | | --- | --- | --- | --- | |  | |  | **ms164682** | |  |  | |  | | **SQL Server Scheduled Job “\_SQL\_TranReplicationLatencyMonitor “  has failed** | | | | | | SQL Server 2005 | | | | | | SQL Server 2008 | | | | | | SQL Server 2012 | | | | | | Replication out of synch | | | | | | Replication is slow | | | | | | **Sample 1**  ***Error 60201*** *Transactional replication latency threshold exceeded. Publication Server: AZHARTAJ1.Publication [TestTransactional1]: Pub\_TestTran1. Subscriber: [AZHARTAJ1\CANCUN].[TranSub1]. Current Overall Latency: 125 min(s). Threshold: 120 min(s). Distributor Latency: "Null" sec(s). Subscriber Latency: "Null" sec(s). The last inserted tracer token has not made it to the subscriber yet. In fact, it has not even made it to the Distribution db. Please check the replication LogReader SqlServerAgent job.*  **Explanation**  In this case, distributor latency (time taken by the tracer token to go from the Publication db to the distribution db), as well as the subscriber latency (time taken by the tracer token to go from the distribution db to the subscription db), is null. This means that the token has not even reached the distributor as yet and you are already over the configured latency threshold. So most probably, you are experiencing an issue with the LogReader replication agent.  **Resolution Steps**    Refer to the article, [**To Troubleshoot with LogReader Agent**](javascript:OpenSolutionInPopup(-1,'ms164683','','','','',false,'645e58d2-ea48-4957-820f-cb10da3c58ef','ASPSESSIONIDSSSBQRTQ=KBNNLIHBJLLKPOBNBCHLAJDH')).    **Sample 2**  ***Error 60201*** *Transactional replication latency threshold exceeded. Publication Server: AZHARTAJ1.Publication [AdventureWorks]: AdventureWorks\_TestPublication. Subscriber: [AZHARTAJ1\CANCUN].[AW\_Subscriber2]. Overall Latency: 1415 min(s). Threshold: 120 min(s). Distributor Latency: 5 sec(s). Subscriber Latency: 84910 sec(s). The last inserted tracer token has reached the subscriber, but latency is over the configured threshold.*  *Or*  ***Error 60201*** *Transactional replication latency threshold exceeded. Publication Server: AZHARTAJ1.Publication [AdventureWorks]: AdventureWorks\_TestPublication. Subscriber: [AZHARTAJ1\CANCUN].[AW\_Subscriber2]. Current Overall Latency: 125 min(s). Threshold: 120 min(s). Distributor Latency: 2 sec(s). Subscriber Latency: "Null" sec(s). The last inserted tracer token has not made it to the subscriber yet.*  **Explanation**  In this case, the token has reached the subscriber, but the overall latency threshold has still been violated. This could be a LogReader or a Distribution agent issue. Looking at distributor and subscriber latency numbers will give the clues. In general, if one of the latencies is in seconds, while the other is in minutes or hours, we would deduce that the replication agent associated with the bigger latency is the problem. Note that the LogReader agent is associated with the Distributor Latency and that the Distribution agent is associated with the Subscriber latency.  **Resolution Steps**  Refer to the articles, [**To Troubleshoot with LogReader Agent**](javascript:OpenSolutionInPopup(-1,'ms164683','','','','',false,'645e58d2-ea48-4957-820f-cb10da3c58ef','ASPSESSIONIDSSSBQRTQ=KBNNLIHBJLLKPOBNBCHLAJDH'))\ [**To Troubleshoot with Distribution Agent**](javascript:OpenSolutionInPopup(-1,'ms164700','','','','',false,'645e58d2-ea48-4957-820f-cb10da3c58ef','ASPSESSIONIDSSSBQRTQ=KBNNLIHBJLLKPOBNBCHLAJDH')).  **Sample 3**  ***Error 60200.****Transactional replication latency is continuing to build up. Publication Server: AZHARTAJ1. Transaction log for the published db "PotatoHead" is 100.00% full. To see what might be preventing the transaction log from clearing up, use query: "select Name, Log\_Reuse\_Wait, Log\_Reuse\_Wait\_Desc from master.sys.databases where Is\_Published = 1". To see the publications affected by this, run query: "Use TestTransactional1 Exec sp\_helppublication". Likewise, to see the subscriptions affected by this, run query: "Use TestTransactional1 Exec sp\_helpsubscription".*  **Explanation**  In the above case, the transaction log of a published database is full. In that case, tracer tokens cannot be inserted to the publication, and replication latency will continue to increase.  **Resolution Steps**  Refer to the article,**[SQL Server Database Log File Full](javascript:OpenSolutionInPopup(-1,'ms164676','','','','',false,'645e58d2-ea48-4957-820f-cb10da3c58ef','ASPSESSIONIDSSSBQRTQ=KBNNLIHBJLLKPOBNBCHLAJDH'))**. | | | | | | * 1. From a workstation or server with SQL Server 2005/2008 installed (you may need to open a terminal server remote session to one), click **Start -> Programs -> Microsoft SQL Server**.   2. Click **SQL Server Management Studio**.   3. In the **Connect to Server** dialog box, type the server name of the SQL server that you are troubleshooting. This will start **Object Explorer**.   4. In **Object Explorer**, connect to an instance of the **SQL Server Database Engine**, and then expand that instance.   5. Expand **SQL Server Agent**, and then expand **Jobs**.   6. Right-click the job **“\_SQL\_TranReplicationLatencyMonitor**, and then click **View History**. **Log File Viewer** will open showing the history of the selected job(s).      1. A successful job will display with a green check mark.      2. A failed job will display with a red circle with a white **X** in the middle.  1. **Note** To update the job history, click **Refresh**. To view fewer rows, click the **Filter** button, and then enter filter parameters.    1. To determine which step of a job failed, click the plus sign to the left of the red circle.       1. A retried step will have a white circle with a blue arrow.       2. A failed step will have a red circle with a white **X** in the middle. | | | | |   Bottom of Form | | | |
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**ms164676**

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| **Back up the transaction log for the database to free up some log space.** |
| SQL Server 2012 |
| SQL Server 2008 |
| SQL Server 2005 |
| Error: 9002, Severity: 17, State: 2. The log file for database '%.\*ls' is full. |
| 61001 - There were some execution errors while executing \_SQL\_CapacityMonitor , check SQLOPSDB.DBO.Tbl\_Proc\_Errors for more details |
| SQL Server is unable to allocate new pages to a database log file. Mostly, this is caused by a process that has run longer than expected or has hung but there are several factors that can impact the size of a transaction log and the appropriate response depends on the condition causing the transaction log to fill. |
| Background or cause  Log file full errors are raised by SQL Server when there is no space in the log file due to autogrowth restrictions or disk space issues. There are several factors that can impact the size of a transaction log and the appropriate response depends on the condition causing the transaction log to fill. SQL Server databases don’t get into this state if data file full warnings are handled effectively.  Log file full warnings are raised by SQLOPS capacity monitoring job (\_*SQL\_CapacityMonitor)* when space usage in database log file exceeds specified threshold.  **Alerts**  *Log file full error*  Error: 9002 Severity: 17 State: 1  The transaction log for database '%.\*ls' is full. To find out why space in the log cannot be reused, see the log\_reuse\_wait\_desc column in sys.databases  *Log file full warnings*  *2012-03-15 21:57:37 -* Log capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: Log file(s) 87.50% used. Threshold: 85%. Configured auto-grow cannot take place due to maxcap or drive space.  *2012-03-15 21:57:37 -* Log capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: Log file(s) 97.50% used. Threshold: 75%. No log file(s) are configured for auto-grow.  *2012-03-15 21:57:37 -* Log capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: Log file(s) 87.50% used. Threshold: 85%. Configured auto-grow will not reduce usage below threshold due to Inappropriate auto grow settings.  These warning messages will be fired in the following scenarios  1.      Auto growth is not configured on the database/File Group  2.      Auto growth cannot happen due to Maximum File Size restrictions.  3.      The next Auto growth size is greater than the free space available.  Troubleshooting Steps  *Considerations before continuing:*  Before making any changes, verify that there is no restriction in place with the application support team regarding making any changes to the underlying servers.  *Actions:*  1.       If the database file is 99% full and you observe the data file full errors, engage customer immediately and add an additional file in different drive as workaround to resolve the problem temporarily.  2.       Check the Autogrowth settings, if Autogrowth is disabled inform customer to enable it.  3.       If the maximum file size is restricted, check the available disk space and increase Restricted File Growth (MB) by 100 MB. Send email to customer to inform the change and ask them to take the appropriate action.  4.       Use the below query to find Database file growth settings or check database properties using SSMS  selectdb\_name(database\_id),type\_desc,name,physical\_name,state\_desc,size/128 Size,  casewhenmax\_size=-1 then-1 whentype= 1 andmax\_size= 268435456 then-1 else (max\_size/ 128)endasmax\_sizeMB,  caseis\_percent\_growthwhen 0 then (growth/ 128 )when 1 thengrowthelsenullendasgrowth,  caseis\_percent\_growthwhen 0 thencast((growth/ 128 )asvarchar(20))+' MB'when 1 thencast(growthasvarchar(20))+' Percent'elsenullendasgrowth,  caseis\_percent\_growthwhen 0 then (growth/ 128) when 1 then ((growth/ 100 )\*size)/ 128 elsenullendasnextGrowthIncMB  fromsys.master\_files  5.       If disk is almost full inform the user and ask them to make some space on the drive by deleting any old files or request for additional disk space.  6.       Check the recovery model of the database   SELECT DATABASEPROPERTYEX ( 'Database Name' , 'Recovery' )  If “Recovery Mode” set to “Full” ensure that there is a valid transaction log backup job (\_SQL\_BackupTranAll ) and that it is not failing. If the transaction log backup job fails then the log will not be able to truncate. If you don’t find the default transaction log backup job, run the below statement to find the transaction log backup details..   SELECT \* FROM msdb.dbo.backupset WHERE database\_name = 'Database Name' AND type ='L' AND backup\_finish\_date BETWEEN GETDATE ()-1 AND GETDATE ().  If the transaction log backups are successful or recovery mode is SIMPLE, execute the below statement to see what is stopping transaction logs to truncate. Send this information to customer to take the further action.  SELECT name,log\_reuse\_wait\_desc FROM sys.databases WHERE name = 'Database Name'  7.       Use the below query to get the disk space on the drives used by SQL Server.  SELECTdistinct  volume\_mount\_pointDriveName,  total\_bytes/1048576 CapacityMB,  available\_bytes/1048576 FreeSpaceMB  FROMsys.master\_filesASf  CROSSAPPLYsys.dm\_os\_volume\_stats (f.database\_id,f.file\_id)  8.       Check if there are any open transaction using DBCC OPENTRAN and DBCC INPUTBUFFER and inform the customer.  9.       Run the below query to find the snapshot of disk and file space details at the time of capacity alert. Understand the space requirements from the output and advice the customers accordingly.  SELECT \* FROM SQLOPSDB.dbo.Tbl\_DB\_SpaceIssues WHERE CreatedDate = <<Alert Date>> (*get the Alert Time from* Database capacity threshold exceeded *alert message*).  10.    Check the below link for some additional troubleshooting steps. <http://msdn.microsoft.com/en-US/library/ms175495(v=SQL.90).aspx>  11.    If the alert message is similar to alert 1 or 3 in the Alerts section, Ask customer to use appropriate autogrowth settings. <http://technet.microsoft.com/en-us/magazine/2008.08.database.aspx>  Execute the below query and see if the database that you are troubleshooting is frequently causing space related issues. If this database is frequently raising the alerts ask customer to add additional disk space or exclude the database from monitoring, if there is any maintenance activity is happening on the database.  If you see frequent space issues on the server, loop SQL Operations Escalations ([sqlopesc@microsoft.com](mailto:sqlopesc@microsoft.com)).  SELECT top 50 \* from SQLOPSDB.dbo.SQLOPS\_Daily\_Alerts where DBname = '<<Database Name>>' and ErrorNum in (60110,60120) order by AlertTime desc  SELECT\*FROMSQLOPSDB.dbo.Tbl\_DB\_SpaceIssuesWHEREDBNAme='<<DBNAME>>'ANDNEXTAutogrowFits='No'    *12.* If the database that you are troubleshooting is Tempdb, check with the customer and see shrinking the Tempdb is an option. <http://support.microsoft.com/kb/307487/en-us> |

**ms213732**

Top of Form



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| SQL Incident Management |
| SQL Server 2000/2005/2008/2008R2/2012.  Many times when an attempt is made to connect a SQL server remotely, the connection fails with the error “SQL Server Doesn’t Exists or Access Denied” or “SQL Server is unavailable or does not exist” or “The specified SQL Server is not found” or "Unable to Connect to SQL Server" |
| The above error message is received in the below conditions: Server-related causes  **-** SQL Server is not installed  **-** SQL Server is not started  **-** SQL Server is not listening  **-** The SQL Server name is different from the computer name  -        Client-related Connection String related errors  -        Wrong [Alias](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SQL%20Client%20alias.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1)  -        Protocol version mismatch  Network-related or domain-related causes  -        A firewall or router is not configured properly or has been configured to block UDP port 1434.  -        The local security policy user rights assignment for your Windows account does not allow access from the network.  -        Domain trust problem  -        Name resolution is not working    The "SQL Server does not exist or access denied" message does NOT indicate the following:  -        That the logon process to SQL Server failed.  -         That SQL Server does not have the correct permissions to process the query.  That you cannot use SQL Server authentication because only Windows authentication is permitted |
| Start with [Basic Connectivity tests](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Basic%20Connectivity%20Tests.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1). We can usually uncover the cause from the Basic connectivity tests. Preserve the results from TCP/IP tests, Telnet and protocol tests, IPConfig /All before making any significant changes.  Other tests could be:  Check if SQL Service is running.  Verify the error logs to check if SQL is ready for client connections.  Connect to SQL Server locally.  See if the instance of SQL Server is started in single-user mode.  Check if the SQL Server machine name is recently renamed. Document what select @@servername is displaying.  Open cliconfg.exe on the client machine to verify the client protocols configured, aliases configured etc.  Check if firewall is configured to allow SQL TCP ports, NP traffic.  Check local security policy for the account being used to connect to SQL. The "Access this Computer from the Network" policy must be permitted. Additionally, the "Deny access to this computer from the network" right must not be granted.  Check which domain the client, server is in. If they trust each other and if at least the server domain trusts the client domain. You can connect from a REDMOND (corp) domain client machine to a server in partners / parttest but not vice versa. If we need to get the latter working, ACLs need to be opened to allow SQL traffic, ports.  Capture output from [SSCD](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SSCD.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1).  **Resolution**  **Services are in stopped state:**  Check event viewer and if you find "The SQL Server (MSSQLSERVER) service failed to start due to the following error: The service did not start due to a logon failure."  **Reason and Resolution:** SQL Service account password is either incorrect or has been expired, You've to work with application team to get correct password or a different service account details along with the correct password.  Based on the outcome of the steps described above, take the necessary actions to resolve the issue.  If you need to escalate the IR, follow the escalation process documented [here](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Escalation%20document.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%257bE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%257d%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) |

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Top of Form



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| **How to Troubleshoot SQL VSS Writer Issues** |
| Infrastructure Incident Management |
| SQL Incident Management |
| SQL Server 2005/2008/2008R2/2012.  Very often DPM backups fail and it is found that either SQL Writer is not getting listed in **vssadminwriters** list or other issues.  This document focuses on the different issues which could lead to DPM backup failures from SQL perspective. |
|         **VSS** VSS is a framework that consists of a set of interfaces and structures that enable applications to perform backups of volumes while other applications use the data in these volumes. VSS is included with Microsoft Windows XP and Microsoft Windows Server 2003 and later versions.          **Backup applications** A backup application is any Windows application that requests a snapshot backup be taken by using VSS. For example, the Windows NT backup application that is included with Windows is a backup application.          **Writers** Writers are applications or services that store persistent information on disk and that cooperate with providers and requestors through the shadow copy interface. We will discuss the MSDEWriter writer and the SqlServerWriter writer in this article.  o   MSDEWriter: The MSDEWriter writer is a VSS Writer for SQL Server. MSDEWriter is included with the VSS framework in Windows XP and Windows Server 2003. MSDEWriter works with SQL Server 7.0, SQL Server 2000, and SQL Server 2005.  o   SqlServerWriter: The SqlServerWriter writer is a VSS Writer for SQL Server. SqlServerWriter is included with SQL Server 2005. SqlServerWriter only works with instances of SQL Server 2005 and later.  SQL Server VSS Writer service is used for backup operation by Backup Team. The first prerequisite for DPM backups to be successful is having SQLSERVERWRITER in Stable state with No Error.  In SQL Server 2000, VSS Writer (MSDE Writer) is shipped with VSS Framework. From SQL server 2005 onwards SQL Writer is preferred writer. Hence, we do not find SQL Server Writer in SQL 2000 servers. Please note that in SQL2005 and onwards, SQL Writer is the preferred writer, though MSDE Writer will continue to work and will be the default writer if installed and SQL Writer is not enabled. |
| Common Issues with SQL server writer:  1)               SQL Server Writer is not enlisted while executing command ‘VSSadmin list writers’ from command prompt in following cases: [Please note that, in Windows Server 2008, run cmd(command prompt) as administrator’].  a.      ‘SQLServer VSS Writer’ service is disabled (services.msc) or stopped.  b.      There are trailing space after database name. Remove trailing space(s) from database name. This can be found through the below script: **select '#'+name+'#' from sys.sysdatabases.**  To resolve the issue, ask for a database downtime and rename the database, removing trailing spaces.  c.      There have been few cases where the SQL server writer was not enlisted dueto trailing space found in file names. This can be identified using the below script: **select '#'+name+'#' from sys.sysaltfiles.**  To resolve the issue, take the database downtime and rename the file by removing trailing spaces.  d.      ’NT Authority\SYSTEM’ login is disabled or not having ‘SA’ permissions.  *When the VSS service and the SQLWriter service are installed, the service startup account is configured as Local System [NT AUTHORITY\SYSTEM]. When the writer tries to establish a connection to instances of SQL Server, the writer uses the credentials of the Local System [NT AUTHORITY\SYSTEM] startup account.*  e.      If there is more than one SQL instance, ’NT Authority\SYSTEM’ login must be having ‘sa’ permissions on both instances.  2)               SQLServer Writer failing ‘Non retryable error’, ‘failed’. :  a.      In such cases check ‘SQLServer VSS Writer’ Service, make sure it is not in ‘Starting’ state. In case if it is in starting state for a long time, Kill the service from command prompt  b.      Check the event viewer for error message corresponding to SQL VDI errors. In 90% of cases, the issue has been ‘Transaction log file full’. Check for the cause behind log file full and take appropriate actions to resolve log file issue.  If you need to escalate the IR, follow the escalation process documented [here](http://infoplus/GetDocument.aspx?DocumentID=D11-UB) |

