RAP as a Service for SQL Server

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Key Findings Report



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Table of Contents

[Executive Summary 5](#_Toc383552057)

[Health Assessment Result 5](#_Toc383552058)

[Risk Assessment Result 6](#_Toc383552059)

[Risk & Health Scorecard 7](#_Toc383552060)

[Issue Level Summary 9](#_Toc383552061)

[Issue Details 14](#_Toc383552062)

[Operational Excellence 15](#_Toc383552063)

[Monitoring 15](#_Toc383552064)

[Operate 16](#_Toc383552065)

[Disaster Recovery 16](#_Toc383552066)

[Backup 18](#_Toc383552067)

[Operational Security 18](#_Toc383552068)

[Environmental Dependencies 21](#_Toc383552069)

[Update Management 22](#_Toc383552070)

[SQL Server update management 22](#_Toc383552071)

[SQL Server Instance Configurations 23](#_Toc383552072)

[SQL Server Configurations 23](#_Toc383552073)

[SQL Server Database Options 40](#_Toc383552074)

[SQL Database Options 40](#_Toc383552075)

[SQL Server Information 47](#_Toc383552076)

[SQL Server Info 47](#_Toc383552077)

[SQL Server Instance Properties 49](#_Toc383552078)

[SQL Server Properties 49](#_Toc383552079)

[Security 50](#_Toc383552080)

[SQL Server Security 50](#_Toc383552081)

[SQL Server Database Architecture and Design 64](#_Toc383552082)

[SQL Server Database File Management 64](#_Toc383552083)

[SQL Database Indexes 71](#_Toc383552084)

[SQL Server High Availability 114](#_Toc383552085)

[SQL Server Always ON 114](#_Toc383552086)

[Cluster HotFixes 114](#_Toc383552087)

[Cluster Resources 125](#_Toc383552088)

[SQL Server Maintenance 128](#_Toc383552089)

[SQL Server Maintenance 128](#_Toc383552090)

[OS Information 133](#_Toc383552091)

[OS Information 133](#_Toc383552092)

[Event Logs 135](#_Toc383552093)

[Event Logs 135](#_Toc383552094)

[SQL Error Log 137](#_Toc383552095)

[SQL Error Log 137](#_Toc383552096)

[Performance 139](#_Toc383552097)

[SQL Server Performance 139](#_Toc383552098)

[All Issues Table 143](#_Toc383552099)

Executive Summary

Microsoft has completed an assessment of your SQL Server environment through interviews with the staff and by running a suite of tools to collect data from SQL Server and its dependent systems. The findings and guidance provided by this assessment are based on an analysis by Microsoft Advanced Services Delivery (ASD) team and the accredited Premier Field Engineer (PFE) that performed the engagement.

The assessment is represented in two formats based on health and risk issues. Health issues generally reflect active problems regarding the configuration or proper function of the product and related components. Risk issues are generally cover areas such as change control, monitoring, disaster recovery, service level agreements and other items that if left unresolved increase risk of future problems or worsening problems.

The overall assessment is viewed as a combination of the Health and Risk items, but each area is represented individually to provide a clearer view into the findings of the environment.

The severity calculation is as follows: Whenever a critical issue is found the overall score is critical. When no critical issue is found the average of all issues is calculated.

Environment Details:

Cluster: **SCMSQLP**

Nodes: **SCMMAVM1P, SCMMAVM2P, SCMMAVM3P**

|  |  |
| --- | --- |
| Health Assessment Result | |
| Machine inserted | The SQL RaaS performed on Cluster - **SCMSQLP** confirms the overall health of the cluster to be unstable.  Few of the key issues contributing to this level of instability are   1. There is only one active network on the node of a cluster. 2. Indexes have been identified with an index key larger than the recommended size (900 bytes). 3. DBCC CHECKDB has not been run within seven days. 4. The latest service pack or hotfix for SQL Server is not installed. 5. SQL Error Log: 1105: Could not allocate space for objects, file group is full. 6. Tables have been identified that do not have any indexes. |
| Risk Assessment Result | |
| Machine inserted | The SQL RaaS performed on Cluster - **SCMSQLP** confirms the overall risk to be high.  Few of the issues leading to this level of risk are:   1. Missing Hotfix – 2494036, 2531907, 2578103, 2578113, 2616514, 2687741, and 980915. 2. The SQL Server configuration setting, user options, has been changed from the default value. 3. The SQL Server configuration setting, scan for startup procs, has been changed from the default value. 4. The SQL Server Configuration setting, xp\_cmdshell, is enabled. 5. The Value configured for SQL Server Configuration, Max Degree of parallelism may impact your SQL Server instance performance. 6. There are foreign keys with no supporting indexes. 7. Databases identified with one or more tables, with indexes that may require update statistics. 8. Database(s) identified with recovery model set to Simple. 9. SQL Error Log: 18204: Backup device failed. 10. Databases need data purity check. 11. The Windows 2008/R2 and later OS power saving setting may affect the CPU performance. 12. Disk Write response times are too long. 13. SQL Server logins identified with passwords same as logins. 14. SQL Server service is running under an account that is a member of the built-in Administrators group. |

Risk & Health Scorecard

This scorecard shows the overall health and risk severity levels for each major and minor category. This is determined by the highest severity issue found per category, per health and risk.

The severity always represents the highest issue level found in a category, the value is not calculated.

| Consolidated Scorecard | Risk Severity | Health Severity |
| --- | --- | --- |
| **SQL Server Configurations** | High | No Issues |
| SQL Configurations | High | No Issues |
| **SQL Server Database Options** | High | No Issues |
| Database Options | High | No Issues |
| **SQL Server Information** | No Issues | Medium |
| SQL Server Info | No Issues | Medium |
| **SQL Server Properties** | No Issues | No Issues |
| SQL Properties | No Issues | No Issues |
| **SQL Server Security** | High | No Issues |
| SQL Security | High | No Issues |
| **SQL Server Architecture and Design** | High | High |
| Database Files | Medium | No Issues |
| Database Indexes | High | High |
| **SQL Server High Availability** | High | High |
| Cluster Hotfixes | High | No Issues |
| Cluster Resource | Low | High |
| Always On | No Issues | No Issues |
| **SQL Server maintenance** | High | High |
| SQL Server maintenance | High | High |
| **OS Configurations for SQL** | High | No Issues |
| OS Configurations for SQL | High | No Issues |
| **Event Log Analysis** | Medium | No Issues |
| Event Log Analysis | Medium | No Issues |
| **Operational Excellence** | High | Low |
| Disaster Recovery | No Issues | Low |
| Environmental Dependencies | Low | No Issues |
| Monitoring | Medium | No Issues |
| Operational Excellence | No Issues | No Issues |
| Security | High | No Issues |
| **Update Management** | Low | No Issues |
| SQL Server Update Management | Low | No Issues |
| **SQL Server Error Log** | High | Medium |
| SQL Error Log | High | Medium |
| **Performance** | High | No Issues |
| SQL Performance | High | No Issues |

Issue Level Summary

The following are details about the issues discovered in your environment. Where applicable the status has been updated to the current state at the time of this report.

| Issue Details Scorecard | Severity | Type | Status |
| --- | --- | --- | --- |
| SQL Server Configurations | | | |
| SQL Configurations | | | |
| [SQL Server Configuration: Backup Compression Default is set to a non-default value.](#SQL_Server_Configuration:_Backup_Compres) | Medium | Risk | Resolved |
| [SQL Server Configuration: Optimize For Ad hoc Workload is set to a non-default value.](#SQL_Server_Configuration:_Optimize_For_A) | Medium | Risk | Resolved |
| [The SQL Server configuration setting, Ad Hoc Distributed Queries, has been changed from the default value.](#The_SQL_Server_configuration_setting,_Ad) | Medium | Risk | Resolved |
| [The SQL Server configuration setting, clr enabled, has been changed from the default value.](#The_SQL_Server_configuration_setting,_cl) | Medium | Risk | Resolved |
| [The SQL Server configuration setting, Database Mail XPs, has been changed from the default value.](#The_SQL_Server_configuration_setting,_Da) | Low | Risk | Resolved |
| [The SQL Server configuration setting, min server memory, has been changed from the default value.](#The_SQL_Server_configuration_setting,_mi) | Low | Risk | Resolved |
| [The SQL Server configuration setting, OLE Automation Procedures, has been changed from the default value.](#The_SQL_Server_configuration_setting,_OL) | Low | Risk | Failed |
| [The SQL Server configuration setting, scan for startup procs, has been changed from the default value.](#The_SQL_Server_configuration_setting,_sc) | High | Risk | Resolved |
| [The SQL Server configuration setting, show advanced options, has been changed from the default value.](#The_SQL_Server_configuration_setting,_sh) | Medium | Risk | Resolved |
| [The SQL Server configuration setting, user options, has been changed from the default value.](#The_SQL_Server_configuration_setting,_us) | High | Risk | Resolved |
| [The SQL Server Configuration setting, xp\_cmdshell, is enabled](#The_SQL_Server_Configuration_setting,_xp) | High | Risk | Resolved |
| [The Value configured for SQL Server Configuration, Max Degree of parallelism may impact your SQL Server instance performance.](#The_Value_configured_for_SQL_Server_Conf) | High | Risk | Resolved |
| SQL Server Database Options | | | |
| Database Options | | | |
| [Database(s) identified with page verify option not set to CHECKSUM](#Database(s)_identified_with_page_verify_) | Medium | Risk | Resolved |
| [Database(s) identified with recovery model set to Simple](#Database(s)_identified_with_recovery_mod) | High | Risk | Resolved |
| [User database is set to compatibility level lower than the default installation level.](#User_database_is_set_to_compatibility_le) | Low | Risk | Resolved |
| [User Databases found that have collations different from master database](#User_Databases_found_that_have_collation) | Medium | Risk | Resolved |
| SQL Server Information | | | |
| SQL Server Info | | | |
| [The latest service pack or hotfix for SQL Server is not installed](#The_latest_service_pack_or_hotfix_for_SQ) | Medium | Health | Failed |
| SQL Server Properties | | | |
| SQL Properties | | | |
| SQL Server Security | | | |
| SQL Security | | | |
| [“Allow log on locally” user right may have granted for non-administrative members.](Allow_log_on_locally) | Medium | Risk | Failed |
| [Non-Default logins are provisioned to SQL Server sysadmin server role.](#Non-Default_logins_are_provisioned_to_SQ) | Medium | Risk | Failed |
| [Non-Default users are provisioned to db\_owner database role.](#Non-Default_users_are_provisioned_to_db_) | Low | Risk | Failed |
| [Ownership issues in SQL Server Agent jobs and/or steps.](#Ownership_issues_in_SQL_Server_Agent_job) | Low | Risk | Failed |
| [SQL Server logins identified that do not adhere to Windows password polices](#SQL_Server_logins_identified_that_do_not) | Medium | Risk | Resolved |
| [SQL Server logins identified with passwords same as logins](#SQL_Server_logins_identified_with_passwo) | High | Risk | Failed |
| [SQL Server service is running under an account that is a member of the built-in Administrators group](#SQL_Server_service_is_running_under_an_a) | High | Risk | Resolved |
| [The SQL Server Agent service is not using a recommended account](#The_SQL_Server_Agent_service_is_not_usin) | Medium | Risk | Failed |
| SQL Server Architecture and Design | | | |
| Database Files | | | |
| [Data and Transaction Log files are not on separate drives for user databases](#Data_and_Transaction_Log_files_are_not_o) | Medium | Risk | Resolved |
| [Databases have been identified with maximum file size set on one or more files](#Databases_have_been_identified_with_maxi) | Low | Risk | Resolved |
| [Databases identified with auto-growth set to percentage growth](#Databases_identified_with_auto-growth_se) | Medium | Risk | Resolved |
| [One or more user database files are placed on the same volume as TempDB database files](#One_or_more_user_database_files_are_plac) | Medium | Risk | Resolved |
| Database Indexes | | | |
| [Databases identified with one or more tables, with indexes that may require update statistics](#Databases_identified_with_one_or_more_ta) | High | Risk | Resolved |
| [Fragmented indexes were found](#Fragmented_indexes_were_found) | Medium | Health | Failed |
| [Indexes have been identified with an index key larger than the recommended size (900 bytes)](#Indexes_have_been_identified_with_an_ind) | High | Health | Failed |
| [Tables and indexed views have been identified that have duplicate indexes.](#Tables_and_indexed_views_have_been_ident) | Medium | Risk | Failed |
| [Tables and/or indexed views have been identified that have redundant indexes.](#Tables_and/or_indexed_views_have_been_id) | Medium | Risk | Failed |
| [Tables have been identified that do not have a clustered index.](#Tables_have_been_identified_that_do_not_) | Medium | Risk | Failed |
| [Tables have been identified that do not have any indexes.](#Tables_have_been_identified_that_do_not_) | Medium | Health | Resolved |
| [Tables have been identified that have more indexes than columns.](#Tables_have_been_identified_that_have_mo) | Medium | Risk | Failed |
| [There are foreign keys with no supporting indexes](#There_are_foreign_keys_with_no_supportin) | High | Risk | Failed |
| SQL Server High Availability | | | |
| Cluster Hotfixes | | | |
| [Hotfix to eliminate incorrect warnings or errors in the validation report when disks are online is not installed.](#Hotfix_to_eliminate_incorrect_warnings_o) | High | Risk | Failed |
| [The hotfix 2494036 is not installed (2008 SP2, 2008 R2, 2008 R2 SP1)](#The_hotfix_2494036_is_not_installed_(200) | High | Risk | Failed |
| [The hotfix 2578103 or 2578113 is not installed (2008 SP2, 2008 R2, 2008 R2 SP1)](#The_hotfix_2578103_or_2578113_is_not_ins) | High | Risk | Failed |
| [The hotfix 2616514 is not installed (2008 SP2, 2008 R2 SP1)](#The_hotfix_2616514_is_not_installed_(200) | High | Risk | Failed |
| [The hotfix 2687741 is not installed (2008 R2 SP1)](#The_hotfix_2687741_is_not_installed_(200) | High | Risk | Failed |
| [The hotfix 980915 is not installed (2003 and 2008 all versions)](#The_hotfix_980915_is_not_installed_(2003) | High | Risk | Failed |
| Cluster Resource | | | |
| [Cluster does not have a network whose role is configured as Internal Cluster Communications Only (private network).](#Cluster_does_not_have_a_network_whose_ro) | Low | Risk | Failed |
| [There is only one active network on the node of a cluster.](#There_is_only_one_active_network_on_the_) | High | Health | Failed |
| Always On | | | |
| SQL Server maintenance | | | |
| SQL Server maintenance | | | |
| [Databases identified that have not had a full database backup in the last 7 days](#Databases_identified_that_have_not_had_a) | Low | Risk | Failed |
| [Databases need data purity check](#Databases_need_data_purity_check) | High | Risk | Failed |
| [DBCC CHECKDB has not been run within seven days.](#DBCC_CHECKDB_has_not_been_run_within_sev) | High | Health | Resolved |
| OS Configurations for SQL | | | |
| OS Configurations for SQL | | | |
| [SQL Server is running on third-party OS Virtualization.](#SQL_Server_is_running_on_third-party_OS_) | Low | Risk | Failed |
| [The Windows 2008/R2 and later OS power saving setting may affect the CPU performance](#The_Windows_2008/R2_and_later_OS_power_s) | High | Risk | Failed |
| Event Log Analysis | | | |
| Event Log Analysis | | | |
| [Application Event Log: Microsoft Operations Manager: 26009: No connection could be made because the target computer actively refused it.](#Application_Event_Log:_Microsoft_Operati) | Medium | Risk | Failed |
| [System Event Log: DCOM: 10009: DCOM was unable to communicate with the computer using any of the configured protocols.](#System_Event_Log:_DCOM:_10009:_DCOM_was_) | Medium | Risk | Failed |
| Operational Excellence | | | |
| Disaster Recovery | | | |
| [Backup schedules are not set to minimize impact on performance.](#Backup_schedules_are_not_set_to_minimize) | Low | Health | Failed |
| Environmental Dependencies | | | |
| [Hardware that is needed for disaster recovery is not readily available.](#Hardware_that_is_needed_for_disaster_rec) | Low | Risk | Failed |
| Monitoring | | | |
| [Define a process to monitor and track resource usage.](#Define_a_process_to_monitor_and_track_re) | Medium | Risk | Resolved |
| Operational Excellence | | | |
| Security | | | |
| [Security logging in the SQL Server environment is not done.](#Security_logging_in_the_SQL_Server_envir) | High | Risk | Resolved |
| [SQL Server infrastructure changes do not go through formal security reviews.](#SQL_Server_infrastructure_changes_do_not) | Medium | Risk | Failed |
| Update Management | | | |
| SQL Server Update Management | | | |
| [No measure of the progress and success level of security updates deployment](#No_measure_of_the_progress_and_success_l) | Low | Risk | Failed |
| [Security Updates deployed less frequently than every month](#Security_Updates_deployed_less_frequentl) | Low | Risk | Failed |
| SQL Server Error Log | | | |
| SQL Error Log | | | |
| [SQL Error Log: 1105: Could not allocate space for objects, file group is full.](#SQL_Error_Log:_1105:_Could_not_allocate_) | Medium | Health | Resolved |
| [SQL Error Log: 18204: Backup device failed.](#SQL_Error_Log:_18204:_Backup_device_fail) | High | Risk | Resolved |
| Performance | | | |
| SQL Performance | | | |
| [Disk Read response times are too long.](#Disk_Read_response_times_are_too_long.) | Medium | Risk | Resolved |
| [Disk Write response times are too long.](#Disk_Write_response_times_are_too_long.) | High | Risk | Failed |

Issue Details

The following are details about the issues discovered in your environment. This includes descriptions, best practice guidance, recommended reading, recommended resolutions and custom comments.

| Severity | Symbol | Description |
| --- | --- | --- |
| Critical |  | Immediate fix needed |
| High |  | Fix as soon as possible |
| Medium |  | Fix within next 3 months |
| Low |  | Fix within the next 6 months |
| Informational |  | Needs to be reviewed |

| Status | Symbol | Description |
| --- | --- | --- |
| Failed |  | Issues identified and action required |
| Inconclusive |  | Couldn’t determine, data collection may have failed |
| Passed |  | No action required |

Operational Excellence

It is commonly accepted that there are three components to successfully operating and improving IT service: people, process, and technology. IT Service Management is the term used for the process surrounding IT functions. Ultimately, sound processes will ensure that the people aspects are either covered adequately, such as adequate training through the Workforce Management process, or mitigated, such as an effective Change Management process that helps eliminate mistakes,. Thus, IT Service Management covers two-thirds of the people, process, and technology equation.

Monitoring

Observing the health of the operating environment is essential to making sound decisions about maintenance, optimization, risk mitigation, and proposed changes. Service monitoring and control provides best practices for monitoring and resolving incidents and alerts in the production environment.

As a network service, SQL Server relies upon Operating System Configurations, Microsoft Failover Cluster platforms, Storage systems and Networking components. As the SQL Server environment increases in size and becomes more critical, monitoring becomes even more important.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Define a process to monitor and track resource usage. |
| **Status** |
| Resolved |
| **Description** |
| Define a process to monitor and track resource usage. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Use a tool to help on the implementation of this task and to give the possibility to store the data collected. System Center Operations Manager with the SQL Server Management Pack configured, gives that possibility without having to define a considerable number of custom rules. SCOM could be used to monitor and store the information about the usage of the principal resources and to understand how those resources are being used and, the most important, to help on the verification when new resources like disk, cpu or memory are required to answer, in an appropriate way, to new performance requirements of each solution. | | **Importance** | | Having enough information about the resources used by a SQL Server instance is crucial for a good plan of governance of that same instance and for the solution that instance is member of. | | **Recommended Reading** | | [Establish a Performance Baseline](http://technet.microsoft.com/en-us/library/ms190943.aspx)  [Monitor and Tune for Performance](http://msdn.microsoft.com/en-us/library/ms189081.aspx)  [Operations Manager](http://technet.microsoft.com/en-us/library/hh205987.aspx)  [SQL Server Utility Features and Tasks](http://msdn.microsoft.com/en-us/library/ee210548.aspx)  [SQL Server 2005/2008 Performance Statistics collection scripts](http://sqlnexus.codeplex.com/wikipage?title=Sql2005PerfStatsScript&referringTitle=Home)  [TechNet Webcast: SQL Server Performance Counter Guidance (Level 300)](https://msevents.microsoft.com/cui/EventDetail.aspx?culture=en-US&EventId=1032357640&CountryCode=US) | |
| **Annotation** |
| SCOM is in place. |

Operate

Once Services have been successfully delivered into the production environment, they need to be managed effectively on a day-to-day basis. This is where service user's interface and your performance as a service provider are measured. This phase helps IT professionals efficiently operate, monitor, and support deployed services in line with existing Service Level Agreement (SLA) targets.

Disaster Recovery

Disaster recovery (DR) documentation and processes are critical to maintaining server and service availability with minimal impact. Failure to maintain good disaster recovery documentation and processes could lead to small problems becoming disasters and disasters becoming unrecoverable failures.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Backup schedules are not set to minimize impact on performance. |
| **Status** |
| Failed |
| **Description** |
| Backup schedules are not set to minimize impact on performance. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Backup schedules should be set to run when the end-user demand for database resources is at a minimum.  It is important to design a backup/restore strategy with three main purposes:  Minimize the impact on the performance of the overall solution  Minimize the possibility to lose data to the minimum  Minimize the downtime of the solution, on a situation where there's the need to restore a database or a set of databases from a backup.  All the factors and variables should be taken in consideration when that strategy is being designed, because there are some factors that are very important for the backup and restore operations:  Intensive usage of resources (Disk, CPU, Memory, Network, etc.)  Performance of the same type of resources  Type of Backups (Full, Transaction Log, Differential or Partial)  Volume of data to backup  With or without Compression  How volatile is the data  The time, in average, required by the application to commit or rollback a transaction  Database physical design  Number of VLFs (Virtual Log Files) inside the Transaction Log, available (status = 0) or active (status = 2)  To manage and control the size of the Transaction Log file, it is important to define the most appropriate schedule for this type of backup, having in consideration the fact that the Transaction Log backup is the unique type of backup that will perform the log truncation, after the end of a transaction, on a database set with full recovery model. On a database set with Simple recovery model, only the nature of the application, will determine the requirements in terms of the size of the transaction log file. | | **Importance** | | Backing up a database can be a resource-intensive activity. Backups that are set to run during periods of high database use will produce larger backup files, take longer to run, and will adversely affect the overall performance of the server. | | **Recommended Reading** | | [Introduction to Backup and Restore Strategies in SQL Server](http://msdn.microsoft.com/en-us/library/ms191239(SQL.105).aspx)  [The Transaction Log (SQL Server)](http://technet.microsoft.com/en-us/library/ms190925.aspx)  [Transaction Log Backups (SQL Server)](http://technet.microsoft.com/en-us/library/ms191429.aspx)  [Back Up a Transaction Log (SQL Server)](http://msdn.microsoft.com/en-us/library/ms179478.aspx)  [Tail-Log Backups (SQL Server)](http://technet.microsoft.com/en-us/library/ms179314.aspx)  [Create a Differential Database Backup (SQL Server)](http://msdn.microsoft.com/en-us/library/ms188248.aspx)  [Manage the Size of the Transaction Log File](http://msdn.microsoft.com/en-us/library/ms365418.aspx)  [Optimizing Backup and Restore Performance in SQL Server](http://msdn.microsoft.com/en-us/library/ms190954(SQL.105).aspx) | |
| **Annotation** |
|  |

Backup

Proper backups are integral to an overall disaster-recovery solution.

Operational Security

Security of the SQL Server Database environment depends on how well the SQL Server platform is protected. Poorly or inconsistently configured operating system security features, necessary component exposure, weak authentication models, and non-encrypted transmissions of sensitive data contribute to large attack surfaces and increased risk of unauthorized access. Correct and consistent security settings for the SQL Server platform and inter-process communications help create a foundation on which other layers of application functionality can be successfully built.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Security logging in the SQL Server environment is not done. |
| **Status** |
| Resolved |
| **Description** |
| Security logging in the SQL Server environment not done. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | The default setting indicates that only failed logins are audited, but you can specify that all logins are audited. Although auditing all logins increases overhead, you may be able to determine patterns of multiple failed logins followed by a successful login and then use this information to detect a possible login security breech. | | **Importance** | | By not having some level of auditing enabled, Microsoft® SQL Server could be under attack and you could be completely unaware of that. | | **Recommended Reading** | | [SQL Server 2008 R2 Security Best Practices - Operational and Administrative Tasks](http://download.microsoft.com/download/1/2/A/12ABE102-4427-4335-B989-5DA579A4D29D/SQL_Server_2008_R2_Security_Best_Practice_Whitepaper.docx)  [Security and Protection (Database Engine)](http://technet.microsoft.com/en-us/library/bb510589.aspx)  [Security Considerations for a SQL Server Installation](http://technet.microsoft.com/en-us/library/ms144228.aspx)[SQL Server Separation of Duties Whitepaper](http://download.microsoft.com/download/D/2/D/D2D931E9-B6B5-4E3B-B0AF-22C749F9BB7E/SQL_Server_Separation_of_Duties_White_Paper_Jul2011.docx)  [SQL Server Common Criteria Certifications](http://www.microsoft.com/sqlserver/en/us/common-criteria.aspx) | | **Recommended Resolution** | | Regularly audit the database tables that contain sensitive data together with the keys and certificates catalog to determine who generates the certificates and keys. To conduct the audit, monitor these tables by using a Microsoft® SQL Server script and alerting mechanism. | |
| **Annotation** |
| The application has it's own auditing enabled and does not require SQL auditing enabled. |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) SQL Server infrastructure changes do not go through formal security reviews. |
| **Status** |
| Failed |
| **Description** |
| SQL Server infrastructure changes do not go through formal security reviews. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Formalizing the security assessment process by means of the Application Security Assurance Program (ASAP) has raised the level of security awareness among the many internal Development teams in Microsoft IT. This has also ensured that future development projects are more secure. Many lessons were learned as part of this process, including the following:  If you wait until an application is already in production to make it secure, you are too late. The vulnerability has already been exposed.  Security should be pushed to the host whenever possible, but sound security practices also consider the application client.  You have to create clearly written and easily accessible security guideline documentation.  You have to create security checklists that include step-by-step instructions for securing applications, hosts, and networks.  You have to develop a thorough policy-exception tracking process.  Education is very important to the success of a security program. Developers, testers, and support personnel should be trained and then receive ongoing updates and information to ensure that all applications are secure.  For SQL Server environments specifically, individuals and teams that are implementing and supporting database technologies in the organization should follow a defined and documented process. This is necessary to evaluate the security of new designs and changes to the SQL Server production environment before deployment or implementation. In addition to that, the results of such an evaluation should be documented and incorporated into future database projects. | | **How Microsoft Does IT** | | Microsoft IT uses the Application Threat Modeling tools to help develop and deliver secure applications. (See the Recommended Reading section for information). In addition, applying basic security principles at the earliest stages of application design is very important in helping create secure and reliable applications.  Microsoft IT security methodology includes developing processes to:  Reduce open ports and vulnerable systems and services  Manage user permissions  Regularly assess risks  Regularly monitor compliance with security guidelines | | **Importance** | | Design and configuration changes made to the Microsoft® SQL Server infrastructure have the potential for introducing risk to the environment. To reduce the effect of this risk, all new designs and core changes should undergo a formal security review. In addition, to support this strategy, an organization should define a security methodology that incorporates an understanding of the business requirements and the process for its implementation. | | **Recommended Reading** | | [Reference Page - Microsoft Operations Framework 4.0](http://technet.microsoft.com/en-us/library/cc506049.aspx)  [Download Page - Microsoft Operations Framework 4.0](http://www.microsoft.com/en-us/download/details.aspx?id=17647)  [Change and Configuration Service Management Function](http://technet.microsoft.com/en-us/library/cc543211.aspx) | | **Recommended Resolution** | | Processes and reporting are required to ensure that inventory information is maintained. Within your security tracking system, you should maintain a current inventory of the following items:  Applications and their versions  Static IP addresses by group, owner, and server  Server lists (development, test, and production) by application  Policies and related guidelines  Policy and guideline exceptions  In addition, security is an ongoing, always changing area. An experienced security team and a well-developed process are required to ensure that ongoing changes are propagated to the applications. | |
| **Annotation** |
|  |

Environmental Dependencies

Maintenance of the correct setup, configuration, and state of all the components installed on your database server ensure that your environment has the technological underpinnings required for optimum performance, reliability, and security. If these dependent technologies are not correctly set up, configured, and secured, subsequent tuning and optimization efforts of the SQL Server will produce less than satisfactory results.

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| [Machine inserted](#IssueLevelSummary) Hardware that is needed for disaster recovery is not readily available. |
| **Status** |
| Failed |
| **Description** |
| Hardware that is needed for disaster recovery is not readily available. |
| **Additional Information** |
| |  | | --- | | **Importance** | | Timely response is essential when responding to a disaster recovery. In addition, all the components required to respond effectively to a disaster recovery, including the hardware, should be readily available at all times. | | **Recommended Resolution** | | Any hardware required to respond to a disaster recovery should be readily available at all times. | |
| **Annotation** |
|  |

Update Management

SQL Server update management

Update management is the process of controlling the deployment and maintenance of interim software releases into production environments. It helps you to maintain operational efficiency and effectiveness, overcome security vulnerabilities, and maintain the stability of your production environment.

If your organization cannot determine and maintain a known level of trust within its operating systems and application software, it might have a number of security vulnerabilities, which, if exploited, could lead to a loss of revenue and intellectual property. Minimizing this threat requires you to have properly configured systems, to use the latest software, and to install the recommended software updates.

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| [Machine inserted](#IssueLevelSummary) Security Updates deployed less frequently than every month |
| **Status** |
| Failed |
| **Description** |
| Microsoft recommends the deployment of urgent updates in the shortest possible timeframe, and the deployment of standard updates in a maximum of one month timeframe. |
| **Additional Information** |
| |  | | --- | | **Recommended Reading** | | [Update Management Process](http://technet.microsoft.com/en-us/library/cc700845.aspx) | |
| **Annotation** |
|  |

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| --- |
| [Machine inserted](#IssueLevelSummary) No measure of the progress and success level of security updates deployment |
| **Status** |
| Failed |
| **Description** |
| After your security update management process is established and running, you will want to ensure effectiveness, monitor performance, and improve results over time. Even with proper planning, there may be improvements to the process that you can identify through monitoring and assessment.  The primary areas of importance within security update management that you may want to measure and improve upon are:  • Improving security releases  • Improving security policy enforcement  • Improving emergency security response. |
| **Additional Information** |
|  |
| **Annotation** |
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SQL Server Instance Configurations

SQL Server Configurations

SQL Server can deliver a very high level performance with relatively little configuration tuning. You can obtain high levels of performance by using good application and database design, and not by extensive configuration tuning.

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| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, user options, has been changed from the default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration setting user options has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Typically, this configuration value is left at the default value. If customer option configurations are required, they can be explicitly set through the application or by using the SET command. For example, Microsoft® SQL Server Management Studio allows for configuration of these options through Tools / Options / Query Execution / SQL Server. | | **Importance** | | This configuration defines the user option defaults, such as ARITHABORT, ANSI\_WARNINGS, and CONCAT\_NULL\_YIELDS\_NULL, for the SQL instance level. These options can be overridden at the user connection level by using the SET command. SELECT @@OPTIONS reflects the default configuration of user option configurations when a user logs on. A list of default query processing options is established for the duration of a user's work session. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188787.aspx)  [user options Option](http://msdn.microsoft.com/en-us/library/ms176031(SQL.105).aspx) | | **Recommended Resolution** | | Leave this configuration at the default value of 0 and, instead, configure custom user options for the connection by using the SET command. | |
| **Annotation** |
| Vendor requirement. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 4472 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 4472 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The value in use is: 4472 | |

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| --- |
| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, scan for startup procs, has been changed from the default value. |
| **Status** |
| Resolved |
| **Description** |
| The value for this option can be set by using sp\_configure; however, it will be set automatically if you use sp\_procoption, which is used to mark or unmark automatically run stored procedures. When sp\_procoption is used to mark the first stored procedure as an autoproc, this option is set automatically to a value of 1. When sp\_procoption is used to unmark the last stored procedure as an autoproc, this option is automatically set to a value of 0. If you use sp\_procoption to mark and unmark autoprocs, and if you always unmark autoprocs before dropping them, there is no need to set this option manually.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | This option is an advanced option and should be changed only by an experienced database administrator or certified SQL Server technician.  This setting allows SQL Server to scan for and automatically run all stored procedures that are set to execute upon service startup.  Automated execution of stored procedures during the SQL Server startup, may delay the availability of SQL Server instance during the startup procedure.  It also introduces the risk of execution of unauthorized code. | | **Importance** | | When this configuration is enabled, Microsoft® SQL Server will scan during startup for automatic execution of stored procedures in the master database. This option is automatically configured when using the sp\_procoption system stored procedure. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [scan for startup procs Option](http://msdn2.microsoft.com/en-us/library/ms179460.aspx)  [sp\_procoption (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms181720.aspx) | | **Recommended Resolution** | | In most cases, do not configure this value.  Use the SQL query below to find the stored procedures configured to execute automatically during the SQL Server instance start-up time and review if they really need to be executed during the startup time.    SELECT [name]FROM sysobjects WHERE type = 'P'  AND OBJECTPROPERTY(id, 'ExecIsStartUp') = 1; | |
| **Annotation** |
| This is a vendor required configuration setting. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The value in use is: 1 | |

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| [Machine inserted](#IssueLevelSummary) The SQL Server Configuration setting, xp\_cmdshell, is enabled |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration xp\_cmdshell has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Do not enable xp\_cmdshell. If there is a requirement to enable xp\_cmdshell and allow sysadmin users to run it, restrict privileges of the Windows process spawned by xp\_cmdshell by using sp\_xp\_cmdshell\_proxy\_account system stored procedure to assign a proxy account with limited privileges. If there is a requirement to allow non-sysadmin users to run xp\_cmdshell, use the GRANT statement to assign Execute permission to those users only.  SAP recommends enabling xp\_cmdshell in order to have all capabilities of the SAP database monitoring framework. | | **How Microsoft Does IT** | | Microsoft IT tries to avoid system designs that require the use of xp\_cmdshell, and using this option is permitted only by exception. Thus, there must be both a clear business need for the function and a lack of other available solutions before it is used. | | **Importance** | | xp\_cmdshell is an extended stored procedure that executes a given string as an operating system command by spawning a Windows command shell. The spawned Windows process has the same security rights as the SQL Server service account. By default, execution of xp\_cmdshell is disabled. It can be enabled by setting the value of xp\_cmdshell server configuration setting to 1. | | **Recommended Reading** | | [xp\_cmdshell (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms175046.aspx)  [xp\_cmdshell Server Configuration Option](http://technet.microsoft.com/en-us/library/ms190693.aspx)  [SAP with Microsoft SQL Server 2008 and SQL Server 2005](http://scn.sap.com/docs/DOC-1006) | | **Recommended Resolution** | | Do not enable xp\_cmdshell configuration setting unless there are application and system designs that require the use of xp\_cmdshell extended stored procedure. | |
| **Annotation** |
| This has been disabled to bring it inline with the other two nodes. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 1 | |

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| [Machine inserted](#IssueLevelSummary) The Value configured for SQL Server Configuration, Max Degree of parallelism may impact your SQL Server instance performance. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration, max degree of parallelism option is not configured in conjunction with the number of CPU's within a NUMA node. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Parallelism is often beneficial for longer running queries or for queries that have complicated execution plans. However, OLTP-centric application performance could sometimes suffer when parallel plans use more processors than the number of physical processors. In that case the time that it takes SQL Server to coordinate all the processors on a high-end server outweighs the advantages of using a parallel plan. Thus, consider modifying this value if you are experiencing excessive CXPACKET wait types on the SQL Server instance. | | **Importance** | | The max degree of parallelism option controls the number of processors that can be used to run a single Microsoft® SQL Server statement using a parallel execution plan. The default value for this configuration is 0 and indicates that all available processors can be used. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [max degree of parallelism Option](http://msdn2.microsoft.com/en-us/library/ms181007.aspx)[General guidelines to use to configure the MAXDOP option](http://support.microsoft.com/kb/329204)  [OLTP Blueprint - A Performance Profile of OLTP Applications](http://blogs.msdn.com/sqlcat/archive/2006/06/23/Tom-Davidson-SQLCAT-Best-Practices.aspx) | | **Recommended Resolution** | | Use the following guidelines when you configure the MAXDOP value:   · For servers that use more than eight processors, use the following configuration: MAXDOP=8.  · For servers that have eight or less processors, use the following configuration where N equals the number of processors: MAXDOP=0 to N.  · For servers that have NUMA configured, MAXDOP should not exceed the number of CPUs that are assigned to each NUMA node.  · For servers that have hyper-threading enabled, the MAXDOP value should not exceed the number of physical processors.   **If your SQL Server is hosting databases for the applications (for instance SAP, BizTalk, SharePoint etc?) require special considerations for MAXDOP, please consult the application vendor before altering the MAXDOP configuration.**   **If the affinity mask option is not set to the default, it may restrict the number of processors available to SQL Server on symmetric multiprocessing (SMP) systems. In this scenario, MAXDOP test case makes recommendation based on the number of processors allocated to SQL Server instance by means of affinity mask configuration parameter. In future if you change the affinity mask setting, Microsoft recommends re-evaluating the Max degree for parallelism setting for optimal value.   We recommend testing the application workload before you alter the MAXDOP configuration in the production environment to make sure that the new value provides possible performance gains.** | |
| **Annotation** |
| I have changed this configuration setting to bring it in line with the other nodes. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM2P.CHOMP.ORG | MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 0 SQL OS Schedular count:2  MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 1 SQL OS Schedular count:2  MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 2 SQL OS Schedular count:2  MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 3 SQL OS Schedular count:2  MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 4 SQL OS Schedular count:2  MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 5 SQL OS Schedular count:2  MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 6 SQL OS Schedular count:2  MaxDOP Run value: 0 MAXDOP in Usage: 16 NUMA Node ID: 7 SQL OS Schedular count:2  Suggested MAX Value: 2 | |

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| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, clr enabled, has been changed from the default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration clr enabled has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Leave this option disabled if you will not be using CLR database objects on the SQL Server instance. | | **Importance** | | This configuration determines whether user assemblies and CLR functionality or objects can be used on a Microsoft® SQL Server instance. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [clr enabled Option](http://msdn2.microsoft.com/en-us/library/ms175193.aspx) | | **Recommended Resolution** | | Disable this option if you do not plan to use CLR database objects on the SQL Server instance. Leave it enabled if you already have CLR objects or plan to create them. | |
| **Annotation** |
| This has been disabled. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The value in use is: 1 | |

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| --- |
| [Machine inserted](#IssueLevelSummary) SQL Server Configuration: Backup Compression Default is set to a non-default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration Backup Compression has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Before enabling the Backup Compression at Server level, consider the possibility to perform a set of tests with the main purpose of understanding the level of impact that this feature could introduce, in terms of CPU consumption and  to understand the level of compression that could be achieved in each database backup operation.  After performing this evaluation the option could be changed at server level, or could be applied to specific backup operations.  To calculate the compression ratio of a backup, use the values for the backup in the backup\_size and compressed\_backup\_size columns of the backupset history table, as follows:    backup\_size:compressed\_backup\_size  Backup Compression is available in these Editions of SQL Server 2012 (Enterprise, Business and Standard) and in SQL Server 2008 R2 (Datacenter, Enterprise e Standard) and in SQL Server 2008 (Enterprise).  Have in consideration:  When you are creating an individual backup, configuring a log shipping configuration, or creating a maintenance plan, you can override the server-level default.  Backup compression is supported for both disk backup devices and tape backup devices.  For compressed backups, the size of the final backup file depends on how compressible the data is, and this is unknown before the backup operation finishes. Therefore, by default, when backing up a database using compression, the Database Engine uses a pre-allocation algorithm for the backup file. This algorithm pre-allocates a predefined percentage of the size of the database for the backup file. If more space is needed during the backup operation, the Database Engine grows the file. If the final size is less than the allocated space, at the end of the backup operation, the Database Engine shrinks the file to the actual final size of the backup.  Trace Flag 3042 - Bypasses the default backup compression pre-allocation algorithm to allow the backup file to grow only as needed to reach its final size. This trace flag is useful if you need to save on space by allocating only the actual size required for the compressed backup. Using this trace flag might cause a slight performance penalty (a possible increase in the duration of the backup operation | | **Importance** | | Enabling backup compression at server level will have an implication on all backup operations where there isn't any explicit indication to perform the backup with or without compression.  For those scenarios where there isn't any possibility to customize the BACKUP command then this is a good possibility to take advantage of the backup compression feature without any change. | | **Recommended Reading** | | [Backup Compression (SQL Server)](http://technet.microsoft.com/en-us/library/bb964719.aspx)  [View or Configure the backup compression default Server Configuration Option](http://technet.microsoft.com/en-us/library/bb933863.aspx)  [Use Resource Governor to Limit CPU Usage by Backup Compression (Transact-SQL)](http://technet.microsoft.com/en-us/library/cc280384.aspx) | | **Recommended Resolution** | | Backup compression is a feature that offers the possibility to reduce:  The space required to store each backup;  The time required to perform the backup;  The number of I/O operations to perform that same backup;  and a reduction on the time required to perform the restore operation.  By default, compression significantly increases CPU usage, and the additional CPU consumed by the compression process might adversely impact concurrent operations. Therefore, you might want to create low-priority compressed backups in a session whose CPU usage is limited by Resource Governor. | |
| **Annotation** |
| Customer is aware of the side effects. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The value in use is: 1 | |

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| [Machine inserted](#IssueLevelSummary) SQL Server Configuration: Optimize For Ad hoc Workload is set to a non-default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration Optimize For Ad hoc Workload has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Understand if there's a high percentage of query plans stored in the plan cache where the use counts is low or equal to 1, this can happen when there's an intensive use of ad hoc queries without any kind of query or plan optimization.  Optimize for ad hoc workloads is a server wide configuration setting. This could be an advantage, specially, for the scenarios where there's a schema/configuration lock, at database level. | | **Importance** | | There are scenarios where one or more applications are still using ad-doc queries without any king of preparation or parameterization. In these scenarios the percentage of reuse a plan from the cache it is very low.  Optimize for Ad hoc Workloads introduces the possibility to store a compiled stub of the query plan, on the first compilation of a query, reducing the plan cache memory requirements but introducing the need to compile the plan for the query a second time and at that time, the full plan is stored on the plan cache. | | **Recommended Reading** | | [optimize for ad hoc workloads Server Configuration Option](http://msdn.microsoft.com/en-us/library/cc645587.aspx)  [Top 10 SQL Server 2008 Features for ISV Applications (7 - Optimize for Ad hoc Workloads Option)](http://sqlcat.com/sqlcat/b/top10lists/archive/2008/11/24/top-10-sql-server-2008-features-for-isv-applications-burzin.aspx) | | **Recommended Resolution** | | When there's an explicit situation of memory pressure due the incapacity to reuse query plans from the plan cache and there are application/schemas that cannot be changed and tuned then that's the most appropriate scenario to enable the "optimize for ad hoc workloads" configuration.  It is expected to notice a small increase on the compilations of the query plans because those are fully stored only after the second compilation. | |
| **Annotation** |
| Vendor requirement. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The value in use is: 1 | |

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| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, Ad Hoc Distributed Queries, has been changed from the default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration Ad Hoc Distributed Queries has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | If remote data must be accessed frequently, disable this option and create linked servers instead. | | **Importance** | | The Ad Hoc Distributed Queries setting is disabled by default. When enabled, ad hoc access through OPENROWSET and OPENDATASOURCE is allowed. | | **Recommended Reading** | | [Ad Hoc Distributed Queries Option](http://msdn2.microsoft.com/en-us/library/ms187569.aspx)  [Linking Servers](http://msdn2.microsoft.com/en-us/library/ms188279.aspx)  [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx) | | **Recommended Resolution** | | Enable this option only if infrequent ad hoc distributed queries are required for the Microsoft® SQL Server instance. Otherwise, disable the option and use linked servers instead. | |
| **Annotation** |
| Vendor requirement. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 1 | |

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| --- |
| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, show advanced options, has been changed from the default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration show advanced options has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Leave this setting at the default value in order to hide advanced options. If you have to configure advanced options, enable this setting only temporarily, make the change, and then reset it to the default value. | | **Importance** | | This configuration effects whether sp\_configure displays advanced options. If this setting is changed from the default value, advanced options will be displayed. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [show advanced options Option](http://msdn2.microsoft.com/en-us/library/ms188265.aspx) | | **Recommended Resolution** | | Leave this option at the default value and enable it only for brief intervals during an advanced configuration change. | |
| **Annotation** |
| This has been disabled on both nodes. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 1 | |

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| --- |
| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, Database Mail XPs, has been changed from the default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration Database Mail XPs has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Change the default value to 1 if you want to use database mail on the SQL Server instance. This configuration is off by default in order to reduce the attack surface area of SQL Server. Do not enable this option if you do not plan to use the database mail functionality. | | **Importance** | | This configuration affects whether Database Mail is enabled for the Microsoft® SQL Server instance. If you want to use this functionality, it must be enabled with a non-default value of 1. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [Database Mail XPs Option](http://msdn2.microsoft.com/en-us/library/ms191189.aspx) | | **Recommended Resolution** | | Do not enable this option if you will not be using database mail. | |
| **Annotation** |
| We are using database mail to email for some custom alerts. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 1 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The value in use is: 1 | |

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| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, OLE Automation Procedures, has been changed from the default value. |
| **Status** |
| Failed |
| **Description** |
| The SQL Server configuration setting OLE Automation Procedures has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Avoid calling OLE Automation Procedures and extended stored procedures. Instead, use CLR objects. OLE Automation Procedures can cause SQL Server instability, such as memory leaks, access violations, and performance issues. Additionally, they do not have the safety mechanisms available natively to CLR objects. | | **Importance** | | This configuration determines whether OLE Automation Procedures are supported on the Microsoft® SQL Server instance (sp\_OACreate, sp\_OADestroy, sp\_OAGetErrorInfo, sp\_OAGetProperty, sp\_OAMethod, sp\_OASetProperty, and sp\_OAStop). By default, the OLE Automation Procedures setting is disabled, which is a value of 0. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [OLE Automation Procedures Option](http://msdn2.microsoft.com/en-us/library/ms191188.aspx) | | **Recommended Resolution** | | Do not enable this option in SQL Server 2005 or SQL Server 2008. Use CLR objects instead. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 1 | |

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| --- |
| [Machine inserted](#IssueLevelSummary) The SQL Server configuration setting, min server memory, has been changed from the default value. |
| **Status** |
| Resolved |
| **Description** |
| The SQL Server configuration setting min server memory has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | In most cases, you can leave this value at the default setting. However, if you want to fix the amount of memory dedicated to a SQL Server instance, you can set the min server memory and max server memory to the same value. You might also consider changing the value for min server memory if you are hosting the SQL Server instance on a computer or node with multiple instances of SQL Server. In this case, consider increasing min server memory to the minimum value that will not be released to the operating system in the event of a memory pressure notification | | **Importance** | | This configuration sets the minimum amount of buffer pool memory that is reserved by a Microsoft® SQL Server instance. The default value for this option is 0. | | **Recommended Reading** | | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [Server Memory Options](http://msdn2.microsoft.com/en-us/library/ms178067.aspx) | | **Recommended Resolution** | | Leave this configuration at the default value if the SQL instance is on a dedicated computer or node that has no other applications or SQL Server instances running concurrently with it.   If a fixed amount of memory is required for the SQL instance, based on known workloads, set the min server memory configuration to the same value as the max server memory configuration.   If you are hosting multiple instances of SQL Server on the same node or computer, consider setting the minimum of each instance in proportion to the expected workload. In addition, increase the min server memory value if you want to reserve memory that will not be released to the operating system. | |
| **Annotation** |
| The min server setting has been configured in order to mitigate any potential issues between SQL Server and the VM-ware memory balloon process. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The value in use is: 204800 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The value in use is: 204800 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The value in use is: 204800 | |

SQL Server Database Options

SQL Database Options

A number of database-level options that determine the characteristics of the database can be set for each database. Only the system administrator, database owner, members of the sysadmin and dbcreator fixed server roles, and db\_owner fixed database roles can modify these options. These options are unique to each database and do not affect other databases.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Database(s) identified with recovery model set to Simple |
| **Status** |
| Resolved |
| **Description** |
| This issue is raised when one or more user database’s recovery model is set to SIMPLE recovery mode. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Use either FULL or BULK\_LOGGED recovery model on production databases where loss of recent transactions is not acceptable. Consider using the SIMPLE recovery model for a database if you do not need point-in-time recovery for that database, and if you want to rely only on full database and differential backups. | | **Importance** | | Recovery model is a database property designed to control transaction log maintenance. A database with SIMPLE recovery model, does not support log backups. As a result, if there is a need to restore the database, all transactions since the last database or differential backup will be lost. Simple recovery model controls the size of the transaction log by truncating the log at every checkpoint. | | **Recommended Reading** | | [Backup Under the Simple Recovery Model](http://msdn.microsoft.com/en-us/library/ms191164(v=SQL.105).aspx)  [Recovery Models (SQL Server)](http://technet.microsoft.com/en-us/library/ms189275.aspx)  [View or Change the Recovery Model of a Database](http://technet.microsoft.com/en-us/library/ms189272.aspx)  [ALTER DATABASE SET Options (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb522682.aspx) | | **Recommended Resolution** | | Review the databases that have SIMPLE recovery model. If the maximum amount of data loss involved is not acceptable, change the recovery model to FULL or BULK\_LOGGED, and schedule frequent log backups. | |
| **Annotation** |
| These databases do not need point in time recovery by design. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG; Prod61\_MT | Database option recovery\_model\_desc for database Prod61\_MT is set to: SIMPLE | | Machine inserted | SCMMAVM3P.CHOMP.ORG; cpm\_StageCDC | Database option recovery\_model\_desc for database cpm\_StageCDC is set to: SIMPLE | | Machine inserted | SCMMAVM3P.CHOMP.ORG; cpm\_Stage | Database option recovery\_model\_desc for database cpm\_Stage is set to: SIMPLE | | Machine inserted | SCMMAVM3P.CHOMP.ORG; CPM\_ReportServerTempDB | Database option recovery\_model\_desc for database CPM\_ReportServerTempDB is set to: SIMPLE | | Machine inserted | SCMMAVM3P.CHOMP.ORG; CPM\_ReportServer | Database option recovery\_model\_desc for database CPM\_ReportServer is set to: SIMPLE | | Machine inserted | SCMMAVM3P.CHOMP.ORG; CPM\_MetaData | Database option recovery\_model\_desc for database CPM\_MetaData is set to: SIMPLE | | Machine inserted | SCMMAVM3P.CHOMP.ORG; cpm\_EPMPortal | Database option recovery\_model\_desc for database cpm\_EPMPortal is set to: SIMPLE | | Machine inserted | SCMMAVM3P.CHOMP.ORG; cpm\_AcuteCare | Database option recovery\_model\_desc for database cpm\_AcuteCare is set to: SIMPLE | | Machine inserted | SCMMAVM2P.CHOMP.ORG; Prod61\_MT | Database option recovery\_model\_desc for database Prod61\_MT is set to: SIMPLE | | Machine inserted | SCMMAVM2P.CHOMP.ORG; EToolkit | Database option recovery\_model\_desc for database EToolkit is set to: SIMPLE | |  |  |  | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) User Databases found that have collations different from master database |
| **Status** |
| Resolved |
| **Description** |
| One or more User Databases found that have collations different from master database |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Microsoft recommends not to use the different collations for user databases from master and model databases. | | **Importance** | | This rule detected that one or more user-defined databases is defined by using a collation that is different from the master and model databases and could cause the collation conflicts that might prevent code from executing. | | **Recommended Reading** | | [Set or Change the Database Collation](http://msdn.microsoft.com/en-us/library/ms175835.aspx)  [Set or Change the Column Collation](http://msdn.microsoft.com/en-us/library/ms190920.aspx) | | **Recommended Resolution** | | If you experience collation conflict errors, consider one of the following solutions:  Export the data from the user database and import it into new tables that have the same collation as the master and model databases.  Rebuild the system databases to use a collation that matches the user database collation.  Modify any stored procedures that join user tables to tables in tempdb to create the tables in tempdb by using the collation of the user database. To do this, add the COLLATE database\_default clause to the column definitions of the temporary table. | |
| **Annotation** |
| These are reporting services databases and collation is different as per MS. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG:CPM\_ReportServerTempDB | master database collation: SQL\_Latin1\_General\_CP1\_CI\_AS  Database Collation: Latin1\_General\_CI\_AS\_KS\_WS | | Machine inserted | SCMMAVM3P.CHOMP.ORG:CPM\_ReportServer | master database collation: SQL\_Latin1\_General\_CP1\_CI\_AS  Database Collation: Latin1\_General\_CI\_AS\_KS\_WS | | Machine inserted | SCMMAVM1P.CHOMP.ORG:ReportServerTempDB | master database collation: SQL\_Latin1\_General\_CP1\_CI\_AS  Database Collation: Latin1\_General\_CI\_AS\_KS\_WS | | Machine inserted | SCMMAVM1P.CHOMP.ORG:ReportServer | master database collation: SQL\_Latin1\_General\_CP1\_CI\_AS  Database Collation: Latin1\_General\_CI\_AS\_KS\_WS | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Database(s) identified with page verify option not set to CHECKSUM |
| **Status** |
| Resolved |
| **Description** |
| One or more User databases were found with page verify not set to CHECKSUM option |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Set the PAGE\_VERIFY database option to CHECKSUM to enable the database engine to identify database inconsistency problems due to I/O errors caused by power failure or failure in the storage subsystem. When a database is upgraded to SQL Server 2005 or later, its PAGE\_VERIFY option remains at NONE or TORN\_PAGE\_DETECTION. We recommend that you change it to CHECKSUM. | | **Importance** | | When PAGE\_VERIFY database option is set to CHECKSUM, SQL Server identifies database pages that have been damaged as a result of power failure or failure in the storage subsystem at the time the page was being written to disk. | | **Recommended Reading** | | [ALTER DATABASE SET Options (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb522682.aspx) | | **Recommended Resolution** | | Set the PAGE\_VERIFY database option to CHECKSUM. | |
| **Annotation** |
| I switched from 'page verify' to 'checksum' on the listed databases. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG:SXASECTRACKING | Database option page\_verify\_option\_desc for database SXASECTRACKING is set to: TORN\_PAGE\_DETECTION | | Machine inserted | SCMMAVM3P.CHOMP.ORG:DART | Database option page\_verify\_option\_desc for database DART is set to: TORN\_PAGE\_DETECTION | | Machine inserted | SCMMAVM3P.CHOMP.ORG:cpm\_StageCDC | Database option page\_verify\_option\_desc for database cpm\_StageCDC is set to: TORN\_PAGE\_DETECTION | | Machine inserted | SCMMAVM3P.CHOMP.ORG:cpm\_Stage | Database option page\_verify\_option\_desc for database cpm\_Stage is set to: TORN\_PAGE\_DETECTION | | Machine inserted | SCMMAVM3P.CHOMP.ORG:CPM\_MetaData | Database option page\_verify\_option\_desc for database CPM\_MetaData is set to: TORN\_PAGE\_DETECTION | | Machine inserted | SCMMAVM3P.CHOMP.ORG:cpm\_AcuteCare | Database option page\_verify\_option\_desc for database cpm\_AcuteCare is set to: TORN\_PAGE\_DETECTION | | Machine inserted | SCMMAVM3P.CHOMP.ORG:Argent | Database option page\_verify\_option\_desc for database Argent is set to: TORN\_PAGE\_DETECTION | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) User database is set to compatibility level lower than the default installation level. |
| **Status** |
| Resolved |
| **Description** |
| User database is set to compatibility level lower than the default installation level. |
| **Additional Information** |
| |  | | --- | | **Importance** | | Setting the databases to a lower compatibility level should be done only as an interim aid during migration. Keeping the databases at the same level indefinitely will disable some of the new features that later versions provide. | | **Recommended Reading** | | [Database Compatibility Level Option](http://msdn.microsoft.com/en-us/library/ms191137.aspx)  [ALTER DATABASE Compatibility Level (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb510680.aspx) | | **Recommended Resolution** | | Review the issues that caused you to operate at the lower compatibility level and then upgrade to the default level. | |
| **Annotation** |
| I set the database compatibility levels to 2012 for the listed databases. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG:SXASECTRACKING | Database option compatibility\_level for database SXASECTRACKING is set to: 100 | | Machine inserted | SCMMAVM3P.CHOMP.ORG:Prod61\_MT | Database option compatibility\_level for database Prod61\_MT is set to: 90 | | Machine inserted | SCMMAVM3P.CHOMP.ORG:DARTData | Database option compatibility\_level for database DARTData is set to: 100 | | Machine inserted | SCMMAVM3P.CHOMP.ORG:DART | Database option compatibility\_level for database DART is set to: 100 | | Machine inserted | SCMMAVM3P.CHOMP.ORG:Argent | Database option compatibility\_level for database Argent is set to: 100 | | Machine inserted | SCMMAVM2P.CHOMP.ORG:Prod61\_MT | Database option compatibility\_level for database Prod61\_MT is set to: 90 | | Machine inserted | SCMMAVM1P.CHOMP.ORG:RTScheduler | Database option compatibility\_level for database RTScheduler is set to: 100 | | Machine inserted | SCMMAVM1P.CHOMP.ORG:PROD61\_MT | Database option compatibility\_level for database PROD61\_MT is set to: 90 | | Machine inserted | SCMMAVM1P.CHOMP.ORG:CHOMP\_TABLES | Database option compatibility\_level for database CHOMP\_TABLES is set to: 100 | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Database(s) identified with AUTO\_UPDATE\_STATISTICS\_ASYNC option enabled |
| **Status** |
| Failed |
| **Description** |
| User database has AutoUpdateStats Async enabled on one or more user databases. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Enable AUTO\_UPDATE\_STATISTICS\_ASYNC when you need shorter and more predictable query response times, and also if you are using applications that experience timeouts as a result of AUTO\_UPDATE\_STATISTICS.  Do not enable AUTO\_UPDATE\_STATISTICS\_ASYNC on databases that support SharePoint Server. | | **Importance** | | Statistics contain information about distribution of values in a column. Query optimizer uses statistics to create optimal execution plans. Data modifications change distribution of column values and cause existing statistics to become outdated. Outdated statistics result in sub-optimal execution plans. When AUTO\_UPDATE\_STATISTICS\_ASYNC is enabled, if SQL Server determines that statistics on column(s) referenced in the WHERE clause of a query are outdated, it creates the execution plan using existing statistics and updates the outdated statistics. | | **Recommended Reading** | | [Statistics](http://msdn.microsoft.com/en-us/library/ms190397.aspx)  [ALTER DATABASE SET Options (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb522682.aspx) | | **Recommended Resolution** | | Consider enabling AUTO\_UPDATE\_STATISTICS\_ASYNC when your application experiences timeouts as a result of queries waiting for statistics to get updated, and if you need more predictable query response times. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG:xaes\_EAS | Database option is\_auto\_update\_stats\_async\_on for database xaes\_EAS is set to: True | |