**ms213734**

Top of Form



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| **How to troubleshoot “SSPI handshake failed”.** |
| Infrastructure Incident Management |
| SQL Incident Management |
| SQL Server 2000/2005/2008/2008R2/2012.  Many times when an attempt is made to connect a SQL server remotely, the connection fails with the error “**SSPI handshake failed**” or “The user is not associated with a trusted SQL Server connection” |
| We normally see two kinds of [SSPI](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SSPI.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) errors. One is “Cannot generate SSPI context” and the other is “SSPI Handshake Failed”. The first error is commonly because the client is trying a [Kerberos](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Kerberos.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1) authentication and that failed, but it did not fall back to [NTLM](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/NTLM.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1). The second one happens usually when the user is not authenticated (either through Kerberos or NTLM). |
| In most situations following the troubleshooting methods for “Cannot generate SSPI context" will suffice but there are other situations that could lead to this issue because let’s say NTLM is not working and Kerberos was never working as SPN was not configured. Here we need to try and find why NTLM is not working. A good test could be to access a network share on the server using the IP address. This will require NTLM authentication. If accessing a share does not work, engage serverim and resolve that issue first.  Ask if the password of the domain account running SQL Service was changed recently. If this is the case, restarting SQL Service may help.  If Kerberos is not working, obvious suggestion would be to create SPN but since this is a time taking process, we should try and get the NTLM working.  Collect all the information specified in troubleshooting section of “Cannot generate SSPI context”  Based on the outcome of the steps described above, take the necessary actions to resolve the issue.  If you need to escalate the IR, follow the escalation process documented [here](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Escalation%20document.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%257bE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%257d%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) |

**ms164046**

Top of Form



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| **Remove SQL Server Blocking** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Slow query processing or performance issues |
| SQL Server jobs or processes that are in a hung state |
| This problem occurs when two or more SQL Server processes are involved in a conflict to gain control over a particular resource.  On occasion SQL server will throw alerts for blockage. Mostly, this blockage will pass on its own. |
| **Resolution**  **Case 1: Alert is raised and blocking still exists**    Run the following query from a new query window to confirm if blocking exists  ***Select \* from sys.sysprocesses where blocked <>O***    If the above query returns rows then    Identify the head blocker,find the sql text using DBCC inputbuffer for the head blocker.    Find the transaction nesting level and process status of the blocking SPID  ***SELECT open\_tran FROM master.sys.sysprocesses WHERE SPID=<blocking***  ***SPID number>***  ***Go***    Run the below query from Query Analyzer to get an idea of how long a SPID may take for rollback:  **KILL <spid#> WITH STATUSONLY**    Try to find out head blocker and troubleshoot further using following KB  [*http://support.microsoft.com/kb/224453*](http://support.microsoft.com/kb/224453)    If blocking spid is a long running job  o   If the job is running over, notify customer of situation.  o   If the job is not running over, notify customer and monitor till expected job end  o   If this is a daily occurrence you may suggest they choose a different time to run their job when the server is under comparatively  less load so that it doesn’t cause blocking    If the blocking transaction is an orphaned transaction i.e spids with -2  o   Find out UOW(UnitOfWork) from syslockinfo  **select req\_transactionUOW from master..syslockinfo where spid=-2**  o   KILL to terminate an orphaned distributed transaction  The following example shows how to terminate an orphaned distributed transaction (session ID = -2) with a *UOW* of D5499C66-E398-45CA-BF7E-DC9C194B48CF.    **KILL 'D5499C66-E398-45CA-BF7E-DC9C194B48CF';**    If possible , use **“SQL Trace Blocked Process Report”.**  o   **IMP** :Please get the customer confirmation before using this method as it means change to the server configuration parameter  o   You can automatically trigger an event when a process has been blocked for more than a specified amount of time. You use the *sp\_configure* command to set the advanced option *blocked process threshold* to a user defined value:  *exec sp\_configure 'show advanced options', 1;  reconfigure;  go  exec sp\_configure 'blocked process threshold', 30;  reconfigure;*  o   This sets the threshold to 30 seconds. You can then start a SQL Trace and select the *Blocked process report* event class in the Errors and Warnings group. [This article](http://msdn.microsoft.com/en-us/library/ms191168.aspx) explains the event class in more detail, however it is important to choose the *TextData* column in order to inspect the contents of the report. The event will fire when a blocked process is detected and the TextData column will return an XML-formatted set of data. Data for the blocked process is shown first, and then the blocking process.  o   The benefit of the Blocked Process Report is that you have the blocking events recorded on disk in a trace file, along with the time and duration of the blocking. The threshold option can be adjusted to narrow down the information returned to narrow down the longest ones.  o   Execute the following script to change the value of blocked process threshold back to ‘0’ once you complete troubleshooting  *exec sp\_configure 'blocked process threshold', 0;  reconfigure;*  **Case 2: Alert is raised and blocking doesn’t exist**    In this scenario, we would try to provide valuable information to customer to avoid further blocking on the SQL Server    The following logic is used to trap blocking information on each server  o   \_SQL\_BlockingMonitor runs every 1 hour  o   This executes the following code in step1  EXEC SQLOpsDB..SQLBlockedInfoSP  @ReportBlockThresholdSpids = 3,@ReportBlockThresholdTime = 5  o   Blocking job is currently set to alert for 3 or more blocked spids continuously for 5 minutes or more    Run this query on from a new query window  *use sqlopsdb*  *select\*from SQLBlockedInfoTbl*    The output has some important columns  o   BlockingDate –provides the blocking date and time  o   Spid –Affected spid  o   SQLSpid-The SQL statement of the affected spid  o   BlockedBy-Blocking Spid  o   Sqlblockedby—The SQL statement of the blocking spid  o   Servername-Affected server  o   Dbname –Affected dbname    Pass the above information which is relevant to the alert raised, to the customer  **CASE 3: Alert email was not sent**    Check if mail alert was enabled by customer using the below query  SELECT \* FROM SQLOPSDB..Tbl\_ParamBlocking    if the customer is not receiving the mail even after enabling the mail alert feature, check the DBMail configuration.    If the job is failing with Error “No global profile is configured. Specify a profile name in the @profile\_name parameter.”  Check if the default profile is configured in the DBMail or not .. select \* from msdb.[dbo].[sysmail\_principalprofile] where is\_default=1 |

**ms164568**

Top of Form



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| SQL Server 2012 |
| SQL Server 2005 |
| SQL Server 2008 |
| Could not allocate run storage in database <database> because of the 'PRIMARY' filegroup. |
| 61001 - There were some execution errors while executing \_SQL\_CapacityMonitor , check SQLOPSDB.DBO.Tbl\_Proc\_Errors for more details |
| The file group **PRIMARY** for the database <database> in SQL instance **MSSQLSERVER** is full. |
| Could not allocate space for object in database because the filegroup is full. Space can be created by dropping objects, adding additional files, or allowing file growth. |
| **Alerts**  *Data File Full Error*  ERROR 1101: Could not allocate a new page for database because of insufficient disk space in filegroup. Create the necessary space by dropping objects in the filegroup, adding additional files to the filegroup, or setting autogrowth on for existing files in the filegroup.  *Data File Full Warnings:*  *2012-03-15 21:57:37.760 - Database capacity threshold exceeded on SQLUTIL01: Database Adventureworks: 98.64% used in filegroup PRIMARY. Threshold 95%. Configured auto-grow cannot take place due to maxcap or drive space.*  *2012-03-15 21:57:37.760 -* Database capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: 97.69% used in filegroup PRIMARY. Threshold 95%. No data files in this filegroup are configured for auto-grow.  *2012-03-15 21:57:37.760 -* Database capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: 97.69% used in filegroup PRIMARY. Threshold 95%.  Configured auto-grow will not reduce usage below threshold due to Inappropriate auto grow settings.  These warning messages will be fired in the following scenarios  1.      Auto growth is not configured on the database/File Group  2.      Auto growth cannot happen due to Maximum File Size restrictions.  3.      The next Auto growth size is greater than the free space available.  Troubleshooting Steps  *Considerations before continuing:*  Before making any changes, verify that there is no restriction in place with the application support team regarding making any changes to the underlying servers.  *Actions:*  1.       If the database file is 99% full and you observe the data file full errors, engage customer immediately and add an additional file in different drive as workaround to resolve the problem temporarily.  2.       Check if Autogrowth settings, if Autogrowth is disabled inform customer to enable it.  3.       If the maximum file size is restricted, check the available disk space and increase Restricted File Growth (MB) by 100 MB. Send email to customer to inform the change and ask them to take the appropriate action.  4.       Use the below query to find Database file growth settings or check database properties using SSMS  selectdb\_name(database\_id),type\_desc,name,physical\_name,state\_desc,size/128 Size,  casewhenmax\_size=-1 then-1 whentype= 1 andmax\_size= 268435456 then-1 else (max\_size/ 128)endasmax\_sizeMB,  caseis\_percent\_growthwhen 0 then (growth/ 128 )when 1 thengrowthelsenullendasgrowth,  caseis\_percent\_growthwhen 0 thencast((growth/ 128 )asvarchar(20))+' MB'when 1 thencast(growthasvarchar(20))+' Percent'elsenullendasgrowth,  caseis\_percent\_growthwhen 0 then (growth/ 128) when 1 then ((growth/ 100 )\*size)/ 128 elsenullendasnextGrowthIncMB  fromsys.master\_files  5.       If disk is almost full inform the user and ask them to make some space on the drive by deleting any old files or request for additional disk space.  6.       Use the below query to get the disk space on the drives used by SQL Server.  SELECTdistinct  volume\_mount\_pointDriveName,  total\_bytes/1048576 CapacityMB,  available\_bytes/1048576 FreeSpaceMB  FROMsys.master\_filesASf  CROSSAPPLYsys.dm\_os\_volume\_stats (f.database\_id,f.file\_id)  7.       Run the below query to find the snapshot of disk and file space details at the time of capacity alert. Understand the space requirements from the output and advice the customers accordingly.  SELECT \* FROM SQLOPSDB.dbo.Tbl\_DB\_SpaceIssues WHERE CreatedDate = <<Alert Date>> (*get the Alert Time from* Database capacity threshold exceeded *alert message*).  8.       If the alert message is similar to alert 1 or 3 in the Alerts section, Ask customer to use appropriate auto growth settings.<http://technet.microsoft.com/en-us/magazine/2008.08.database.aspx>  Execute the below queries and see if the database that you are troubleshooting is frequently causing space related issues. If this database is frequently raising the alerts ask customer to add additional disk space or exclude the database from monitoring, if there is any maintenance activity is happening on the database.  If you see frequent space issues on the server, loop SQL Operations Escalations ([sqlopesc@microsoft.com](mailto:sqlopesc@microsoft.com)).  SELECT top 50 \* from SQLOPSDB.dbo.SQLOPS\_Daily\_Alerts where DBname = '<<Database Name>>' and ErrorNum in (60110,60120) order by AlertTime desc  SELECT\*FROMSQLOPSDB.dbo.Tbl\_DB\_SpaceIssuesWHEREDBNAme='<<DBNAME>>'ANDNEXTAutogrowFits='No'    *9.* If the database that you are troubleshooting is Tempdb, check with the customer and see shrinking the Tempdb is an option. <http://support.microsoft.com/kb/307487/en-us>  Job Overview  \_SQL\_CapacityMonitor  *exec sqlopsdb.dbo.usp\_capacitymonitor*  The job checks overall space available for database and alerts if database usage is higher than configured threshold on a percentage basis.  This job logs the alerts under the following conditions  1.       The Data file or Log file space usage is greater than the defined threshold and  2.       The next autogrowth size is larger than available disk space or the autogrowth size don’t increase the space used percentage beyond the threshold.  This job takes the input from Tbl\_ParamCapacityMonitor table  The threshold values for data and log files will be inserted at the table creation. These values can be changed as per user’s requirement. |

**ms164676**

Top of Form



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| **Back up the transaction log for the database to free up some log space.** |
| SQL Server 2012 |
| SQL Server 2008 |
| SQL Server 2005 |
| Error: 9002, Severity: 17, State: 2. The log file for database '%.\*ls' is full. |
| 61001 - There were some execution errors while executing \_SQL\_CapacityMonitor , check SQLOPSDB.DBO.Tbl\_Proc\_Errors for more details |
| SQL Server is unable to allocate new pages to a database log file. Mostly, this is caused by a process that has run longer than expected or has hung but there are several factors that can impact the size of a transaction log and the appropriate response depends on the condition causing the transaction log to fill. |
| Background or cause  Log file full errors are raised by SQL Server when there is no space in the log file due to autogrowth restrictions or disk space issues. There are several factors that can impact the size of a transaction log and the appropriate response depends on the condition causing the transaction log to fill. SQL Server databases don’t get into this state if data file full warnings are handled effectively.  Log file full warnings are raised by SQLOPS capacity monitoring job (\_*SQL\_CapacityMonitor)* when space usage in database log file exceeds specified threshold.  **Alerts**  *Log file full error*  Error: 9002 Severity: 17 State: 1  The transaction log for database '%.\*ls' is full. To find out why space in the log cannot be reused, see the log\_reuse\_wait\_desc column in sys.databases  *Log file full warnings*  *2012-03-15 21:57:37 -* Log capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: Log file(s) 87.50% used. Threshold: 85%. Configured auto-grow cannot take place due to maxcap or drive space.  *2012-03-15 21:57:37 -* Log capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: Log file(s) 97.50% used. Threshold: 75%. No log file(s) are configured for auto-grow.  *2012-03-15 21:57:37 -* Log capacity threshold exceeded on SQLUTIL01: Database *Adventureworks*: Log file(s) 87.50% used. Threshold: 85%. Configured auto-grow will not reduce usage below threshold due to Inappropriate auto grow settings.  These warning messages will be fired in the following scenarios  1.      Auto growth is not configured on the database/File Group  2.      Auto growth cannot happen due to Maximum File Size restrictions.  3.      The next Auto growth size is greater than the free space available.  Troubleshooting Steps  *Considerations before continuing:*  Before making any changes, verify that there is no restriction in place with the application support team regarding making any changes to the underlying servers.  *Actions:*  1.       If the database file is 99% full and you observe the data file full errors, engage customer immediately and add an additional file in different drive as workaround to resolve the problem temporarily.  2.       Check the Autogrowth settings, if Autogrowth is disabled inform customer to enable it.  3.       If the maximum file size is restricted, check the available disk space and increase Restricted File Growth (MB) by 100 MB. Send email to customer to inform the change and ask them to take the appropriate action.  4.       Use the below query to find Database file growth settings or check database properties using SSMS  selectdb\_name(database\_id),type\_desc,name,physical\_name,state\_desc,size/128 Size,  casewhenmax\_size=-1 then-1 whentype= 1 andmax\_size= 268435456 then-1 else (max\_size/ 128)endasmax\_sizeMB,  caseis\_percent\_growthwhen 0 then (growth/ 128 )when 1 thengrowthelsenullendasgrowth,  caseis\_percent\_growthwhen 0 thencast((growth/ 128 )asvarchar(20))+' MB'when 1 thencast(growthasvarchar(20))+' Percent'elsenullendasgrowth,  caseis\_percent\_growthwhen 0 then (growth/ 128) when 1 then ((growth/ 100 )\*size)/ 128 elsenullendasnextGrowthIncMB  fromsys.master\_files  5.       If disk is almost full inform the user and ask them to make some space on the drive by deleting any old files or request for additional disk space.  6.       Check the recovery model of the database   SELECT DATABASEPROPERTYEX ( 'Database Name' , 'Recovery' )  If “Recovery Mode” set to “Full” ensure that there is a valid transaction log backup job (\_SQL\_BackupTranAll ) and that it is not failing. If the transaction log backup job fails then the log will not be able to truncate. If you don’t find the default transaction log backup job, run the below statement to find the transaction log backup details..   SELECT \* FROM msdb.dbo.backupset WHERE database\_name = 'Database Name' AND type ='L' AND backup\_finish\_date BETWEEN GETDATE ()-1 AND GETDATE ().  If the transaction log backups are successful or recovery mode is SIMPLE, execute the below statement to see what is stopping transaction logs to truncate. Send this information to customer to take the further action.  SELECT name,log\_reuse\_wait\_desc FROM sys.databases WHERE name = 'Database Name'  7.       Use the below query to get the disk space on the drives used by SQL Server.  SELECTdistinct  volume\_mount\_pointDriveName,  total\_bytes/1048576 CapacityMB,  available\_bytes/1048576 FreeSpaceMB  FROMsys.master\_filesASf  CROSSAPPLYsys.dm\_os\_volume\_stats (f.database\_id,f.file\_id)  8.       Check if there are any open transaction using DBCC OPENTRAN and DBCC INPUTBUFFER and inform the customer.  9.       Run the below query to find the snapshot of disk and file space details at the time of capacity alert. Understand the space requirements from the output and advice the customers accordingly.  SELECT \* FROM SQLOPSDB.dbo.Tbl\_DB\_SpaceIssues WHERE CreatedDate = <<Alert Date>> (*get the Alert Time from* Database capacity threshold exceeded *alert message*).  10.    Check the below link for some additional troubleshooting steps. <http://msdn.microsoft.com/en-US/library/ms175495(v=SQL.90).aspx>  11.    If the alert message is similar to alert 1 or 3 in the Alerts section, Ask customer to use appropriate autogrowth settings. <http://technet.microsoft.com/en-us/magazine/2008.08.database.aspx>  Execute the below query and see if the database that you are troubleshooting is frequently causing space related issues. If this database is frequently raising the alerts ask customer to add additional disk space or exclude the database from monitoring, if there is any maintenance activity is happening on the database.  If you see frequent space issues on the server, loop SQL Operations Escalations ([sqlopesc@microsoft.com](mailto:sqlopesc@microsoft.com)).  SELECT top 50 \* from SQLOPSDB.dbo.SQLOPS\_Daily\_Alerts where DBname = '<<Database Name>>' and ErrorNum in (60110,60120) order by AlertTime desc  SELECT\*FROMSQLOPSDB.dbo.Tbl\_DB\_SpaceIssuesWHEREDBNAme='<<DBNAME>>'ANDNEXTAutogrowFits='No'    *12.* If the database that you are troubleshooting is Tempdb, check with the customer and see shrinking the Tempdb is an option. <http://support.microsoft.com/kb/307487/en-us> |