SQL Server Information

SQL Server Info

This provides a comprehensive view of the SQL Server instance as a whole. This includes, but is not limited to SQL Server Non-Uniform Memory Access (NUMA) configuration, Processing power and memory, SQL Server current Service pack information etc.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) The latest service pack or hotfix for SQL Server is not installed |
| **Status** |
| Failed |
| **Description** |
| Service packs are the main delivery vehicle for fixes, security patches, and general improvements to the SQL Server system. These updates can protect you from as well as provide you with solutions to known issues. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | After the availability of a service pack is announced, it should be applied to a test region of the environment. It should also be subjected to a comprehensive testing program that involves all the applications in the environment that use SQL Server. In addition, the tests should be conducted in such a way that a load similar to, if not equal to, the loads experienced in production are run against the test system. Hotfixes should only be installed when specifically instructed by Microsoft Support.   Cumulative Updates (CU) are only recommended for installation when specific symptoms are experienced on your SQL Server, if you are running QFE branch, review the issues fixed in the KB article associated with the release of CU and apply if your sever is experiencing any of those symptoms. | | **Importance** | | Service packs are the main delivery vehicle for fixes, security patches, and general improvements to the SQL Server system. These updates can protect you from as well as provide you with solutions to known issues. Therefore, applying service packs and hotfixes as soon as possible after thorough testing can greatly reduce your vulnerability to a wide range of issues. Additionally, because service packs often include improvements to performance, supportability, and diagnostics, having the latest service packs installed can improve response in general and can reduce the amount of time necessary to diagnose and troubleshoot an issue.  Finally, support for older Microsoft® SQL Server versions and service packs could be discontinued, thus leaving your system in an unsupported configuration. Thus, it is essential to apply all service packs as soon as possible.  Over time, a Cumulative Update (CU) package is created by the development team to address specific product issues affecting certain customers. These CU builds contain all fixes since the product or service pack is released as stated in the KB article associated with a specific CU package release. Sometimes the issue has a broad customer impact, security implications, or both. Thus, a General Distribution Release (GDR) is issued so that all customers can receive the updates. | | **Recommended Reading** | | [How to obtain the latest service pack for SQL Server 2008 R2](http://support.microsoft.com/kb/2527041)  [How to obtain the latest service pack for SQL Server 2008](http://support.microsoft.com/kb/968382)  [An Incremental Servicing Model is available from the SQL Server team to deliver hotfixes for reported problems](http://support.microsoft.com/kb/935897) | | **Recommended Resolution** | | The following summary lists the recommended builds depending on the version and branch of SQL Server.  **For SQL Server 2005**  GDR Branch Builds: 9.00.3042 - 9.00.4999  GDR Branch Recommended: 9.00.5000  QFE Branch Builds: 9.00.5001-9.00.5323  QFE Branch Recommended: 9.00.5324  **For SQL Server 2008**  GDR Branch Builds: 10.0.1019 - 10.0.5499  GDR Branch Recommended: 10.0.5500  QFE Branch Builds: 10.0.5501-10.0.5847  QFE Branch Recommended: 10.0.5848  **For SQL Server 2008 R2**  GDR Branch Builds: 10.50.1092-10.50.3999  GDR Branch Recommended: 10.50.4000  QFE Branch Builds: 10.50.4001-10.50.4294  QFE Branch Recommended: 10.50.4295  **For SQL Server 2012**  GDR Branch Builds: 11.00.1103 - 11.00.2999  GDR Branch Recommended: 11.00.3000  QFE Branch Builds: 11.00.3001 - 11.00.3392  QFE Branch Recommended: 11.00.3393 | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Installed Build: 11.0.3391.0  Latest Build: 11.00.3393 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Installed Build: 11.0.3391.0  Latest Build: 11.00.3393 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Installed Build: 11.0.3391.0  Latest Build: 11.00.3393 | |

SQL Server Instance Properties

SQL Server Properties

Identifies the risks associated with the configurations made into SQL Server instance properties.

Security

SQL Server Security

Security is a major concern for the modern age systems/ network/ database administrators. It is natural for an administrator to worry about hackers and external attacks while implementing security. However, there is more to it. It is essential to first implement security within the organization, to make sure the right people have access to the right data. Without these security measures in place, you might find someone destroying your valuable data, or selling your company's secrets to your competitors or someone invading the privacy of others. Primarily, a security plan must identify which users in the organization can see which data and perform which activities in the database.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) SQL Server logins identified with passwords same as logins |
| **Status** |
| Failed |
| **Description** |
| SQL Server logins identified with passwords same as SQL logins. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Use complex passwords, and enforce password policies on SQL Server logins. | | **Importance** | | A login without a password, or with password the same as login, provides an entry point for hackers and worms. | | **Recommended Reading** | | [Password Policy](http://msdn.microsoft.com/en-us/library/ms161959.aspx)  [Understanding Password Policy for SQL Server Logins](http://support.microsoft.com/kb/2028712)  [PWDCOMPARE (Transact-SQL)](http://msdn.microsoft.com/en-us/library/dd822792.aspx)  [CREATE LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189751.aspx)  [ALTER LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189828.aspx)  [Microsoft Baseline Security Analyzer 2.2 (for IT Professionals)](http://www.microsoft.com/en-us/download/details.aspx?id=7558) | | **Recommended Resolution** | | Use Microsoft Baseline Security Analyzer or the PWDCOMPARE command to identify SQL Server logins with blank or weak passwords. Use complex passwords and enforce password policies. Prior to changing passwords, coordinate with related users and developers to prevent logon failures and service interruptions.    You can also use the below T-SQL query to identify the logins with passwords same as logins and create strong passwords for those logins.   ---SQL Logins with passwords same as logins  select serverproperty('machinename') as 'Server Name',  isnull(serverproperty('instancename'),serverproperty('machinename')) as 'Instance Name',  name as 'Login With Password Same As Name'  from master.sys.sql\_logins  where pwdcompare(name,password\_hash) = 1  order by name  option (maxdop 1) | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG |  | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) SQL Server service is running under an account that is a member of the built-in Administrators group |
| **Status** |
| Resolved |
| **Description** |
| SQL Server service is running under an account that is a member of the built-in Administrators group. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Use the principle of least privilege when configuring a service account. Use a different account for each service. When assigning a service account to SQL Server service, create a domain user account and use SQL Server Configuration Manager to assign the account to the service. SQL Server Configuration Manager automatically assigns the necessary rights and permissions to the related service account. | | **Importance** | | SQL Server service is a Windows service that runs the relational database engine. The account assigned to SQL Server service should have enough rights and permissions to let the service perform its functions. Using accounts with excessive rights such as Local Administrator, Domain Administrator, Local System or the Network Service Account, increases attack surface area. | | **Recommended Reading** | | [Guidelines on choosing Service Accounts for SQL Server Services](http://support.microsoft.com/kb/2160720)  [Change the Service Startup Account for SQL Server (SQL Server Configuration Manager)](http://msdn.microsoft.com/en-us/library/ms345578.aspx)  [Configure Windows Service Accounts and Permissions](http://technet.microsoft.com/en-us/library/ms143504.aspx) | | **Recommended Resolution** | | Create a domain user account without assigning rights or permissions. Use SQL Server Configuration Manager to assign the account to SQL Server service. Do not assign an account to more than one service. | |
| **Annotation** |
| Business requirement as per vendor. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Server Name(s): SCMMAVM3P.CHOMP.ORG  Service Account(s): CHOMP\scmadmin | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Server Name(s): SCMMAVM2P.CHOMP.ORG  Service Account(s): CHOMP\scmadmin | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Server Name(s): SCMMAVM1P.CHOMP.ORG  Service Account(s): CHOMP\scmadmin | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) SQL Server logins identified that do not adhere to Windows password polices |
| **Status** |
| Resolved |
| **Description** |
| This issue is fired when one or more SQL Server standard logins not enforced with “Password Complexity” and “Password Expiration” policies by leveraging the Windows password policy mechanisms. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Enforce password complexity rules on standard SQL logins. When using CREATE LOGIN to create a SQL Server login, set CHECK\_POLICY and CHECK\_EXPIRATION to ON. | | **Importance** | | Complex passwords can protect against brute force attacks by increasing the number of possible passwords. On an instance of SQL Server that is running on Windows Server 2003 or later, SQL Server logins can be configured to use Windows password complexity rules. | | **Recommended Reading** | | [Password Policy](http://msdn.microsoft.com/en-us/library/ms161959(v=SQL.105).aspx)  [Understanding Password Policy for SQL Server Logins](http://support.microsoft.com/kb/2028712)  [CREATE LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189751.aspx)  [ALTER LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189828.aspx) | | **Recommended Resolution** | | Query mster.sys.sql\_logins for logins that have is\_policy\_checked or is expiration\_checked set to 0. Use ALTER LOGIN to set CHECK\_POLICY and CHECK\_EXPIRATION to on.    You can use the below T-SQL script to get the logins that do not adhere to Windows password policies.    SELECT serverproperty('machinename') as 'Server Name',  isnull(serverproperty('instancename'),serverproperty('machinename')) as 'Instance Name',  [name], [is\_policy\_checked], [is\_expiration\_checked]  FROM master.sys.sql\_logins WHERE ( [is\_policy\_checked] = 0 OR [is\_expiration\_checked] = 0 )  and name not like '##MS\_%' | |
| **Annotation** |
| Vendor requirement. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG |  | | Machine inserted | SCMMAVM2P.CHOMP.ORG |  | | Machine inserted | SCMMAVM1P.CHOMP.ORG |  | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) “Allow log on locally” user right may have granted for non-administrative members. |
| **Status** |
| Failed |
| **Description** |
| “Allow log on locally” user right may have granted for non-administrative members.  The rule fires for any other users or groups except Administrators, Backup Operators and Power Users |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Failure to restrict console access to legitimate user accounts could result in unauthorized users downloading and executing malicious code to change their user rights. Removal of the Allow log on locally user right prevents unauthorized logons on the consoles of computers, such as domain controllers or application servers. Removal of this logon right prevents non-domain accounts from logging on at the console of member computers in the domain. | | **Importance** | | Users who are trying to log on at the console of a Microsoft Windows-based computer (by using the CTRL+ALT+DELETE logon key sequence) and accounts who are trying to start a service must have local logon privileges on the hosting computer. SQL RaaS identified Non-administrators have rights to logon locally to the server. Typically, non-administrators only need to access the server through an application. | | **Recommended Reading** | | [Allow log on locally](http://technet.microsoft.com/en-us/library/cc756809.aspx) | | **Recommended Resolution** | | Ascertain whether or not non-administrators need to be able to logon locally to the server and remove this ability if not needed  You can review the local user right assignments by following through below steps:  1. Click **Start**, and then click **Run**.  2. In the **Open** box, type **Gpedit.msc**, and then click **OK**.  3. Expand the console tree Computer Configuration\Windows Settings\Security Settings\Local Policies\User Rights Assignment  4. Navigate to the “Allow log on locally” policy on the left pane, and get to the properties  5. Review the accounts granted this right and make appropriate changes. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Account Name(s): BUILTIN\Backup Operators, BUILTIN\Users, BUILTIN\Administrators | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Account Name(s): BUILTIN\Backup Operators, BUILTIN\Users, BUILTIN\Administrators | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Account Name(s): BUILTIN\Backup Operators, BUILTIN\Users, BUILTIN\Administrators | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Non-Default logins are provisioned to SQL Server sysadmin server role. |
| **Status** |
| Failed |
| **Description** |
| One or more SQL Server instances found with Non-Default logins are provisioned to SQL Server sysadmin server role. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | The below are the logins by default SQL Server installation provisions into the sysadmin server role and review any other logins for the purpose of their sysadmin role membership:  **SQL Server 2005:**  BUILTIN\Administrators  NT AUTHORITY\SYSTEM  sa  SQLServer2005MSSQLUser$<>$<<InstanceName>>  SQLServer2005SQLAgentUser$<>$<<InstanceName>>  **SQL Server 2008/R2:**  NT AUTHORITY\SYSTEM  NT SERVICE\MSSQLSERVER  NT SERVICE\SQLSERVERAGENT  Sa  **SQL Server 2012:**  NT SERVICE\MSSQLSERVER  NT SERVICE\SQLSERVERAGENT  Sa  NT SERVICE\SQLWriter  NT SERVICE\Winmgmt    In SQL Server 2005 and prior SQL Server versions, even though the build-in Administrators are part of the sysadmin server role, in some environments, you might want to impede Microsoft Windows system administrators from having this kind of access to SQL Server.   You can use the following query to determine the logins provisioned in the SQL Server sysadmin fixed server role.    SELECT  p.name AS [Name]  FROM  sys.server\_principals r  INNER JOIN sys.server\_role\_members m ON r.principal\_id = m.role\_principal\_id  INNER JOIN sys.server\_principals p ON  p.principal\_id = m.member\_principal\_id  WHERE r.type = 'R' and r.name = N'sysadmin' | | **Importance** | | Sysadmin SQL Server security role is very powerful role and members of the sysadmin fixed server role can perform any activity in the SQL Server instance. It is important to evaluate the logins placed in sysadmin role on a regular basis if they still need the highest privilege.  By default, SQL Server 2005 and earlier Setup creates the BUILTIN\Administrators login, and then adds the login to the "Sysadmin" fixed server role. This change grants system administrator permissions to any account in the Local Administrators group.  In SQL Server 2008 and later, the local Windows Group BUILTIN\Administrator is no longer provisioned as a login in the SQL Server sysadmin fixed server role by default at SQL Server setup install. As a result, box administrators cannot login to the new SQL Server 2008, SQL Server 2008 R2 and SQL Server 2012 instance by default. | | **Recommended Reading** | | [How to impede Windows NT administrators from administering a clustered instance of SQL Server](http://support.microsoft.com/kb/263712)  [SQL Server 2008 R2 Security Changes](http://technet.microsoft.com/en-us/library/cc280562(SQL.105).aspx) | | **Recommended Resolution** | | Consider removing the BUILTIN\Administrators group from the sysadmin SQL Server group in case the account is placed in sysadmin role. Administrative access should be provided to individual users as required and not to groups. Certain functionality and features may be disabled if steps are not taken prior to removing the BUILTIN\Administrators group. For example, for a SQL Server virtual service instance, the cluster service account must be first added to the sysadmin role.  Before you remove the BUILTIN\Administrators group, please make sure that NT AUTHORITY\SYSTEM account is added to SYSADMIN role. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG |  | | Machine inserted | SCMMAVM2P.CHOMP.ORG |  | | Machine inserted | SCMMAVM1P.CHOMP.ORG |  | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) The SQL Server Agent service is not using a recommended account |
| **Status** |
| Failed |
| **Description** |
| The SQL Server Agent service is not using a recommended account. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Use the principle of least privilege when configuring a service account. Use a different account for each service. When assigning a service account to SQL Server Agent service, create a domain user account and use SQL Server Configuration Manager to assign the account to the service. SQL Server Configuration Manager automatically assigns the necessary rights and permissions to the related service account. | | **Importance** | | SQL Server Agent is a Windows service that runs scheduled SQL Server tasks. The account assigned to SQL Server Agent service should have enough rights and permissions to let the service perform its functions. Using accounts with excessive rights such as Local Administrator, Domain Administrator, Local System or the Network Service Account, increases attack surface area. | | **Recommended Reading** | | [Guidelines on choosing Service Accounts for SQL Server Services](http://support.microsoft.com/kb/2160720)  [Selecting an Account for the SQL Server Agent Service](http://msdn.microsoft.com/en-us/library/ms191543(v=SQL.100).aspx)  [Change the Service Startup Account for SQL Server (SQL Server Configuration Manager)](http://msdn.microsoft.com/en-us/library/ms345578.aspx)  [Configure Windows Service Accounts and Permissions](http://technet.microsoft.com/en-us/library/ms143504.aspx) | | **Recommended Resolution** | | Create a domain user account without assigning rights or permissions. Use SQL Server Configuration Manager to assign the account to SQL Server Agent service. Do not assign an account to more than one service. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Server Names(s): SCMMAVM3P.CHOMP.ORG  Service Account(s): CHOMP\scmadmin | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Server Names(s): SCMMAVM2P.CHOMP.ORG  Service Account(s): CHOMP\scmadmin | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Server Names(s): SCMMAVM1P.CHOMP.ORG  Service Account(s): CHOMP\scmadmin | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Non-Default users are provisioned to db\_owner database role. |
| **Status** |
| Failed |
| **Description** |
| Non-Default users are provisioned to db\_owner database role for one more databases. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Use the below query to get the users currently privileged with db\_owner role and evaluate if those users really need such a high privileged grants for the business need.    select db\_name(),  member.name,  [role].name  from sys.database\_principals member  join sys.database\_role\_members rm  on member.principal\_id = rm.member\_principal\_id  join sys.database\_principals [role]  on [role].principal\_id = rm.role\_principal\_id  and [role].name in ('dbo','db\_owner')  and member.name not in ('db','db\_owner')  where member.name not in ('dbo')  order by member.name, [role].name  option (maxdop 1) | | **Importance** | | The db\_owner database role grants permission to perform the activities of all the fixed database roles as well as the maintenance and configuration activities in the database. Therefore, users should not be added to this role, unless they are required full control on the database. In SQL Server 2005, members of the db\_owner fixed database role can drop a database. This is a change of behavior from earlier versions. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG:SXASECTRACKING |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:Prod61\_MT |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:DARTData |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:DART |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:cpm\_StageCDC |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:cpm\_Stage |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:CPM\_ReportServerTempDB |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:CPM\_ReportServer |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:CPM\_MetaData |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG:cpm\_EPMPortal |  | |  |  |  | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Ownership issues in SQL Server Agent jobs and/or steps. |
| **Status** |
| Failed |
| **Description** |
| There are SQL Agent jobs owned by the SA account or member of sysadmin role |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Follow these guidelines to improve the security of your SQL Server Agent implementation:   · Create dedicated user accounts specifically for proxies, and only use these proxy user accounts for running job steps.  · Only grant the necessary permissions to proxy user accounts. Grant only those permissions actually required to run the job steps that are assigned to a given proxy account.  · Do not run the SQL Server Agent service under a Microsoft Windows account that is a member of the Windows Administrators group. | | **Importance** | | Jobs owned by a logon account that is a member of the sysadmin fixed server role will be run under the security context of the Microsoft® SQL Server Agent account. Jobs that are not will be run under the domain user account used for the SQL Server Agent proxy account.  SQL Server Agent lets the database administrator run each job step in a security context that has only the permissions required to perform that job step, which is determined by a SQL Server Agent proxy created for each job system. | | **Recommended Reading** | | [Security Administration](http://technet.microsoft.com/library/Cc966507)  [Select an Account for the SQL Server Agent Service](http://msdn.microsoft.com/en-us/library/ms191543.aspx)  [Implement SQL Server Agent Security](http://msdn.microsoft.com/en-us/library/ms190926.aspx) | | **Recommended Resolution** | | Evaluate whether the jobs need to run under the SQL Agent account or could be set to run under some other account using SQL Server Agent proxies. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG\XAES Update Statistics\_Run HVCUpdateStatisticsPr | Job/step Name: XAES Update Statistics  Run Context: CHOMP\scmadmin  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\Test job that fails\_query | Job/step Name: Test job that fails  Run Context: CHOMP\CR9181  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\SuspendedIDAlert\_EXEC dbo.CHOMP\_SuspendedIDAlert | Job/step Name: SuspendedIDAlert  Run Context: sa  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\SCA CDC Extract Job\_PopulateCDCTables | Job/step Name: SCA CDC Extract Job  Run Context: NT AUTHORITY\SYSTEM  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\HVC xaes\_EAS Update Statistics\_Step 1 | Job/step Name: HVC xaes\_EAS Update Statistics  Run Context: NT AUTHORITY\SYSTEM  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\HVC xaes\_EAS Auditing Purge Job\_Step 1 | Job/step Name: HVC xaes\_EAS Auditing Purge Job  Run Context: NT AUTHORITY\SYSTEM  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\HVC xaes\_EAS Audit Monitor\_Step 1 | Job/step Name: HVC xaes\_EAS Audit Monitor  Run Context: NT AUTHORITY\SYSTEM  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\HVC Prod61\_vm Update Statistics\_Step 1 | Job/step Name: HVC Prod61\_vm Update Statistics  Run Context: NT AUTHORITY\SYSTEM  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\HVC Prod61\_mnc Update Statistics\_Step 1 | Job/step Name: HVC Prod61\_mnc Update Statistics  Run Context: NT AUTHORITY\SYSTEM  Job Enabled: Yes | | Machine inserted | SCMMAVM3P.CHOMP.ORG\HVC Prod61\_img Update Statistics\_Step 1 | Job/step Name: HVC Prod61\_img Update Statistics  Run Context: NT AUTHORITY\SYSTEM  Job Enabled: Yes | |  |  |  | |

SQL Server Database Architecture and Design

SQL Server Database File Management

The placement of data and log files onto physical hard disks plays a significant role in overall SQL Server performance. Placing these files on their own hard disk or redundant array of independent disks (RAID) set is the optimal scenario.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Data and Transaction Log files are not on separate drives for user databases |
| **Status** |
| Resolved |
| **Description** |
| This issue is fired when our assessment locates one or more disk volumes host both the SQL Server Database data files and Transaction log files belong to one or more user databases. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Place data and log files of user databases on separate volumes that do not use the same spindles. In an environment where tempdb is used heavily, place tempdb database files on a drive that does not contain user database files and does not share spindles. Tempdb files should be placed on a fast drive. | | **Importance** | | Placing data and log files on the same drive can cause contention for that drive and impact performance. In an environment where tempdb is used heavily, placing tempdb and user database files on the same volume can result in performance degradation. | | **Recommended Reading** | | [Place Data and Log Files on Separate Drives](http://technet.microsoft.com/en-us/library/bb402876.aspx)  [Separate database and transaction log files on different drives for optimal performance and disaster recovery](http://support.microsoft.com/kb/2033523)  [Moving Database Files](http://msdn.microsoft.com/en-us/library/ms189133(v=SQL.100).aspx) | | **Recommended Resolution** | | If performance data indicate that there is disk contention, move user database data and log files, backup files and tempdb data files onto separate drives. Use volumes that do not share spindles. | |
| **Annotation** |
| It's a known fact for the user database. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Server Name: SCMMAVM3P.CHOMP.ORG  Drives share Data and Transaction Log files:  J:\  K:\ | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) One or more user database files are placed on the same volume as TempDB database files |
| **Status** |
| Resolved |
| **Description** |
| This issue is fired when our assessment locates one or more disk volumes host both the SQL Server user Database data files and tempdb data files |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Separate tempdb and user database files by placing them on different volumes. In environments where tempdb is used heavily, place tempdb on a fast drive. | | **Importance** | | In environments where tempdb is used heavily, placing user database and tempdb files on the same volume, or on separate volumes that use the same spindles, can result in performance degradation. | | **Recommended Reading** | | [Optimizing tempdb Performance](http://msdn.microsoft.com/en-us/library/ms175527(v=sql.105).aspx)  [Move System Databases](http://technet.microsoft.com/en-us/library/ms345408.aspx) | |
| **Annotation** |
| Reportservertempdb is on the Tempdb drive and it is okay. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Server Name: SCMMAVM3P.CHOMP.ORG  Drives share User Database data files and tempdb Data files:  H:\ | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Server Name: SCMMAVM2P.CHOMP.ORG  Drives share User Database data files and tempdb Data files:  H:\ | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Server Name: SCMMAVM1P.CHOMP.ORG  Drives share User Database data files and tempdb Data files:  H:\ | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Databases identified with auto-growth set to percentage growth |
| **Status** |
| Resolved |
| **Description** |
| This rule verifies the data and log files for all user databases and the TempDB system database if the auto grow setting is set to % growth. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Proactively monitor available space in data and log files, and expand them manually when necessary. Use auto-growth as contingency for unexpected growth. Configure auto-growth with a fixed size growth increment of less than 1 GB. | | **Importance** | | If auto-growth is expanding the transaction log of a database, transactions that are trying to write to that log will have to wait until file growth is complete. This can result in transaction delays and potentially transaction timeouts. Configuring auto-growth to expand database files based on percentage of file size, instead of a fixed size, results in growth increment to increase as the file size increases. This in turn, increases the amount of time needed for auto-growth to complete. | | **Recommended Reading** | | [Considerations for the “autogrow” and “autoshrink” settings in SQL Server](http://support.microsoft.com/kb/315512)  [ALTER DATABASE (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms174269.aspx) | | **Recommended Resolution** | | Modify auto-growth settings to use a fixed size growth increment of less than 1 GB. | |
| **Annotation** |
| These database have been configured with fixed size file growth. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG;SXASECTRACKING;File: SXASecTracking\_Log | Auto Growth Mode: %  Logical File Name: SXASecTracking\_Log  NextGrowthSize in MB: 196.96 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Log | Auto Growth Mode: %  Logical File Name: Global\_Vantage\_Log  NextGrowthSize in MB: 0.26 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Data | Auto Growth Mode: %  Logical File Name: Global\_Vantage\_Data  NextGrowthSize in MB: 29.13 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;DARTData;File: DARTData\_log | Auto Growth Mode: %  Logical File Name: DARTData\_log  NextGrowthSize in MB: 8.24 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer;File: CPM\_ReportServer\_log | Auto Growth Mode: %  Logical File Name: CPM\_ReportServer\_log  NextGrowthSize in MB: 4.73 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_EPMPortal;File: cpm\_EPMPortal\_log | Auto Growth Mode: %  Logical File Name: cpm\_EPMPortal\_log  NextGrowthSize in MB: 0.08 | | Machine inserted | SCMMAVM2P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Log | Auto Growth Mode: %  Logical File Name: Global\_Vantage\_Log  NextGrowthSize in MB: 0.26 | | Machine inserted | SCMMAVM2P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Data | Auto Growth Mode: %  Logical File Name: Global\_Vantage\_Data  NextGrowthSize in MB: 29.13 | | Machine inserted | SCMMAVM2P.CHOMP.ORG;EToolkit;File: EToolkit\_log | Auto Growth Mode: %  Logical File Name: EToolkit\_log  NextGrowthSize in MB: 14.88 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;XAES;File: XAES\_log | Auto Growth Mode: %  Logical File Name: XAES\_log  NextGrowthSize in MB: 9.07 | |  |  |  | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Databases have been identified with maximum file size set on one or more files |
| **Status** |
| Resolved |
| **Description** |
| This rule verifies the auto grow settings of data and log files for all system and user databases. The rule is raised when the maximum size is set for one or more data or log file. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | If you set maximum size for data and log files in order to control disk space usage, proactively monitor available space in all database files, and expand them before they reach the maximum size. | | **Importance** | | When a data or log file reaches its maximum size, transactions that need space in that file will fail. | | **Recommended Reading** | | [Manage the size of the Transaction Log File](http://msdn.microsoft.com/en-us/library/ms365418.aspx)  [Troubleshooting Insufficient Data Disk Space](http://msdn.microsoft.com/en-us/library/ms366198(v=sql.105).aspx)  [ALTER DATABASE (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms174269.aspx) | |
| **Annotation** |
| The databases listed have experienced uncontrolled growth in the past so we have capped them to prevent them from filling up the disks they reside on. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServerTempDB | Database files and maximum sizes:  Logical name: CPM\_ReportServerTempDB; Type: data file; Maximum size: unlimited.  Logical name: CPM\_ReportServerTempDB\_log; Type: log file; Maximum size: 32768 MB.  Logical name: CPM\_RS10; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS11; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS12; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS2; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS3; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS4; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS5; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS6; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS7; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS8; Type: data file; Maximum size: unlimited.  Logical name: CPM\_RS9; Type: data file; Maximum size: unlimited. | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare | Database files and maximum sizes:  Logical name: cpm\_AcuteCare\_Data; Type: data file; Maximum size: unlimited.  Logical name: cpm\_AcuteCare\_Log; Type: log file; Maximum size: 61440 MB.  Logical name: cpm\_AcuteCare\_Data1; Type: data file; Maximum size: unlimited.  Logical name: cpm\_AcuteCare\_Data2; Type: data file; Maximum size: unlimited.  Logical name: cpm\_AcuteCare\_Data3; Type: data file; Maximum size: unlimited.  Logical name: cpm\_AcuteCare\_Data11; Type: data file; Maximum size: unlimited.  Logical name: cpm\_AcuteCare\_Data12; Type: data file; Maximum size: unlimited. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;xaes\_EAS | Database files and maximum sizes:  Logical name: xaes\_EAS\_dat; Type: data file; Maximum size: unlimited.  Logical name: xaes\_EAS\_log; Type: log file; Maximum size: 7168 MB.  Logical name: ESP; Type: data file; Maximum size: unlimited. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServerTempDB | Database files and maximum sizes:  Logical name: ReportServerTempDB; Type: data file; Maximum size: unlimited.  Logical name: ReportServerTempDB\_log; Type: log file; Maximum size: 34000 MB.  Logical name: RSTemp10; Type: data file; Maximum size: unlimited.  Logical name: RSTemp11; Type: data file; Maximum size: unlimited.  Logical name: RSTemp12; Type: data file; Maximum size: unlimited.  Logical name: RSTemp13; Type: data file; Maximum size: unlimited.  Logical name: RSTemp14; Type: data file; Maximum size: unlimited.  Logical name: RSTemp15; Type: data file; Maximum size: unlimited.  Logical name: RSTemp16; Type: data file; Maximum size: unlimited.  Logical name: RSTemp2; Type: data file; Maximum size: unlimited.  Logical name: RSTemp3; Type: data file; Maximum size: unlimited.  Logical name: RSTemp4; Type: data file; Maximum size: unlimited.  Logical name: RSTemp5; Type: data file; Maximum size: unlimited.  Logical name: RSTemp6; Type: data file; Maximum size: unlimited.  Logical name: RSTemp7; Type: data file; Maximum size: unlimited.  Logical name: RSTemp8; Type: data file; Maximum size: unlimited.  Logical name: RSTemp9; Type: data file; Maximum size: unlimited. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61 | Database files and maximum sizes:  Logical name: CHXAP\_Data; Type: data file; Maximum size: unlimited.  Logical name: CHXAP\_Log; Type: log file; Maximum size: 112640 MB.  Logical name: CHXAP\_Data3; Type: data file; Maximum size: unlimited.  Logical name: AMB; Type: data file; Maximum size: unlimited.  Logical name: DM; Type: data file; Maximum size: unlimited.  Logical name: IMM; Type: data file; Maximum size: unlimited.  Logical name: CHXAP\_Data2; Type: data file; Maximum size: unlimited.  Logical name: CHXAP\_Data4; Type: data file; Maximum size: unlimited.  Logical name: ArcData1FG; Type: data file; Maximum size: unlimited.  Logical name: ArcData2FG; Type: data file; Maximum size: unlimited.  Logical name: ArcData3FG; Type: data file; Maximum size: unlimited.  Logical name: ArcData4FG; Type: data file; Maximum size: unlimited.  Logical name: ArcData5FG; Type: data file; Maximum size: unlimited.  Logical name: CurDataFG; Type: data file; Maximum size: unlimited.  Logical name: CD; Type: data file; Maximum size: unlimited.  Logical name: VWF; Type: data file; Maximum size: unlimited.  Logical name: ISS; Type: data file; Maximum size: unlimited.  Logical name: ED; Type: data file; Maximum size: unlimited.  Logical name: MM; Type: data file; Maximum size: unlimited.  Logical name: ARC; Type: data file; Maximum size: unlimited.  Logical name: ARC\_10; Type: data file; Maximum size: unlimited.  Logical name: ARC\_EMPTY; Type: data file; Maximum size: unlimited.  Logical name: SCM; Type: data file; Maximum size: unlimited.  Logical name: ARC\_20; Type: data file; Maximum size: unlimited. | |

SQL Database Indexes

One of the most important routes to high performance in a SQL Server database is the eight index strategy. Indexes speed up the querying process by providing swift access to rows in the data tables, similar to the way a book’s index helps you find information quickly within that book.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) There are foreign keys with no supporting indexes |
| **Status** |
| Failed |
| **Description** |
| One or more tables found, with foreign key constraint defined but no supporting indexes created on the foreign key columns. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | SQL Server doesnt put an index on foreign key columns by default and indexing foreign key fields in referencing tables is not required.  Foreign key columns usage must evaluated to determine whether or not indexing this column will help up increase the current workloads performance by enhancing join performance, reducing table locking (for full table scans) while cascading updates and deletes, etc. | | **Importance** | | Creating an index on a foreign key is often useful for the following reasons:  Changes to PRIMARY KEY constraints are checked with FOREIGN KEY constraints in related tables.  Foreign key columns are frequently used in join criteria thats why indexing them provides better join performance  Better performance on maintaining the relationship on a delete of a primary/unique key. When you delete a key row, SQL Server must check to see if there are any rows which reference the row being deleted.  If the foreign key relationship is defined with NO ACTION (on update/delete) then a referenced row CANNOT be deleted as it would leave the referencing rows “orphaned.” To find the rows efficiently an index on the foreign key column helps!  If the foreign key relationship is defined with CASCADE (on update/delete) then when a referenced row is modified all of the referencing rows must be modified as well (either updated to reflect the new value or on cascade delete). To find the rows to modify efficiently, an index on the foreign key column helps. | | **Recommended Reading** | | [FOREIGN KEY Constraints](http://msdn.microsoft.com/en-us/library/ms175464.aspx) | | **Recommended Resolution** | | Check all the current Foreign Keys that are used frequently in joins and create a non-clustered index for each one of them.  The following query can be used to retrieve all the foreign key column details and whether they are part of indexes in a database. | | **Troubleshooting** | | Use the below T-SQL script to generate the list of foreign keys with no supporting indexes in a given database:  */\* Foreign keys \*/*  *;WITH FKTable*  *as(*  *SELECT schema\_name(o.schema\_id) AS 'parent\_schema\_name',object\_name(FKC.parent\_object\_id) 'parent\_table\_name',*  *object\_name(constraint\_object\_id) AS 'constraint\_name',schema\_name(RO.Schema\_id) AS 'referenced\_schema',object\_name(referenced\_object\_id) AS 'referenced\_table\_name',*  *(SELECT '['+col\_name(k.parent\_object\_id,parent\_column\_id) +']' AS [data()]*  *FROM sys.foreign\_key\_columns (NOLOCK) AS k*  *INNER JOIN sys.foreign\_keys (NOLOCK)*  *ON k.constraint\_object\_id =object\_id*  *AND k.constraint\_object\_id =FKC.constraint\_object\_id*  *ORDER BY constraint\_column\_id*  *FOR XML PATH('')*  *) AS 'parent\_colums',*  *(SELECT '['+col\_name(k.referenced\_object\_id,referenced\_column\_id) +']' AS [data()]*  *FROM sys.foreign\_key\_columns (NOLOCK) AS k*  *INNER JOIN sys.foreign\_keys (NOLOCK)*  *ON k.constraint\_object\_id =object\_id*  *AND k.constraint\_object\_id =FKC.constraint\_object\_id*  *ORDER BY constraint\_column\_id*  *FOR XML PATH('')*  *) AS 'referenced\_columns'*  *FROM sys.foreign\_key\_columns FKC (NOLOCK)*  *INNER JOIN sys.objects o (NOLOCK) ON FKC.parent\_object\_id = o.object\_id*  *INNER JOIN sys.objects RO (NOLOCK) ON FKC.referenced\_object\_id = RO.object\_id*  *WHERE o.object\_id in (SELECT object\_id FROM sys.objects (NOLOCK) WHERE type ='U') AND RO.object\_id in (SELECT object\_id FROM sys.objects (NOLOCK) WHERE type ='U')*  *group by o.schema\_id,RO.schema\_id,FKC.parent\_object\_id,constraint\_object\_id,referenced\_object\_id*  *),*  */\* Index Columns \*/*  *IndexColumnsTable AS*  *(*  *SELECT distinct schema\_name (o.schema\_id) AS 'schema\_name',object\_name(o.object\_id) AS TableName,*  *(SELECT case key\_ordinal when 0 then NULL else '['+col\_name(k.object\_id,column\_id) +']' end AS [data()]*  *FROM sys.index\_columns (NOLOCK) AS k*  *WHERE k.object\_id = i.object\_id*  *AND k.index\_id = i.index\_id*  *ORDER BY key\_ordinal, column\_id*  *FOR XML PATH('')*  *) AS cols*  *FROM sys.indexes (NOLOCK) AS i*  *INNER JOIN sys.objects o (NOLOCK) ON i.object\_id =o.object\_id*  *INNER JOIN sys.index\_columns ic (NOLOCK) ON ic.object\_id =i.object\_id AND ic.index\_id =i.index\_id*  *INNER JOIN sys.columns c (NOLOCK) ON c.object\_id = ic.object\_id AND c.column\_id = ic.column\_id*  *WHERE i.object\_id in (SELECT object\_id FROM sys.objects (NOLOCK) WHERE type ='U') AND i.index\_id > 0*  *group by o.schema\_id,o.object\_id,i.object\_id,i.Name,i.index\_id,i.type*  *)*  *SELECT*  *fk.parent\_schema\_name AS SchemaName,*  *fk.parent\_table\_name AS TableName,*  *fk.constraint\_name AS ConstraintName,*  *fk.referenced\_schema AS ReferencedSchemaName,*  *fk.referenced\_table\_name AS ReferencedTableName*  *FROM FKTable fk*  *WHERE (SELECT COUNT(\*) AS NbIndexes  FROM IndexColumnsTable ict  WHERE fk.parent\_schema\_name = ict.schema\_name AND fk.parent\_table\_name = ict.TableName      AND fk.parent\_colums = ict.cols*  *) = 0* | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES | The database CHOMP\_TABLES has 39 foreign key(s) with no supporting index:  Constraint: [hud].[WindowRelationships].[fk\_WindowRelationships\_WindowDefinition\_ParentWindowDefinitionID]. Referenced Table: [hud].[WindowDefinition]  Constraint: [hud].[WindowRelationships].[fk\_WindowRelationships\_WindowDefinition\_ChildWindowDefinitionID]. Referenced Table: [hud].[WindowDefinition]  Constraint: [hud].[WindowQuery].[fk\_WindowQuery\_WindowDefinition\_WindowDefinitionID]. Referenced Table: [hud].[WindowDefinition]  Constraint: [hud].[WindowQuery].[fk\_WindowQuery\_QueryDefinition\_QueryDefinitionID]. Referenced Table: [hud].[QueryDefinition]  Constraint: [hud].[WindowDefinition].[fk\_WindowDefinition\_WindowType\_WindowTypeID]. Referenced Table: [hud].[WindowType]  Constraint: [hud].[QueryDisplay].[fk\_QueryDisplay\_QueryDisplayType\_QueryDisplayTypeID]. Referenced Table: [hud].[QueryDisplayType]  Constraint: [hud].[QueryDisplay].[fk\_QueryDisplay\_QueryDefinition\_QueryDefinitionID]. Referenced Table: [hud].[QueryDefinition]  Constraint: [hud].[QueryDefinition].[fk\_QueryDefinition\_QueryType\_QueryTypeID]. Referenced Table: [hud].[QueryType]  Constraint: [hud].[QueryDefinition].[fk\_QueryDefinition\_ContentType\_ContentTypeID]. Referenced Table: [hud].[ContentType]  Constraint: [hist].[HistoryColumn].[FK\_HistoryColumn\_TableSchema\_TableName]. Referenced Table: [hist].[HistoryTable]  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ELinkCore | The database ELinkCore has 14 foreign key(s) with no supporting index:  Constraint: [dbo].[SecurityPermissions].[FK\_SecurityPermissions\_SecurityObjects]. Referenced Table: [dbo].[SecurityObjects]  Constraint: [dbo].[SecurityPermissions].[FK\_SecurityPermissions\_SecurityGroups]. Referenced Table: [dbo].[SecurityGroups]  Constraint: [dbo].[SecurityPasswordHistory].[FK\_SecurityPasswordHistory\_SecurityUsers]. Referenced Table: [dbo].[SecurityUsers]  Constraint: [dbo].[SecurityOperationObjects].[FK\_SecurityOperationObjects\_SecurityOperations]. Referenced Table: [dbo].[SecurityOperations]  Constraint: [dbo].[SecurityOperationObjects].[FK\_SecurityOperationObjects\_SecurityObjects]. Referenced Table: [dbo].[SecurityObjects]  Constraint: [dbo].[SecurityObjects].[FK\_SecurityObjects\_SecurityTypes]. Referenced Table: [dbo].[SecurityTypes]  Constraint: [dbo].[SecurityLastLogonUsers].[FK\_SecurityLastLogonUsers\_SecurityWorkstations]. Referenced Table: [dbo].[SecurityWorkstations]  Constraint: [dbo].[SecurityLastLogonUsers].[FK\_SecurityLastLogonUsers\_SecurityUsers]. Referenced Table: [dbo].[SecurityUsers]  Constraint: [dbo].[SecurityGroupUsers].[FK\_SecurityGroupUsers\_SecurityUsers]. Referenced Table: [dbo].[SecurityUsers]  Constraint: [dbo].[SecurityGroupUsers].[FK\_SecurityGroupUsers\_SecurityGroups]. Referenced Table: [dbo].[SecurityGroups]  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ELinkQueues | The database ELinkQueues has 1 foreign key(s) with no supporting index:  Constraint: [dbo].[ELKMasterArchive].[FK\_ELKArchQueueID]. Referenced Table: [dbo].[ELKMasterQueue] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61 | The database Prod61 has 885 foreign key(s) with no supporting index:  Constraint: [dbo].[SXAVWFWorkflowTaskReasonReferenceXREF].[SXAVWFWorkflowTaskReasonReferenceXREFSXAVWFBusinessProblemFK]. Referenced Table: [dbo].[SXAVWFBusinessProblem]  Constraint: [dbo].[SXAVWFWorkflowEngineQueue].[SXAVWFWorkflowEngineQueueSXAVWFStatusFK]. Referenced Table: [dbo].[SXAVWFStatus]  Constraint: [dbo].[SXAVWFWorkflowEngineQueue].[SXAVWFWorkflowEngineQueueSXAVWFPriorityFK]. Referenced Table: [dbo].[SXAVWFPriority]  Constraint: [dbo].[SXAVWFWorkflowDefinition].[SXAVWFWorkflowDefinitionSXAVWFBusinessCategoryFK]. Referenced Table: [dbo].[SXAVWFBusinessCategory]  Constraint: [dbo].[SXAVWFWorkflowContextXREF].[SXAVWFWorkflowContextXREFSXAVWFContextFK]. Referenced Table: [dbo].[SXAVWFContext]  Constraint: [dbo].[SXAVWFWorkflowActivityXREF].[SXAVWFWorkflowActivityXREFSXAVWFActivityFK]. Referenced Table: [dbo].[SXAVWFActivity]  Constraint: [dbo].[SXAVWFTeamUserXREF].[SXAVWFTeamUserXREFSXAVWFUserFK]. Referenced Table: [dbo].[SXAVWFUser]  Constraint: [dbo].[SXAVWFTeamUserXREF].[SXAVWFTeamUserXREFSXAVWFTeamFK]. Referenced Table: [dbo].[SXAVWFTeam]  Constraint: [dbo].[SXAVWFTeamUserFunctionXREF].[SXAVWFTeamUserFunctionXREFSXAVWFUserFunctionFK]. Referenced Table: [dbo].[SXAVWFUserFunction]  Constraint: [dbo].[SXAVWFTeamUserFunctionXREF].[SXAVWFTeamUserFunctionXREFSXAVWFTeamUserXREFFK]. Referenced Table: [dbo].[SXAVWFTeamUserXREF]  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61\_img | The database Prod61\_img has 4 foreign key(s) with no supporting index:  Constraint: [dbo].[SXAIMGDocumentTypeRightXref].[SXAIMGDocumentTypeRightXrefSXAIMGDocumentTypeFK]. Referenced Table: [dbo].[SXAIMGDocumentType]  Constraint: [dbo].[SXAIMGDocument].[SXAIMGDocumentSXAIMGDocTypeSetXRefFK]. Referenced Table: [dbo].[SXAIMGDocTypeSetXRef]  Constraint: [dbo].[SXAIMGDocTypeSetXRef].[SXAIMGDocTypeSetXRefSXAIMGDocumentTypeSetFK]. Referenced Table: [dbo].[SXAIMGDocumentTypeSet]  Constraint: [dbo].[SXAIMGDocTypeSetXRef].[SXAIMGDocTypeSetXRefSXAIMGDocumentTypeFK]. Referenced Table: [dbo].[SXAIMGDocumentType] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61\_mnc | The database Prod61\_mnc has 1 foreign key(s) with no supporting index:  Constraint: [dbo].[SXAMNCQueryProcedure].[SXAMNCQueryProcedureSXAMNCReasonFK]. Referenced Table: [dbo].[SXAMNCReason] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServer | The database ReportServer has 17 foreign key(s) with no supporting index:  Constraint: [dbo].[Subscriptions].[FK\_Subscriptions\_Owner]. Referenced Table: [dbo].[Users]  Constraint: [dbo].[Subscriptions].[FK\_Subscriptions\_ModifiedBy]. Referenced Table: [dbo].[Users]  Constraint: [dbo].[Subscriptions].[FK\_Subscriptions\_Catalog]. Referenced Table: [dbo].[Catalog]  Constraint: [dbo].[SecData].[FK\_SecDataPolicyID]. Referenced Table: [dbo].[Policies]  Constraint: [dbo].[Schedule].[FK\_Schedule\_Users]. Referenced Table: [dbo].[Users]  Constraint: [dbo].[PolicyUserRole].[FK\_PolicyUserRole\_User]. Referenced Table: [dbo].[Users]  Constraint: [dbo].[PolicyUserRole].[FK\_PolicyUserRole\_Role]. Referenced Table: [dbo].[Roles]  Constraint: [dbo].[PolicyUserRole].[FK\_PolicyUserRole\_Policy]. Referenced Table: [dbo].[Policies]  Constraint: [dbo].[Notifications].[FK\_Notifications\_Subscriptions]. Referenced Table: [dbo].[Subscriptions]  Constraint: [dbo].[ModelItemPolicy].[FK\_PoliciesPolicyID]. Referenced Table: [dbo].[Policies]  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServerTempDB | The database ReportServerTempDB has 1 foreign key(s) with no supporting index:  Constraint: [dbo].[TempDataSets].[FK\_DataSetItemID]. Referenced Table: [dbo].[TempCatalog] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;RTScheduler | The database RTScheduler has 29 foreign key(s) with no supporting index:  Constraint: [hist].[HistoryColumn].[FK\_HistoryColumn\_TableSchema\_TableName]. Referenced Table: [hist].[HistoryTable]  Constraint: [dbo].[WorkListPatient].[FK\_WorklistPatient\_WorkDay\_ShiftID\_OrderCategoryID]. Referenced Table: [dbo].[WorkList]  Constraint: [dbo].[WorkList].[FK\_WorkList\_ShiftID]. Referenced Table: [dbo].[Shift]  Constraint: [dbo].[WorkList].[FK\_WorkList\_OrderCategoryID]. Referenced Table: [dbo].[OrderCategory]  Constraint: [dbo].[WorkItem].[FK\_WorkItem\_WorkItemStatusID]. Referenced Table: [dbo].[WorkItemStatus]  Constraint: [dbo].[WorkItem].[FK\_WorkItem\_WorkDay\_ShiftID\_OrderCategoryID\_ClientGuid\_ChartGuid]. Referenced Table: [dbo].[WorkListPatient]  Constraint: [dbo].[WorkItem].[FK\_WorkItem\_TherapistID]. Referenced Table: [dbo].[Therapist]  Constraint: [dbo].[WorkItem].[FK\_WorkItem\_FrequencyID]. Referenced Table: [dbo].[Frequency]  Constraint: [dbo].[UnitSuppress].[FK\_UnitSuppress\_OrderCategoryID]. Referenced Table: [dbo].[OrderCategory]  Constraint: [dbo].[TaskNotDoneReason].[FK\_TaskNotDoneReason\_Valid]. Referenced Table: [dbo].[TaskNotDoneReasonValid]  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;XAES | The database XAES has 41 foreign key(s) with no supporting index:  Constraint: [dbo].[SXAMIGTranslationValues].[SXAMIGTranslationValuesSXAMIGTranslationOutputColumnFK]. Referenced Table: [dbo].[SXAMIGTranslationOutputColumn]  Constraint: [dbo].[SXAMIGTranslationOutputColumn].[SXAMIGTranslationOutputColumnSXAMIGTranslationFK]. Referenced Table: [dbo].[SXAMIGTranslation]  Constraint: [dbo].[SXAMIGMigrationPlan].[SXAMIGMigrationPlanSXAMIGApplicationFK02]. Referenced Table: [dbo].[SXAMIGApplication]  Constraint: [dbo].[SXAMIGMigrationPlan].[SXAMIGMigrationPlanSXAMIGApplicationFK01]. Referenced Table: [dbo].[SXAMIGApplication]  Constraint: [dbo].[SXAMIGColumnMappingTranslationXRef].[SXAMIGColumnMappingTranslationXRefSXAMIGTranslationFK]. Referenced Table: [dbo].[SXAMIGTranslation]  Constraint: [dbo].[SXAMIGColumnMappingTranslationXRef].[SXAMIGColumnMappingTranslationXRefSXAMIGColumnMappingFK]. Referenced Table: [dbo].[SXAMIGColumnMapping]  Constraint: [dbo].[SXAMIGColumnMappingTransformationXRef].[SXAMIGColumnMappingTransformationXRefSXAMIGColumnMappingFK]. Referenced Table: [dbo].[SXAMIGColumnMapping]  Constraint: [dbo].[SXAMIGColumnMapping].[SXAMIGColumnMappingSXAMIGColumnFK02]. Referenced Table: [dbo].[SXAMIGColumn]  Constraint: [dbo].[SXAMIGColumnMapping].[SXAMIGColumnMappingSXAMIGColumnFK01]. Referenced Table: [dbo].[SXAMIGColumn]  Constraint: [dbo].[SXAMIGApplicationAssemblyXREF].[SXAMIGApplicationAssemblyXREFSXAMIGAssemblyFK]. Referenced Table: [dbo].[SXAMIGAssembly]  To generate the complete list, run the script provided in the Troubleshooting section. | |  |  |  | |

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| [Machine inserted](#IssueLevelSummary) Indexes have been identified with an index key larger than the recommended size (900 bytes) |
| **Status** |
| Failed |
| **Description** |
| Indexes identified with row length greater than max value 900 bytes |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Avoid exceeding the 900-byte limit when creating indexes in order to avoid INSERT and UPDATE operation failures. Narrower indexes also take up less disk space and require fewer system resources to maintain. To allow for larger indexes without exceeding the index key byte limit, use the INCLUDE option provided in Microsoft® SQL  SQL Server 2005 and higher versions. | | **Importance** | | The total size of an index key cannot exceed 900 bytes. With variable length data types, you will be allowed to exceed the 900-byte limit. However, if an actual INSERT or UPDATE operation exceeds the limit, you will receive an error message and the operation will fail. | | **Recommended Reading** | | [sys.dm\_db\_index\_physical\_stats (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms188917.aspx)  [Create Indexes with Included Columns](http://msdn.microsoft.com/en-us/library/ms190806.aspx) | | **Recommended Resolution** | | Evaluate how the index is currently being used by querying the sys.dm\_db\_index\_usage\_stats dynamic management view. If it is frequently queried, determine the impact of reducing the number of columns or the width of the underlying data types in a development environment. This step will help ensure that the index is still useful to the application queries that are referencing it. If the index is rarely or infrequently used, consider dropping it in a development environment to gauge the impact on the referencing queries. | | **Troubleshooting** | | Use the below T-SQL script to generate the complete list of indexes with a key size greater than 900 Bytes in a given database:  *SELECT DISTINCT*  *schema\_name (o.schema\_id) AS 'SchemaName',object\_name(o.object\_id) AS TableName, i.Name AS IndexName, i.type\_desc AS IndexType,sum(max\_length) AS RowLength*  *FROM sys.indexes AS i (NOLOCK)*  *INNER JOIN sys.objects o (NOLOCK) ON i.object\_id =o.object\_id*  *INNER JOIN sys.index\_columns ic (NOLOCK) ON ic.object\_id =i.object\_id and ic.index\_id =i.index\_id*  *INNER JOIN sys.columns c (NOLOCK) ON c.object\_id = ic.object\_id and c.column\_id = ic.column\_id*  *WHERE i.object\_id in (SELECT object\_id FROM sys.objects (NOLOCK) WHERE type ='U') and i.index\_id >0*  *GROUP BY o.schema\_id,o.object\_id,i.object\_id,i.Name,i.index\_id,i.type\_desc*  *HAVING (sum(max\_length) > 900)*  *ORDER BY 1,2,3* | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES | The database CHOMP\_TABLES has 1 index(es) with a key size greater than 900 Bytes:  Index: [dbo].[sxaMLMFiredLog].[pk\_sxaMLMFiredLog]. Row Length: 2008 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServer | The database ReportServer has 1 index(es) with a key size greater than 900 Bytes:  Index: [dbo].[Schedule].[IX\_Schedule]. Row Length: 1040 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;XAES | The database XAES has 3 index(es) with a key size greater than 900 Bytes:  Index: [dbo].[SXAESPASContextMapping].[SXAESPASContextMappingAI02]. Row Length: 1000  Index: [dbo].[SXAESPASContextMapping].[SXAESPASContextMappingAI01]. Row Length: 1000  Index: [dbo].[SXAESPASApplication].[SXAESPASApplicationAI01]. Row Length: 1020 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;Argent | The database Argent has 1 index(es) with a key size greater than 900 Bytes:  Index: [dbo].[ExceptionText].[PK\_ExceptionText]. Row Length: 8000 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer | The database CPM\_ReportServer has 1 index(es) with a key size greater than 900 Bytes:  Index: [dbo].[Schedule].[IX\_Schedule]. Row Length: 1040 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;DART | The database DART has 1 index(es) with a key size greater than 900 Bytes:  Index: [dbo].[ExceptionText].[PK\_ExceptionText]. Row Length: 8000 | |