**ms164693**

Top of Form



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| **To resolve any Transaction Log Capacity issue** |
| SQL Server 2000 |
| SQL Server 2005 |
| SQL Server 2008 |
| Error 60110: Database <database name>: Tran log 76% full. Threshold: 75%. Database recovery model is "FULL". Run "select \* from SqlOpsDb.dbo.LogCap\_Info order by Date desc", for information on spids with high CPU and disk I/O. |
| Database Log Space has exceeded 90% free space. Determine the log space using the below query:  Use <dbname>              set nocount on if exists (select \* from dbo.sysobjects where id = object\_id(N'[dbo].[#temp]') and OBJECTPROPERTY(id, N'IsUserTable') = 1) drop table [dbo].[#temp]  select getdate() as time\_stamp,database\_id,db\_name(database\_id) database\_name ,name,physical\_name as filename,        substring(upper(physical\_name),1,1) as drive,         file\_id,        cast(cast (size\*8.0/(1024) as DEC(10,2)) as varchar(20)) as Total\_Filesize\_MB,        size\*8.0\*1024/(1024\*1024) - fileproperty(name,'SpaceUsed')\*8.0\*1024/(1024\*1024) as FreeMB,          fileproperty(name,'SpaceUsed')\*8.0\*1024/(1024\*1024) as UsedMB,        case when is\_percent\_growth = 1               then cast(growth as char(3)) + '%'              else               case when growth=0 then 'No Growth Configured'              else              cast(cast((growth \* 8.00)/1024.00 as dec(10,2))as varchar(20))  + ' '+' MB'              end             end as Growth,                 case when Growth=0 and max\_size =-1 then 'No Growth Configured'         when max\_size=-1 or max\_size= 268435456 then 'Unrestricted'         else CAST(cast((max\_size\*8.00)/1024.00 as DEC(10,2)) as varchar(20)) +'  '+ 'MB'         end as MaxSize       into #temp    from sys.master\_files where database\_id=DB\_ID()              --select \* from #temp  if exists (select \* from dbo.sysobjects where id = object\_id(N'[dbo].[#temp1]') and OBJECTPROPERTY(id, N'IsUserTable') = 1) drop table [dbo].[#temp1]        CREATE TABLE #temp1 (drive char(1), MB\_free int)  INSERT INTO #temp1 EXEC master..xp\_fixeddrives  if exists (select \* from dbo.sysobjects where id = object\_id(N'[dbo].[#temp2]') and OBJECTPROPERTY(id, N'IsUserTable') = 1) drop table [dbo].[#temp2]  SELECT @@SERVERNAME Server,\* , (MB\_free/1024) as free\_SpaceonDisk\_GB into #temp2 FROM #temp1  select t1.time\_stamp timestamp,@@servername Servername,t1.database\_id,t1.database\_name, t1.name,t1.drive,t1.Total\_FileSize\_MB,cast(t1.FreeMB as Dec(10,2)) FreeMB,cast(t1.UsedMB as DEC(10,2)) UsedMB,cast(t2.free\_SpaceonDisk\_Gb as dec (5,2))Space\_on\_Disk\_GB, t1.filename,t1.Maxsize,t1.Growth from #temp t1 join #temp2 t2 on t1.drive=t2.drive  drop table #temp drop table #temp1 drop table #temp2  The result will be displayed as below:  \\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164676_fig 1.png |
| Note that log capacity warning is not an immediate outage. Before making any changes, validate the action plan with the application owner(s). |

Bottom of Form

**ms164875**

Top of Form



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| **To resolve any *Tempdb file/log file Full* issues.** |
| SQL Server 2005 |
| SQL Server 2008 |
| Database ""tempdb"": Tran log 79% full. Threshold: 75% |
| The log file for database 'tempdb' is full. Back up the transaction log for the database to free up some log space. Determine the log space using the below query:  Use <tempdb>              set nocount on if exists (select \* from dbo.sysobjects where id = object\_id(N'[dbo].[#temp]') and OBJECTPROPERTY(id, N'IsUserTable') = 1) drop table [dbo].[#temp]  select getdate() as time\_stamp,database\_id,db\_name(database\_id) database\_name ,name,physical\_name as filename,        substring(upper(physical\_name),1,1) as drive,         file\_id,        cast(cast (size\*8.0/(1024) as DEC(10,2)) as varchar(20)) as Total\_Filesize\_MB,        size\*8.0\*1024/(1024\*1024) - fileproperty(name,'SpaceUsed')\*8.0\*1024/(1024\*1024) as FreeMB,          fileproperty(name,'SpaceUsed')\*8.0\*1024/(1024\*1024) as UsedMB,        case when is\_percent\_growth = 1               then cast(growth as char(3)) + '%'              else               case when growth=0 then 'No Growth Configured'              else              cast(cast((growth \* 8.00)/1024.00 as dec(10,2))as varchar(20))  + ' '+' MB'              end             end as Growth,                 case when Growth=0 and max\_size =-1 then 'No Growth Configured'         when max\_size=-1 then 'Unrestricted'         else CAST(cast((max\_size\*8.00)/1024.00 as DEC(10,2)) as varchar(20)) +'  '+ 'MB'         end as MaxSize       into #temp    from sys.master\_files where database\_id=DB\_ID()              --select \* from #temp  if exists (select \* from dbo.sysobjects where id = object\_id(N'[dbo].[#temp1]') and OBJECTPROPERTY(id, N'IsUserTable') = 1) drop table [dbo].[#temp1]        CREATE TABLE #temp1 (drive char(1), MB\_free int)  INSERT INTO #temp1 EXEC master..xp\_fixeddrives  if exists (select \* from dbo.sysobjects where id = object\_id(N'[dbo].[#temp2]') and OBJECTPROPERTY(id, N'IsUserTable') = 1) drop table [dbo].[#temp2]  SELECT @@SERVERNAME Server,\* , (MB\_free/1024) as free\_SpaceonDisk\_GB into #temp2 FROM #temp1  select t1.time\_stamp timestamp,@@servername Servername,t1.database\_id,t1.database\_name, t1.name,t1.drive,t1.Total\_FileSize\_MB,cast(t1.FreeMB as Dec(10,2)) FreeMB,cast(t1.UsedMB as DEC(10,2)) UsedMB,cast(t2.free\_SpaceonDisk\_Gb as dec (5,2))Space\_on\_Disk\_GB, t1.filename,t1.Maxsize,t1.Growth from #temp t1 join #temp2 t2 on t1.drive=t2.drive  drop table #temp drop table #temp1 drop table #temp2  The result will be displayed as the figure below:  \\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164875_fig 1.png |

Bottom of Form

**ms165204**

Top of Form



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| **INFRA: Data Corruption** | **Issues** |
| We will try to use **DBCC REPAIR\_REBUILD** option to repair the corruption without data loss but if this option does not fix the issue, we will run **DBCC** with **REPAIR\_ALLOW\_DATA\_LOSS** option which will repair the DB with potential loss of data. There should be a scheduled downtime to repair the corruption.  Backup the database or table first, before you run DBCC to fix data corruption. | |
| SQL Server 2005 | |
| SQL Server 2008 | |
| An error occurred while processing the log for database. | |
| Cannot recover the master database. Exiting. | |
| Cannot retrieve row from page by **RID** because the *slotid* is not valid. | |
| Could not find column in syscolumns for object in database. | |
| Could not find filegroup ID in *sys.filegroups* for database. | |
| Could not mark database as suspect. **Getnext NC** scan on *sysdatabases.dbid* failed. | |
| Could not recover database due to unresolved transaction outcomes. | |
| Database could not recover. | |
| One or more indexes are damaged and must be repaired or dropped. | |
| The log for database is not available. | |
| **Resolution:**  **NOTE: Before applying the below resolution steps, confirm with the customer(s) of the change.**  **Step 1:** Check the state of a database in the ***sys.databases*** catalog view:                SELECT state\_desc FROM sys.databases WHERE name = <database\_name>;        GO             Or, by using the following DATABASEPROPERTYEX function:         SELECT DATABASEPROPERTYEX ('master', 'STATUS');         GO  **Step 2:** Go to **SQL Server Error Logs** to get the exact error.  **Example:**  *2010-03-06 22:41:19.55 spid58      Error: 823, Severity: 24, State: 2.  2010-03-06 22:41:19.55 spid58      The operating system returned error 38(Reached the end of the file.) to SQL Server during a read at offset 0x000000a72c0000 in file 'C:\Program Files\Microsoft SQL Server\MSSQL10.SQL2008\MSSQL\DATA\my\_db.mdf'. Additional messages in the SQL Server error log and system event log may provide more detail. This is a severe system-level error condition that threatens database integrity and must be corrected immediately. Complete a full database consistency check (DBCC CHECKDB). This error can be caused by many factors; for more information, see SQL Server Books Online.*    **Step 3:** Get the corruption related details using the below query               SELECT \* FROM SQLOPSDB.dbo.Tbl\_ConsistencyCheckResults  WHERE Level <> 10            The RepairLevel Column from the above result set indicates the possible repair option.          If the data is not available in the above mentioned table then get the confirmation from customer before running this command:  **DBCC CHECKDB(‘DB\_Name’)**  **Example :** If there is a corruption, then follow the consistency errors which may appear as below:  *Msg 8979, Level 16, State 1, Line 1 Table error: Object ID 7, index ID 1, partition ID 458752, alloc unit ID 458752 (type In-row data).  Page (1:102726) is missing references from parent (unknown) and previous (page (1:51089)) nodes.  Possible bad root entry in system catalog. CHECKDB found 0 allocation errors and 1 consistency errors in table 'sysallocunits' (object ID 7). Msg 7995, Level 16, State 1, Line 1 Database 'Database': consistency errors in system catalogs prevent further DBCC checkdb processing. CHECKDB found 0 allocation errors and 1 consistency errors in table 'ALLOCATION' (object ID 99). CHECKDB found 0 allocation errors and 2 consistency errors in database 'Database'. DBCC execution completed. If DBCC printed error messages, contact your system administrator.*  **Step 4:** Put the database in a Emergency mode:  ALTER DATABASE <databasename> set emergency  **Step 5:** Put the database in single user Mode:  ALTER DATABASE emergencydemo SET SINGLE\_USER;  **Step 6:** Fix data in the table level:           Run DBCC CHECKTABLE(‘TABLENAME’,repair\_fast) or dbccc checktable (‘tablename’, repair\_rebuild) to see if it can fix the corruption without data loss. If not, go the next step.           DBCC CHECKTABLE (‘tablename’, Repair\_allow\_data\_loss).           Re-run DBCC CHECKDB on database to make sure that everything is clean.           Bring database to multi user mode.          Perform full backup on that server.    **Step 7:** Fix data in database level (when DBCC Checktable doesn't resolve the issue):    You can run dbcc checkdb (‘database\_name’) with physical\_only first    Or, dbcc checkdb (‘database\_name’, repair\_rebuild)    Or, dbcc checkdb (‘database\_name’, repair\_allow\_data\_loss)  **Step 8:** Fix data from backup files (if database is not operational):                  Restore database from backup files.  **Example:** Restore database database\_name from disk = ‘Z:\backup.bak’   Or, restore database from SQL Litespeed:    EXEC master.dbo.xp\_restore\_database @database = 'MyDB', @filename= 'C:\MSSQL\Backup\MyDB\_Backup.BAK' | |

Bottom of Form

**ms165216**

Top of Form



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|  | **INFRA: Database cannot be recovered** |
| First, verify that the database is marked IsShutdown using DATABASEPROPERTY. Then, determine the cause of the error by consulting the errorlog, and take action as noted below. | |
| SQL Server 2005 | |
| SQL Server 2008 / R2 | |
| SQL Server 2012 | |
| SQL Server 2014 | |
| Database cannot be opened due to inaccessible files or insufficient memory or disk space. See the SQL Server errorlog for details. | |
| If one or more data or log files are missing. | |
| If insufficient log space or data space. | |
| If there is insufficient memory. | |
| Determine the cause of the error by consulting the errorlog, and take action as noted below. | |
| **Resolution:**  **Case 1:** If one or more data or log files are missing:  **Resolution:**  1.     Make the files available and bring the database **OFFLINE** using ***ALTER DATABASE*:**              alter database <databasename> set offline  2.     Use ***ALTER DATABASE*** to bring the database **ONLINE**:                 alter database <databasename> set online  **Case 2:** If there is insufficient log space:  **Resolution:**   * Use sp\_add\_log\_file\_recover\_suspect\_db() to add another log file. For more information, refer to <http://msdn.microsoft.com/en-us/library/ms188052.aspx>   **Note:**The database is recovered and brought online by this procedure.  **Case 3:** If there is insufficient data space:  **Resolution:**   * Use sp\_add\_data\_file\_recover\_suspect\_db() to add another data file (.ndf). For more information, refer to <http://msdn.microsoft.com/en-us/library/ms188065.aspx>   **Note:** The database is recovered and brought online by this procedure.  **Case 4:** If there is insufficient memory:  **Resolution:**  The insufficient memory error can occur when a number of databases are recovered at the same time. Retrying the operation may fix the problem:       1.   Retry the operation using ***ALTER DATABASE*** to bring the database **OFFLINE**         alter database <databasename> set offline       2.    Use ***ALTER DATABASE*** to bring the database **ONLINE:**  alter database <databasename> set online  **NOTE:** If retrying the operation does not work, consider freeing up memory according to [Memory Allocation Failed](javascript:OpenSolutionInPopup(-1,'ms165210','','','','',false,'07bef164-1fbd-4c84-baac-056c190009d7','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')). | |

**ms163956**

Bottom of Form

**ms163956**

Top of Form



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| **To resolve the problem when there is logshipping failure or out of sync** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Customer raised IR , Log Shipping Out Of Sync |
| The SQL Agent Job : LSAlert\_<Server Name>, has failed |
| *The SQL Agent Job : LSAlert\_<Server Name>, has failed* |
| *The LS secondary database <database\_name> has latency of 45 mins* |
| *The log shipping secondary database<database\_name>has restore threshold of 90 minutes* |
| *LS job LSBackup\_<database\_name> has failed* |
| There can be many causes for the issue such as password expired, disk full or network issues |
| **Server Scheduled Job Log Shipping Restore for < Servername><databasename > failed**  Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms164616](javascript:OpenSolutionInPopup(-1,'ms164616','','','','',false,'34d557e5-68ae-442c-8002-eb2a32e4301f','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')).    **The SQL Agent Job: LSAlert\_<Servername> has failed**  Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms164617](javascript:OpenSolutionInPopup(-1,'ms164617','','','','',false,'34d557e5-68ae-442c-8002-eb2a32e4301f','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')).    **Customer raised IR, Log Shipping Out Of Sync**  Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms164618](javascript:OpenSolutionInPopup(-1,'ms164618','','','','',false,'34d557e5-68ae-442c-8002-eb2a32e4301f','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')).    **The LS secondary database <database\_name> has latency of 45 mins**  Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms164619](javascript:OpenSolutionInPopup(-1,'ms164619','','','','',false,'34d557e5-68ae-442c-8002-eb2a32e4301f','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')).    **The log shipping secondary database<database\_name> has restore threshold of 90 minutes**  Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms164616](javascript:OpenSolutionInPopup(-1,'ms164616','','','','',false,'34d557e5-68ae-442c-8002-eb2a32e4301f','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')).    **LS job LSBackup\_<database\_name> has failed**  Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms164629](javascript:OpenSolutionInPopup(-1,'ms164629','','','','',false,'34d557e5-68ae-442c-8002-eb2a32e4301f','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')). |

Bottom of Form

Top of Form



Bottom of Form

**ms164618**

Top of Form



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| **Customer raised IR, Logshipping out of sync** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| SQL Server 2014 |
| Log shipping failure. |
| There can be many causes for the issue such as password expired, disk full or network issues. |
| If the logshipping is fails then one of the following jobs must be failing. Look for errors in the job history of one of these jobs and troubleshoot accordingly.  1.     Transaction Log Backup Job.(Primary Server)  2.     Transaction Log Copy Job.(Secondary Server)  3.     Transaction Log Restore Job.(Secondary Server)  4.     Backup Alert Job.(Monitoring Server)  5.     Restore Alert Job .(Monitoring Server) |

Bottom of Form

**ms164619**

Top of Form



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| **The LS secondary database <database\_name> has latency of 45 mins.** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| SQL Server 2014 |
| Log shipping failure. |
| There can be many causes for the issue such as password expired, disk full or network issues. |
| Refer to the article,[The SQL Agent Job: LSAlert <Servername>, has failed](javascript:OpenSolutionInPopup(-1,'ms164617','','','','',false,'45d4009a-9be2-45d9-a820-fab32896cf99','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')). |

Bottom of Form

**ms164628**

Top of Form



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| **The log shipping secondary database<database\_name> has restore threshold of 90 minutes**. |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Log shipping failure. |
| There can be many causes for the issue such as password expired, disk full or network issues. |
| Refer to [Server Scheduled Job Log Shipping Restore for < Servername> <databasename > failed](javascript:OpenSolutionInPopup(-1,'ms164616','','','','',false,'c7d9310f-0feb-46ce-b3c5-fe64be230aa2','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')). |

**Bottom of Form**

**ms164616**

Top of Form



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| **Server Scheduled Job Log Shipping Restore for < Servername><databasename > failed.** |
| SQL Server 2005 |
| SQL Server 2008/2008 R2 |
| SQL Server 2012 |
| SQL Server 2014 |
| Log Shipping failure. |
| There can be many causes for the issue such as password expired, disk full or network issues. |
| 1.Connect to the SQL Server using Server Name specified in the Alert mail.  2. Get the alert timing  3.    Go to the SQL Server Agent Jobs  4.     Find the Job mentioned in the alert  5.    Open the history (View History) for the job  6.    Find the failed run in the history  7.    Match the failed run timing with alert timing  8.    Try to run through the history steps of the job to find the exact error.    **Error Message  Sample:**  **2014-10-27 02:30:31.17 \*\*\* Error: The file 'E:\mssql\Tran\CMS\CMS\_20141022043031.trn' is too recent to apply to the secondary database 'CMS'.(Microsoft.SqlServer.Management.LogShipping) \*\*\***  **2014-10-27 02:30:31.17 \*\*\* Error: The log in this backup set begins at LSN 53750000003759400001, which is too recent to apply to the database. An earlier log backup that includes LSN 53750000002986900001 can be restored.**  **RESTORE LOG is terminating abnormally.(.Net SqlClient Data Provider) \*\*\***  **2014-10-27 02:30:31.21 Searching for an older log backup file. Secondary Database: 'CMS'**      9.     As you can see from the above error the job is failing due to gap in the transactional logs where **LSN 53750000002986900001 can be restored.**  10.  Check both the LS Backup and Copy Jobs are running fine  11.  Now check the data relating to last copied and last restored information thru the stored procedure 'sp\_help\_log\_shipping\_monitor' or you can use the Log Shipping Status report by right clicking on the Server Name in Management Studio -> Reports -> Standard Reports -> Transaction Log Shipping Status to see what was the last file loaded. Also check the error message. Usually it is due to a LSN mismatch that the restore job fails. This LSN mismatch occurs due to a trn file missing(not copied or deleted from destination folder) or sometimes someone runs an explicit log backup command on the db from Primary .So the next time the LS backup job runs it generates a trn file with LSN number greater than the those LSNs missing. The backup job succeeds and the file copy job also succeeds. But when the Restore job runs it compares the last LSN in the trn file and recognizes the LSN to not be in sequence. Due to which the Log Shipping will fail.  The work-around for this is to do a manual BCR (Back-Copy-Restore)/ DCL(Dump-Copy-Load) again and re-configure the Log Shipping using following article:  <http://msdn.microsoft.com/en-us/library/ms190640.aspx> |