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| [Machine inserted](#IssueLevelSummary) Databases identified with one or more tables, with indexes that may require update statistics |
| **Status** |
| Resolved |
| **Description** |
| Updating statistics ensures that queries compile with up-to-date statistics. The query optimizer uses statistics to create query plans that improve query performance. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Statistics can be maintained either automatically or manually. To automatically update statistics, set AUTO\_UPDATE\_STATISTICS to the default setting of ON. This will periodically update the statistical information as the data in the tables change. | | **Importance** | | When you create an index, the query optimizer automatically stores statistical information about the indexed columns. Also, when the AUTO\_CREATE\_STATISTICS database option is set to ON (the default setting), the database engine automatically creates statistics for columns without indexes that are used in a predicate.   As the data in a column changes, index and column statistics can become out of date and cause the query optimizer to make less than optimal decisions about how to process a query. For example, if you create a table with an indexed column and 1,000 rows of data, all with unique values in the indexed column, the query optimizer sees the indexed column as a good way to collect the data for a query. If you update the data in the column so there are many duplicate values, the column is no longer an ideal candidate for use in a query. However, the query optimizer still considers it to be a good candidate because of the index's outdated distribution statistics, which are based on the data before the update. Consequently, this will lead to poor database query performance. | | **Recommended Reading** | | [SQL Server Books Online: Index Statistics](http://technet.microsoft.com/en-us/library/ms190397.aspx)  [SQL Server Books Online: CREATE STATISTICS (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms188038.aspx)  [SQL Server Books Online: UPDATE STATISTICS (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms187348.aspx)  [SQL Server Books Online: DBCC SHOW\_STATISTICS (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms174384.aspx) | | **Recommended Resolution** | | If AUTO\_UPDATE\_STATISTICS is disabled on your system (set to OFF), you will have to set up a maintenance plan to update index statistics. This is necessary to ensure that the query optimizer has current information about the distribution of data values in the tables. This allows the query optimizer to more accurately determine the best way to access data because it has more information about the data stored in the database. | | **Troubleshooting** | | Use the below T-SQL script to generate the complete list of tables that need statistics update in a given database:  *SELECT DISTINCT SCHEMA\_NAME(so.schema\_id) AS 'SchemaName', OBJECT\_NAME(so.object\_id) AS 'TableName',so.object\_id AS 'object\_id',CASE OBJECTPROPERTY(MAX(so.object\_id), 'TableHasClustIndex') WHEN 1 THEN 'Clustered' WHEN 0 THEN 'Heap' ELSE 'Indexed View' END AS 'ClusteredHeap',CASE objectproperty(max(so.object\_id), 'TableHasClustIndex') WHEN 0 THEN count(si.index\_id) - 1 ELSE count(si.index\_id) END AS 'IndexCount', MAX(d.ColumnCount) AS 'ColumnCount',MAX(s.StatCount) AS 'StatCount',MAX(dmv.rows) AS 'ApproximateRows',MAX(dmv.rowmodctr) AS 'RowModCtr'*  *FROM sys.objects so (NOLOCK)*  *JOIN sys.indexes si (NOLOCK) ON so.object\_id = si.object\_id AND so.type in (N'U',N'V')*  *JOIN sysindexes dmv (NOLOCK) ON so.object\_id = dmv.id AND si.index\_id = dmv.indid*  *FULL OUTER JOIN (SELECT object\_id, count(1) AS ColumnCount FROM sys.columns (NOLOCK) GROUP BY object\_id) d ON d.object\_id = so.object\_id*  *FULL OUTER JOIN (SELECT object\_id, count(1) AS StatCount FROM sys.stats (NOLOCK) GROUP BY object\_id) s ON s.object\_id = so.object\_id*  *WHERE so.is\_ms\_shipped = 0*  *AND so.object\_id not in (SELECT major\_id FROM sys.extended\_properties (NOLOCK) WHERE name = N'microsoft\_database\_tools\_support')*  *AND indexproperty(so.object\_id, si.name, 'IsStatistics') = 0*  *GROUP BY so.schema\_id, so.object\_id,*  *(CASE objectproperty(si.object\_id, 'TableHasClustIndex')*  *WHEN 1 THEN 'Clustered'*  *WHEN 0 THEN 'Heap'*  *ELSE 'Indexed View'*  *end)*  *HAVING ( MAX(dmv.rows) > 500 AND MAX(dmv.rowmodctr) > (max(dmv.rows)\*0.2 + 500 ))*  *ORDER BY 1,2* | |
| **Annotation** |
| I setup some new statistics rebuild jobs to cover these databases. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES | The database CHOMP\_TABLES has 14 table(s) that need statistics update:  Table: [dbo].[SXAReportMonitorHistory]. Approximate Rows: 120553. RowModCtr: 188190  Table: [dbo].[sxaObjectsPlusAuth]. Approximate Rows: 624109. RowModCtr: 298669  Table: [dbo].[sxaObjectsPlusAppUserMap]. Approximate Rows: 3356. RowModCtr: 13156  Table: [dbo].[sxaMLMFormCoordinatorHistory]. Approximate Rows: 994. RowModCtr: 828  Table: [dbo].[sxaMLMFiredLog]. Approximate Rows: 7388. RowModCtr: 132391  Table: [dbo].[sxaMLMCoordinatorHistory]. Approximate Rows: 768. RowModCtr: 7452  Table: [dbo].[sxaEPFUserGroup]. Approximate Rows: 3326. RowModCtr: 3969  Table: [dbo].[sxaEPFPhotoUpload]. Approximate Rows: 20324. RowModCtr: 5297  Table: [dbo].[ISSReportedError]. Approximate Rows: 21648. RowModCtr: 7046  Table: [dbo].[CHOMP\_ReportsProcessTime]. Approximate Rows: 171354. RowModCtr: 1380999  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ELinkQueues | The database ELinkQueues has 1 table(s) that need statistics update:  Table: [dbo].[ELKMasterArchive]. Approximate Rows: 818249. RowModCtr: 1098282 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61 | The database Prod61 has 13 table(s) that need statistics update:  Table: [dbo].[SXAMMOrderOptionNoteHistory]. Approximate Rows: 794016. RowModCtr: 161197  Table: [dbo].[HVCRequestedReport]. Approximate Rows: 11711. RowModCtr: 2965  Table: [dbo].[ECS\_CDV\_User\_CheckBox\_Sel]. Approximate Rows: 2024. RowModCtr: 20751  Table: [dbo].[ECS\_CDV\_User\_Category\_Sort]. Approximate Rows: 15385. RowModCtr: 11168  Table: [dbo].[ECS\_CDV\_ProfileCheckboxParameter]. Approximate Rows: 2601. RowModCtr: 307939  Table: [dbo].[CV3WorklistClientVisit]. Approximate Rows: 555. RowModCtr: 2621  Table: [dbo].[CV3VisitListJoin\_R]. Approximate Rows: 4866922. RowModCtr: 46080225  Table: [dbo].[CV3SendOrderQueue]. Approximate Rows: 5657. RowModCtr: 2135  Table: [dbo].[CV3OrderRequestByJoin\_R]. Approximate Rows: 3430. RowModCtr: 2850716  Table: [dbo].[CV3OrderGenerationQueue]. Approximate Rows: 23918. RowModCtr: 41836  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;PROD61\_MT | The database PROD61\_MT has 6 table(s) that need statistics update:  Table: [dbo].[xp\_clinical\_text\_xref]. Approximate Rows: 32085. RowModCtr: 2364442  Table: [dbo].[script\_common\_denorm]. Approximate Rows: 13211. RowModCtr: 13256  Table: [dbo].[script\_common]. Approximate Rows: 5663. RowModCtr: 10270  Table: [dbo].[ndc\_denorm]. Approximate Rows: 202274. RowModCtr: 4016628  Table: [dbo].[ndc\_core\_description\_upd]. Approximate Rows: 1274. RowModCtr: 72737  Table: [dbo].[ddi\_description]. Approximate Rows: 1132. RowModCtr: 2264 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServer | The database ReportServer has 2 table(s) that need statistics update:  Table: [dbo].[Users]. Approximate Rows: 1318. RowModCtr: 1350  Table: [dbo].[ExecutionLogStorage]. Approximate Rows: 1263103. RowModCtr: 5159539 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServerTempDB | The database ReportServerTempDB has 1 table(s) that need statistics update:  Table: [dbo].[SegmentedChunk]. Approximate Rows: 1598. RowModCtr: 217691 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;RTScheduler | The database RTScheduler has 4 table(s) that need statistics update:  Table: [dbo].[WorkListPatientHistory]. Approximate Rows: 403637. RowModCtr: 402974  Table: [dbo].[WorkListHistory]. Approximate Rows: 23231. RowModCtr: 16308  Table: [dbo].[WorkItemHistory]. Approximate Rows: 913337. RowModCtr: 370504  Table: [dbo].[DistribTargetHistory]. Approximate Rows: 236178. RowModCtr: 60011 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Tlkernel | The database Tlkernel has 3 table(s) that need statistics update:  Table: [dbo].[XLateAttribute\_StdX12]. Approximate Rows: 20709. RowModCtr: 20709  Table: [dbo].[XLateAttribute\_StdWizard]. Approximate Rows: 7905. RowModCtr: 7905  Table: [dbo].[XLateAttribute\_StdHL7]. Approximate Rows: 17637. RowModCtr: 17637 | | Machine inserted | SCMMAVM2P.CHOMP.ORG;Prod61\_MT | The database Prod61\_MT has 6 table(s) that need statistics update:  Table: [dbo].[xp\_clinical\_text\_xref]. Approximate Rows: 31461. RowModCtr: 1854354  Table: [dbo].[script\_common\_instruction]. Approximate Rows: 1140. RowModCtr: 2280  Table: [dbo].[script\_common\_denorm]. Approximate Rows: 14461. RowModCtr: 24874  Table: [dbo].[ndc\_denorm]. Approximate Rows: 199894. RowModCtr: 11241125  Table: [dbo].[ndc\_core\_description\_upd]. Approximate Rows: 12347. RowModCtr: 24694  Table: [dbo].[ddi\_description]. Approximate Rows: 1132. RowModCtr: 2264 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;Argent | The database Argent has 2 table(s) that need statistics update:  Table: [dbo].[Visit]. Approximate Rows: 6513. RowModCtr: 290290  Table: [dbo].[ProbablyBlankReports]. Approximate Rows: 963. RowModCtr: 1926 | |  |  |  | |

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| [Machine inserted](#IssueLevelSummary) Tables and indexed views have been identified that have duplicate indexes. |
| **Status** |
| Failed |
| **Description** |
| Tables identified with duplicate indexes. This rule is raised against the tables, when table has multiple indexes defined on the same columns. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Duplicate indexes should always be avoided and usually indicate that correct processes for developer change control are not being enforced. You should remove duplicate indexes from the database unless they are explicitly referenced within the calling application. If they are referenced in the calling application, try to remove the referencing index hints or the batch references so that you can drop the duplicate indexes from the database. | | **Importance** | | An index is considered to be a duplicate if it references the same column and ordinal position as another index in the same database. Duplicate indexes provide no performance or manageability benefits. In addition, each duplicate index increases the I/O overhead of ongoing insert, update, and delete operations, as well as index rebuilds and index reorganizations. The overall result is reduced insert, update, and delete performance, and also prolonged index maintenance periods and wasted disk space.   Eliminating the duplicate index or indexes can provide an immediate performance benefit for data modifications and also for index rebuilds and reorganizations. Existing queries that reference the index will continue to use the original, non-duplicated index. | | **Recommended Reading** | | [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [DROP INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176118.aspx) | | **Recommended Resolution** | | Ensure that no applications explicitly reference the duplicate indexes that you plan to drop. Also, script out the duplicate index in Microsoft® SQL Server Management Studio in the event that you will have to create it again.   After scripting the index, issue a DROP INDEX command against the duplicate index in order to remove it from the database. | | **Troubleshooting** | | **Use the below T-SQL script to generate the complete list of duplicate indexes in a given database:**  ;WITH IndexColumns AS(  SELECT DISTINCT schema\_name (o.schema\_id) AS 'SchemaName',object\_name(o.object\_id) AS TableName, o.object\_id, i.Name AS IndexName,i.index\_id,i.type,  (SELECT CASE key\_ordinal WHEN 0 THEN NULL ELSE '['+col\_name(k.object\_id,column\_id) +']' END AS [data()]  FROM sys.index\_columns as k (NOLOCK)  WHERE k.object\_id = i.object\_id  AND k.index\_id = i.index\_id  ORDER BY key\_ordinal, column\_id  FOR XML PATH('')) AS cols  FROM sys.indexes (NOLOCK) AS i  INNER JOIN sys.objects o (NOLOCK) ON i.object\_id =o.object\_id  INNER JOIN sys.index\_columns ic (NOLOCK) ON ic.object\_id =i.object\_id and ic.index\_id =i.index\_id  INNER JOIN sys.columns c (NOLOCK) ON c.object\_id = ic.object\_id and c.column\_id = ic.column\_id  WHERE i.object\_id in (SELECT object\_id from sys.objects (NOLOCK) WHERE type ='U') AND i.index\_id <>0 AND i.type <>3 AND i.type <>6  GROUP BY o.schema\_id,o.object\_id,i.object\_id,i.Name,i.index\_id,i.type  )  SELECT ic1.SchemaName,ic1.TableName,ic1.IndexName,ic2.IndexName as DuplicateIndexName, ic1.cols as IndexCols  FROM IndexColumns ic1 JOIN IndexColumns ic2 ON ic1.object\_id = ic2.object\_id AND ic1.index\_id < ic2.index\_id AND ic1.cols = ic2.cols  ORDER BY 1,2,3  **Use the below T-SQL script to generate the complete list of duplicate XML indexes in a given database:**  ;WITH XMLTable AS (  SELECT object\_name (x.object\_id) as 'TableName' ,schema\_name(o.schema\_id) as SchemaName ,x.object\_id,x.name,x.index\_id,x.using\_xml\_index\_id,x.secondary\_type,x.secondary\_type\_desc, ic.column\_id  FROM sys.xml\_indexes x (NOLOCK)  JOIN sys.objects o (NOLOCK) on x.object\_id = o.object\_id  JOIN sys.index\_columns ic (NOLOCK) on x.object\_id = ic.object\_id and x.index\_id = ic.index\_id  )  SELECT x1.SchemaName,x1.TableName,x1.name as IndexName,x2.name as DuplicateIndexName, x1.secondary\_type\_desc as IndexType  FROM XMLTable x1 JOIN XMLTable x2 ON x1.object\_id = x2.object\_id AND x1.index\_id < x2.index\_id AND x1.using\_xml\_index\_id = x2.using\_xml\_index\_id AND x1.secondary\_type = x2.secondary\_type  ORDER BY 1,2,3 | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES | Table: [hud].[QueryDisplay]. Indexes: [pk\_QueryDisplay\_QueryDisplayID] and [uq\_QueryDisplay\_QueryDefinitionID].  Column List: [QueryDisplayID] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ELinkCore | Table: [dbo].[SecurityCategorys]. Indexes: [PK\_SecurityCategory] and [IX\_SecurityCategorys].  Column List: [CategoryId] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61 | Table: [dbo].[SXAVWFAuditEventUIDetail]. Indexes: [SXAVWFAuditEventUIDetailPK] and [SXAVWFAuditEventUIDetailAI01].  Column List: [AuditEventUIDetailID]  Table: [dbo].[SXAMMDispensingPolicy]. Indexes: [SXAMMDispensingPolicyAI01] and [SXAMMDispensingPolicyAI01UQ].  Column List: [DispensingPolicyName] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61\_vm | Table: [dbo].[SXAVMeRxFormularyStatus]. Indexes: [SXAVMeRxFormularyStatusCI] and [SXAVMeRxFormularyStatusAI02].  Column List: [SourceNDC] [FormularyId]  Table: [dbo].[SXAVMeRxCoverageInfo]. Indexes: [SXAVMeRxCoverageInfoCI] and [SXAVMeRxCoverageInfoAI03].  Column List: [SourceNDC] [CoverageId]  Table: [dbo].[SXAVMeRxCopayList]. Indexes: [SXAVMeRxCopayListCI] and [SXAVMeRxCopayListAI02].  Column List: [NDC] [CopayId]  Table: [dbo].[SXAVMeRxAlternativeList]. Indexes: [SXAVMeRxAlternativeListCI] and [SXAVMeRxAlternativeListAI03].  Column List: [AlternativeId] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServer | Table: [dbo].[Segment]. Indexes: [PK\_Segment] and [IX\_SegmentMetadata].  Column List: [SegmentId] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServerTempDB | Table: [dbo].[Segment]. Indexes: [PK\_Segment] and [IX\_SegmentMetadata].  Column List: [SegmentId] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;RTScheduler | Table: [dbo].[Therapist]. Indexes: [PK\_Therapist] and [CI\_Therapist].  Column List: [TherapistID]  Table: [dbo].[Party]. Indexes: [IX\_Party\_SamAccountName] and [IX\_UQ\_Party\_SamAccountName].  Column List: [SamAccountName]  Table: [dbo].[AppSetting]. Indexes: [PK\_AppSetting] and [IX\_AppSetting\_AppSettingID\_Value].  Column List: [AppSettingID] | | Machine inserted | SCMMAVM3P.CHOMP.ORG;Argent | Table: [dbo].[Report]. Indexes: [UQ\_Report\_Descr] and [IX\_Report\_Descr\_DefaultDestSubtitle].  Column List: [Descr] | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare | Table: [dbo].[SCAVisit]. Indexes: [SCAVisit\_PK] and [SCAVisit\_IX17].  Column List: [VisitID]  Table: [dbo].[SCAValueSetXRefDim]. Indexes: [SCAValueSetXRefDim\_IX1] and [SCAValueSetXRefDim\_IX2].  Column List: [CodeSetName]  Table: [dbo].[SCAResultNameDim]. Indexes: [SCAResultNameDim\_UC1] and [SCAResultNameDim\_IX3].  Column List: [ResultName]  Table: [dbo].[SCAReconcileCommentDim]. Indexes: [SCAReconcileCommentDim\_CIX1] and [SCAReconcileCommentDim\_PK].  Column List: [ReconcileCommentDimID]  Table: [dbo].[SCAQualityMeasure]. Indexes: [SCAQualityMeasure\_UC1] and [SCAQualityMeasure\_IX3].  Column List: [VisitID]  Table: [dbo].[SCAQualityMeasure]. Indexes: [SCAQualityMeasure\_PK] and [SCAQualityMeasure\_IX11].  Column List: [QualityMeasureID]  Table: [dbo].[SCAProviderRole]. Indexes: [SCAProviderRole\_IX3] and [SCAProviderRole\_IX6].  Column List: [VisitID]  Table: [dbo].[SCAObsValueDim]. Indexes: [SCAObsValueDim\_PK] and [SCAObsValueDim\_IX3].  Column List: [ObsValueDimID]  Table: [dbo].[SCAObsValueDim]. Indexes: [SCAObsValueDim\_IX2] and [SCAObsValueDim\_IX5].  Column List: [ObsValueShort]  Table: [dbo].[SCAMedicationDim]. Indexes: [SCAMedicationDim\_PK] and [SCAMedicationDim\_IX5].  Column List: [MedicationDimID] | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer | Table: [dbo].[Segment]. Indexes: [PK\_Segment] and [IX\_SegmentMetadata].  Column List: [SegmentId] | |  |  |  | |

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| [Machine inserted](#IssueLevelSummary) Fragmented indexes were found |
| **Status** |
| Failed |
| **Description** |
| This issue is raised when the average logical fragmentation exceeds 10% and also the table contains more than 500 SQL Server pages. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Use sys.dm\_db\_index\_physical\_stats dynamic management function to identify the level of index fragmentation, and rebuild all indexes that are fragmented more than 5%. If your maintenance window is not long enough to rebuild all indexes, then only rebuild indexes that are more than 30% fragmented, and reorganize the remaining ones. To reduce downtime, use online index rebuild for indexes that can be rebuilt online.  BizTalk Server does not support reorganizing indexes. BizTalk Server does support rebuilding indexes, but only during maintenance windows when it is not processing data. | | **Importance** | | Index fragmentation occurs when data modification results in the logical ordering of some of the index pages, based on the index key values, to be different from their physical ordering in the data file. Index fragmentation can slow down query performance by increasing the number of reads needed to retrieve the data requested by a query. | | **Recommended Reading** | | [ALTER INDEX (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms188388.aspx)  [sys.dm\_db\_index\_physical\_stats](http://msdn.microsoft.com/en-us/library/ms188917.aspx)  [Reorganizing and Rebuilding Indexes](http://msdn.microsoft.com/en-US/library/ms189858(v=SQL.90).aspx)  [SQL Server Settings That Should Not Be Changed [BizTalk]](http://msdn.microsoft.com/en-us/library/ee308910(v=bts.10).aspx) | | **Recommended Resolution** | | Create a maintenance plan to rebuild indexes and schedule it to run during maintenance windows. Use online index rebuild for indexes that can be rebuilt online, in order to reduce downtime. | | **Troubleshooting** | | Use the below T-SQL query to identify fragmented indexed in a given database:  *SELECT s.name AS 'SchemaName', object\_name(frag.object\_id) AS 'TableName', si.name AS 'IndexName', frag.alloc\_unit\_type\_desc AS 'AllocUnitType', frag.index\_type\_desc AS 'IndexType', frag.page\_count AS 'PageCount', frag.index\_depth AS 'IndexDepth', frag.avg\_fragmentation\_in\_percent AS 'AvgFragmentationPercent', frag.fragment\_count AS 'FragmentCount',*  *frag.avg\_fragment\_size\_in\_pages AS 'AvgFragmentPageCount', frag.object\_id, frag.index\_id, frag.partition\_number*  *FROM sys.dm\_db\_index\_physical\_stats(DB\_ID(),null,null,null,'LIMITED') frag*  *LEFT OUTER JOIN sys.indexes si (NOLOCK) ON si.object\_id = frag.object\_id AND si.index\_id = frag.index\_id*  *JOIN sys.objects o (NOLOCK) ON frag.object\_id = o.object\_id*  *JOIN sys.schemas AS s (NOLOCK) ON s.schema\_id = o.schema\_id*  *WHERE o.is\_ms\_shipped = 0*  *AND o.object\_id not in (SELECT major\_id FROM sys.extended\_properties (NOLOCK) WHERE name = N'microsoft\_database\_tools\_support')*  *AND frag.index\_id <> 0*  *AND page\_count > 500*  *AND avg\_fragmentation\_in\_percent > 10*  *ORDER BY frag.page\_count DESC* | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG; CHOMP\_TABLES | The database CHOMP\_TABLES has 2 fragmented index(es):  Index: [dbo].[sxaObjectsPlusAuth].[pk\_sxaObjectsPlusAuth\_GUID]. Page Count: 17105. AvgFragmentationInPercent: 99.12  Index: [dbo].[sxaMLMAlertLog].[CI\_sxaMLMAlertLog]. Page Count: 123002. AvgFragmentationInPercent: 58.66 | | Machine inserted | SCMMAVM1P.CHOMP.ORG; ELinkQueues | The database ELinkQueues has 3 fragmented index(es):  Index: [dbo].[ELKMasterArchive].[IX\_QueueID]. Page Count: 5547. AvgFragmentationInPercent: 96.11  Index: [dbo].[ELKMasterArchive].[IX\_OdometerQueueID]. Page Count: 4973. AvgFragmentationInPercent: 98.27  Index: [dbo].[ELKMasterArchive].[IX\_QueuedTimeOdometer]. Page Count: 19170. AvgFragmentationInPercent: 73.51 | | Machine inserted | SCMMAVM1P.CHOMP.ORG; Prod61 | The database Prod61 has 121 fragmented index(es):  Index: [dbo].[SXACDObservationParameter].[SXACDObservationParameterAI01]. Page Count: 2107839. AvgFragmentationInPercent: 40.99  Index: [dbo].[SXACDObservationParameter].[SXACDObservationParameterCI]. Page Count: 4176219. AvgFragmentationInPercent: 30.75  Index: [dbo].[CV3TaskStatusHistory].[TaskStatusHistoryClustIdx]. Page Count: 2461743. AvgFragmentationInPercent: 13.66  Index: [dbo].[CV3OrderStatusHistory].[OrderStatusHistClustIdx]. Page Count: 4241203. AvgFragmentationInPercent: 48.78  Index: [dbo].[SCMObsFSListValues].[SCMObsFSListValuesAI03]. Page Count: 2698158. AvgFragmentationInPercent: 40.75  Index: [dbo].[SCMObsFSListValues].[SCMObsFSListValuesCI]. Page Count: 7530475. AvgFragmentationInPercent: 33.16  Index: [dbo].[CV3OrderTaskOccurrence].[OrderTaskOccurClustIdx]. Page Count: 3017787. AvgFragmentationInPercent: 30.94  Index: [dbo].[CV3ObservationDocumentARC].[CV3ObservationDocumentARCCI]. Page Count: 3569868. AvgFragmentationInPercent: 26.61  Index: [dbo].[SXACDClientDocDetailTextARC].[SXACDClientDocDetailTextARCPK]. Page Count: 6074973. AvgFragmentationInPercent: 14.35  Index: [dbo].[CV3Order].[CV3OrderCI]. Page Count: 2541559. AvgFragmentationInPercent: 12.44  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG; PROD61\_MT | The database PROD61\_MT has 12 fragmented index(es):  Index: [dbo].[xp\_clinical\_text].[XPKxp\_clinical\_text]. Page Count: 6052. AvgFragmentationInPercent: 43.18  Index: [dbo].[ndc\_core\_description].[IXE4ndc\_core\_description]. Page Count: 668. AvgFragmentationInPercent: 99.85  Index: [dbo].[ndc\_cost].[XPKndc\_cost]. Page Count: 2114. AvgFragmentationInPercent: 59.46  Index: [dbo].[drc\_ranges].[XPKdrc\_ranges]. Page Count: 721. AvgFragmentationInPercent: 98.75  Index: [dbo].[ddm\_map\_icd\_10].[XPKddm\_map\_icd\_10]. Page Count: 9554. AvgFragmentationInPercent: 38.30  Index: [dbo].[ndc\_core\_description].[IXE5ndc\_core\_description]. Page Count: 668. AvgFragmentationInPercent: 99.85  Index: [dbo].[drc\_denorm].[IX1drc\_denorm]. Page Count: 5318. AvgFragmentationInPercent: 22.77  Index: [dbo].[ndc\_core\_description].[IXE2ndc\_core\_description]. Page Count: 668. AvgFragmentationInPercent: 99.85  Index: [dbo].[ddm\_map].[XPKddm\_map]. Page Count: 2066. AvgFragmentationInPercent: 99.95  Index: [dbo].[ndc\_core\_description].[IXE3ndc\_core\_description]. Page Count: 730. AvgFragmentationInPercent: 99.86  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG; Prod61\_vm | The database Prod61\_vm has 17 fragmented index(es):  Index: [dbo].[SXAMTRefDrug].[SXAMTRefDrugCI]. Page Count: 2917. AvgFragmentationInPercent: 98.22  Index: [dbo].[SXAMTNdcCoreDescription].[SXAMTNdcCoreDescriptionAI01]. Page Count: 1422. AvgFragmentationInPercent: 98.95  Index: [dbo].[SXAMTNdcCoreDescription].[SXAMTNdcCoreDescriptionPK]. Page Count: 2993. AvgFragmentationInPercent: 75.41  Index: [dbo].[SXAMTNdcCost].[SXAMTNdcCostPK]. Page Count: 3517. AvgFragmentationInPercent: 84.65  Index: [dbo].[SXAVMeRxCoverageInfo].[SXAVMeRxCoverageInfoAI01]. Page Count: 5656. AvgFragmentationInPercent: 99.98  Index: [dbo].[SXAVMeRxFormularyStatus].[SXAVMeRxFormularyStatusCI]. Page Count: 10385. AvgFragmentationInPercent: 99.99  Index: [dbo].[SXAVMeRxFormularyStatus].[SXAVMeRxFormularyStatusPK]. Page Count: 2174. AvgFragmentationInPercent: 99.95  Index: [dbo].[SXAVMeRxCoverageInfo].[SXAVMeRxCoverageInfoCI]. Page Count: 35750. AvgFragmentationInPercent: 100.00  Index: [dbo].[SXAVMeRxFormularyStatus].[SXAVMeRxFormularyStatusAI01]. Page Count: 1735. AvgFragmentationInPercent: 99.94  Index: [dbo].[SXAVMeRxCoverageInfo].[SXAVMeRxCoverageInfoPK]. Page Count: 6286. AvgFragmentationInPercent: 99.98  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG; ReportServer | The database ReportServer has 2 fragmented index(es):  Index: [dbo].[ExecutionLogStorage].[IX\_ExecutionLog]. Page Count: 8590. AvgFragmentationInPercent: 66.04  Index: [dbo].[Segment].[PK\_Segment]. Page Count: 506. AvgFragmentationInPercent: 14.03 | | Machine inserted | SCMMAVM1P.CHOMP.ORG; ReportServerTempDB | The database ReportServerTempDB has 2 fragmented index(es):  Index: [dbo].[Segment].[PK\_Segment]. Page Count: 2880. AvgFragmentationInPercent: 15.17  Index: [dbo].[SessionLock].[IDX\_SessionLock]. Page Count: 4315. AvgFragmentationInPercent: 98.66 | | Machine inserted | SCMMAVM1P.CHOMP.ORG; RTScheduler | The database RTScheduler has 5 fragmented index(es):  Index: [dbo].[WorkItemHistory].[PK\_WorkItemHistory]. Page Count: 13082. AvgFragmentationInPercent: 54.03  Index: [dbo].[WorkItem].[PK\_WorkItem]. Page Count: 4924. AvgFragmentationInPercent: 48.68  Index: [dbo].[WorkListPatient].[PK\_WorklistPatient]. Page Count: 3890. AvgFragmentationInPercent: 32.72  Index: [dbo].[WorkListPatientHistory].[PK\_WorkListPatientHistory]. Page Count: 6334. AvgFragmentationInPercent: 52.42  Index: [dbo].[DistribTargetHistory].[PK\_DistribTargetHistory]. Page Count: 1643. AvgFragmentationInPercent: 48.63 | | Machine inserted | SCMMAVM1P.CHOMP.ORG; TermRuntimeDB |  | | Machine inserted | SCMMAVM1P.CHOMP.ORG; TermUsageStatsDB |  | |  |  |  | |