Bottom of Form

**ms164617**

Top of Form



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| **The SQL Agent Job: LSAlert\_<Servername> has failed.** |
| SQL Server 2005 |
| SQL Server 2008/2008 R2 |
| SQL Server 2012 |
| SQL Server 2014 |
| Log Shipping failure. |
| There can be many causes for the issue such as password expired, disk full or network issues. |
| 1.     Connect to the SQL server using Server Name in the Alert.  2.     Get the alert timing.  3.     Expand the SQL Server Agent Jobs.  4.     Find the job mentioned in the Alert.  5.     Open the history for the job.  6.     Find the failed run in the job history.  7.     Match the failed run timing with alert timing.  8.     Try to run through the history steps of the job to find the exact error.    9.    In the LS\_Alert job, you can see from the error it looks to be a restore failure on Secondary server.  By definition, **message 14421** does not necessarily indicate a problem with Log Shipping. This message indicates that the difference between the last backed up file and last restored file is greater than the time selected for the **Out of Sync Alert** threshold.There are serveral reasons why the alert message is generated. The following list includes some of these reasons:          The date or time (or both) on the monitor server is different from the date or time on the primary server. It is also possible that the system date or time was modified on the monitor or the primary server. This may also generate alert messages.  **Resolution:**  Make sure that system date or time match on the primary and the monitor server.           When the monitor server is offline and then back online, the fields in the **log\_shipping\_primaries** table are not updated with the current values before the alert message job runs.  **Resolution**  Run the log shipping copy job to update the **log\_shipping\_primaries** table.           The log shipping Copy job that is run on the primary server might not connect to the monitor server **msdb** database to update the fields in the **log\_shipping\_primaries** table. This may  be the result of an authentication problem between the monitor server and the primary server.  **Resolution**  Look further in the history of the Copy job for any authentication related failures. Update the password or change the authentication as required.          You may have set an incorrect value for the **Backup Alert** threshold. Ideally, you must set this value to at least three times the frequency of the backup job. If you change the frequency of the backup job after log shipping is configured and functional, you must update the value of the **Backup Alert** threshold accordingly.  **Resolution**  Make sure the Backup Alert threshold is 3 times the frequency of the backup job  Go to Log-shipped database 🡪 Right click Properties 🡪 Transaction Log Shipping 🡪Backup Settings 🡪Adjust **‘Alert if no backup occurs within'** settings             The backup job on the primary server is failing. In this case, check the job history for the backup job to see a reason for the failure.   10.  If this would have been a primary server we will get this error  Error: 14420, Severity: 16, State: 1 The log shipping primary database %s.%s has backup threshold of %d minutes and has not performed a backup log operation for %d minutes. Check agent log and logshipping monitor information.  By definition, **message 14421** does not necessarily indicate a problem with Log Shipping. This message indicates that the difference between the last backed up file and last restored file is greater than the time selected for the **Out of Sync Alert** threshold. There are serveral reasons why the alert message is raised. The following list includes some of these reasons:          The date or time (or both) on the primary server is modified such that the date or time on the primary server is significantly ahead between consecutive transaction log backups.  **Resolution**  Make sure that system date or time on the primary has not changed significantly.           The log shipping Restore job that is running on the secondary server cannot connect to the monitor server **msdb** database to update the **log\_shipping\_secondaries** table with the correct value. This may be the result of an authentication problem between the secondary server and the monitor server.  **Resolution**  Look further in the history of the Restore job for any authentication related failures. Update the password or change the authentication as required.          You may have set an incorrect value for the **Out of Sync Alert** threshold. Ideally, you must set this value to at least three times the frequency of the slower of the Copy and Restore jobs. If the frequency of the Copy or Restore jobs is modified after log shipping is set up and functional, you must modify the value of the **Out of Sync Alert** threshold accordingly.  **Resolution**  Change the Out of Synch Alert value to at least three times the frequency of the slower of the Copy and Restore jobs.  Go to Log-shipped database on primary server 🡪 Right click Properties 🡪 Transaction Log Shipping🡪Choose the right secondary server if there are more than one server and hit the  eliipses(…) 🡪 Go to ‘Restore Transaction log’ 🡪Alert if no restore occurs within  Also select the check box **by default** “Disconnect users in the database when restoring backups’. In case you have selected Read-Only option for the secondary or changed from restoring state to read-only secondary and if you have not selected this option then there is every chance that the restore will fail as the user will not be disconnected and the LS\_Restore job will go on waiting till the user is disconnected.             Problems either with the Backup job or Copy job are most likely to result in "out of sync" alert messages. If "out of sync" alert messages are raised and if there are no problems with the Backup or the Restore job, check the Copy job for potential problems. Additionally, network connectivity may cause the Copy job to fail.  **Resolution**  Involve the network team, if copy job has any network failure errors.            It is also possible that the Restore job on the secondary server is failing. In this case, check the job history for the Restore job because it may indicate a reason for the failure.  **Resolution**  Check the job history for the Restore job because it may indicate a reason for the failure .It may fail due to LSN mismatch reasons and a BCR may be required. Follow  <http://msdn.microsoft.com/en-us/library/ms190640.aspx> to do a BCR. |

Bottom of Form

**ms164629**

Top of Form



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| **LS job LSBackup\_<database\_name> has failed.** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| SQL Server 2014 |
| Log shipping failure. |
| There can be many causes for the issue such as password expired, disk full or network issues. |
| This is alert indicates that the backup job is not able backup the database  1.     Connect to the SQL server using server name in the alert.  2.     Get the alert timing.  3.     Go to the SQL Server Agent jobs.  4.     Find the job mentioned in the alert.  5.     Open the history of the job.  6.     Find the failed run in the history.  7.     Match the failed run timing with alert timing.  8.     Try to run through the history steps of the job to find the exact error.    **Case 1**  Disk doesn’t have space to accommodate backup.  **Resolution**  Check the following conditions but do not make any changes until confirming action plan with server owners.           Old backup files which can be deleted.           Backup location can be changed to some other drive where we have enough space.           If none of the above is possible, work with customer and SUOPS to increase the space on the backup drive and make sure we have disabled the job.    **Case 2**  Path doesn’t exist.  **Resolution**  1.     Get the backup location  Go to Log-shipped database 🡪 Right click Properties 🡪 Transaction Log Shipping 🡪Backup Settings 🡪Network path to backup folder  2.     Go to start🡪run and paste the above network path in the run command and check if you can access the share.  3.     If you cannot access the share, verify the permissions to access the share or involve DCOPS\Network team to resolve the access issues. |

Bottom of Form

**ms164634**

Top of Form



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| **Synchronize the Mirrored database with the Principal database.** |
| SQL Server 2005/2008/2008 r2 /2012 |
| The Database Mirroring protocol transport has stopped listening for connections |
| An error occurred in a Service Broker/ Database Mirroring transport connection endpoint |
| The specified network name is no longer available. |
| The mirroring connection to **TCP://<Server\_name\_with\_FQDN:Port#>** has timed out for database **<database\_name>** after 10 seconds without a response. |
| Database mirroring will be suspended. Server instance **<Instance\_name>**encountered *error 823, state 6, severity 24* when it was acting as a mirroring partner for database **<database\_name>**. The database mirroring partners might try to recover automatically from the error and resume the mirroring session. |
| **Resolution:**  1.     Check the SQL error logs on principal and mirror instances and verify the errors. The error logs give lot of information for the reason for failure of mirroring between the instances.eg  2010-02-08 12:05:39.030 spid18s Error: 1474, Severity: 16, State: 1.  2010-02-08 12:05:39.030 spid18s Database mirroring connection error 2 'Connection attempt failed with error: '10061(No connection could be made because the target machine actively refused it.)'.' for 'TCP://financial.fmpartners.local:5022'.  2010-02-08 12:07:48.790 spid53 The Database Mirroring protocol transport has stopped listening for connections.  2010-02-08 12:07:50.790 spid53 The Database Mirroring protocol transport is disabled or not configured.  2010-02-08 12:07:58.080 spid53 Error: 26023, Severity: 16, State: 1.  2010-02-08 12:07:58.080 spid53 Server TCP provider failed to listen on [ 'any' <ipv4> 5022]. Tcp port is already in use.  2010-02-08 12:07:58.080 spid53 Error: 9692, Severity: 16, State: 1.  2010-02-08 12:07:58.080 spid53 The Database Mirroring protocol transport cannot listen on port 5022 because it is in use by another process.  As you can see in the above example the mirroring is failing as the port is already in use.  2.     If you see the following errors, then proceed with the below steps:  The Database Mirroring protocol transport has stopped listening for connections.  An error occurred in a Service Broker/Database Mirroring transport connection endpoint  The specified network name is no longer available           Make sure that the name and port of the mirror server instance are correct.           Make sure that the destination mirror server instance is not behind a firewall.  o    Telnet into the server to check that the destination mirror server instance is not behind a firewall  Open a command prompt and type **Telnet <Servername><Portname>Example:**Telnet SQLUTIL01.redmond.corp.microsoft.com 5223  o    Instead of TELNET the other options available are NETSTAT & PORTQRY  From a command prompt on the server itself, use **netstat -an** to check to see which ports are listening  Use PowerShell & run **netstat -an | where{$\_.Contains("Yourport")}** to filter on specific ports.  To verify multi way checks use **portqry -n \*\*IP\*\* -r \*\*PORT\*\***           Make sure that the principal server instance is not behind a firewall using any of the utilities explained above. Test this from the Mirror Server.           Verify that the endpoints are started on the partners by using the state or state\_desc column the of the sys.database\_mirroring\_endpoints catalog view. If either end point is not started, execute an ALTER ENDPOINT statement to start it.           In case there are multiple instances on the box, verify that they are using different port#.           Make sure that the principal server instance is listening on the port assigned to its database mirroring endpoint and that the mirror server instance is listening on its port. To list listening ports and the processes that have those ports opened, enter the following command at the Windows command prompt:  netstat –abn  3.     Sometimes due to slow network conditions, you might receive following errors  The mirroring connection to "TCP://<Server\_name\_with\_FQDN:Port#>" has timed out for database “<database\_name>" after 10 seconds without a response. Check the service and network connections.  In these scenarios, increase the time-out value for Partner database using following statement:  [ALTER DATABASE <database> SET PARTNER TIMEOUT <integer>](http://msdn.microsoft.com/en-us/library/ms174269.aspx)  4.     The following error indicates corruption due to hardware failure, check the application log for more information:  Database mirroring will be suspended. Server instance '<Instance\_name>' encountered error 823, state 6, severity 24 when it was acting as a mirroring partner for database '<database\_name>'. The database mirroring partners might try to recover automatically from the error and resume the mirroring session. |
| For any  issues in setting up Database Mirroring, refer <http://msdn2.microsoft.com/en-us/library/ms189127.aspx>. |

Bottom of Form

**ms164670**

Top of Form



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| **To Troubleshoot Transactional Replication.** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Infra: To Troubleshoot Transactional Replication: Subscriber not in sync with Publisher. |
| If any of the Replication agents are in red color in Replication Monitor. |
| Distribution agent fails with “Cannot insert duplicate key row in object '<tablename>' with unique index ‘<indexname>’. The statement has been terminated”. |
| Replication Agents fail with “Timeout Expired.” |
| Distribution agent fails with “The row was not found at the Subscriber when applying the replicated command." |
| This problem occurs when the subscriber and publisher are out of sync or one of the replication agents is failing. |
| **Resolution**  **Subscriber not in sync with Publisher**  The procedure to check whether the subscriber is in sync with the Publisher without using GUI (EM) is explained below:  1.     On the distributor, Check the log reader agent is running fine or not using the EM. If this runs fine proceed with the next step else troubleshoot it to fix the issue.  2.     On the subscriber, connect to the subscriber database and execute the following query:  Select \* from <subscriber database>.dbo.Msreplication\_subscriptions.  This will give all details related to the subscriptions. In these entries, take the value (omit all exceeding zeros) for transaction timestamp field, which is nothing but the last xactseqno got loaded in the subscription database. There will be only one row present for this table in subscription database unless if this database is subscribed to many publications. Hence transaction timestamp correlates to individual publications. Once you got the transaction we can easily know how many transactions yet to be delivered to the subscriber database from the distribution database.  In GUI interface we can make use of Replication monitor to verify the sync status.  For example: 0x000004570001E3FE000100000000 is the current value for transaction timestamp.  Xactseqno is 0x000004570001E3FE0001 (Exclude the exceeding zeros).  3.     Using the above xactseqno, check out with the following commands and identify what are all the transactions that are yet to be delivered to the subscribers. If there are no rows returned from the below query, indicates the replication is in sync. In addition to this, check log reader agent is running fine or not.  Select \* from Msrepl\_commands where xact\_seqno > 0x000004570001E3FE0001  **If any of the Replication agents are in red color in Replication Monitor**  If any agent fails in the distributor, it displays an icon with a red circle in Replication monitor. There are may be a case that some of the failed replication entries may be invalid (present in the tempdb database) and because of these rogue red color stays in the replication monitor.  The above replication monitor entries get maintained in the tempdb database in Msreplication\_agent\_status. Refreshing the table will resolve this issue.  **Four ways to remove red color**  1.     Open the Msreplication\_agent\_status and check which has the status as that of 6. Make a note of the agent tha that has the status as 6 and go back to Replication Monitor > Agents and check the status of that agent, if it is in a  failed state, hten we have to fix that error.  If the agent is successfully running, then you can change the status value from 6 to 4 and then refresh the Enterprise Manager.  2.     Open the table, check which agent has status as 6 and if that agent doesn't exists on distribution agent. Remove the entry from that table and refresh the enterprise manager.  3.     Use procedure sp\_MSload\_replication\_status which will refreshes the tempdb table and rogue red color will be removed after refreshing enterprise manager. Recycle the SQL server and it will recreates the tempdb database in which in turn refreshes all the tables.  **Distribution agent fails with “Cannot insert duplicate key row in object '<tablename>' with unique index ‘<indexname>’. The statement has been terminated”.**  Refer to URL, [http://eserver/iview/ui/eserver.asp?ID= ms164040](javascript:OpenSolutionInPopup(-1,'ms164040','','','','',false,'b421125a-80d6-48a3-8411-69ad39d7450b','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))    **Replication Agents fail with   “Timeout Expired**.”  Refer to URL, [http://eserver/iview/ui/eserver.asp?ID= ms164635](javascript:OpenSolutionInPopup(-1,'ms164635','','','','',false,'b421125a-80d6-48a3-8411-69ad39d7450b','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))  **Distribution agent fails with “The row was not found at the Subscriber when applying the replicated command."**    Refer to URL, [http://eserver/iview/ui/eserver.asp?ID= ms164636](javascript:OpenSolutionInPopup(-1,'ms164636','','','','',false,'b421125a-80d6-48a3-8411-69ad39d7450b','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))    **Distribution agent fails with “The agent is suspect. No response for the past 10 minutes.”**  Refer to URL, [http://eserver/iview/ui/eserver.asp?ID= ms164637](javascript:OpenSolutionInPopup(-1,'ms164637','','','','',false,'b421125a-80d6-48a3-8411-69ad39d7450b','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')) |

Bottom of Form

**ms164635**

Top of Form



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| **Replication - Timeout Expired** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Replication Agents fail. |
| If the log reader agent or distribution agent is trying to connect to the publisher or distributor (subscriber) and querying for more than 300 seconds (default), will result in this error. |
| **Workaround**  Follow the below steps to fix the above error:  1.     Set the retry interval of the job to 2 or 3, and then try rerunning the job. If this doesn’t help, then move to the next step.  2.     Increase the QueryTimeout to 1000. This can be implemented either by specifying the parameter in job under Run agent step or create a new agent profile/Default and give value as 1000 for QueryTimeout. |

Bottom of Form

**ms164637**

Top of Form



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| **The agent is suspect. No response for the past 10 minutes.** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2008 R2 |
| SQL Server 2012 |
| Distribution agent fails. |
| If an agent is running and has not logged any activity in 10 minutes, it will report this as warning and is displayed as an error. |
| **Version : SQL Server 2000:**  **Workaround**  Follow the below steps to fix the above error:    1.     By default, the Log Reader Agent polls the published database's transaction log every 10 seconds. Increase the polling interval will rectify the above error. ( CHECK IF this is related or not; polling interval of log reader and the issue might not be related).  2.     Increase the **Inactivity Threshold** value to suppress this error message. Just right click the **Replication Monitor** node, click **Refresh Rate and Settings**, and then increase the **Inactivity Threshold** values. By default, **Inactivity Threshold** value is 10 minutes.  **Version : SQL Server 2005/2008/2008 R2/2012/2014**  **Error/Warning message:**  **The replication agent has not logged a progress message in %ld minutes. This might indicate an unresponsive agent or high system activity. Verify that records are being replicated to the destination and that connections to the Subscriber, Publisher, and Distributor are still active. Please use below steps to check if log reader agent is running fine.**  **Description:**        The Replication agents checkup job runs at a specified interval (10 minutes by default) to check on the status of each replication agent. If an agent has not logged any progress messages since the last time the agent checkup job ran, this message will be logged. It can often happen that If the agent is too busy to respond when polled by the agent checkup job, the agent checkup job cannot report whether the replication agent is functioning properly and hence logs this message.  **Resolution:**  1.       Connect to Replication monitor and check if the agent is running fine. If the agent is not running, check the error details in replication monitor. Error details might provide additional information on why the agent was not running properly.  2.       If the agent is running fine without errors, identify the SPID of log reader agent and check if its progressing fine. Status RUNNABLE, no blockings, CPU and DISK IO of the connection moving.  3.       Further to the above, to make sure the agent is progressing fine and not hung, add the parametets –Output and –OutputVerboseLevel to the agent . Make sure that the path of the output file specified with –Output is valid. Values of 3 or 4 can be used with –OutputVerboseLevel (the higher the number, the more output is generated. Default is 2).  4.       Next, the output file generated, needs to be analyzed for further checks.  Once we are done with the troubleshooting work, these parameters must be removed; else we might fill up the drive where the specified log file resides.  For distribution agent same above steps can be followed by connecting to distributor server.  Also, If this error is raised frequently because the agent is busy to respond to agent checkup job, but processing the data fine without any issues, you can increase the interval at which agent status is checked using the Job Properties dialog box. |

Bottom of Form

**ms164683**

Top of Form



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| **To Troubleshoot issues with  LogReader Agent** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| LogReader agent is timing out. |
| LogReader agent is slow on a sql server, where the published database is also being mirrored. |
| LogReader agent error: The process could not execute 'sp\_replcmds' on ***servername***. |
| LogReader agent is slow, because the underlying disk subsystem is slow. |
| LogReader agent is slow, or it is failing with the generic “Unable to execute sp\_replcmds”, or similar error. |
| LogReader error: Repldone log scan occurs before the current start of replication. |
| LogReader error: The process could not execute 'sp\_repldone/sp\_replcounters. |
| Possible slow LogReader agent performance with 1000’s of VLF’s for the transaction log of the published db. |
| Need to get more information about the failing LogReader agent. |
| Further detailed troubleshooting is needed. |
| **LogReader agent is timing out**  **Resolution**  Add parameter –QueryTimeOut to the “Run Agent” of the failing LogReader SqlServerAgent job. The default value of this parameter is 1800 secs (30 minutes). Try putting in a higher number. “0” specifies unlimited time. Once the LogReader agent is caught up again, remove this parameter.  **LogReader agent is slow on a sql server, where the published database is also being mirrored**  **Resolution**  Read the following doc to see how the LogReader agent behaves in this situation:  <http://download.microsoft.com/download/d/9/4/d948f981-926e-40fa-a026-5bfcf076d9b9/ReplicationAndDBM.docx>  **LogReader agent error: The process could not execute 'sp\_replcmds' on *servername***  **Resolution**  Refer to the article, [**The process could not execute 'sp\_replcmds' on servername**](javascript:OpenSolutionInPopup(-1,'ms164690','','','','',false,'5f54345c-6c7f-4387-91c6-492bc4da8d82','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))**.**  **LogReader agent is slow, because the underlying disk subsystem is slow**  **Resolution**  Check the “Logical Disk: Avg. Disk sec/Read” and “Logical Disk: Avg. Disk sec/write” perfmon counters, for the disk drives where the published database and especially the log file(s) of the same reside. Ideally, those numbers should be 15 milli-secs or less. If we see quite a few messages like the one in brown below, in the sql errorlog, for the log file drive(s) in question, then this may indicate a disk bottleneck:  SQL Server has encountered 16 occurrence(s) of I/O requests taking longer than 15 seconds to complete on file [O:\ MSSQL\DATA\ProdDb.ldf] in database [ProdDb].           An occasional such message, every now and then is fine. However, if we see lots and lots of those at regular intervals in the sql errorlog, then we may have a disk bottleneck. If we see this, contact dcops, or for SAN drives, suops.           Also, look into the possibility of Publication and Distribution DBs sharing the same drives and experiencing contention.    **LogReader agent is slow, or it is failing with the generic “Unable to execute sp\_replcmds”, or similar error**  **Resolution**  Take a look at some of the parameter tweaks for the LogReader agent and see if tweaking one or more of them makes sense in this scenario:  <http://msdn.microsoft.com/en-us/library/ms151762.aspx>  **MaxCmdsInTran:** Specifies the maximum number of statements grouped into a transaction as the Log Reader writes commands to the distribution database. ***Default is 0, i.e., unlimited.* Specifying a smaller size can be useful, in case we have very large transactions.**  **ReadBatchSize:** Is the maximum number of transactions read out of the transaction log of the publishing database per processing cycle, with a *default of 500*. When a large number of transactions is written to a publication database, but only a small subset of those are marked for replication, you should use the **this** parameter to increase the read batch size of the Log Reader Agent. On the other hand, for purposes of troubleshooting, we can specify a low number, even 1.  **PollingInterval:** Is how often, in seconds, the log is queried for replicated transactions. The *default is 5 seconds*. If we decrease this value, the log is polled more frequently, which can result in lower latency for the delivery of transactions from the publication database to the distribution database.  **NOTE**: While making a change, it is good to measure and have the before and after values of the following perfmon counters, so that we know if our change actually helped:  SQLServer: Replication LogReader: Delivered Cmds/sec  SQLServer: Replication LogReader: Delivered Trans/sec  SQLServer: Replication LogReader: Delivery Latency  **LogReader error: Repldone log scan occurs before the current start of replication**  **Resolution**  Refer to the article, [**Repldone log scan occurs before the current start of replication**](javascript:OpenSolutionInPopup(-1,'ms164691','','','','',false,'5f54345c-6c7f-4387-91c6-492bc4da8d82','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))**.**  **LogReader error: The process could not execute 'sp\_repldone/sp\_replcounters**  **Resolution**  Refer to the article**,** [**The process could not execute 'sp\_repldone/sp\_replcounters**](javascript:OpenSolutionInPopup(-1,'ms164692','','','','',false,'5f54345c-6c7f-4387-91c6-492bc4da8d82','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))**.**  **Possible slow LogReader agent performance with 1000s of VLFs for the transaction log of the published db**  **Resolution**  Look into the possibility of reducing the VLFs. The following are good readings, in this regard:  <http://support.microsoft.com/kb/949523>  <http://www.sqlskills.com/BLOGS/KIMBERLY/category/Transaction-Log.aspx>  **Need to get more information about the failing LogReader agent**  **Resolution**             Generate an output file, by specifying –Output and –OutputVerboseLevel parameters in the “Run Agent” of the LogReader agent job in concern. Make sure that the path of the output file specified with –Output is valid. Values of 3 or 4 can be used with –OutputVerboseLevel (the higher the number, the more output is generated. Default is 2).           Next, the generated output file needs to be analyzed.           Once we are done with the troubleshooting work, these parameters must be removed; else we might fill up the drive where the specified log file resides.  **Further detailed troubleshooting is needed**  **Resolution**  The following blog by Chris Skorlinski (chrissk) talks about transactional replication conversations. The first part of this article talks about the LogReader agent, reader and writer threads:  <http://blogs.msdn.com/b/chrissk/archive/2009/05/25/transactional-replication-conversations.aspx> |

Bottom of Form

**ms164690**

Top of Form



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| **The process could not execute 'sp\_replcmds' on servername** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| LogReader agent error |
| See KB article below:  <http://support.microsoft.com/kb/811030> |

Bottom of Form

**ms164691**

Top of Form



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| **Repldone log scan occurs before the current start of replication** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| LogReader error |
| See Chris Skorlinski’s (chrissk) blog regarding this:  <http://blogs.msdn.com/b/repltalk/archive/2010/04/11/troubleshooting-logreader-error-repldone-log-scan-occurs-before-the-current-start-of-replication.aspx> |

Bottom of Form

**ms164692**

Top of Form



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| **The process could not execute 'sp\_repldone/sp\_replcounters** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| LogReader error |
| See Chris Skorlinski’s (chrissk) blog regarding this:  <http://blogs.msdn.com/b/repltalk/archive/2010/02/19/the-process-could-not-execute-sp-repldone-sp-replcounters.aspx> |

Bottom of Form

**ms164700**

Top of Form



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| **To troubleshoot issues with Distribution Agent** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Distribution agent is timing out. |
| Distribution agent is slow, or it is erroring out. |
| Distribution agent is slow, because the underlying disk subsystem is slow |
| Distribution agent error: The process could not connect to Subscriber ‘SubscriberServerName' |
| Distribution agent error: Msg 0, Level 20, State 0, Line 0 A severe error occurred on the current command. The results, if any, should be discarded |
| Need to get more information about the failing LogReader agent |
| Further detailed troubleshooting is needed |
| **Distribution agent is timing out**  Add parameter –QueryTimeOut to the “Run Agent” of the failing Distribution SqlServerAgent job. The *default value of this parameter is 1800 secs (30 minutes)*. Try putting in a higher number. “0” specifies unlimited time. Once the Distribution agent is caught up again, remove this parameter.  **Distribution agent is slow, or it is erroring out**  Take a look at some of the parameter tweaks for the Distribution agent and see if one or more of them make sense in this scenario:  <http://msdn.microsoft.com/en-us/library/ms151762.aspx>  **SubscriptionStreams[0|1**|**2|...64]:**  This is the number of connections allowed per Distribution Agent to apply batches of changes in parallel to a Subscriber, while maintaining many of the transactional characteristics present when using a single thread. *Default is 1 for a transactional SQL Server subscription*. In case of high incoming transaction rate from publisher, this parameter may help. A good place to start is to set this equal to the number of processors on the subscriber. See blog below:  <http://blogs.msdn.com/b/repltalk/archive/2010/03/01/navigating-sql-replication-subscriptionstreams-setting.aspx>  Once the replication is in sync, remove the SubscriptionStreams parameter.  **CommitBatchSize:**  This is the number of transactions to be issued to the Subscriber before a COMMIT statement is issued. *Default is 100.*Committing a set of transactions has a fixed overhead; by committing a larger number of transactions less frequently, the overhead is spread across a larger volume of data.  **PacketSize:**  This is the packet size, in bytes. *The default is 4096 (bytes).* See the blog below for the possibility of tuning this:  <http://blogs.msdn.com/b/repltalk/archive/2010/03/11/tune-replication-performance-using-packetsize.aspx>  **SkipErrors*native\_error\_id* [:*...n*]:**  Is a colon-separated list that specifies the error numbers to be skipped by this agent? See below:  <ms-help://MS.SQLCC.v10/MS.SQLSVR.v10.en/s10rp_4deptrbl/html/4114913c-4c1e-4c11-95d3-f9eb396c489a.htm>  **PollingInterval:**Is how often, in seconds, the distribution database is queried for replicated transactions. *The default is 5 seconds.*If we decrease this value, the distribution db is polled more frequently.  **NOTE**: While making a change, it is good to measure and have the before and after values of the following perfmon counters, so that we know if our change actually helped:  SQLServer: Replication Dist: Delivered Cmds/sec  SQLServer: Replication Dist: Delivered Trans/sec  SQLServer: Replication Dist: Delivery Latency  **Distribution agent is slow, because the underlying disk subsystem is slow**  Check the “Logical Disk: Avg. Disk sec/Read” and “Logical Disk: Avg. Disk sec/write” perfmon counters, for the disk drives where the distribution and subscription databases reside. Ideally, those numbers should be 15 milli-secs or less. If we see quite a few messages like the one below in the sql errorlog, for the drives where those db’s reside, then this may indicate a disk bottleneck:  SQL Server has encountered 16 occurrence(s) of I/O requests taking longer than 15 seconds to complete on file [H:\ MSSQL\DATA\ProdDb.mdf] in database [ProdDb].           An occasional such message, every now and then is fine, however, if we see lots and lots of those at regular intervals in the sql errorlog, then we may have a disk bottleneck. If we see this, contact dcops, or for SAN drives, suops.           Also, look into the possibility of distribution and subscription db’s sharing the same drives and experiencing contention.  **Distribution agent error: The process could not connect to Subscriber ‘SubscriberServerName'**  Refer to the article, [**The process could not connect to Subscriber ‘SubscriberServerName'**](javascript:OpenSolutionInPopup(-1,'ms164706','','','','',false,'324f506f-7155-40e2-8454-7481dae0259c','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')) for resolution steps**.**    **Distribution agent error: Msg 0, Level 20, State 0, Line 0 A severe error occurred on the current command.The results, if any, should be discarded**  Refer to the article,  **[Msg 0, Level 20, State 0, Line 0A severe error occurred on the current command.The results, if any, should be discarded](javascript:OpenSolutionInPopup(-1,'ms164707','','','','',false,'324f506f-7155-40e2-8454-7481dae0259c','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))**for resolution steps**.**  **Need to get more information about the failing LogReader agent**           Generate an output file, by specifying –Output and –OutputVerboseLevel parameters in the “Run Agent” of the Distribution agent job in concern. Make sure that the path of the output file specified with –Output is valid. A value of 2 is the highest value which can be specified for –OutputVerboseLevel in case of the distribution agent and is also the default.           Next, the output file generated needs to be analyzed.           Once we are done with the troubleshooting work, these parameters must be removed; else we might fill up the drive where the specified log file resides.  **Further detailed troubleshooting is needed**  The following blog by Chris Skorlinski (chrissk) talks about transactional replication conversation. The latter half of this article talks about the Distribution agent reader and writer threads:  <http://blogs.msdn.com/b/chrissk/archive/2009/05/25/transactional-replication-conversations.aspx> |

Bottom of Form

**ms237264**

Top of Form



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| **How to troubleshoot replication error “The row not found at subscriber”.** |
| The row was not found at the Subscriber when applying the replicated command, error is logged when a row to be deleted or updated is not found at the subscriber, in SQL server transactional / peer-to-peer replication. |
| This document has been developed to outline the process to resolve the issue “The row was not found at the Subscriber when applying the replicated command”. |
| The row not found at the subscriber error is logged, when the row to be modified through replication is not found at the subscriber. This is logged when delete or update is done at the publisher and same is replicated at subscriber. And the distribution agent fails with the below message:  “The row was not found at the Subscriber when applying the replicated command.” |
| **Step 1:** Connect to the distributor server. If distributor servers is not known, execute the below command on publisher to know distributor.  **sp\_helpdistributor**  **Step 2:** Execute below query to find the error logged and xact seqno, corresponding to which the row is missing:  **Select \* from distribution..msrepl\_errors order by time desc.**  Above query will give output as shown in the figure below:  **Step 3:** Make a note of xactseqno and command\_id from the above table and execute the below command on distribution database:  Use distribution  go  sp\_browsereplcmds @xact\_seqno\_start=’<xactseqno>’,  @xact\_seqno\_end=’<xactseqno>’  Output of above query will be as shown below:  Select command corresponding to the command\_id as noted from the query executed in Step 2. This the command which is being replicated and the corresponding row is missing at the subscriber.  **Step 4:** Closely observe the command and figure out if it is Deleting or Updating the row based on keyword DEL and UPD in the sp.  Alternatively, the command and the missing row can be found by enabling verbose logging and reviewing the output file. Use the following article to configure verbose history  <http://support.microsoft.com/kb/312292>  Check the verbose history . This will show the 'Last command', which will be something like: {CALL sp\_MSupd\_TTTT( ... values ...)} where 'TTTT' is the name of the table and '... values ...' is a comma separated list of values. These are the values that it attempted to delete and failed.  **Step 5:** If the operation attempted is DEL, we can introduce –SkipErrors <error number>, to skip the error and continue further. More details about –Skiperrors can be found [here](http://support2.microsoft.com/kb/327817).  However, if operation is UPD, drop a mail to the clients with the above details and advise them to insert the missing row and ensure no other rows are missing, this can be achieved by comparing the tables at publisher and subscriber. However, if clients find that there are multiple rows missing and inserting them manually is not an option, then they need to reinitialize subscription |
| If verbose logging is enabled to troubleshoot this issue, make sure to turn it off once the issue is resolved, as it will eat up disk space.  If Skiperrors parameter is introduced to resolve this issue, remove the parameter from distribution agent, and restart the distribution agent job.  \*\*\* |

Bottom of Form

**ms164706**

Top of Form



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| **The process could not connect to Subscriber ‘SubscriberServerName'** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Distribution agent error |
| See Chris Skorlinski’s (chrissk) blog regarding this:  <http://blogs.msdn.com/b/repltalk/archive/2010/04/26/distribution-agent-fails-with-error-locating-server-instance-specified-xffffffff.aspx>  Note: This error can also happen, if there have been changes on the cluster and the SPN is not registered correctly. |

Bottom of Form

**ms165228**

Top of Form



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| **Memory Errors** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| There is insufficient system memory in resource pool '*pool\_name*' to run this query. |
| There is insufficient memory available in the buffer pool. |
| A time out occurred while waiting to optimize the query. Rerun the query. |
| A timeout occurred while waiting for memory resources to execute the query in resource pool '*pool\_name*' (*pool\_id*). Rerun the query. |
| Could not perform the operation because the requested memory grant was not available in resource pool '%ls' (%ld). Rerun the query, reduce the query load, or check resource governor configuration setting. |
| **There is insufficient system memory in resource pool '*pool\_name*' to run this query**    Refer to the URL**,** [http://eserver/iview/ui/eserver.asp?ID=ms165229](javascript:OpenSolutionInPopup(-1,'ms165229','','','','',false,'25beb80e-9d4e-4648-9a98-54cd215edff2','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG'))    **A time out occurred while waiting to optimize the query. Rerun the query**    Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms165230](javascript:OpenSolutionInPopup(-1,'ms165230','','','','',false,'25beb80e-9d4e-4648-9a98-54cd215edff2','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')).    **A timeout occurred while waiting for memory resources to execute the query in resource pool '*pool\_name*' (*pool\_id*). Rerun the query.**    Refer to the URL, [http://eserver/iview/ui/eserver.asp?ID=ms165231](javascript:OpenSolutionInPopup(-1,'ms165231','','','','',false,'25beb80e-9d4e-4648-9a98-54cd215edff2','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')).    **Could not perform the operation because the requested memory grant was not available in resource pool '%ls' (%ld). Rerun the query, reduce the query load, or check resource governor configuration setting**    Refer to the URL**,**[http://eserver/iview/ui/eserver.asp?ID=ms165234](javascript:OpenSolutionInPopup(-1,'ms165234','','','','',false,'25beb80e-9d4e-4648-9a98-54cd215edff2','ASPSESSIONIDSQSCQTSQ=OALNHBCCBFBMGLKPCHPJNGIG')). |

Bottom of Form

**ms165210**

Top of Form



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| **Memory Allocation Failed** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Failed to allocate memory for Common Language Runtime (CLR). |
| Maximum limit for connections has been reached. |
| The server is too busy to perform the backup or restore operation. |
| Follow these general steps to troubleshoot memory errors:  1.     Verify whether other applications or services are consuming memory on this server. Reconfigure less critical applications or services to consume less memory.  2.     Start collecting performance monitor counters for **SQL Server: Buffer Manager**, **SQL Server: Memory Manager**.  3.     Check the following SQL Server memory configuration parameters:           **max server memory**           **min server memory**           **awe enable**           **min memory per query**  Notice any unusual settings. Correct them as necessary. Account for increased memory requirements for SQL Server 2005. Default settings are listed in "Setting Server Configuration Options" in SQL Server Books Online.  4.     If you are using Address Windowing Extensions (AWE), verify that the Windows security setting **Lock pages in memory**' is enabled.  5.     Observe DBCC MEMORYSTATUS output and the way it changes when you see these error messages.  6.     Check the workload (for example, number of concurrent sessions, currently executing queries).  The following actions may make more memory available to SQL Server:           If applications besides SQL Server are consuming resources, try stopping running these applications or consider running them on a separate server. This will remove external memory pressure.           If you have configured max server memory, increase its setting.  Run the following DBCC commands to free several SQL Server memory caches           DBCC FREESYSTEMCACHE           DBCC FREESESSIONCACHE           DBCC FREEPROCCACHE |