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| [Machine inserted](#IssueLevelSummary) Tables have been identified that have more indexes than columns. |
| **Status** |
| Failed |
| **Description** |
| Tables have been identified that have more indexes than columns.  During Inserts, Updates and Deletes every index on a table has to be evaluated and potentially updated. If too many indexes exist, SQL Server will spend unnecessary resources maintaining indexes that may not be used. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Don?t build any indexes, including a clustering index on a primary key, until a query demonstrates a requirement for it. In general, all columns named in a multi-table query should be covered by an index. | | **How Microsoft Does IT** | | MSIT performs both automated and manual tuning processes on its database implementations to ensure optimal performance in all aspects, including index utilization. | | **Importance** | | During Inserts, Updates and Deletes every index on a table has to be evaluated and potentially updated. If too many indexes exist, SQL Server will spend unnecessary resources maintaining indexes that may not be used.   How indexes are chosen significantly affects the amount of disk I/O generated and, subsequently, performance | | **Recommended Reading** | | [Index-Related Dynamic Management Views and Functions (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms187974.aspx) | | **Recommended Resolution** | | Review the indexes and remove those that are unnecessary.   For SQL Server 2000, use the Database Tuning Advisor to find unused or missing indexes.   For QL Server 2005 and above, use the dynamic management view sys.dm\_db\_index\_usage\_stats to find unused indexes. | | **Troubleshooting** | | Use the below T-SQL script to generate the complete list of tables that have more indexes that columns in a given database:  *SELECT DISTINCT*  *schema\_name(so.schema\_id) AS 'SchemaName',*  *object\_name(so.object\_id) AS 'TableName',*  *CASE objectproperty(max(so.object\_id), 'TableHasClustIndex')*  *WHEN 0 THEN count(si.index\_id) - 1*  *ELSE count(si.index\_id)*  *END AS 'IndexCount',*  *MAX(d.ColumnCount) AS 'ColumnCount'*  *FROM sys.objects so (NOLOCK)*  *JOIN sys.indexes si (NOLOCK) ON so.object\_id = si.object\_id AND so.type in (N'U',N'V')*  *JOIN sysindexes dmv (NOLOCK) ON so.object\_id = dmv.id AND si.index\_id = dmv.indid*  *FULL OUTER JOIN (SELECT object\_id, count(1) AS ColumnCount FROM sys.columns (NOLOCK) GROUP BY object\_id) d*  *ON d.object\_id = so.object\_id*  *WHERE so.is\_ms\_shipped = 0*  *AND so.object\_id not in (select major\_id FROM sys.extended\_properties (NOLOCK) where name = N'microsoft\_database\_tools\_support')*  *AND indexproperty(so.object\_id, si.name, 'IsStatistics') = 0*  *GROUP BY so.schema\_id, so.object\_id*  *HAVING(CASE objectproperty(MAX(so.object\_id), 'TableHasClustIndex')*  *WHEN 0 THEN COUNT(si.index\_id) - 1*  *ELSE COUNT(si.index\_id)*  *END > MAX(d.ColumnCount))* | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare | The database cpm\_AcuteCare has 1 table(s) with more indexes than columns:  Table: [dbo].[SCAResultNameDim]. Column Count: 4. Index Count: 5 | |

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| --- |
| [Machine inserted](#IssueLevelSummary) Tables and/or indexed views have been identified that have redundant indexes. |
| **Status** |
| Failed |
| **Description** |
| This rule checks if there are any redundant indexes created on tables or indexed views. Two or more indexes is considered redundant if those indexes have the same subset of index columns and ordinal positions. For example, an index on col1 and another index on col1 and col2 is considered redundant. There is no need for a separate index on col1. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Redundant indexes should always be avoided and usually indicate that correct processes for developer change control are not being enforced. You should remove redundant indexes from the database unless they are explicitly referenced within the calling application. If they are referenced in the calling application, try to remove the referencing index hints or the batch references so that you can drop the redundant indexes from the database.   The only exception to this case is a covering index for the primary key of a wide row. In certain scenarios, such a duplicate index provides performance benefits for aggregates run against the primary key. | | **Importance** | | An index is considered to be a redundant if it references the same subset of columns and ordinal positions as another index in the same database. Redundant indexes provide no performance or manageability benefits. In addition, each redundant index increases the I/O overhead of ongoing insert, update, and delete operations, as well as index rebuilds and index reorganizations. The overall result is reduced insert, update, and delete performance, and also prolonged index maintenance periods and wasted disk space.   Eliminating the redundant index or indexes can provide an immediate performance benefit for data modifications and also for index rebuilds and reorganizations. Existing queries that reference the index will continue to use the original, non-redundant index. | | **Recommended Reading** | | [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [DROP INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176118.aspx) | | **Recommended Resolution** | | Ensure that no applications explicitly reference the redundant indexes that you plan to drop. Also, script out the redundant index in Microsoft® SQL Server Management Studio in the event that you will have to create it again.  After scripting the index, issue a DROP INDEX command against the redundant index in order to remove it from the database. | | **Troubleshooting** | | Use the below T-SQL script to generate the complete list of redundant indexes in a given database:  *;WITH IndexColumns as(*  *SELECT DISTINCT*  *schema\_name (o.schema\_id) AS 'SchemaName', object\_name(o.object\_id) AS TableName,*  *i.Name AS IndexName, o.object\_id,i.index\_id,i.type,*  *(SELECT CASE key\_ordinal WHEN 0 THEN NULL ELSE '['+col\_name(k.object\_id,column\_id) +']' END AS [data()]*  *FROM sys.index\_columns AS k WHERE k.object\_id = i.object\_id AND k.index\_id = i.index\_id*  *ORDER BY key\_ordinal, column\_id FOR XML PATH('')) AS cols*  *FROM sys.indexes AS i INNER JOIN sys.objects o ON i.object\_id =o.object\_id*  *INNER JOIN sys.index\_columns ic ON ic.object\_id =i.object\_id AND ic.index\_id =i.index\_id*  *INNER JOIN sys.columns c ON c.object\_id = ic.object\_id AND c.column\_id = ic.column\_id*  *WHERE i.object\_id in (SELECT object\_id FROM sys.objects WHERE type ='U') AND i.index\_id <>0 AND i.type <>3 AND i.type <>6*  *GROUP BY o.schema\_id,o.object\_id,i.object\_id,i.Name,i.index\_id,i.type*  *)*  *SELECT*  *ic1.SchemaName,ic1.TableName,ic1.IndexName,ic1.cols AS IndexCols,ic2.IndexName AS RedundantIndexName, ic2.cols AS RedundantIndexCols*  *FROM IndexColumns ic1*  *JOIN IndexColumns ic2 ON ic1.object\_id = ic2.object\_id*  *AND ic1.index\_id <> ic2.index\_id*  *AND ic1.cols <> ic2.cols*  *AND ic2.cols LIKE REPLACE(ic1.cols,'[','[[]') + ' %'*  *ORDER BY 1,2,3,5* | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61 | The database Prod61 has 5 redundant index(es):  Table: [dbo].[SXAHMEventDefinition]. Indexes: [SXAHMEventDefinitionAI02] and [SXAHMEventDefinitionAI01].  Column Lists: [[ScheduleID]] and [[ScheduleID] [Name]]  Table: [dbo].[HVCSiteProviderXRef]. Indexes: [SiteProviderAltIdx] and [SiteProviderXRefClustIdx].  Column Lists: [[RemoteSiteID]] and [[RemoteSiteID] [ProviderGUID] [RoleCode]]  Table: [dbo].[CV3OrderTask]. Indexes: [CV3OrderTaskPK] and [CV3OrderTaskAI02].  Column Lists: [[GUID]] and [[GUID] [TaskState] [IsLastOccurGenerated]]  Table: [dbo].[HVCSiteLocationXRef]. Indexes: [SiteLocationAltIdx] and [SiteLocationXRefClustIdx].  Column Lists: [[RemoteSiteID]] and [[RemoteSiteID] [LocationGUID]]  Table: [dbo].[SXAAMFreeTextCareProviderIdty]. Indexes: [SXAAMFreeTextCareProviderIdtyPK] and [SXAAMFreeTextCareProviderIdtyCI].  Column Lists: [[FreeTextCareProviderIdtyID]] and [[FreeTextCareProviderIdtyID] [ProviderIDTypeGUID]] | | Machine inserted | SCMMAVM1P.CHOMP.ORG;RTScheduler | The database RTScheduler has 1 redundant index(es):  Table: [dbo].[UnitSuppress]. Indexes: [UQ\_UnitSuppress\_UnitName] and [PK\_UnitSuppress].  Column Lists: [[UnitName]] and [[UnitName] [OrderCategoryID]] | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare | The database cpm\_AcuteCare has 225 redundant index(es):  Table: [dbo].[SCAHMExemptionDim]. Indexes: [SCAHMExemptionDim\_PK] and [SCAHMExemptionDim\_IX2].  Column Lists: [[HMExemptionDimID]] and [[HMExemptionDimID] [ExemptionType]]  Table: [dbo].[SCAHMExemptionDim]. Indexes: [SCAHMExemptionDim\_UC1] and [SCAHMExemptionDim\_CIX1].  Column Lists: [[ExemptionType]] and [[ExemptionType] [HMExemptionDimID]]  Table: [dbo].[SCAPatientDim]. Indexes: [SCAPatientDim\_IX2] and [SCAPatientDim\_IX3].  Column Lists: [[PatientDimID] [PatientName] [MRN]] and [[PatientDimID] [PatientName] [MRN] [BirthDtm]]  Table: [dbo].[SCAPatientDim]. Indexes: [SCAPatientDim\_PK] and [SCAPatientDim\_IX3].  Column Lists: [[PatientDimID]] and [[PatientDimID] [PatientName] [MRN] [BirthDtm]]  Table: [dbo].[SCAPatientDim]. Indexes: [SCAPatientDim\_PK] and [SCAPatientDim\_IX2].  Column Lists: [[PatientDimID]] and [[PatientDimID] [PatientName] [MRN]]  Table: [dbo].[SCAVisit]. Indexes: [SCAVisit\_IX5] and [SCAVisit\_IX21].  Column Lists: [[VisitTypeDimID]] and [[VisitTypeDimID] [VisitID]]  Table: [dbo].[SCAVisit]. Indexes: [SCAVisit\_IX17] and [SCAVisit\_IX19].  Column Lists: [[VisitID]] and [[VisitID] [AdmitDtm] [DischargeDtm]]  Table: [dbo].[SCAVisit]. Indexes: [SCAVisit\_IX17] and [SCAVisit\_IX16].  Column Lists: [[VisitID]] and [[VisitID] [ClientVisitGUID]]  Table: [dbo].[SCAVisit]. Indexes: [SCAVisit\_IX17] and [SCAVisit\_IX15].  Column Lists: [[VisitID]] and [[VisitID] [PatientDimID] [ProviderDimID]]  Table: [dbo].[SCAVisit]. Indexes: [SCAVisit\_IX17] and [SCAVisit\_IX14].  Column Lists: [[VisitID]] and [[VisitID] [DemographicDimID] [AgeDimID] [AdmitDtm] [AdmitReasonDimID]]  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_Stage | The database cpm\_Stage has 8 redundant index(es):  Table: [dbo].[WorkAllergy]. Indexes: [WorkAllergy\_IX1] and [WorkAllergy\_IX12].  Column Lists: [[AllergyDeclarationGUID]] and [[AllergyDeclarationGUID] [Allergen] [AllergyType] [ExternalCategory] [ExternalDrug]]  Table: [dbo].[WorkAllergy]. Indexes: [WorkAllergy\_IX1] and [WorkAllergy\_IX11].  Column Lists: [[AllergyDeclarationGUID]] and [[AllergyDeclarationGUID] [Status] [ScopeLevel] [ApplicationSource] [Confidence] [Severity] [AllergyCategory]]  Table: [dbo].[WorkAllergy]. Indexes: [WorkAllergy\_IX1] and [WorkAllergy\_IX10].  Column Lists: [[AllergyDeclarationGUID]] and [[AllergyDeclarationGUID] [EnteredDtm] [OnsetYearNum] [OnsetMonthNum] [OnsetDayNum] [ResolvedDtm]]  Table: [dbo].[WorkAllergy]. Indexes: [WorkAllergy\_IX1] and [WorkAllergy\_IX9].  Column Lists: [[AllergyDeclarationGUID]] and [[AllergyDeclarationGUID] [TouchedWhen] [IsActive] [EnteredDtm] [ToBeVerified] [ToBeSigned] [ClientGUID] [ClientVisitGUID] [IsChronic] [OnsetYearNum] [OnsetMonthNum] [OnsetDayNum] [ResolvedDtm] [OnsetDtm]]  Table: [dbo].[WorkPatientIdentifier]. Indexes: [WorkPatientIdentifier\_IX1] and [WorkPatientIdentifier\_IX3].  Column Lists: [[ClientGUID]] and [[ClientGUID] [ClientIDCode] [TypeCode] [IDStatus] [IDSourceType]]  Table: [dbo].[WorkVisit]. Indexes: [WorkVisit\_IX1] and [WorkVisit\_IX2].  Column Lists: [[GUID]] and [[GUID] [ClientGUID] [ChartGUID] [AdmitDtm] [DischargeDtm] [CurrentLocationGUID] [IsVIP] [TouchedWhen]]  Table: [dbo].[Audit\_Visits\_SCM\_Historical]. Indexes: [Audit\_Visits\_SCM\_Historical\_IX1] and [Audit\_Visits\_SCM\_Historical\_IX2].  Column Lists: [[GUID]] and [[GUID] [ClientGUID] [ChartGUID]]  Table: [dbo].[WorkQualifiedVisit]. Indexes: [WorkQualifiedVisit\_IX2] and [WorkQualifiedVisit\_IX1].  Column Lists: [[ClientGUID]] and [[ClientGUID] [ChartGUID] [ClientVisitGUID]] | | Machine inserted | SCMMAVM3P.CHOMP.ORG;SXASECTRACKING | The database SXASECTRACKING has 9 redundant index(es):  Table: [dbo].[CV3UserSecurityGroup]. Indexes: [usg\_guid\_idx] and [usg\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3User]. Indexes: [user\_guid\_idx] and [user\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3SecurityGrpServiceRights]. Indexes: [sg\_guid\_idx] and [sg\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3SecurityGrpProviderRights]. Indexes: [sg\_guid\_idx] and [sg\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3SecurityGrpLocationRights]. Indexes: [sg\_guid\_idx] and [sg\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3SecurityGroupRights]. Indexes: [sgr\_guid\_idx] and [sgr\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3SecurityGroup]. Indexes: [sg\_guid\_idx] and [sg\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3Rights]. Indexes: [rights\_guid\_idx] and [rights\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]]  Table: [dbo].[CV3OrdMaintRights]. Indexes: [omr\_guid\_idx] and [omr\_guid\_touchedwhen\_idx].  Column Lists: [[GUID]] and [[GUID] [TouchedWhen]] | |

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| [Machine inserted](#IssueLevelSummary) Tables have been identified that do not have a clustered index. |
| **Status** |
| Failed |
| **Description** |
| A heap is a table without a clustered index. One or more nonclustered indexes can be created on tables stored as a heap. Data is stored in the heap without specifying an order. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Clustered indexes define the physical order of the rows in a table, with the leaf level of the clustered index containing the actual data rows for the table. When selecting a clustered index key, select columns that have a high cardinality, are frequently referenced in query criteria, and are used within range queries.   Do not use a heap when the data is frequently returned in a sorted order. A clustered index on the sorting column could avoid the sorting operation.  Do not use a heap when the data is frequently grouped together. Data must be sorted before it is grouped, and a clustered index on the sorting column could avoid the sorting operation.  Do not use a heap when ranges of data are frequently queried from the table. A clustered index on the range column will avoid sorting the entire heap.  Do not use a heap when there are no nonclustered indexes and the table is large. In a heap, all rows of the heap must be read to find any row. | | **Importance** | | In most situations, each table in the database should have a clustered index defined for it. Without a clustered index, the heap will not be defragmented as part of your regular index rebuild or reorganization process. As a result, query performance could suffer. | | **Recommended Reading** | | [General Index Design Guidelines](http://msdn.microsoft.com/en-us/library/ms191195(v=SQL.105).aspx)  [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [Heaps (Tables without Clustered Indexes)](http://technet.microsoft.com/en-us/library/hh213609.aspx) | | **Recommended Resolution** | | Evaluate your application query activity against the heap table. In addition, define the best column candidate for the index key and create the clustered index. | | **Troubleshooting** | | Use the below T-SQL script to generate the complete list of tables no clustered index in a given database:  *SELECT DISTINCT*  *schema\_name(so.schema\_id) AS 'SchemaName',object\_name(so.object\_id) AS 'TableName',so.object\_id AS 'object\_id', max(dmv.rows) AS 'ApproximateRows',*  *CASE objectproperty(MAX(so.object\_id), 'TableHasClustIndex') WHEN 0 THEN count(si.index\_id) - 1 ELSE COUNT(si.index\_id) END as 'IndexCount', MAX(d.ColumnCount) AS 'ColumnCount'*  *FROM sys.objects so (NOLOCK)*  *JOIN sys.indexes si (NOLOCK) ON so.object\_id = si.object\_id AND so.type in (N'U',N'V')*  *JOIN sysindexes dmv (NOLOCK) ON so.object\_id = dmv.id AND si.index\_id = dmv.indid*  *FULL OUTER JOIN (SELECT object\_id, count(1) AS ColumnCount FROM sys.columns (NOLOCK) GROUP BY object\_id) d*  *ON d.object\_id = so.object\_id*  *WHERE so.is\_ms\_shipped = 0*  *AND so.object\_id NOT IN (SELECT major\_id FROM sys.extended\_properties (NOLOCK) WHERE name = N'microsoft\_database\_tools\_support')*  *AND indexproperty(so.object\_id, si.name, 'IsStatistics') = 0*  *GROUP BY so.schema\_id, so.object\_id*  *HAVING (objectproperty(max(so.object\_id), 'TableHasClustIndex') = 0*  *AND COUNT(si.index\_id)-1 > 0*  *)*  *ORDER BY SchemaName, TableName* | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ELinkCore | The database ELinkCore has 1 table(s) with no clustered index:  Table: [dbo].[Context]. Approximate Row Count: 377. Index Count: 1. Column Count: 4 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61 | The database Prod61 has 2 table(s) with no clustered index:  Table: [dbo].[CompletedScope]. Approximate Row Count: 0. Index Count: 2. Column Count: 4  Table: [dbo].[ECS\_CDV\_User\_Category\_Sort]. Approximate Row Count: 15385. Index Count: 1. Column Count: 5 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;PROD61\_MT | The database PROD61\_MT has 8 table(s) with no clustered index:  Table: [dbo].[script\_common\_denorm]. Approximate Row Count: 13211. Index Count: 1. Column Count: 23  Table: [dbo].[script\_common]. Approximate Row Count: 5663. Index Count: 2. Column Count: 19  Table: [dbo].[ndc\_denorm]. Approximate Row Count: 202274. Index Count: 1. Column Count: 36  Table: [dbo].[ddi\_map]. Approximate Row Count: 8862. Index Count: 1. Column Count: 2  Table: [dbo].[ddi\_drug\_condition]. Approximate Row Count: 8662. Index Count: 1. Column Count: 4  Table: [dbo].[ddi\_description]. Approximate Row Count: 1132. Index Count: 1. Column Count: 5  Table: [dbo].[ddi\_condition\_category]. Approximate Row Count: 498. Index Count: 1. Column Count: 2  Table: [dbo].[int\_interaction\_description]. Approximate Row Count: 4557. Index Count: 1. Column Count: 2 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ReportServer | The database ReportServer has 1 table(s) with no clustered index:  Table: [dbo].[ReportSchedule]. Approximate Row Count: 20. Index Count: 3. Column Count: 4 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;XAES | The database XAES has 3 table(s) with no clustered index:  Table: [dbo].[WorkstationLastLogon]. Approximate Row Count: 0. Index Count: 1. Column Count: 2  Table: [dbo].[SXADBSetting]. Approximate Row Count: 18. Index Count: 2. Column Count: 11  Table: [dbo].[SXADBAppDependencyXREF]. Approximate Row Count: 34. Index Count: 1. Column Count: 7 | | Machine inserted | SCMMAVM2P.CHOMP.ORG;Prod61\_MT | The database Prod61\_MT has 8 table(s) with no clustered index:  Table: [dbo].[script\_common\_denorm]. Approximate Row Count: 14461. Index Count: 1. Column Count: 23  Table: [dbo].[script\_common]. Approximate Row Count: 5901. Index Count: 2. Column Count: 19  Table: [dbo].[ndc\_denorm]. Approximate Row Count: 199894. Index Count: 1. Column Count: 36  Table: [dbo].[ddi\_map]. Approximate Row Count: 8864. Index Count: 1. Column Count: 2  Table: [dbo].[ddi\_drug\_condition]. Approximate Row Count: 8664. Index Count: 1. Column Count: 4  Table: [dbo].[ddi\_description]. Approximate Row Count: 1132. Index Count: 1. Column Count: 5  Table: [dbo].[ddi\_condition\_category]. Approximate Row Count: 498. Index Count: 1. Column Count: 2  Table: [dbo].[int\_interaction\_description]. Approximate Row Count: 4468. Index Count: 1. Column Count: 2 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;Argent | The database Argent has 1 table(s) with no clustered index:  Table: [dbo].[DocNameGuid]. Approximate Row Count: 0. Index Count: 1. Column Count: 3 | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare | The database cpm\_AcuteCare has 56 table(s) with no clustered index:  Table: [dbo].[SCAVisitIdentifier]. Approximate Row Count: 267351. Index Count: 3. Column Count: 9  Table: [dbo].[SCAVisitExtension]. Approximate Row Count: 0. Index Count: 1. Column Count: 4  Table: [dbo].[SCAAllergyCategoryTypeDim]. Approximate Row Count: 4. Index Count: 2. Column Count: 6  Table: [dbo].[SCAPatientDim]. Approximate Row Count: 337303. Index Count: 4. Column Count: 42  Table: [dbo].[SCAAllergy]. Approximate Row Count: 35167. Index Count: 8. Column Count: 28  Table: [dbo].[SCAVisit]. Approximate Row Count: 286036. Index Count: 17. Column Count: 85  Table: [dbo].[SCAPatientDataDim]. Approximate Row Count: 1587449. Index Count: 3. Column Count: 7  Table: [dbo].[SCAValueSetXRefDim]. Approximate Row Count: 57. Index Count: 4. Column Count: 10  Table: [dbo].[SCAPatDrivingStatusDim]. Approximate Row Count: 0. Index Count: 1. Column Count: 4  Table: [dbo].[SCAOrderWorkList]. Approximate Row Count: 171848. Index Count: 1. Column Count: 12  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_MetaData | The database CPM\_MetaData has 67 table(s) with no clustered index:  Table: [dbo].[SANMDWorkTable]. Approximate Row Count: 94. Index Count: 1. Column Count: 4  Table: [dbo].[SANMDSQLString]. Approximate Row Count: 601730. Index Count: 2. Column Count: 5  Table: [dbo].[SANMDAppConfig]. Approximate Row Count: 46. Index Count: 1. Column Count: 7  Table: [dbo].[SANMDAuditRun]. Approximate Row Count: 76. Index Count: 2. Column Count: 8  Table: [dbo].[SANMDMeasureCategory]. Approximate Row Count: 27. Index Count: 1. Column Count: 14  Table: [dbo].[SANMDWorkColumn]. Approximate Row Count: 1467. Index Count: 1. Column Count: 13  Table: [dbo].[SANMDSource]. Approximate Row Count: 1. Index Count: 1. Column Count: 12  Table: [dbo].[SANMDAuditConfig]. Approximate Row Count: 3. Index Count: 1. Column Count: 6  Table: [dbo].[SANMDScheduleProcess]. Approximate Row Count: 23. Index Count: 1. Column Count: 5  Table: [dbo].[SANMDLog]. Approximate Row Count: 727569. Index Count: 4. Column Count: 17  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer | The database CPM\_ReportServer has 1 table(s) with no clustered index:  Table: [dbo].[ReportSchedule]. Approximate Row Count: 0. Index Count: 3. Column Count: 4 | |  |  |  | |