Bottom of Form

**ms165229**

Top of Form



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| **There is insufficient system memory in resource pool 'pool\_name' to run this query**. |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| There is insufficient system memory in resource pool '*pool\_name*' to run this query. |
| There is insufficient system memory in resource pool '*pool\_name*' to run this query.  **Causes**  This is generic out-of-memory error for the server. It indicates a failed memory allocation. It can be due to a variety of reasons, including hitting memory limits on the current workload. With increased memory requirements for SQL Server 2008 and SQL Server 2005 and certain configuration settings (such as the **max server memory** option and Resource Governor configuration settings), users are more likely to see this error. Usually the transaction that failed is not the cause of this error. Check the **out\_of\_memory\_count** column of the **sys.dm\_resource\_governor\_resource\_pools**DMV. If this count is localized to a particular resource pool, Resource Governor configuration is the most likely reason.  **Troubleshooting**  Regardless of whether the error is consistent and repeatable (that is, it stays in the same state) or random (that is, it appears at random times with different states), you should investigate server memory distribution during the time you see this error. When this error is present, it is possible that the diagnostic queries will fail. When you see this error, the best place to start investigation is the error log. It should contain output that looks something like this.  2009-01-28 04:27:15.43 spid51 Failed allocate pages: FAIL\_PAGE\_ALLOCATION 1  or  2009-01-28 04:27:15.43 spid51 Failed Virtual Allocate Bytes: FAIL\_VIRTUAL\_RESERVE 65536  The possible failures are:           FAIL\_PAGE\_ALLOCATION followed by the number of pages attempted to allocate.           FAIL\_VIRTUAL\_RESERVE followed by the number of bytes attempted to reserve.           FAIL\_VIRTUAL\_COMMIT followed by the number of bytes attempted to commit.  Usually the task that first encountered the out-of-memory error is not the task that caused the condition. Most likely it is a cumulative effect of multiple tasks running. For the very common case of a single page allocation failure, your investigation should take the global picture into account.  The next piece of information from error log is the memory status output. Depending on the failure, you should look for single page, multipage, virtual reserved or committed numbers for individual memory clerks. Identifying the biggest memory consumers is key to proceeding with investigation. You may find that the biggest consumers are of the following type:           MEMORYCLERK\_\* means that the server configuration or workload requires so much memory to be allocated. The offending workload can sometimes be identified just by the memory clerks, but more often you will have to drill further into the memory objects associated with the clerks in order to find out what causes such memory consumption.           CACHESTORE\_\*, USERSTORE\_\*, OBJECTSTORE\_\* are the types of caches. Big consumption by a cache may mean the following:  o    Memory is allocated out of the cache but is not inserted yet as an entry that can be evicted. This is very similar to the MEMORYCLERK case discussed earlier.  o    All cache entries are in use so they cannot be evicted. You can confirm this by looking at the **sys.dm\_os\_memory\_cache\_counters** DMV and comparing the **entries\_count** and **entries\_in\_use\_count** columns.  o    Most cache entries are not in use. This case most likely indicates a bug in the server.           MEMORYCLERK\_SQLQERESERVATIONS shows how much memory has been reserved by the query execution (QE) to run queries with sorts/joins.  The memory status output in the error log also shows which Resource Governor resource pool memory is exhausted. The memory brokers for every pool show the memory distribution between stolen (compilation), cached, and reserved (granted) memory. The numbers for the three brokers correspond to the three bullet points in the previous list. Unfortunately there is no way to find out how much memory is allocated for a pool from a given clerk or memory object. The **sys.dm\_os\_memory\_cache\_entries** DMV is extended to show the **pool\_id** each entry is associated with.  Possible solutions include the following:           Remove external memory pressure.           Increase the **max server memory** setting(after taking into account SQLOps standard memory configuration), and then adjust the MIN\_MEMORY\_PERCENT and MAX\_MEMORY\_PERCENT settings for the resource pool.           Free caches by using one of the following commands: DBCC FREESYSTEMCACHE, DBCC FREESESSIONCACHE, or DBCC FREEPROCCACHE.  If the problem reappears, reduce the workload.  SQL 2012:  There is a bug in SQL 2012 which can cause this error. Symptom is high memory allocation to MEMORYCLERK\_SQLLOGPOOL. Fix for this bug is available at <http://support.microsoft.com/kb/2769594>. CU5 or SP1 CU2. |

Bottom of Form

**ms165231**

Top of Form



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| **A timeout occurred while waiting for memory resources to execute the query in resource pool 'pool\_name' (pool\_id). Rerun the query**. |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Memory Error |
| **Causes**  This error indicates that many concurrent memory-intensive queries are being executed on the server. Queries that use sorts (ORDER BY) and joins can consume significant amounts of memory during execution. Query memory requirements are significantly increased if a high degree of parallelism is enabled or if a query operates on a partitioned table with nonaligned indexes. A query that cannot access the memory resources it requires within the predefined time-out (by default, the time-out is 25 times the estimated query cost, the **sp\_configure** ‘query wait’ amount if it is set, or the Resource Governor workload group setting request\_memory\_grant\_timeout\_sec) receives this error. Usually, the query that receives the error is not the one that is consuming the memory...    **Resolution**         Follow general steps to assess server memory condition         Identify problematic queries: Check to see whether a significant number of queries operate on partitioned tables, check to see whether they use nonaligned indexes, and check to see whether there are many queries involving joins and/or sorts.         Check the sp\_configure parameters degree of parallelism and min memory per query. Try reducing the degree of parallelism and verify that min memory per query is not set to a high value. If it is set to a high value, even small queries will acquire the specified amount of memory.         Find out whether queries are waiting on RESOURCE\_SEMAPHORE.         Check Resource Governor configuration.  **Note:** Though, Resource governor falls out of SQLIM scope, You can use below information to explore more on resource governor related settings for better understanding.  SQL Server Resource Governor enables you to specify limits on the amount of CPU and memory that incoming application requests can use using resource pools and Workload groups. 2 resource pools (internal and default) are created when SQL Server 2012 is installed. User defined resource pools can be created.  The error indicates that query has time out has occurred while waiting for memory resources in pool\_name resource pool. Either configure the timeout value to be higher or reduce the query load to the server.  1.       To check if resource governor is enabled on the server or not and to check the resource governor configuration, please use below DMVs. Column is\_enabled =1  indicates resource governor is enabled.              select\*FROMsys.resource\_governor\_configuration              Go  2. Below DMV returnsone row for each resource pool and provide details details about min and max cpu percentage and memory that a resource pool are allotted          select \* from sys.resource\_governor\_resource\_pools          Go  Please refer to the below link for complete information on resource governor  and related dynamic management views.  <http://msdn.microsoft.com/en-in/library/bb933866.aspx>  <http://msdn.microsoft.com/en-us/library/bb895331.aspx> |

Bottom of Form

**ms165234**

Top of Form



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| **Could not perform the operation because the requested memory grant was not available in resource pool '%ls' (%ld). Rerun the query, reduce the query load, or check resource governor configuration setting.** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Could not perform the operation because the requested memory grant was not available in resource pool '%ls' (%ld). Rerun the query, reduce the query load, or check resource governor configuration setting. |
| **Causes**  Causes in part are similar to the 8645 error; this may also be an indication of generally low memory conditions on the server. A **min memory per query** option setting that is too high can also generate this error.    **Resolution**             Follow general memory error troubleshooting steps.           Verify that the **sp\_configure min memory per query** option setting is not too high.           Check Resource Governor configuration settings. |

Bottom of Form

**ms164638**

Top of Form



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| **To Troubleshoot SQL Server or Agent Service Failure** |
| SQL Server 2005, 2008, 2008R2, 20012 |
| The Windows service for the DB Engine instance MSSQLSERVER has stopped on computer %%. |
| The Windows service for the SQL Server Agent for instance MSSQLSERVER has stopped on computer %%. |
| **The Windows service for the DB Engine instance SQL2008 has stopped.** |
| Service for the SQL Server Agent for  instance has stopped. |
| The Windows service for the DB Engine instance SIEBEL has stopped on computer. |
| Unable to restart Sql Server Reporting Service |
| After failover or upgrade SQL Service goes in script upgrade mode. |
| Open a command window in the Terminal Server ([\\AITTS](file:///\\aitts\))           **Start > Run**           Type **CMD**           Click **OK**  2.     At the command prompt, type the following:  **sqlstat <server\_name>**  **\\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164490_fig1.PNG**  3.     View the results of the command and proceed as results indicate:           If the results of the command show no errors, then the following holds true:                                                         i.    RPC is working.                                                        ii.    There is Network Connectivity.                                                       iii.    SQL server is running on at least one instance or the default instance.                                                       iv.    Simple queries made to SQL get a response.                                                       v.    There is no blockage (unless noted otherwise).                                                       vi.    Databases are available and in working state (unless noted otherwise).        If the results of the command state is **No Network Connectivity**, problem is not with SQL. Move to verify the health of the Server at the OS level by escalating the issue to DCOps.        If the results of the command state is **SQL Server \ SQL Server Agent Service is not running**, verify the following:                                                     vii.    Start-up mode of the service.                           a.   Automatic?                           b.   Manual? (Often the case for Clustered servers or default installs)                                                     viii.    If server is in a cluster.                                                     ix.    If service is supposed to be running.        Once service-running state is verified as ‘required running’ perform the following:                                                     i.    Click **Start**>**Run**                                                     ii.    Type **CMD**. From the command prompt, type the following:  **SC \\<server\_name> start servicename**        If the results of the command state anything else, escalate to Level 2  Check SQL error log/event viewer for any events/errors related to missing executable or DLL's, if you find an event/error logged for missing files then repair the reporting services.  For any access issues provide the necessary permissions on the folder where reporting services files are residing.  If Reporting services are coming online on one node and failing on other node, verify that all the nodes are running similar version of reporting services, and for any discrepancies found ask customer to work with GCO to get it upgraded.  Add trace flag -t902 and restarted the SQL service, this will skip sql service in going into script upgrade mode. |

Bottom of Form

**ms164639**

Top of Form



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| **Service for the SQL Server Agent for instance has stopped.** |
| SQL Server 2005 |
| SQL Server 2008 |
| The Windows service for the DB Engine instance MSSQLSERVER has stopped on computer %%. |
| The Windows service for the SQL Server Agent for instance MSSQLSERVER has stopped on computer %%. |
| SQL Server is unable to allocate new pages to a database log file. This is most often caused by a process has run longer than expected or has hung. |
| 1.     Open a command window in the Terminal Server ([\\AITTS](file:///\\aitts\))           **Start > Run**           Type **CMD**           Click **OK**  2.     At the command prompt, type the following:  **sqlstat <server\_name>**  **\\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164490_fig1.PNG**  3.     View the results of the command and proceed as results indicate:           If the results of the command show no errors, then the following holds true:                                                         i.    RPC is working.                                                        ii.    There is Network Connectivity.                                                       iii.    SQL server is running on at least one instance or the default instance.                                                       iv.    Simple queries made to SQL get a response.                                                       v.    There is no blockage (unless noted otherwise).                                                       vi.    Databases are available and in working state (unless noted otherwise).        If the results of the command state is **No Network Connectivity**, problem is not with SQL. Move to verify the health of the Server at the OS level by escalating the issue to DCOps.        If the results of the command state is **SQL Server \ SQL Server Agent Service is not running**, verify the following:                                                     vii.    Start-up mode of the service.                           a.   Automatic?                           b.   Manual? (Often the case for Clustered servers or default installs)                                                     viii.    If server is in a cluster.                                                     ix.    If service is supposed to be running.        Once service-running state is verified as ‘required running’ perform the following:                                                     i.    Click **Start**>**Run**                                                     ii.    Type **CMD**. From the command prompt, type the following:  **SC \\<server\_name> start servicename**        If the results of the command state anything else, escalate to Level 2. |

Bottom of Form

**ms164646**

Top of Form



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| **The Windows service for the DB Engine instance SIEBEL has stopped on computer.** |
| SQL Server 2005 |
| SQL Server 2008 |
| The Windows service for the DB Engine instance MSSQLSERVER has stopped on computer %%. |
| The Windows service for the SQL Server Agent for instance MSSQLSERVER has stopped on computer %%. |
| SQL Server is unable to allocate new pages to a database log file. This is most often caused by a process has run longer than expected or has hung. |
| 1.     Open a command window in the Terminal Server ([\\AITTS](file:///\\aitts\))           **Start > Run**           Type **CMD**           Click **OK**  2.     At the command prompt, type the following:  **sqlstat <server\_name> (figure)**  **\\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164490_fig1.PNG**  3.     View the results of the command and proceed as results indicate:           If the results of the command show no errors, then the following holds true:                                                         i.    RPC is working.                                                        ii.    There is Network Connectivity.                                                       iii.    SQL server is running on at least one instance or the default instance.                                                       iv.    Simple queries made to SQL get a response.                                                       v.    There is no blockage (unless noted otherwise).                                                       vi.    Databases are available and in working state (unless noted otherwise).        If the results of the command state is **No Network Connectivity**, problem is not with SQL. Move to verify the health of the Server at the OS level by escalating the issue to DCOps.        If the results of the command state is **SQL Server \ SQL Server Agent Service is not running**, verify the following:                                                     vii.    Start-up mode of the service.                           a.   Automatic?                           b.   Manual? (Often the case for Clustered servers or default installs)                                                     viii.    If server is in a cluster.                                                     ix.    If service is supposed to be running.        Once service-running state is verified as ‘required running’ perform the following:                                                     i.    Click **Start**>**Run**                                                     ii.    Type **CMD**. From the command prompt, type the following:  **SC \\<server\_name> start servicename**        If the results of the command state anything else, escalate Level 2. |

Bottom of Form

**ms164647**

Top of Form



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| **Unable to run the SQL server agent using the account** |
| SQL Server 2005 |
| SQL Server 2008 |
| The Windows service for the DB Engine instance MSSQLSERVER has stopped on computer %%. |
| The Windows service for the SQL Server Agent for instance MSSQLSERVER has stopped on computer %%. |
| SQL Server is unable to allocate new pages to a database log file. This is most often caused by a process has run longer than expected or has hung. |
| 1.     Open a command window in the Terminal Server ([\\AITTS](file:///\\aitts\))           **Start > Run**           Type **CMD**           Click **OK**  2.     At the command prompt, type the following:  **sqlstat <server\_name>**  **\\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164490_fig1.PNG**  3.     View the results of the command and proceed as results indicate:           If the results of the command show no errors, then the following holds true:                                                         i.    RPC is working                                                        ii.    There is Network Connectivity                                                       iii.    SQL server is running on at least one instance or the default instance.                                                       iv.    Simple queries made to SQL get a response.                                                       v.    There is no blockage (unless noted otherwise).                                                       vi.    Databases are available and in working state (unless noted otherwise).        If the results of the command state is **No Network Connectivity**, problem is not with SQL. Move to verify the health of the Server at the OS level by escalating the issue to DCOps.        If the results of the command state is **SQL Server \ SQL Server Agent Service is not running**, verify the following:                                                     vii.    Start-up mode of the service.                           a.   Automatic?                           b.   Manual? (Often the case for Clustered servers or default installs)                                                     viii.    If server is in a cluster.                                                     ix.    If service is supposed to be running.        Once service-running state is verified as ‘required running’ perform the following:                                                     i.    Click **Start**>**Run**                                                     ii.    Type **CMD**. From the command prompt, type the following:  **SC \\<server\_name> start servicename**        If the results of the command state anything else, escalate Level 2. |

Bottom of Form

**ms164648**

Top of Form



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| **The Windows service [SQL Service Name] has stopped on computer.** |
| SQL Server 2012 |
| SQL Server 2005 |
| SQL Server 2008 |
| The Windows service for the DB Engine instance MSSQLSERVER has stopped on computer %%. |
| The Windows service for the SQL Server Agent for instance MSSQLSERVER has stopped on computer %%. |
| SQL Server is unable to allocate new pages to a database log file. This is most often caused by a process has run longer than expected or has hung. |
| To identify and fix a failed service follow these steps:   1. Connect to SQL/IS/RS from remote computer. 2. If step 1 fails, remote desktop into the server. 3. If the server is not responding engage serverIM. 4. Once logged in check the services status and startup mode. 5. If the startup is automatic, then check in Windows application logs of any cause of the failure. Example, logon failure. 6. If the startup is manual and the server is part of a cluster, then check if the service is running in any other node. 7. Take corrective measures depending on the failure in the logs. For example, if the failure is due to logon then change the service account password and try to start the service again. Take inputs from the customer before doing this step. 8. Once the service is started check for local and remote connectivity. |

Bottom of Form

**ms164040**

Top of Form



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| **Cannot insert duplicate key row in object '<tablename>' with unique index ‘<indexname>’. The statement has been terminated.** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| Distribution agent fails. |
| This problem occurs if when a row which is to be delivered on the subscriber already exists on the subscriber database. This occurs as a part of insertion operations, so sp\_MSins\_impNodes procedure with value of primary key will be executed on the subscriber, if it finds that value already exists in the subscriber table, it reports the above error and fails. These procedures are custom written based on the requirements. If the below workaround doesn’t helps and if you get the same error for the other table, then proceeding with reinitializing the subscription or investigate what causes this error in the first place. |
| **Resolution**  1.     Configure the distribution agent for the verbose history .Use the following article to configure verbose history     <http://support.microsoft.com/kb/312292>.  2.     Check the verbose history. This will show the 'Last command', which will be something like:  {CALL sp\_MSins\_TTTT( ... values ...)}  where 'TTTT' is the name of the table and '... values ...' is a comma separated list of values. These are the values that it attempted to insert and failed on. Comparing these values with the primary keys or unique constraints applied to the table should allow you to identify the offending row at the subscriber.  3.     Check with customer if this row can be deleted at the subscriber to resolve the issue  4.     Delete the row if the customer confirms the same to resolve the same.  5.     Or else add –skiperrors <error number> parameter in the agent profiles to avoid this alert. |

Bottom of Form

**ms164707**

Top of Form



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| **Msg 0, Level 20, State 0, Line 0 - A severe error occurred on the current command. The results, if any, should be discarded**. |
| SQL Server 2005 |
| SQL Server 2008 |
| Distribution agent error |
| See Chris Skorlinski’s (chrissk) blog regarding this:  <http://blogs.msdn.com/b/repltalk/archive/2010/04/05/distribution-agent-fails-with-error-msg-0-level-20-state-0-line-0.aspx> |

Bottom of Form

**ms237084**

Top of Form



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| **How to grant access to users in SQL server** |
| To resolve issues where users are not able to access SQL server due to lack of permissions |
| This document has been developed to outline the process to grant access to users so that they can access SQL server. This applies to all versions of SQL from SQL 2005 onwards. |
| As the user lacks permission, a connection with server is established but still “Login failed” message is received. This KB is also applicable to RF raised to grant ‘sa’ access to users and Security Groups.  There could be various reasons for getting login failed messages, apart from access. A few are summarized below: Are you connecting from an app (Visual Studio etc.) and not SSMS?   If yes then try to connect from SSMS if it works then problem might be in the app.  If no then is there any user account that works? Yes :  Then username may not exist or might be mispelled.  Password might be incorrect/ Login Missing  Account may be disabled No:   Check Sql Services, Connectivity etc. refer KB ms213631 (General Network Errors)  This KB is specific to missing logins and how to add an account in SQL logins. |
| **Ensure that there is necessary approval from Server Owners to add any user or group as sysadmin in SQL server**  **\*\*Only user having sysadmin access on the server can add another user.\*\***  **Step 1:** Connect to SQL Server through SSMS **Step 2:** Goto Security 🡪 Logins  **Step 3:** Right Click on logins and select new login:  1)      Enter user name or SG to be added:    i)  Ensure the login name provided gets resolved through search button.  ii)                  If the account to be added is a Security Group (SG), select Groups in Object Type.  2)      Ensure correct authentication is selected. By default its Windows Authentication  3)      **Go to Server Roles and select ‘sysadmin’**  Once everything is done select OK.  Logins can also be added using below t-SQL script.   CREATE LOGIN [<domainName>\<loginName>] FROM WINDOWS;  GO  EXEC master..sp\_addsrvrolemember @loginame = N'domainname\loginName', @rolename = N'sysadmin' GO |
| Based on the outcome of the steps described above, take the necessary actions to resolve the issue.  If you need to escalate the IR, follow the escalation process documented [here](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Escalation%20document.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%257bE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%257d%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) |

Bottom of Form

**ms237270**

Top of Form



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| **How to troubleshoot issues with Mail not sending through DBMail.** |
| To resolve issues where after configuring DBMail, mails are stuck and does not get delivered. This document also outlines the process to be followed when an incident is raised to configure DBMail |
| This document has been developed to outline the process to resolve the issues with mail delivery using DbMail in all versions of SQL from SQL 2005 onwards. |
| As the service account lacks permission, mails are not delivered to the recipients and below errors are logged:  The mail could not be sent to the recipients because of the mail server failure. (Sending Mail using Account 1 (2014-10-27T22:40:30). Exception Message: Cannot send mails to mail server. (Mailbox unavailable. The server response was: 5.7.1 Client does not have permissions to send as this sender). |
| **Step 1:** Go to DbMail Logs:  **Step 2:** Find the error message being logged.  The mail could not be sent to the recipients because of the mail server failure. (Sending Mail using Account 1 (2014-10-27T22:40:30). Exception Message: Cannot send mails to mail server. (Mailbox unavailable. The server response was: 5.7.1 Client does not have permissions to send as this sender).  **Step 3:** Verify if DBMail has been configured correctly and if SMTPHOST is accessible. Also verify if the port, mostly 25, is not blocked.  1)      Make sure DbMail is enabled, this can be verified through sp\_configure and value of Database Mail Xps should be 1:  sp\_configure 'show advanced options', 1;  GO  RECONFIGURE;  GO sp\_configure ‘Database Mail XPs’  If Database Mail XPs value is 0, use the below code to change it to 1.   sp\_configure 'Database Mail XPs', 1;  GO  RECONFIGURE  2)      Ensure that correct profile is selected. Email Address, Server Address (SMTPHOST)and port is entered correctly. Below queries can be used to find out dbmail configuration:  a)      select \* from msdb.dbo.*sysmail\_profile --- > To view dbmail profiles*  b)      select \* from msdb.dbo.**sysmail\_account --🡪 To view accounts**  c)       select \* from msdb.dbo.**sysmail\_profileaccount where profile\_id=<> -🡪 To view accounts of a profile**  d)  select \* from **sysmail\_server -🡪 To display mail server details**    3)      To verify if SMTPHOST is reachable, use the below methods:  Ping <SMTPHOST name>  telnet <smtphost name><port number>  <http://www.port25.com/how-to-check-an-smtp-connection-with-a-manual-telnet-session-2/>  **Step 4:** To deliver the mails to the recipients, the dbMail profile account should have SendAs permissions at SMTPHOST. Recommend customer to get the same verified by contacting Global held desk on 425-706-5000. They shall help to log a ticket to Messaging team. |
| If an incident or RF is raised requesting to configure DBMail, please advise the clients to submit RFC with the KCt# KCT0002053. |
| In case mail server other than SMTPHOST is used and dbmail does not work, confirm  with them if it has ever worked or working in their environment. If not, ask them  to test DbMail by using smtphost.gtm.corp.microsoft.com  or xsmtphost.partners.extranet.microsoft.com (in partners domain). If it works, ask them to verify their mail server, connectivity etc. |

Bottom of Form

**ms164923**

Top of Form



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| **To Troubleshoot with the exception in the subsystem** |
| SQL Server 2005 |
| SQL Server 2008 |
| Job step cannot be run because the subsystem failed to load. |
| Step of a job caused an exception in the subsystem. |
| To work around this problem, delete the entries from the **msdb.dbo.syssubsystems** table, and then repopulate the entries. The following steps will update the subsystem DLLs to the correct path based on the current install folder. To do this, follow these steps:  1.     In SQL Server Management Studio, run the following script.  use msdb  go  delete from msdb.dbo.syssubsystems  exec msdb.dbo.sp\_verify\_subsystems 1  go  2.     Stop and then restart the SQL Server Agent service. |

**Bottom of Form**

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Top of Form



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| **RO access to a Secondary replica or using an AOAG Listener for Read-Only Routing** |
| Read-only routing refers to the ability to route incoming connections to an availability group listener to a secondary replica that is configured to allow read-only workloads. |
| The following end to end steps demonstrate how to configure and use read-only routing to route read-intent listener connections to the secondary replica.  These instructions help to perform the following:  1.      Configure availability group replicas to accept read-only connections while in the secondary role.  2.      Configure Read-Only Routing for each availability replica. Each secondary replica must  1.      Define a read-only routing URL  2.      Specify a read-only routing list  We have the following defined objects:   * Availability group named ag * Listener named aglisten * Replicas SQLNODE1 (primary) and SQLNODE2 (secondary)   **1 Configure Availability Group Replicas to Accept Read-Only Connections**  Configure your availability group replicas to allow for read-only connection requests when in the secondary role. The following script configures both SQLNODE1 and SQLNODE2 replicas, when in in the secondary role, to accept read-only connections through the listener.  ALTER AVAILABILITY GROUP [ag] MODIFY REPLICA ON N'SQLNODE1' WITH (SECONDARY\_ROLE(ALLOW\_CONNECTIONS = READ\_ONLY))  ALTER AVAILABILITY GROUP [ag] MODIFY REPLICA ON N'SQLNODE2' WITH (SECONDARY\_ROLE(ALLOW\_CONNECTIONS = READ\_ONLY))  NOTE: Read-only routing can support ALLOW\_CONNECTIONS property set to READ\_ONLY or ALL.  Alternatively, use SQL Server Management Studio to pull up the availability group properties using Object Explorer, and set the Readable Secondary property to 'Read-intent only.'    **2 Configure Read-Only Routing**  Each availability replica that will accept these read-only connections must be defined with a read-only routing URL and a routing list. In this step you will  1.      Define a read-only routing URL address.  2.      Specify a read-only routing list for each availability replica while in the primary role.  NOTE: Configuring the read-only routing URL and the routing list can be performed through Transact-SQL. SQL Server Management Studio does not offer these availability group properties for modification.  First, define the read-only URL for each replica. This designates the address for each availability replica you wish to accept read-only connection requests when in the secondary role. For example, define a URL SQLNODE2, so that when SQLNODE2 is in the secondary role, it can accept read-only connections.  ALTER AVAILABILITY GROUP ag MODIFY REPLICA ON N'SQLNODE1' WITH (SECONDARY\_ROLE (READ\_ONLY\_ROUTING\_URL = N'TCP://SQLNODE1:1433'));  ALTER AVAILABILITY GROUP ag MODIFY REPLICA ON N'SQLNODE2' WITH (SECONDARY\_ROLE (READ\_ONLY\_ROUTING\_URL = N'TCP://SQLNODE2:1433'));  Next, define a routing list for each replica. When the replica is in the primary role, this designates where to route read-only connection requests to. For example, when SQLNODE1 is in the primary role, define our routing list to consist of SQLNODE2 which is where read-only connection requests will be routed.  ALTER AVAILABILITY GROUP ag MODIFY REPLICA ON N'SQLNODE1' WITH (PRIMARY\_ROLE (READ\_ONLY\_ROUTING\_LIST=('SQLNODE2')));  ALTER AVAILABILITY GROUP ag MODIFY REPLICA ON N'SQLNODE2' WITH (PRIMARY\_ROLE (READ\_ONLY\_ROUTING\_LIST=('SQLNODE1')));  **3 Confirm read-only routing using SQLCMD**  SQLCMD ships with SQL Server 2012, supporting the latest SQL Server connection parameters for AlwaysOn availability groups including the new Application Intent connection property.  To test your newly configured read-only routing, use SQLCMD to specify the application intent option (-K).  **sqlcmd -S aglisten -E -d agdb1 -K readonly**  NOTE: You must specify one availability database from the availability group using the database option (-d). If this option is not specified your connection will not be successfully routed to the secondary replica. |

Bottom of Form

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Top of Form



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| **How to Add a Database in Availability Group.** |
| **Prerequisites and Restrictions**           Connect to the server instance hosting the primary replica.           User should‘ve ALTER AVAILABILITY GROUP permission on the availability group, CONTROL AVAILABILITY GROUP permission, ALTER ANY AVAILABILITY GROUP permission, or CONTROL SERVER permission.           The database must reside on the server instance that hosts the primary replica and comply with the prerequisites and restrictions for availability databases.  **Using Transact-SQL**  To add a database to an availability group on Primary.  1.     Connect to the server instance that hosts the primary replica.  2.     Create a full backup of the database, place the backup and a subsequent log backup on a network share.  3.     Use the [ALTER AVAILABILITY GROUP](http://msdn.microsoft.com/en-us/library/ff878601.aspx) statement, as follows:  ALTER AVAILABILITY GROUP group\_name ADD DATABASE database\_name [,...]  where group\_name is the name of the availability group and database\_name is the name of a database to be added to the group.  The following example adds the MyDb3 database to the MyAG availability group.  -- Connect to the server instance that hosts the primary replica. Add an existing database to the availability group.  ALTER AVAILABILITY GROUP MyAG ADD DATABASE MyDb3;  4.     After you add a database to an availability group, you need to configure the corresponding secondary database on each server instance that hosts a secondary replica.  Setup database in an availability group on the Secondary.  1.     On the server instance that will hold the secondary replica, restore the full database backup of the primary database and the following TLOG backup using WITH NORECOVERY for each restore.  2.     In case of non-symmetric storage MOVE option in the WITH clause and always RESTORE WITH NORECOVERY.  3.     ALTER DATABASE database\_name SET HADR AVAILABILITY GROUP = group\_name where database\_name is the name of a database to be joined and group\_name is the name of the availability group.  ALTER DATABASE MyDb3 SET HADR AVAILABILITY GROUP = MyAG; |

Bottom of Form

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Top of Form



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| **Troubleshooting SQL AlwaysON Issues** |
| SQL AO latency between Primary and secondary replica Log backup failure on Secondary due to AlwaysOn latency. |
| This is a known issue, due to high data processing on primary latency increases between primary and secondary. |
| Enable the log backups on primary and once latency issue has been fixed then log backups have to be enabled on secondary. Check value for log\_reuse\_wait\_desc in sys'databases and log\_send\_queue\_size in sys.dm\_hadr\_database\_replica\_states |

Bottom of Form

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Top of Form



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| **How to Troubleshoot “Login failed for user null” errors** |
| Infrastructure Incident Management |
| SQL Incident Management |
| SQL Server 2000/2005/2008/2008R2/2012.  Many times when an attempt is made to connect a SQL server remotely, the connection fails with the error  1- “Login failed for user null” or  2- Login failed for user Anonymous” or 3- “Login failed for User ‘NT Authority\Anonymous’” or 4- “Login failed for User“ or  5-“Login failed for user null - not associated with a trusted SQL Server connection” |
| First determine if this is[Kerberos](file:///C:\Users\v-vamand\Desktop\Please%20raise%20an%20RCA%20ticket%20with%20server%20team%20by%20following%20the%20link%20:%20http:\sharepoint\sites\IIM\SitePages\PBMaspx)Double-hop authentication issue. Double hop is a term given to the scenario where you must use Kerberos delegation to impersonate a user's identity across multiple servers. In pre win2k versions of windows we used[NTLM](file:///C:\Users\v-vamand\Desktop\Please%20raise%20an%20RCA%20ticket%20with%20server%20team%20by%20following%20the%20link%20:%20http:\sharepoint\sites\IIM\SitePages\PBMaspx)which required the client to have the user's password when connecting to a remote server. The drawback of NTLM was once you authenticated to the serveryou could not go on and authenticate to a backend server because the middle tier server did not have the clients password. In order to do this you must be using Kerberos authentication because server b needs to impersonate the client and delegate credentials. |
|         Do basic[protocol testing](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Protocol%20testing.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1). Verify single hop connectivity is working.          [SSCD](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Protocol%20testing.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1)tool is of great help here. It helps checking if NTLM, Kerberos are working, if SPN is existing, if SPN is correct, if there are any duplicate SPNsetc. If tools did not work, proceed onto the troubleshooting sections under Kerberos, NTLM.          If the issue is still not resolved, you can youuse[SSPIClient](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SSPI%20Client.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1)tool. This will output the DC name that the server is connecting to, the NTLM / Kerberos login packets etc.          You can also find the name of the DC using nltest command.          nltest /sc\_query:<domainname>          eg. nltest /sc\_query:fareast          Once you have the DC name, ping with -4 and -6 options and document the results.          Document the output from the tools.          Run[Netmon](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Network%20Monitor.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1)at SQL Server while reproducing the issue and preserve the Netmon file.  **Resolution**  Based on the outcome of the steps described above, take the necessary actions to resolve the issue.  If you need to escalate the IR, follow the escalation process documented [here](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Escalation%20document.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%257bE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%257d%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1). |

Bottom of Form

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Top of Form



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| **How to troubleshoot “General Network Errors (GNE)”** |
| Infrastructure Incident Management |
| SQL Incident Management |
| SQL Server 2000/2005/2008/2008R2/2012.  Many times when an attempt is made to connect a SQL server remotely, the connection fails with the error “General Network Errors” or “Communication link failure” or “A transport-level error” |
| A General Network Error (GNE) is an error message raised by the SQL Server network libraries. It is caused by any unexpected low-level network event, such as port closure, non-response, etc. In older libraries, such as DBNETLIB, the message "General Network Error" masked about 28 specific causes, making it quite difficult to diagnose issues. In newer libraries (SNAC and .NET 2.0 and later) these events raise more appropriate messages, such as "The port was closed by the remote host", making it easier to troubleshoot.    When you are looking at Netmon capture, A GNE is often accompanied by a RESET packet from either the client or the server. If the packet contains just the RESET flag, then it is most likely from the transport layer and due to low level networking causes, such as unexpected closed port. If it contains both ACK+RESET, then it is typically the application layer resetting the connection, such as bad protocol.   A GNE can be caused by a number of factors. Likely causes include:   * Server load * Network Offloading * Other incorrect network settings   **Miscellaneous Errors:**  •        [SQL Server Native Client 11.0]Named Pipes Provider: Could not open a connection to SQL Server [53].  •        [SQL Server Native Client 11.0]Named Pipes Provider: Could not open a connection to SQL Server [2].  •        [SQL Server Native Client 11.0]TCP Provider: A connection attempt failed because the connected party did not properly respond after a period of time, or established connection failed because connected host has failed to respond.  •        [SQL Server Native Client 11.0]Login timeout expired  •        [SQL Server Native Client 11.0]A network-related or instance-specific error has occurred while establishing a connection to SQL Server. Server is not found or not accessible. Check if instance name is correct and if SQL Server is configured to allow remote connections. For more information see SQL Server Books Online  •                                      53 = The network path was not found.  •                                      2 = The system cannot find the file specified.  •        Provider: TCP Provider, error: 0 - No connection could be made because the target machine actively refused it.  •        Provider: Named pipes provider, error: 40 could not open a connection to SQL Server  •        SQL Network Interfaces: Server doesn't support requested protocol [xFFFFFFFF].  •        Login Failed (Error 18456/18452)  •        Could not open a connection to SQL Server |
| Server Load:  Check Browser service is running or not.  Collect [Netmon](file:///E:\MSIT\Primus-Articles\SQLIM\170913\General%20Network%20Errors.docx) at SQL Server.  If the server is too busy to respond to a request, it will RESET the connection. The client may retry a number of times. Depending on when the connection attempt is reset, the client may raise a number of exceptions, including a GNE. In a Network trace, you can see the following pattern of TCP/IP flags (sometimes called SARS packets):  S  A..R  S  A..R  ...    If no connection is being allowed to SQL, if SQL is in hung state, try DAC connection. In many cases, administrators stop and restart their SQL Server services, in order to temporarily get rid of the problem. In many cases the problem may not return but in others, the problem returns only to have the server stopped and restarted repeatedly. Before restarting, if you want to collect any diagnostic information from SQL Server, DAC can help.  <http://msdn.microsoft.com/en-us/library/ms189595.aspx>  Network Offloading:  Network offloading is done for performance reasons. It delegates certain tasks done by the transport layer directly to the network card or network driver. In a number of cases, we have seen buggy implementations that result in corrupt packets and GNE. Turning off offloading can result in more reliable networking.   * TCP Chimney / Scalable Network Pack (see the KB below) * Disable Checksum Offloading (requires reboot): HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters  REG\_DWORD: DisableTaskOffload, Value: 1 * Disable SynAttackProtect: HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\  REG\_DWORD: SynAttackProtect, Value: 0   Run the commands and document the output from **Netsh int tcp show global, Netsh int tcp show chimneystats.**  "General Network error," "Communication link failure," or "A transport-level error" message when an application connects to SQL Server <http://support.microsoft.com/kb/942861>  To enable, disable TCP Chimney:<http://technet.microsoft.com/en-us/library/gg162682(v=ws.10).aspx>  **Data to collect:**   * Network topology (diagram if available)   Try collect network architecture details, including any intermediate hubs, firewalls, routers, switches between client and SQL Server. We need to have a clear picture of all the networking hardware between the client and the SQL Server, for example:  Web Server: Network Card(s)->Local Hub->Cisco Firewall->Network Card(s)->SQL Server.   * Run [tracert](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Basic%20Connectivity%20Tests.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1) from client to server and document the output. * In case of suspected server load issue, A [PSSDiag](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SQL%20Server%20PSSDIAG.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) and [Netmon](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Network%20Monitor.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1) from SQL Server while the issue is occurring. If the issue is not repro’able at will, just collect a snapshot of PSSDiag (run about 5 or 10 minutes). * "ipconfig /all" output from SQL Server and affected client(s) (again, the client may be the web server). From a command prompt, run ipconfig /all > output.txt. This will produce the file output.txt. * Output from [SSCD](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SSCD.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1).     **Miscellenous errors:** In each case, we need to check the full text of the error message and formulate appropriate troubleshooting method. [Basic connectivity tests](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Basic%20Connectivity%20Tests.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1) are appropriate in many of the cases. It is essential to check the entire message as there will be generic error messages like “timeout expired”. Unless we check the full error text, we cannot tell whether it is login or the query that timed out. In case of log in timeout, we need to check the connectivity and in case of query, we need to check performance. Check SQL error logs for more clues if the error text itself is not useful.   .  **Resolution**  Based on the outcome of the steps described above, take the necessary actions to resolve the issue.  If you need to escalate the IR, follow the escalation process documented [here](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Escalation%20document.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%257bE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%257d%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1). |