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| [Machine inserted](#IssueLevelSummary) Tables have been identified that do not have any indexes. |
| **Status** |
| Resolved |
| **Description** |
| Effective indexes are one of the best ways to improve performance in a database application. Use indexes on tables with numerous rows, on columns that are used in the WHERE clause of queries or in table joins, and on columns used in ORDER BY and GROUP BY queries. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | By default, every table should have a clustered index defined for it so it can participate in ongoing index rebuilds and reorganizations. If the table is frequently queried and the selectivity of the data lends itself to it, consider adding nonclustered indexes to the table as well. Indexes should be created based on query behavior and on the required query duration defined by the application owners in the service level agreements. | | **Importance** | | At a minimum, most tables should be indexed with a clustered index and, possibly, with nonclustered indexes, depending on the query activity against it. In rare situations, such as for staging tables and infrequently referenced small tables, a table without an index is acceptable. | | **Recommended Reading** | | [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [General Index Design Guidelines](http://msdn.microsoft.com/en-us/library/ms191195(v=SQL.105).aspx) | | **Recommended Resolution** | | At a minimum, define a clustered index for the table. If the table is queried frequently, define nonclustered indexes for the columns referenced in the query criteria. | | **Troubleshooting** | | Use the below T-SQL script to generate the complete list of tables with no indexes in a given database:  *SELECT DISTINCT*  *schema\_name(so.schema\_id) AS 'SchemaName', object\_name(so.object\_id) AS 'TableName',*  *so.object\_id AS 'object\_id', max(dmv.rows) AS 'ApproximateRows',MAX(d.ColumnCount) AS 'ColumnCount'*  *FROM sys.objects so (NOLOCK)*  *JOIN sys.indexes si (NOLOCK) ON so.object\_id = si.object\_id AND so.type in (N'U',N'V')*  *JOIN sysindexes dmv (NOLOCK) ON so.object\_id = dmv.id AND si.index\_id = dmv.indid*  *FULL OUTER JOIN (SELECT object\_id, count(1) AS ColumnCount FROM sys.columns (NOLOCK) GROUP BY object\_id) d ON d.object\_id = so.object\_id*  *WHERE so.is\_ms\_shipped = 0 AND so.object\_id NOT IN (SELECT major\_id FROM sys.extended\_properties (NOLOCK) WHERE name = N'microsoft\_database\_tools\_support')*  *AND indexproperty(so.object\_id, si.name, 'IsStatistics') = 0*  *GROUP BY so.schema\_id, so.object\_id*  *HAVING( CASE objectproperty(MAX(so.object\_id), 'TableHasClustIndex') WHEN 0 THEN COUNT(si.index\_id) - 1 ELSE COUNT(si.index\_id) END  = 0)*  *ORDER BY SchemaName, TableName* | |
| **Annotation** |
| Most of the tables are staging or test purposes only. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES | The database CHOMP\_TABLES has 51 table(s) with no indexes:  Table: [qm].[Leapfrog\_riskfactors]. Approximate Row Count: 1399 Column Count: 8  Table: [Req161].[AllowedProviderTypeCode]. Approximate Row Count: 1 Column Count: 1  Table: [Req161].[ReleasedLocations]. Approximate Row Count: 23 Column Count: 1  Table: [Req161].[AllowedUserIDs]. Approximate Row Count: 21 Column Count: 1  Table: [Req161].[DowntimeSchedule]. Approximate Row Count: 1 Column Count: 2  Table: [dbo].[sxaMLMTriggerValue\_bkup]. Approximate Row Count: 63 Column Count: 13  Table: [dbo].[sxaMLMDocTrigger\_bkup]. Approximate Row Count: 18 Column Count: 11  Table: [dbo].[CHOMP\_SQL\_JobHistory]. Approximate Row Count: 301 Column Count: 6  Table: [dbo].[CHOMP\_AG\_Server]. Approximate Row Count: 825 Column Count: 3  Table: [dbo].[CHI\_AllAdmits\_SpecLoc]. Approximate Row Count: 365 Column Count: 10  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;ELinkCore | The database ELinkCore has 1 table(s) with no indexes:  Table: [dbo].[SecurityPasswordConfig]. Approximate Row Count: 1 Column Count: 13 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Prod61 | The database Prod61 has 21 table(s) with no indexes:  Table: [dbo].[CHOMP\_SoftMedICMExport\_ProviderMap]. Approximate Row Count: 8 Column Count: 3  Table: [dbo].[CHOMP\_SxaAuthentication]. Approximate Row Count: 1178 Column Count: 4  Table: [dbo].[cpu\_usage]. Approximate Row Count: 1189 Column Count: 2  Table: [dbo].[CHOMP\_AnalystStoredProcs]. Approximate Row Count: 324 Column Count: 1  Table: [dbo].[CHOMP\_ShowContigOutput]. Approximate Row Count: 3344 Column Count: 20  Table: [dbo].[CV3ClientDocHistoryCUR\_ToUpdate]. Approximate Row Count: 7 Column Count: 5  Table: [dbo].[CHOMP\_TableSpace]. Approximate Row Count: 858 Column Count: 6  Table: [dbo].[CV3ClientDocHistoryCUR\_Affected]. Approximate Row Count: 2 Column Count: 4  Table: [dbo].[CHOMP\_ReportStoredProcs]. Approximate Row Count: 615 Column Count: 1  Table: [dbo].[CV3OrderEntryFieldGridItem\_bk]. Approximate Row Count: 90398 Column Count: 6  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM1P.CHOMP.ORG;PROD61\_MT | The database PROD61\_MT has 2 table(s) with no indexes:  Table: [dbo].[cvx\_ndc\_map]. Approximate Row Count: 2248 Column Count: 5  Table: [dbo].[cvx\_vaccine]. Approximate Row Count: 160 Column Count: 6 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;RTScheduler | The database RTScheduler has 3 table(s) with no indexes:  Table: [dbo].[AuthMap]. Approximate Row Count: 0 Column Count: 2  Table: [dbo].[AuthScheme]. Approximate Row Count: 9 Column Count: 2  Table: [dbo].[Display]. Approximate Row Count: 4 Column Count: 3 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;Tlkernel | The database Tlkernel has 3 table(s) with no indexes:  Table: [dbo].[XLProject]. Approximate Row Count: 0 Column Count: 7  Table: [dbo].[FrameIdTable]. Approximate Row Count: 1 Column Count: 2  Table: [dbo].[CodeXLate]. Approximate Row Count: 0 Column Count: 4 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;XAES | The database XAES has 1 table(s) with no indexes:  Table: [dbo].[prodworkstationcopy]. Approximate Row Count: 13511 Column Count: 9 | | Machine inserted | SCMMAVM1P.CHOMP.ORG;xaes\_EAS | The database xaes\_EAS has 4 table(s) with no indexes:  Table: [dbo].[CHOMP\_DaylightSavingsOffset]. Approximate Row Count: 9 Column Count: 5  Table: [dbo].[CHOMP\_EventType]. Approximate Row Count: 170 Column Count: 2  Table: [dbo].[DaylightSavingsOffset\_chrisdelete20130315]. Approximate Row Count: 7 Column Count: 5  Table: [dbo].[SXADBServiceBrokerDeadMessageLogBkup]. Approximate Row Count: 1 Column Count: 6 | | Machine inserted | SCMMAVM2P.CHOMP.ORG;EToolkit | The database EToolkit has 257 table(s) with no indexes:  Table: [dbo].[ECLP\_sp\_configure\_259B]. Approximate Row Count: 69 Column Count: 5  Table: [dbo].[ECLP\_sysjobhistory\_266B]. Approximate Row Count: 49854 Column Count: 16  Table: [dbo].[ECLP\_Boot\_ini\_259B]. Approximate Row Count: 2 Column Count: 1  Table: [dbo].[ECLP\_sysjobs\_266B]. Approximate Row Count: 40 Column Count: 19  Table: [dbo].[ECLP\_xp\_msver\_259B]. Approximate Row Count: 20 Column Count: 4  Table: [dbo].[SQL\_ErrorLog\_266]. Approximate Row Count: 3041 Column Count: 3  Table: [dbo].[ECLP\_sp\_helpdb\_259B]. Approximate Row Count: 21 Column Count: 7  Table: [dbo].[ECLP\_DB\_Value\_266B]. Approximate Row Count: 0 Column Count: 3  Table: [dbo].[ECLP\_DBCC\_LOGINFO\_259B]. Approximate Row Count: 21 Column Count: 2  Table: [dbo].[ECLP\_DB\_MiscCounts\_266B]. Approximate Row Count: 0 Column Count: 5  To generate the complete list, run the script provided in the Troubleshooting section. | | Machine inserted | SCMMAVM2P.CHOMP.ORG;Prod61\_MT | The database Prod61\_MT has 2 table(s) with no indexes:  Table: [dbo].[cvx\_ndc\_map]. Approximate Row Count: 2048 Column Count: 5  Table: [dbo].[cvx\_vaccine]. Approximate Row Count: 156 Column Count: 6 | |  |  |  | |

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| [Machine inserted](#IssueLevelSummary) Index Fragmentation data collection is either skipped or failed on one or more user databases |
| **Status** |
| Failed |
| **Description** |
| Index fragmentation data collection will be skipped for databases of size more than 1TB as the data collection may take long time or impact the target SQL Server instances.  The index fragmentation data collection also skipped for the SQL Server instances hosting more than 200 databases. |
| **Additional Information** |
| |  | | --- | | **Importance** | | Index fragmentation occurs naturally as changes are made to data. Fragmentation exists when the logical ordering of pages in an index does not match the physical ordering of data on the disk. In addition, fragmentation can decrease performance by increasing the number of reads that are necessary to retrieve information.  In Microsoft®  SQL Server 2005 and higher, the sys.dm\_db\_index\_physical\_stats function is used to detect fragmentation at the index, table, or database level. In SQL Server 2000, DBCC SHOWCONTIG is used to detect fragmentation. | | **Recommended Reading** | | [Reorganizing and Rebuilding Indexes](http://technet.microsoft.com/en-us/library/ms189858.aspx) | | **Recommended Resolution** | | Rebuilding indexes is essential to good performance, and you should have a maintenance plan in place to regularly rebuild indexes.  An index that is more than 5 percent or less than 30 percent fragmented should be reorganized. In addition, an index that is more than 30 percent fragmented should be rebuilt.  Priority in both of these processes should be given to indexes which consume 1000 or more data pages. | | **Troubleshooting** | | Use the below T-SQL query to identify fragmented indexed on failed or skipped database:  SELECT s.name AS 'SchemaName', object\_name(frag.object\_id) AS 'TableName', si.name AS 'IndexName', frag.alloc\_unit\_type\_desc AS 'AllocUnitType', frag.index\_type\_desc AS 'IndexType', frag.page\_count AS 'PageCount', frag.index\_depth AS 'IndexDepth', frag.avg\_fragmentation\_in\_percent AS 'AvgFragmentationPercent', frag.fragment\_count AS 'FragmentCount',  frag.avg\_fragment\_size\_in\_pages AS 'AvgFragmentPageCount', frag.object\_id, frag.index\_id, frag.partition\_number  FROM sys.dm\_db\_index\_physical\_stats(DB\_ID(),null,null,null,'LIMITED') frag  LEFT OUTER JOIN sys.indexes si (NOLOCK) ON si.object\_id = frag.object\_id AND si.index\_id = frag.index\_id  JOIN sys.objects o (NOLOCK) ON frag.object\_id = o.object\_id  JOIN sys.schemas AS s (NOLOCK) ON s.schema\_id = o.schema\_id  WHERE o.is\_ms\_shipped = 0  AND o.object\_id not in (SELECT major\_id FROM sys.extended\_properties (NOLOCK) WHERE name = N'microsoft\_database\_tools\_support')  AND frag.index\_id <> 0  AND page\_count > 500  AND avg\_fragmentation\_in\_percent > 10  ORDER BY frag.page\_count DESC | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM1P.CHOMP.ORG;TermRuntimeDB |  | | Machine inserted | SCMMAVM1P.CHOMP.ORG;TermUsageStatsDB |  | |

SQL Server High Availability

SQL Server Always ON

SQL Server AlwaysOn is the new high availability and disaster recovery solution for SQL Server. Using AlwaysOn, businesses can achieve increased application availability for their mission critical applications and get higher returns on their high availability investments through better utilization of hardware resources. AlwaysOn also increases productivity and lowers Total Cost of Ownership (TCO) by simplifying high availability deployment and management.

Cluster HotFixes

This section presents the comprehensive view of missing hot fixes on the cluster nodes.

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| [Machine inserted](#IssueLevelSummary) The hotfix 2494036 is not installed (2008 SP2, 2008 R2, 2008 R2 SP1) |
| **Status** |
| Failed |
| **Description** |
| Hotfix to configure WSFC optimal quorum with non-automatic failover targets is not installed (2008 SP2, 2008 R2, 2008 R2 SP1). |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | To configure a cluster node that does not have quorum votes install hotfix KB2494036.  After you apply the following hotfix, you can select which nodes vote. This functionality improves multi-site clusters. For example, you may want one site to have more votes than other sites in a disaster recovery. Without the following hotfix, you have to plan the numbers physical servers that are deployed to distribute the number of votes that you want for each site.  By default, all nodes in the cluster have one vote. After you apply the following hotfix, administrators can change the vote functionality in the quorum model by configuring a node to have 0 votes.    This hotfix adds the following functionalities:  - The **NodeWeight** common property for nodes  This property can be configured by using either the **Get-ClusterNode** Windows PowerShell cmdlet or the **Cluster.exe** command. For example, you run the following command at a command prompt:  **Cluster.exe . node /prop NodeWeight=0**  To query the NodeWeight common property, you can use the following PowerShell cmdlet command:  **Get-ClusterNode “NodeName” | fl \***  To modify the **NodeWeight** property, you can use the following PowerShell cmdlet command:  **(Get-ClusterNode “NodeName”).NodeWeight = 0**  A new **NodeWeight** property is added to the **MSCluster\_Node** WMI class to let you manage node weights by using WMI.    - The **PreventQuorum (PQ)** switch  This switch starts the Cluster service (ClusSvc) and prevents a node from reaching quorum. The Cluster service can be started by using the **PQ** switch. For example, you can run the following command at a command prompt:  **NET START ClusSvc /PQ**  The **PQ** switch can be used to enforce the cluster owner and to maintain consistency in the Cluster database.  For example, you have a partitioned 2-node cluster in which **NodeA** has one vote and **NodeB** has zero votes. By default, **NodeB** cannot reach quorum and cannot start the cluster. However, the Cluster database may be updated when the **ForceQuorum** switch is used to start **NodeB** even if it does not have quorum. Therefore, **NodeB** has a newer Cluster database, and **NodeB** can prevents **NodeA** from starting and from incorrectly overwriting the updated Cluster database by usingits one vote to reachquorum. The **PQ** switch can be used to prevent **NodeA** from reaching quorum. Therefore, **NodeA** waits until it can communicate with the existing cluster and until it can join the existing cluster that has **NodeB** to obtain the updated Cluster database and to maintain consistency.  The **PQ** switch performs the opposite action of the **ForceQuorum** switch. The **ForceQuorum** switch allows the Cluster service to form a cluster even if it has not received a majority of votes. The **PQ** switch does not allow the Cluster service to form a cluster even if it has received a majority of votes. | | **Importance** | | Windows Server Failover Clustering (WSFC) uses a majority of votes to establish a quorum for determining cluster membership. Votes are assigned to nodes in the cluster or to a witness that is either a disk or a file share witness. You can use the Configure Cluster Quorum Wizard to configure the clusters quorum model. When you configure a Node Majority, Node and Disk Majority, or Node and File Share Majority quorum model, all nodes in the cluster are each assigned one vote. WSFC does not let you select the cluster nodes that vote for determining quorum. | | **Recommended Reading** | | [For information about quorum voting, see WSFC Quorum Modes and Voting Configuration (SQL Server)](http://msdn.microsoft.com/en-us/library/hh270280)  [A hotfix is available to let you configure a cluster node that does not have quorum votes in Windows Server 2008 and in Windows Server 2008 R2](http://support.microsoft.com/kb/2494036) | | **Recommended Resolution** | | Install hotfix KB2494036:  http://support.microsoft.com/kb/2494036 | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.21685  Clusapi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21685  Cluswmi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.17514 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.21685  Clusapi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21685  Cluswmi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.17514 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.21685  Clusapi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21685  Cluswmi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.17514 | |

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| [Machine inserted](#IssueLevelSummary) Hotfix to eliminate incorrect warnings or errors in the validation report when disks are online is not installed. |
| **Status** |
| Failed |
| **Description** |
| The recommended hotfix 2531907 to eliminate incorrect warnings or errors in the validation report when disks are online is not installed (2008 R2 SP1). |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | To eliminate incorrect warnings or errors in the validation report when disks are online, install hotfix KB 2531907. | | **Importance** | | If a WSFC node is running Windows Server 2008 R2 Service Pack 1 (SP1) and the Validate SCSI Device Vital Product Data (VPD) storage test fails after incorrectly running on disks that are online and not available to all nodes in the WSFC cluster. | | **Recommended Reading** | | [Validate SCSI Device Vital Product Data (VPD) test fails after you install Windows Server 2008 R2 SP1](http://support.microsoft.com/kb/2531907) | | **Recommended Resolution** | | Install the hotfix described in Knowledge Base article 2531907  http://support.microsoft.com/kb/2531907 | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Failoverclusters.agent.interop.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.17514  Failoverclusters.validation.common.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21710 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Failoverclusters.agent.interop.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.17514  Failoverclusters.validation.common.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21710 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Failoverclusters.agent.interop.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.17514  Failoverclusters.validation.common.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21710 | |

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| [Machine inserted](#IssueLevelSummary) The hotfix 2578103 or 2578113 is not installed (2008 SP2, 2008 R2, 2008 R2 SP1) |
| **Status** |
| Failed |
| **Description** |
| IPV6 hotfix is not installed |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | If you use IPv6, we recommend that you review the specific scenarios detailed in Knowledge Base article 2578103 or 2578113, depending on your Windows Server operating system.  If your Windows Server topology uses IP version 6 (IPv6), the WSFC Cluster service requires about 30 seconds to fail over the IPv6 IP address. This causes clients to wait for about 30 seconds to reconnect to the IPv6 IP address. | | **Importance** | | Consider the following scenario:  - You create a failover cluster on some computers that are running Windows Server 2008/2008 R2.  - An IP version 6 (IPv6) IP address fails over from one cluster node to another cluster node.  In this scenario, the Cluster service takes about 30 seconds to fail over the IPv6 IP address. This causes clients to wait for about 30 seconds to reconnect to the IPv6 IP address.  This issue occurs because the Cluster Resource DLL (ClusRes.dll) module only sends gratuitous Neighbor Advertisement messages for IP version 4 (IPv4) IP addresses, and not for IPv6 IP addresses. | | **Recommended Reading** | | [The Cluster service takes about 30 seconds to fail over IPv6 IP addresses in Windows Server 2008](http://support.microsoft.com/kb/2578103)  [The Cluster service takes about 30 seconds to fail over IPv6 IP addresses in Windows Server 2008](http://support.microsoft.com/kb/2578113) | | **Recommended Resolution** | | Windows 2008:  Review and Install the following Hotfix:  The Cluster service takes about 30 seconds to fail over IPv6 IP addresses in Windows Server 2008  http://support.microsoft.com/kb/2578103  Windows 2008 R2:  Review and Install the following Hotfix:  The Cluster service takes about 30 seconds to fail over IPv6 IP addresses in Windows Server 2008  http://support.microsoft.com/kb/2578113 | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Clusres.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21772 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Clusres.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21772 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Clusres.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21772 | |

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| [Machine inserted](#IssueLevelSummary) The hotfix 2616514 is not installed (2008 SP2, 2008 R2 SP1) |
| **Status** |
| Failed |
| **Description** |
| The hotfix 2616514 for efficient use of network bandwidth on WSFC is not installed (2008 SP2, 2008 R2 SP1). |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | For efficient use of network bandwidth on WSFC install the hotfix KB 2616514. | | **Importance** | | Consider the following scenario:  - You create a failover cluster among many nodes that are running Windows Server 2008 or Windows Server 2008 R2 with the Failover Cluster feature installed.  - A cluster-aware application, such as a SQL Server 2012 AlwaysOn Availability Group, registers for multiple registry key change notifications when changes are made to the cluster.  - There are some registry changes in the cluster. This is the expected behavior in a cluster that works correctly.  In this scenario, the Cluster service sends unnecessary notifications among cluster nodes. Specifically, each registry key change notification is sent to every cluster node by every other cluster node. The unnecessary propagation of registry notifications limits network bandwidth and is a serious issue in a large cluster environment. | | **Recommended Reading** | | [Cluster service sends unnecessary registry key change notifications among cluster nodes in Windows Server 2008 or in Windows Server 2008 R2](http://support.microsoft.com/kb/2616514) | | **Recommended Resolution** | | Install hotfix KB 2616514  http://support.microsoft.com/kb/2616514 | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.17730 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.17730 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.17730 | |

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| [Machine inserted](#IssueLevelSummary) The hotfix 2687741 is not installed (2008 R2 SP1) |
| **Status** |
| Failed |
| **Description** |
| Hotfix 2687741 to improve the performance of AlwaysOn Availability Groups failover to local replicas is not installed. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Install hotfix KB 2687741. This hotfix improves the performance of the AlwaysOn Availability Group feature in SQL Server 2012 so that failover occurs more quickly. | | **Importance** | | Assume that you enable the **AlwaysOn Availability Group** feature in Microsoft SQL Server 2012 on a Windows Server 2008 R2-based failover cluster. However, when you use local and remote Availability Group database replicas, the failover time to the local replica takes longer than expected.    **Note** This issue occurs because of inter-node communication within the cluster. | | **Recommended Reading** | | [A hotfix that improves the performance of the "AlwaysOn Availability Group" feature in SQL Server 2012 is available for Windows Server 2008 R2](http://support.microsoft.com/KB/2687741) | | **Recommended Resolution** | | Install the hotfix described in Knowledge Base article 2687741  http://support.microsoft.com/KB/2687741 | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.21940  Cluswmi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21940 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.21940  Cluswmi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21940 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  ClusSvc.exe version is: 6.1.7601.17514. Required version is: 6.1.7601.21940  Cluswmi.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21940 | |

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| --- |
| [Machine inserted](#IssueLevelSummary) The hotfix 980915 is not installed (2003 and 2008 all versions) |
| **Status** |
| Failed |
| **Description** |
| The IPSec Connection delay hotfix 980915 is not installed (2008 all versions) |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | If your environment uses IPsec connections, you could experience a long time delay (about two or three minutes) when a client computer reestablishes the IPsec connection to a virtual network name (in this context, to connect to the availability group listener). If you use IPsec connections, we recommend that you review the specific scenarios detailed in Knowledge Base article (KB 980915). | | **Importance** | | Consider the following scenarios.  **Scenario 1**  - You have a Windows Server based cluster that uses Windows Network Load Balancing, Failover Clustering, a hardware load balancer, or a hardware cluster product.  - You establish an Internet Protocol Security (IPsec) connection to the cluster virtual IP from a computer that is running one of the following operating systems:          - Windows Server 2003          - Windows Vista          - Windows Server 2008          - Windows 7          - Windows Server 2008 R2  - One node fails in the cluster, or you manually restart the node, or you fail the node so that another node picks up the client connection.  **Scenario 2**  - A non-cluster Windows Server 2003-based operating system restarts in less than 6 minutes (such as a virtual machine), or restarts automatically within 6 minutes after a Stop error occurs.  - You establish an IP security (IPsec) connection to the operating system from another computer that is running one of the following operating systems:          - Windows Server 2003          - Windows Vista          - Windows Server 2008          - Windows 7          - Windows Server 2008 R2  - In these scenarios, you experience a long time delay (about two or three minutes) when the client computer reestablishes the IPsec connection to the cluster in scenario 1 and the non-cluster computer in scenario 2.  This issue occurs because IPsec is not optimally designed for reconnection scenarios. A large time-out value is associated with the current IPSec security association (SA). We also try an additional negotiation which has to time out. | | **Recommended Reading** | | [A long time delay occurs when you reconnect an IPSec connection from a computer that is running Windows Server 2003, Windows Vista, Windows Server 2008, Windows 7, or Windows Server 2008 R2](http://support.microsoft.com/kb/980915) | | **Recommended Resolution** | | Review the specific scenarios detailed in Knowledge Base article (KB 980915) and install the hotfix KB 980915 if necessary.  http://support.microsoft.com/kb/980915  After you install the hotfix package, you must create the following registry subkeys on the Windows Server 2003-based client computer:  HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\IPSec\NlbsIdleTime    HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\PolicyAgent\Oakley\NlbsIdle  Or, create the following registry subkeys on the client computer that is running Windows Vista, Windows Server 2008, Windows 7, or Windows Server 2008 R2:  HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\IKEEXT\Parameters\NlbsIdleTime    HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\IKEEXT\Parameters\NlbsQMRetransmitDuration  To do this, follow the steps that are described in the Registry information section of the KB Article. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Bfe.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21728  Fwpuclnt.dll version is: 6.1.7601.18283. Required version is: 6.1.7601.21728  Ikeext.dll version is: 6.1.7601.18283. Required version is: 6.1.7601.21728 | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Bfe.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21728  Fwpuclnt.dll version is: 6.1.7601.18283. Required version is: 6.1.7601.21728  Ikeext.dll version is: 6.1.7601.18283. Required version is: 6.1.7601.21728 | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Operating System is: Microsoft Windows Server 2008 R2 Enterprise Service Pack 1  Processor Architecture: AMD64  Bfe.dll version is: 6.1.7601.17514. Required version is: 6.1.7601.21728  Fwpuclnt.dll version is: 6.1.7601.18283. Required version is: 6.1.7601.21728  Ikeext.dll version is: 6.1.7601.18283. Required version is: 6.1.7601.21728 | |

Cluster Resources

Client/server applications rely on the availability of network services. These services are provided by resources, which are defined in this context as any entity residing on a server that can be managed by clustering software and that provides a service to clients in a client/server environment. For example, a public file share, a web server, and a database application can all be managed as resources.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) There is only one active network on the node of a cluster. |
| **Status** |
| Failed |
| **Description** |
| There is only one active network on the node of a cluster. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | The main consideration when designing Failover Cluster networks is to ensure there is built-in redundancy for cluster communications.This is typically accomplished by having a minimum of two physical Network Interface Cards (NICs) installed in each node that will be part of the cluster.These cards must be supported by two separate and distinct buses (e.g.Two PCI NICs).   The best configuration would be two multi-port NICs running on separate buses and having fault tolerance implemented by way of NIC Teaming software (provided by 3rd Party vendors.) and being physically connected to separate network switches.   It is important in any cluster that there are no NICs on the same node that are configured to be on the same subnet.This is because the cluster network driver uses the subnet to identify networks and will use the first one detected and ignore any other NICs configured on the same subnet on the same node.The cluster validation process will register a Warning if any network interfaces in a cluster node are configured to be on the same network.The only possible exception to this would be for iSCSI (Internet Small Computer System Interface) connections.If iSCSI is implemented in a cluster, and MPIO (Multi-Path Input/Output) is being used for fault-tolerant connections to iSCSI Storage, then it is possible that the network interfaces could be on the same network. In this configuration, the iSCSI network in the Failover Cluster Manager should be configured such that cluster would not use it for any cluster communications. | | **Importance** | | Having only one network in the cluster does not meet the minimum requirements for redundancy for cluster communications. | | **Recommended Reading** | | [Windows Server 2008 Failover Clusters: Networking (Part 2)](http://technet.microsoft.com/en-us/library/cc730919%28WS.10%29.aspx) | | **Recommended Resolution** | | Add additional network interfaces to the cluster to achieve the minimum requirements for networking. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMSQLP.CHOMP.ORG | The the number of cluster networks is less than 2.  The number of cluster networks found: 1 | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Cluster does not have a network whose role is configured as Internal Cluster Communications Only (private network). |
| **Status** |
| Failed |
| **Description** |
| Cluster does not have a network whose role is configured as Internal Cluster Communications Only (private network). |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Ensure that the private interface is configured for internal access. | | **How Microsoft Does IT** | | Microsoft IT ensures that private interfaces are configured for internal access. | | **Importance** | | Cluster nodes should have their private interface bound as internal to ensure that public adapter communication is used for client access. | | **Recommended Reading** | | [Recommended Private "Heartbeat" Configuration on a Cluster Server](http://support.microsoft.com/kb/258750/en-us) | | **Recommended Resolution** | | To modify network settings for a failover cluster  In the Failover Cluster Manager snap-in, if the cluster that you want to configure is not displayed, in the console tree, right-click Failover Cluster Manager, click Manage a Cluster, and then select or specify the cluster that you want.  If the console tree is collapsed, expand the tree under the cluster that you want to configure.  Expand Networks.  Right-click the network that you want to modify settings for, and then click Properties.  If needed, change the name of the network.  Select one of the following options:  Allow cluster network communication on this network  If you select this option and you want the network to be used by the nodes only (not clients), clear Allow clients to connect through this network. Otherwise, make sure it is selected. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMSQLP.CHOMP.ORG | 0 Internal cluster networks found. | |