Bottom of Form

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Top of Form



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| **How to troubleshooting “Cannot Generate SSPI Context” errors** |
| Infrastructure Incident Management |
| SQL Incident Management |
| SQL Server 2000/2005/2008/2008R2/2012.  Many times when an attempt is made to connect a SQL server remotely, the connection fails with the error “Cannot Generate SSPI context” |
| The above error message is received when the below conditions are fulfilled:          You are connecting to Microsoft SQL Server.          You are using Integrated Security.          Kerberos authentication is used to perform the security delegation.  The following problems may cause authentication and security issues:          Problems occur with [NTLM](file:///E:\MSIT\Primus-Articles\SQLIM\170913\Cannot%20Generate%20SSPI%20Context%20Errors.docx) authentication or with [Kerberos](file:///E:\MSIT\Primus-Articles\SQLIM\170913\Cannot%20Generate%20SSPI%20Context%20Errors.docx) authentication          The domain controller cannot be contacted because of connectivity issues          Problems occur with trust relationships across domains.  If you run the SQL Server service under the Local System account, the SPN is automatically registered and Kerberos authentication interacts successfully with the computer that is running SQL Server. However, if you run the SQL Server service under a domain account or under a local account, the attempt to create the SPN will fail in most cases because the domain account and the local account do not have the right to set their own SPNs. When the SPN creation is not successful, this means that no SPN is set up for the computer that is running SQL Server. If you test by using a domain administrator account as the SQL Server service account, the SPN is successfully created because the domain administrator-level credentials that you must have to create an SPN are present.   Because you might not use a domain administrator account to run the SQL Server service (to prevent security risk), the computer that is running SQL Server cannot create its own SPN. Therefore, you must manually create an SPN for your computer that is running SQL Server if you want to use Kerberos authentication when you connect to a computer that is running SQL Server. This is true if you are running SQL Server under a domain user account or under a local user account. The SPN you create must be assigned to the service account of the SQL Server service on that particular computer. The SPN cannot be assigned to the computer container unless the computer that is running SQL Server starts with the local system account. There must be one and only one SPN, and it must be assigned to the appropriate container. Typically, this is the current SQL Server service account, but this is the computer account container with the local system account.  For more information about possible causes, see the event logs on the computer. To isolate problems with Windows authentication, you can use SQL Server Authentication to connect to the instance of SQL Server (if SQL authentication is already enabled. Don’t enable SQL authentication for this testing purpose alone). For additional information about how to troubleshoot and resolve the "Cannot Generate SSPI Context" error, click the following article number to view the article in the Microsoft Knowledge Base:  How to troubleshoot the "Cannot generate SSPI context" error message <http://support.microsoft.com/kb/811889> |
| Do [protocol testing](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Protocol%20testing.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C&DefaultItemOpen=1). Isolate the issue to TCP if possible. If named pipes is working remotely, it may indicate that NTLM is working and may be the issue is with Kerberos only. If you are able to connect using lpc, np document if you can see NTLM/ Kerberos connections to SQL Server using the below command.  SELECT auth\_scheme FROM sys.dm\_exec\_connections  [SSCD](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SSCD.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%7BE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%7D%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) tool is of great help here. It helps checking if NTLM, Kerberos are working, if SPN is existing, if SPN is correct, if there are any duplicate SPNs etc. If tools did not work, proceed onto the troubleshooting sections under Kerberos, NTLM.  If the issue is still not resolved, you can you use [SSPIClient](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/SSPI%20Client.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%7BE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%7D%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) tool. This will output the DC name that the server is connecting to, the NTLM / Kerberos login packets etc.  You can also find the name of the DC using nltest command.  nltest /sc\_query:<domainname>  eg. nltest /sc\_query:fareast  Once you have the DC name, ping with -4 and -6 options and document the results.  Document the output from the tools.  Run [Netmon](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Network%20Monitor.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%7BE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%7D%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1) at SQL Server while reproducing the issue and preserve the Netmon file. |
| If it is found that Kerberos Authentication is being used and SPN is present, there is every possibility that either SPN is not registered correctly. Verify if the Service Name, Server Name. Port number is correct in the SPN, though setspn –L <Serviceaccount of SQL services>, in such cases, recommend to get the SPN reset by raising SR with IDMSUPP team through the below link:  If an issue is identified with AD connectivity, involved ServerIM to investigate further.  If you need to escalate the IR, follow the escalation process documented [here](http://sharepoint/sites/IIM/MembersOnly/_layouts/WordViewer.aspx?id=/sites/IIM/MembersOnly/Shared%20Documents/SQL/Escalation%20document.docx&Source=http%3A%2F%2Fsharepoint%2Fsites%2FIIM%2FMembersOnly%2FShared%2520Documents%2FForms%2FAllItems%2Easpx%3FRootFolder%3D%252Fsites%252FIIM%252FMembersOnly%252FShared%2520Documents%252FSQL%26FolderCTID%3D0x01200061798C80F7D9FD49BAC80BEA08BE0D6C%26View%3D%257bE7934C62%2D3F00%2D4528%2D8B9A%2DA054B05EB379%257d%26InitialTabId%3DRibbon%252EDocument%26VisibilityContext%3DWSSTabPersistence&DefaultItemOpen=1). |

Bottom of Form

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Top of Form



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| **To recover SQL Server Scheduled Job \_SQL\_BackupDiffAll that is in failed state**. |
| SQL Server 2005 |
| SQL Server 2008 |
| There is not enough space on the disk. |
| Current database backup does not exist. |
| The system cannot find the file specified. |
| The backup data at the end of **backup\_file\_name.BAK** is incorrectly formatted. |
| **Resolution:**   1. From a workstation or server with SQL Server 2005/2008 installed (you may need to open a terminal server remote session to one), click **Start -> Programs -> Microsoft SQL Server**. 2. Click **SQL Server Management Studio**. 3. In the **Connect to Server** dialog box, type the server name of the SQL server that you are troubleshooting. This will start **Object Explorer**. 4. In **Object Explorer**, connect to an instance of the **SQL Server Database Engine**, and then expand that instance. 5. Expand **SQL Server Agent**, and then expand **Jobs**. 6. Right-click the job **\_SQL\_BackupDiffAll**, and then click **View History**. **Log File Viewer** will open showing the history of the selected job(s).    1. A successful job will display with a green check mark.    2. A failed job will display with a red circle with a white **X** in the middle.   **Note** To update the job history, click **Refresh**. To view fewer rows, click the **Filter** button, and then enter filter parameters.   1. To determine which step of a job failed, click the plus sign to the left of the red circle.    1. A retried step will have a white circle with a blue arrow.    2. A failed step will have a red circle with a white **X** in the middle.   **Case 1:**  Executed as user: PARTNERS\emccalc1. Backing Up DB: Warehouse [SQLSTATE 01000] (Message 0)  10 percent processed. [SQLSTATE 01000] (Message 3211)  20 percent processed. [SQLSTATE 01000] (Message 3211)  30 percent processed. [SQLSTATE 01000] (Message 3211)  40 percent processed. [SQLSTATE 01000] (Message 3211)  50 percent processed. [SQLSTATE 01000] (Message 3211)  Write on "e:\mssql\bak\diff\Warehouse\_Diff.BAK" failed: 112(There is not enough space on the disk.) [SQLSTATE 42000] (Error 3202)  BACKUP DATABASE is terminating abnormally. [SQLSTATE 42000] (Error 3013).  NOTE: The step was retried the requested number of times (3) without succeeding.  The step failed.  **Resolution:**  1.      Open the failed job ***\_SQL\_BackupDiffAll*** and click **Properties -> Steps -> \_SQL\_BackupDiffAll01** to get the location.    **Example:** The location here is E:\mssql\bak\diff      \\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164664_fig 1.png    2.     Open the **SQL Management Studio** query window. Connect to the SQL Server and execute **xp\_fixeddrives**.  3.     Determine if there is enough space on the backup drive e.g. **E:** drive in this case.  4.     If you do not find enough space on the drive, then perform the below given conditions.  **Note:** Do not make any changes until the action plan has been confirmed with the service owner.           Delete the old backup files           Change the backup location to some other drive where there is enough space  5.     If the issue is still not resolved, then work with **customer** and **SUOPS** to increase the space on the backup drive and make sure the job has been disabled.    **Case 2:**  Executed as user: NT AUTHORITY\NETWORK SERVICE. Backing Up DB: GroupID68 [SQLSTATE 01000] (Message 0)  SQL Litespeed Version 4.7.0.00096 Copyright (C) 2004-2006, Quest Software Inc. Quest Software Inc.. Registered Name: Microsoft [SQLSTATE 01000] (Message 1)  SQL Server has returned a failure message to LiteSpeed 2005 which has prevented the operation from succeeding. The following message is not a LiteSpeed 2005 message. Please refer to SQL Server books online or Microsoft technical support for a solution:   BACKUP DATABASE is terminating abnormally.  Cannot perform a differential backup for database "GroupID68", because a current database backup does not exist. Perform a full database backup by reissuing BACKUP DATABASE, omitting the WITH DIFFERENTIAL option. [SQLSTATE HY000] (Error 62309)Unable to open Step output file.  NOTE: The step was retried the requested number of times (3) without succeeding.  The step failed.  **Resolution:**  1.       Run the job ***\_SQL\_BackupAll***.  2.       Then, run the job ***\_SQL\_BackupDiffAll****.*    **Case 3:**  The system cannot find the file specified. **LiteSpeed** could not open the backup file: e:\mssql\bak\diff\AppSupport\_Diff.BAK.  **Resolution:**  1.    Open the specified location in the failed job history.  **Example:** The location here is e:\mssql\bak\diff  2.    Determine if the path exists:             If the path exists, then re-run the job.             If the path does not exist, then change the backup location path in the job.  **Case 4:**  The backup data at the end of **AppSupport\_Diff.BAK** is incorrectly formatted.  **Resolution:**  **Note:** The above error is commonly observed when the backup is terminated abruptly or when we have backup of two different databases from two different servers with same name in the same location.  1.       Re-run the job.  2.       If the job still fails, then create a new folder in the same location and change the backup location in the job to this new folder. Re-run the job again and resolve the issue. |

Bottom of Form

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Top of Form



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| **To recover SQL Server Scheduled Job *\_SQL\_BackupTranAll* that is in failed state** |
| SQL Server 2005 |
| SQL Server 2008 |
| The backup data is incorrectly formatted. |
| **Resolution:**   1. From a workstation or server with SQL Server 2005/2008 installed (you may need to open a terminal server remote session to one), click **Start -> Programs -> Microsoft SQL Server**. 2. Click **SQL Server Management Studio**. 3. In the **Connect to Server** dialog box, type the server name of the SQL server that you are troubleshooting. This will start **Object Explorer**. 4. In **Object Explorer**, connect to an instance of the **SQL Server Database Engine**, and then expand that instance. 5. Expand **SQL Server Agent**, and then expand **Jobs**. 6. Right-click the job **\_SQL\_BackupTranAll**, and then click **View History**. **Log File Viewer** will open showing the history of the selected job(s).    1. A successful job will display with a green check mark.    2. A failed job will display with a red circle with a white **X** in the middle.   **Note** To update the job history, click **Refresh**. To view fewer rows, click the **Filter** button, and then enter filter parameters.   1. To determine which step of a job failed, click the plus sign to the left of the red circle.    1. A retried step will have a white circle with a blue arrow.    2. A failed step will have a red circle with a white **X** in the middle.   **Case 1:**  The backup data at the end of *ELMS82Vanila\_Tran.lsb*is incorrectly formatted.  **Resolution:**  **NOTE:** The mentioned error is commonly observed when the backup is terminated abruptly or when we have backup of two different databases from two different servers with same name in the same location.         1.      Re-run the job.            2.      If the job still fails, create a new folder in the same location and change the backup location in the job to this new folder. Re-run the job again.      **Case 2:**  size: 1.50 MB Backup Size: 0.08 MB CPU Seconds: 0.17 [SQLSTATE 01000] (Message 1) LiteSpeed(R) for SQL Server Version 5.1.0.1293 Copyright 2004-2009, Quest Software Inc. Registered Name: Microsoft [SQLSTATE 01000] (Message 1) VDI open failed due to requested abort. BACKUP LOG is terminating abnormally. BACKUP LOG cannot be performed because there is no current database backup. [SQLSTATE 42000] (Error 61700)Unable to open Step output file. NOTE: The step was retried the requested number of times (3) without succeeding. The step failed.    **Resolution:**  1.     Run the ***\_SQL\_BackupAll***job.  2.     Then, run the job ***\_SQL\_BackupTranAll*** and resolve the issue.      **Case 3:**  Executed as user: REDMOND\ebmssql. 10 percent processed. [SQLSTATE 01000] (Message 3211)  20 percent processed. [SQLSTATE 01000] (Message 3211)  30 percent processed. [SQLSTATE 01000] (Message 3211)  40 percent processed. [SQLSTATE 01000] (Message 3211)  Write on "e:\mssql\tran\dbGSXBMODS\_Tran.BAK" failed: 112(There is not enough space on the disk.) [SQLSTATE 42000] (Error 3202)  BACKUP LOG is terminating abnormally. [SQLSTATE 42000] (Error 3013).  NOTE: The step was retried the requested number of times (3) without succeeding.  The step failed.  **Resolution:**  1.     Open the failed job ***\_SQL\_BackupTranAll*** and click **Properties -> Steps -> \_SQL\_BackupTranAll01** and get the location.  **Example:** The location here is F:\mssql\tran    \\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164659_fig 1.png  2.     Open the **SQL Management Studio** query window. Connect to the SQL Server and execute **xp\_fixeddrives**.  3.     Determine if there is enough space on the backup drive e.g. **F:** drive in this case.  4.     If you do not find enough space on the drive, then perform the following conditions:  **Note:** Do not make any changes until the action plan is confirmed with the respective service owners.           Delete the old backup files           Change the backup location to some other drive where there is enough space  **Case 4:**  The system cannot find the file specified. **LiteSpeed** could not open the backup file: e:\mssql\tran\ ELMS82Vanila\_Tran.lsb  **Resolution:**  1.     Open the specified location in the failed job history.  **Example:** In this case, e:\mssql\tran\  2.     Determine if the path exists:           If the path exists, then re-run the job.           If the path does not exist, then change the backup location path in the job. |

Bottom of Form

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Top of Form



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| **To recover SQL Server Scheduled Job \_SQL\_BackupAll that has failed** |
| SQL Server 2005 |
| SQL Server 2008 |
| SQL Server 2012 |
| There is not enough space on the disk. |
| The system cannot find the specified file. |
| Cannot open backup device *LiteSpeed* for SQL Server backup file. |
| The backup data at the end of **%.bak** is incorrectly formatted. |
| **Resolution:**   1. From a workstation or server with SQL Server 2005/2008 installed (you may need to open a terminal server remote session to one), click **Start -> Programs -> Microsoft SQL Server**. 2. Click **SQL Server Management Studio**. 3. In the **Connect to Server** dialog box, type the server name of the SQL server that you are troubleshooting. This will start **Object Explorer**. 4. In **Object Explorer**, connect to an instance of the **SQL Server Database Engine**, and then expand that instance. 5. Expand **SQL Server Agent**, and then expand **Jobs**. 6. Right-click the job **\_SQL\_BackupAll**, and then click **View History**. **Log File Viewer** will open showing the history of the selected job(s).    1. A successful job will display with a green check mark.    2. A failed job will display with a red circle with a white **X** in the middle.   **Note** To update the job history, click **Refresh**. To view fewer rows, click the **Filter** button, and then enter filter parameters.   1. To determine which step of a job failed, click the plus sign to the left of the red circle.    1. A retried step will have a white circle with a blue arrow.    2. A failed step will have a red circle with a white **X** in the middle.     **Case 1:**  Msg 60900, Sev 18, State 1: Error saving data to file. Thread: 2 BACKUP DATABASE is terminating abnormally. A nonrecoverable I/O error occurred on file "VDI\_ADE981BA-3A61-4F31-8A32-90F23513BAB9\_0:" 995(The I/O operation has been aborted because of either a thread exit or an application request.). Write on "VDI\_ADE981BA-3A61-4F31-8A32-90F23513BAB9\_1" failed: 112(There is not enough space on the disk.) [SQLSTATE 42000]  **Resolution:**  1.     Go to the failing job *\_SQL\_BackupAll*. Open **Properties -> Steps -> SQLBackupAll01** and get the location.  **Example:** Location in this case is **g:\mssql\bak**.    \\sharepoint\sites\IIM\MembersOnly\PRIMUS\SQL\ms164658_fig1.png  2.     Open the **SQL Management Studio** query window and connect to the SQL Server and execute **xp\_fixeddrives**. Check if there is enough space on the backup drive e.g. **G:** drive in this case.           If you do not find enough space on **G:** Drive, then check the below conditions.  **Note:** Do not make changes until the action plan is confirmed with the respective server owners.    o    Delete the old backup files.  o    Change the backup location to some other drive where we have enough space.  3.     If none of the above is possible, then work with **customer** and **SUOPS** to increase the space on the backup drive and make sure that the job has been disabled.        **Case 2:**  The system cannot find the file specified. **LiteSpeed** could not open the Backup file:e:\mssql\bak\VTX\_Reporting.lsb  **Resolution:**    1.   Go to the failing job *\_SQL\_BackupAll*. Open **Properties -> Steps -> SQLBackupAll01** and get the location.  **Example:** In this case, the location is g:\mssql\bak.    2.   Determine if the path exists:  o    If the path exists, re-run the job.  o    If the path does not exist, change the backup location path in the job.    **Case 3:**  BACKUP DATABASE is terminating abnormally. Cannot open backup device LiteSpeed for SQL Server backup file. Operating system error 0x80070002(The Job '\_SQL\_BackupAll' : Step 3, 'SQLBackupAll02 (with retry)' : Began Executing 2010-11-15 18:00:0  **Resolution:**   Refer to **Case 2** for the same **Resolution**.      **Case 4:**  The backup data at the end of ***EDS3DControl\_Compressed.bak*** is incorrectly formatted.  **Resolution:**  **Note:**The above error is commonly observed:           When the backup does not complete successfully  Or,           When we have backup of two different databases from two different servers with the same name in the same location.    1)      Go to the failing job ***\_SQL\_BackupAll****.*  2)      Re-run the job.  3)      If the job still fails, create a new folder in the same location and change the backup location in the job to this new folder and then re-run the job. |

Bottom of Form