SQL Server Maintenance

SQL Server Maintenance

Fine-tuning maintenance practices is the key activity for efficient execution of the SQL Server environment. These tasks include, but are not limited to Database Backups, Index re-builds, Updating statistics and so on.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Databases need data purity check |
| **Status** |
| Failed |
| **Description** |
| This rule fires when data purity needs to be checked for one or more databases |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Make sure to run data purity check for all databases that need it. | | **Importance** | | For databases created in versions prior to SQL Server 2005, and later brought to SQL Server 2005 and later, checking data purity will allow detecting data issues within the database, like column values not valid or out-of-range.  For databases created in SQL Server 2005 and later versions, this option is on by default and no further action is needed. | | **Recommended Reading** | | [DBCC CHECKDB (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176064.aspx)  [Troubleshooting DBCC error 2570 in SQL Server 2005 and later versions](http://support.microsoft.com/kb/923247) | | **Recommended Resolution** | | Use the following command to check data purity for a given database.  Under the context of the database, run : DBCC CHECKDB WITH DATA\_PURITY | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG;SXASECTRACKING |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;Prod61\_MT |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;DARTData |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;DART |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_StageCDC |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_Stage |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServerTempDB |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_MetaData |  | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_EPMPortal |  | |  |  |  | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) DBCC CHECKDB has not been run within seven days. |
| **Status** |
| Resolved |
| **Description** |
| DBCC CHECKDB remains an important tool for detecting and correcting logical consistency problems and physical corruption in the database. However, for large-scale databases utilizing a high quality SAN or storage subsystem, the specific recommendations this technical note presents can reduce the frequency of DBCC and certainly relax the prior standard of running such checks on daily basis. |
| **Additional Information** |
| |  | | --- | | **Importance** | | The frequency in which DBCC CHECKDB should be run against any particular database depends largely on the individual business needs and the importance of the information in the database. However, at a minimum, DBCC CHECKDB should be run against all production databases at least once a week.  DBCC CHECKDB should also be run on a regular basis to proactively identify inconsistencies in data structures and other types of corruption.   Failure to resolve the problems detected by DBCC CHECKDB in a timely manner can lead to significant data loss and to the server failing to respond. | | **Recommended Reading** | | [DBCC CHECKDB (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176064.aspx) | | **Recommended Resolution** | | DBCC CHECKDB should be run regularly. In addition, the results should be reviewed as soon as possible after execution completes in order to identify and resolve any errors before they become critical.   If DBCC CHECKDB uncovers any errors, it will specify the minimum repair level that should be used to fix the problem. Note that running DBCC CHECKDB with the repair option might not resolve the issue, depending on the type of damage uncovered. This could potentially result in a significant loss of data.   DBCC CHECKDB in Microsoft® SQL Server uses an internal database snapshot to perform the checks in order to avoid blocking and concurrency problems. However, because SQL Server 2005 and higher versions performs much more extensive checks than earlier versions, it may take considerably longer to complete. Thus, Microsoft recommends that the PHYSICAL\_ONLY option be used for frequent checks on production databases.   Because DBCC CHECKDB performs the following checks, you do not need to run these commands:  DBCC CHECKALLOC  DBCC CHECKTABLE  DBCC CHECKCATALOG | |
| **Annotation** |
| I setup a new job on 3p to run a DBCC CHECKDB on these databases. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG;DARTData | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_StageCDC | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_Stage | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServerTempDB | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM3P.CHOMP.ORG;CPM\_MetaData | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_EPMPortal | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare | Last clean DBCC execution date: Never Executed | | Machine inserted | SCMMAVM2P.CHOMP.ORG;EToolkit | Last clean DBCC execution date: Never Executed | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Databases identified that have not had a full database backup in the last 7 days |
| **Status** |
| Failed |
| **Description** |
| This rule checks if the database has been backed up within 7 days. To recover a database to the time of failure or to a specific point in time, you must restore the most recent full database backup, restore the most recent differential database backup, restore all transaction log file backups that are more recent than the last full or differential database backup, and manually initiate recovery. The time required to fully recover a database depends on the number and size of these backup files. To decrease the number of these files and improve the total recovery time, it is important to perform frequent full database backups. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Make a full database backup as often as is practical. If possible, make a full database backup every day. When dealing with large databases where long duration of backups impacts performance, use a less frequent schedule, but backup databases at least one a week. | | **Importance** | | Backups are required to restore a damaged database or to replace corrupted data. Lack of database backups will leave the environment exposed to complete data loss. Whether restoring to a specific point in time or to the time of failure, the most recent full database backup is needed to start the restore process. If log backups are used to reduce the amount of data loss, full database backups should be performed more frequently in order to reduce the number of log backups that need to be restored to reach the desired recovery point, and to reduce the total time needed for recovery. | | **Recommended Reading** | | [Introduction to Backup and Restore Strategies in SQL Server](http://msdn.microsoft.com/en-us/library/ms191239(v=SQL.105).aspx)  [Backup (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms186865.aspx) | | **Recommended Resolution** | | Backup all databases to protect against data loss. If practical, schedule full database backups to run every day; otherwise, backup databases less frequently, but no less than once per week. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM2P.CHOMP.ORG;Prod61\_MT | SQL Server Instance: SCMMAVM2P.CHOMP.ORG. Backup Days Old: none | | Machine inserted | SCMMAVM2P.CHOMP.ORG;EToolkit | SQL Server Instance: SCMMAVM2P.CHOMP.ORG. Backup Days Old: none | |

OS Information

OS Information

The OS Information data collection routine queries certain configuration information about every SQL Server in the environment scanned. This includes the operating system version, service pack level, uptime, and certain memory configuration settings.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) The Windows 2008/R2 and later OS power saving setting may affect the CPU performance |
| **Status** |
| Failed |
| **Description** |
| The Windows 2008/R2 and later OS power saving setting may affect the CPU performance. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | If the instance of SQL Server is under heavy load and is hosted by Windows Server 2008 or later OS, set the operating system power saving plan to High Performance. | | **Importance** | | In Windows Server 2008 and later OS, the default power saving setting is set to Balanced, which means that components such as CPU and storage will be scaled back if the system is not busy. In some cases this may result in performance degradation for SQL Server. | | **Recommended Reading** | | [Windows Server 2008 Power Savings](http://technet.microsoft.com/en-us/library/dd353192(v=Office.12).aspx)  [Degraded overall performance on Windows Server 2008 R2](http://support.microsoft.com/kb/2207548) | | **Recommended Resolution** | | If the instance of SQL Server is under heavy load, change the Windows power saving plan to High Performance. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | The configured Power Scheme is: @C:\Windows\system32\powrprof.dll,-15,Balanced | | Machine inserted | SCMMAVM2P.CHOMP.ORG | The configured Power Scheme is: @C:\Windows\system32\powrprof.dll,-15,Balanced | | Machine inserted | SCMMAVM1P.CHOMP.ORG | The configured Power Scheme is: @C:\Windows\system32\powrprof.dll,-15,Balanced | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) SQL Server is running on third-party OS Virtualization. |
| **Status** |
| Failed |
| **Description** |
| SQL Server is running on third-party OS Virtualization. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | Ensure that you are running SQL 2005, SQL 2008, and later versions, and consider the following: Server Virtualization Validation Program (SVVP) approved host OS.  · Windows Server 2003 SP2 or Windows Server 2008 or Windows Server 2008 R2 as guest OS.  · Do not run SQL 2000 Server or earlier versions in any virtualization environment.  · Use pass-through disks, or fixed-size VHDs for SQL data volumes. Dynamic VHDs are not recommended for performance reasons. Review this with your virtualization vendor.  · Virtualization Snapshots for any virtualization vendor are not supported for use with SQL Server in a virtual computer.  · Consult your virtualization provider for performance tuning and setup guidance. | | **Importance** | | Microsoft provides technical support for hosting SQL Server 2005 and SQL Server 2008 (this includes all components that that are included with SQL Server 2005 and 2008) on the following supported, hardware virtualization environments:  · Windows Server 2008 and Windows Server 2008 R2 with Hyper-V  · Microsoft Hyper-V Server 2008 and Hyper-V Server 2008 R2  · Configurations that are validated through the Server Virtualization Validation Program (SVVP) | | **Recommended Reading** | | [Support policy for Microsoft SQL Server products that are running in a hardware virtualization environment](http://support.microsoft.com/kb/956893)  [Support policy for Microsoft software running in non-Microsoft hardware virtualization software](http://support.microsoft.com/kb/897615)  [Server Virtualization Validation Program](http://windowsservercatalog.com/svvp.aspx?svvppage=svvp.htm) | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Virtualization platform: VMWare | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Virtualization platform: VMWare | | Machine inserted | SCMMAVM1P.CHOMP.ORG | Virtualization platform: VMWare | |

Event Logs

Event Logs

The Event Logs test gathers all errors and warnings for the previous five days across the system and application.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Application Event Log: Microsoft Operations Manager: 26009: No connection could be made because the target computer actively refused it. |
| **Status** |
| Failed |
| **Description** |
| This event may indicate that there are problems with a MOM agent. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | The issue could be due to a known issue fixed through a hotfix. Consider applying the hotfix to resolve this issue. | | **Importance** | | This event may indicate that there are problems with a MOM agent. | | **Recommended Reading** | | [Event ID: 26009 occurs after a MOM 2005 agent tries to fail over to the secondary MOM 2005 server](http://support.microsoft.com/kb/934441)  [(http://support.microsoft.com/kb/934441)](http://support.microsoft.com/kb/934441) | | **Recommended Resolution** | | This issue may be due to a known problem described in the article referenced in the Recommended Reading section. Please check the article for the detailed steps. If you need further assistance and consistently see this issue, consider opening a support incident with the Microsoft CSS team to help research this further. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | This event may indicate that there are problems with a MOM agent. This Event ID ‘26009’ from Microsoft Operations Manager occurred in the System log 0 times and Application log 3 times. | | Machine inserted | SCMMAVM2P.CHOMP.ORG | This event may indicate that there are problems with a MOM agent. This Event ID ‘26009’ from Microsoft Operations Manager occurred in the System log 0 times and Application log 3 times. | | Machine inserted | SCMMAVM1P.CHOMP.ORG | This event may indicate that there are problems with a MOM agent. This Event ID ‘26009’ from Microsoft Operations Manager occurred in the System log 0 times and Application log 3 times. | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) System Event Log: DCOM: 10009: DCOM was unable to communicate with the computer using any of the configured protocols. |
| **Status** |
| Failed |
| **Description** |
| This indicates a potential failure of DCOM calls. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | This issue needs to be investigated and the incorrect configuration corrected. | | **Importance** | | This indicates a potential failure of DCOM calls. | | **Recommended Reading** | | [BUG: COM+ Incorrectly Lets You Configure Datagram Protocol](http://support.microsoft.com/kb/245197)  [(http://support.microsoft.com/kb/245197)](http://support.microsoft.com/kb/245197)   [Event ID 10009 — COM Remote Service Availability(Windows 2008)](http://technet.microsoft.com/en-us/library/cc774368(WS.10).aspx)  [(http://technet.microsoft.com/en-us/library/cc774368(WS.10).aspx)](http://technet.microsoft.com/en-us/library/cc774368(WS.10).aspx) | | **Recommended Resolution** | | Although this can be due to many possible reasons, the most common reason would be incorrectly named servers or incompatible protocols selected for DCOM communication. If you need further assistance and consistently see this issue, consider opening a support incident with the Microsoft CSS team to help research this further. Also refer the "  Event ID 10009 — COM Remote Service Availability(Windows 2008)" article mentioned in the recommended reading section for resolution steps. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM2P.CHOMP.ORG | This indicates a potential failure of DCOM calls. This Event ID ‘10009’ from Microsoft-Windows-DistributedCOM occurred in the System log 26 times and Application log 0 times. | | Machine inserted | SCMMAVM1P.CHOMP.ORG | This indicates a potential failure of DCOM calls. This Event ID ‘10009’ from Microsoft-Windows-DistributedCOM occurred in the System log 10390 times and Application log 0 times. | |

SQL Error Log

SQL Error Log

SQL Error log is the key source in which SQL Server instance records several errors, warnings and informative messages. It is important to monitor the SQL Error log on a regular basis and take corrective actions against the errors and warnings.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) SQL Error Log: 18204: Backup device failed. |
| **Status** |
| Resolved |
| **Description** |
| Backup device failed. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | This error message usually occurs as a result of incorrect permissions to the network drive or when the MSSQLSERVER account does not have the correct access permissions to the folder where the backup file is to be created. | | **Importance** | | This message indicates that the operating system was unable to open or close a backup device (disk, tape, or pipe) specified as part of a BACKUP or RESTORE command. | | **Recommended Reading** | | [%1: Backup device '%2' failed to %3. Operating system error = %4](http://www.microsoft.com/technet/support/ee/transform.aspx?ProdName=SQL+Server&ProdVer=2000.80.760.0&EvtID=18204&EvtSrc=MSSQLServer&LCID=1033)  [You cannot back up databases to a network drive if your account have not sufficient permissions to access the network drive](http://support.microsoft.com/kb/207187)  [SQL Server Backup to Remote Drive Does Not Work, Generates 'Error 18204 Access is Denied' Message](http://support.microsoft.com/kb/255235) | | **Recommended Resolution** | | To resolve this behavior, make sure that the MSSQLSERVER account has been granted the Access this computer from the network user right on the remote computer, and that it has Full Control permissions to the folder where the backup file is to be created. If the backup file already exists on the remote share, make sure the MSSQLSERVER account has Full Control permissions to the existing file.  If it was related to backup to a network drive then check the detailed steps in article KB207187. | |
| **Annotation** |
| This is a known issue and was for testing purpose. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM2P.CHOMP.ORG | Error Count: 2  Last time Recorded: 1/16/2014 3:08:17 PM | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) SQL Error Log: 1105: Could not allocate space for objects, file group is full. |
| **Status** |
| Resolved |
| **Description** |
| Could not allocate space for object in database because the filegroup is full, Create disk space by deleting unneeded files, dropping objects in the filegroup, adding additional files to the filegroup, or setting autogrowth on for existing files in the filegroup. |
| **Additional Information** |
| |  | | --- | | **Best Practice Guidance** | | The following actions may make space available in the filegroup:  · Turn on Autogrow.  · Add more files to the file group.  · Free disk space by dropping index or tables that are no longer needed.  For more information, see Troubleshooting Insufficient Data Disk Space in SQL Server Books Online. | | **Importance** | | No disk space is available in a filegroup. | | **Recommended Reading** | | [MSSQLSERVER\_1105](http://msdn.microsoft.com/en-us/library/aa337441.aspx) | | **Recommended Resolution** | | Monitor the database for insufficient space and manually expand the database as necessary. Inserts and updates that allocate new pages will be blocked while the database is expanding. Thus, this operation should be performed during normal maintenance hours. | |
| **Annotation** |
| Known issue. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG | Error Count: 8  Last time Recorded: 2/8/2014 10:51:15 AM | |

Performance

SQL Server Performance

The Performance Information test queries certain performance statistics for each SQL Server host. These statistics include overall CPU usage, sqlserver.exe CPU and memory usage, open sessions and files, total logons, and so forth. This test performs a certain number of snapshots over a specific period of time and averages the results. However, it is not intended to replace long-term performance benchmarks and trending analysis tools. Instead, this test helps identify and verify potential performance issues.

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Disk Write response times are too long. |
| **Status** |
| Failed |
| **Description** |
| Disk response times are too long. Disk sec/Write were outside of recommended values.  Avg. Disk sec/Write is the average time, in seconds, of a write of data to the disk.  Non cached Writes  Excellent less than 08 Msec ( .008 seconds )  Good less than 12 Msec ( .012 seconds )  Fair less than 20 Msec ( .020 seconds )  Poor greater than 20 Msec ( .020 seconds )  Cached Writes Only  Excellent less than 01 Msec ( .001 seconds )  Good less than 02 Msec ( .002 seconds )  Fair less than 04 Msec ( .004 seconds )  Poor greater than 04 Msec ( .004 seconds) |
| **Additional Information** |
| |  | | --- | | **Importance** | | At least one drive has an average read or write response time that is over 10 milliseconds (ms). There is the risk of degraded performance. | | **Recommended Resolution** | | Investigate disk performance. In addition, identify queries that are using excessive reads or writes and tune them to reduce I/O. Consider moving highly active databases requiring significant I/O to drives that are less utilized. Use SQLIO.exe or IOmeter.exe ([http://www.iometer.org](http://www.iometer.org/)) during low usage hours to test whether the storage system is configured for maximum throughput. | |
| **Annotation** |
|  |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG\H:\ | Logical Drive Letter: H:  Failed Time-Slices:  2/22/2014 12:14:29 AM-Avg. Disk sec/Write (H:)-0.0229721035956644  2/22/2014 12:34:29 AM-Avg. Disk sec/Write (H:)-0.0315795632622062  2/22/2014 12:54:29 AM-Avg. Disk sec/Write (H:)-0.0831020801310805 | |

|  |
| --- |
| [Machine inserted](#IssueLevelSummary) Disk Read response times are too long. |
| **Status** |
| Resolved |
| **Description** |
| Disk Read response times are too long. Disk sec/Read was outside of recommended values.  Avg. Disk sec/Read is the average time, in seconds, of a read of data from the disk.  Reads  Excellent less than 08 Msec ( .008 seconds )  Good less than 12 Msec ( .012 seconds )  Fair less than 20 Msec ( .020 seconds )  Poor greater than 20 Msec ( .020 seconds ) |
| **Additional Information** |
| |  | | --- | | **Importance** | | At least one drive has an average read response time that is over 10 milliseconds (ms). There is the risk of degraded performance. | | **Recommended Resolution** | | Investigate disk performance. In addition, identify queries that are using excessive reads or writes and tune them to reduce I/O. Consider moving highly active databases requiring significant I/O to drives that are less utilized. Use SQLIO.exe or IOmeter.exe (http://www.iometer.org) during low usage hours to test whether the storage system is configured for maximum throughput. | |
| **Annotation** |
| False positive...customer wants to re-validate the finding using perfmon over an extended period of time. |
| **Affected Nodes** |
| |  |  |  | | --- | --- | --- | | Machine inserted | SCMMAVM3P.CHOMP.ORG\H:\ | Logical Drive Letter: H:  Failed Time-Slices:  2/22/2014 12:14:29 AM-Avg. Disk sec/Read (H:)-0.015572966849646  2/22/2014 12:34:29 AM-Avg. Disk sec/Read (H:)-0.0103881194742672  2/22/2014 12:54:29 AM-Avg. Disk sec/Read (H:)-0.0209093286277181 | | Machine inserted | SCMMAVM3P.CHOMP.ORG\E:\ | Logical Drive Letter: E:  Failed Time-Slices:  2/22/2014 12:14:29 AM-Avg. Disk sec/Read (E:)-0.0084151810331845  2/22/2014 12:34:29 AM-Avg. Disk sec/Read (E:)-0.00815823418227288  2/22/2014 12:54:29 AM-Avg. Disk sec/Read (E:)-0.00866167024098105 | | Machine inserted | SCMMAVM1P.CHOMP.ORG\E:\ | Logical Drive Letter: E:  Failed Time-Slices:  2/22/2014 12:14:29 AM-Avg. Disk sec/Read (E:)-0.00942999153627062  2/22/2014 12:34:29 AM-Avg. Disk sec/Read (E:)-0.0105146688243229  2/22/2014 12:54:29 AM-Avg. Disk sec/Read (E:)-0.0092865106840715 | |

All Issues Table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name | Tags | Severity | Classification | Status | Description | Annotation | Affected Objects | Recommended Reading |
| **Database(s) identified with recovery model set to Simple** | Database Options | High | Risk | Resolved | This issue is raised when one or more user database’s recovery model is set to SIMPLE recovery mode. | These databases do not need point in time recovery by design. | SCMMAVM3P.CHOMP.ORG; Prod61\_MT; SCMMAVM3P.CHOMP.ORG; cpm\_StageCDC; SCMMAVM3P.CHOMP.ORG; cpm\_Stage; SCMMAVM3P.CHOMP.ORG; CPM\_ReportServerTempDB; SCMMAVM3P.CHOMP.ORG; CPM\_ReportServer; SCMMAVM3P.CHOMP.ORG; CPM\_MetaData; SCMMAVM3P.CHOMP.ORG; cpm\_EPMPortal; SCMMAVM3P.CHOMP.ORG; cpm\_AcuteCare; SCMMAVM2P.CHOMP.ORG; Prod61\_MT; SCMMAVM2P.CHOMP.ORG; EToolkit | [Backup Under the Simple Recovery Model](http://msdn.microsoft.com/en-us/library/ms191164(v=SQL.105).aspx)  [Recovery Models (SQL Server)](http://technet.microsoft.com/en-us/library/ms189275.aspx)  [View or Change the Recovery Model of a Database](http://technet.microsoft.com/en-us/library/ms189272.aspx)  [ALTER DATABASE SET Options (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb522682.aspx) |
| **Databases identified with one or more tables, with indexes that may require update statistics** | Database Indexes | High | Risk | Resolved | Updating statistics ensures that queries compile with up-to-date statistics. The query optimizer uses statistics to create query plans that improve query performance. | I setup some new statistics rebuild jobs to cover these databases. | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES; SCMMAVM1P.CHOMP.ORG;ELinkQueues; SCMMAVM1P.CHOMP.ORG;Prod61; SCMMAVM1P.CHOMP.ORG;PROD61\_MT; SCMMAVM1P.CHOMP.ORG;ReportServer; SCMMAVM1P.CHOMP.ORG;ReportServerTempDB; SCMMAVM1P.CHOMP.ORG;RTScheduler; SCMMAVM1P.CHOMP.ORG;Tlkernel; SCMMAVM2P.CHOMP.ORG;Prod61\_MT; SCMMAVM3P.CHOMP.ORG;Argent | [SQL Server Books Online: Index Statistics](http://technet.microsoft.com/en-us/library/ms190397.aspx)  [SQL Server Books Online: CREATE STATISTICS (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms188038.aspx)  [SQL Server Books Online: UPDATE STATISTICS (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms187348.aspx)  [SQL Server Books Online: DBCC SHOW\_STATISTICS (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms174384.aspx) |
| **Databases need data purity check** | SQL Server maintenance | High | Risk | Failed | This rule fires when data purity needs to be checked for one or more databases |  | SCMMAVM3P.CHOMP.ORG;SXASECTRACKING; SCMMAVM3P.CHOMP.ORG;Prod61\_MT; SCMMAVM3P.CHOMP.ORG;DARTData; SCMMAVM3P.CHOMP.ORG;DART; SCMMAVM3P.CHOMP.ORG;cpm\_StageCDC; SCMMAVM3P.CHOMP.ORG;cpm\_Stage; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServerTempDB; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer; SCMMAVM3P.CHOMP.ORG;CPM\_MetaData; SCMMAVM3P.CHOMP.ORG;cpm\_EPMPortal | [DBCC CHECKDB (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176064.aspx)  [Troubleshooting DBCC error 2570 in SQL Server 2005 and later versions](http://support.microsoft.com/kb/923247) |
| **DBCC CHECKDB has not been run within seven days.** | SQL Server maintenance | High | Health | Resolved | DBCC CHECKDB remains an important tool for detecting and correcting logical consistency problems and physical corruption in the database. However, for large-scale databases utilizing a high quality SAN or storage subsystem, the specific recommendations this technical note presents can reduce the frequency of DBCC and certainly relax the prior standard of running such checks on daily basis. | I setup a new job on 3p to run a DBCC CHECKDB on these databases. | SCMMAVM3P.CHOMP.ORG;DARTData; SCMMAVM3P.CHOMP.ORG;cpm\_StageCDC; SCMMAVM3P.CHOMP.ORG;cpm\_Stage; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServerTempDB; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer; SCMMAVM3P.CHOMP.ORG;CPM\_MetaData; SCMMAVM3P.CHOMP.ORG;cpm\_EPMPortal; SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare; SCMMAVM2P.CHOMP.ORG;EToolkit | [DBCC CHECKDB (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176064.aspx) |
| **Disk Write response times are too long.** | SQL Performance | High | Risk | Failed | Disk response times are too long. Disk sec/Write were outside of recommended values.  Avg. Disk sec/Write is the average time, in seconds, of a write of data to the disk.  Non cached Writes  Excellent less than 08 Msec ( .008 seconds )  Good less than 12 Msec ( .012 seconds )  Fair less than 20 Msec ( .020 seconds )  Poor greater than 20 Msec ( .020 seconds )  Cached Writes Only  Excellent less than 01 Msec ( .001 seconds )  Good less than 02 Msec ( .002 seconds )  Fair less than 04 Msec ( .004 seconds )  Poor greater than 04 Msec ( .004 seconds) |  | SCMMAVM3P.CHOMP.ORG\H:\ |  |
| **Hotfix to eliminate incorrect warnings or errors in the validation report when disks are online is not installed.** | Cluster Hotfixes | High | Risk | Failed | The recommended hotfix 2531907 to eliminate incorrect warnings or errors in the validation report when disks are online is not installed (2008 R2 SP1). |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Validate SCSI Device Vital Product Data (VPD) test fails after you install Windows Server 2008 R2 SP1](http://support.microsoft.com/kb/2531907) |
| **Indexes have been identified with an index key larger than the recommended size (900 bytes)** | Database Indexes | High | Health | Failed | Indexes identified with row length greater than max value 900 bytes |  | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES; SCMMAVM1P.CHOMP.ORG;ReportServer; SCMMAVM1P.CHOMP.ORG;XAES; SCMMAVM3P.CHOMP.ORG;Argent; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer; SCMMAVM3P.CHOMP.ORG;DART | [sys.dm\_db\_index\_physical\_stats (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms188917.aspx)  [Create Indexes with Included Columns](http://msdn.microsoft.com/en-us/library/ms190806.aspx) |
| **Security logging in the SQL Server environment is not done.** | Security | High | Risk | Resolved | Security logging in the SQL Server environment not done. | The application has it's own auditing enabled and does not require SQL auditing enabled. |  | [SQL Server 2008 R2 Security Best Practices - Operational and Administrative Tasks](http://download.microsoft.com/download/1/2/A/12ABE102-4427-4335-B989-5DA579A4D29D/SQL_Server_2008_R2_Security_Best_Practice_Whitepaper.docx)  [Security and Protection (Database Engine)](http://technet.microsoft.com/en-us/library/bb510589.aspx)  [Security Considerations for a SQL Server Installation](http://technet.microsoft.com/en-us/library/ms144228.aspx)[SQL Server Separation of Duties Whitepaper](http://download.microsoft.com/download/D/2/D/D2D931E9-B6B5-4E3B-B0AF-22C749F9BB7E/SQL_Server_Separation_of_Duties_White_Paper_Jul2011.docx)  [SQL Server Common Criteria Certifications](http://www.microsoft.com/sqlserver/en/us/common-criteria.aspx) |
| **SQL Error Log: 18204: Backup device failed.** | SQL Error Log | High | Risk | Resolved | Backup device failed. | This is a known issue and was for testing purpose. | SCMMAVM2P.CHOMP.ORG | [%1: Backup device '%2' failed to %3. Operating system error = %4](http://www.microsoft.com/technet/support/ee/transform.aspx?ProdName=SQL+Server&ProdVer=2000.80.760.0&EvtID=18204&EvtSrc=MSSQLServer&LCID=1033)  [You cannot back up databases to a network drive if your account have not sufficient permissions to access the network drive](http://support.microsoft.com/kb/207187)  [SQL Server Backup to Remote Drive Does Not Work, Generates 'Error 18204 Access is Denied' Message](http://support.microsoft.com/kb/255235) |
| **SQL Server logins identified with passwords same as logins** | SQL Security | High | Risk | Failed | SQL Server logins identified with passwords same as SQL logins. |  | SCMMAVM1P.CHOMP.ORG | [Password Policy](http://msdn.microsoft.com/en-us/library/ms161959.aspx)  [Understanding Password Policy for SQL Server Logins](http://support.microsoft.com/kb/2028712)  [PWDCOMPARE (Transact-SQL)](http://msdn.microsoft.com/en-us/library/dd822792.aspx)  [CREATE LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189751.aspx)  [ALTER LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189828.aspx)  [Microsoft Baseline Security Analyzer 2.2 (for IT Professionals)](http://www.microsoft.com/en-us/download/details.aspx?id=7558) |
| **SQL Server service is running under an account that is a member of the built-in Administrators group** | SQL Security | High | Risk | Resolved | SQL Server service is running under an account that is a member of the built-in Administrators group. | Business requirement as per vendor. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Guidelines on choosing Service Accounts for SQL Server Services](http://support.microsoft.com/kb/2160720)  [Change the Service Startup Account for SQL Server (SQL Server Configuration Manager)](http://msdn.microsoft.com/en-us/library/ms345578.aspx)  [Configure Windows Service Accounts and Permissions](http://technet.microsoft.com/en-us/library/ms143504.aspx) |
| **The hotfix 2494036 is not installed (2008 SP2, 2008 R2, 2008 R2 SP1)** | Cluster Hotfixes | High | Risk | Failed | Hotfix to configure WSFC optimal quorum with non-automatic failover targets is not installed (2008 SP2, 2008 R2, 2008 R2 SP1). |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [For information about quorum voting, see WSFC Quorum Modes and Voting Configuration (SQL Server)](http://msdn.microsoft.com/en-us/library/hh270280)  [A hotfix is available to let you configure a cluster node that does not have quorum votes in Windows Server 2008 and in Windows Server 2008 R2](http://support.microsoft.com/kb/2494036) |
| **The hotfix 2578103 or 2578113 is not installed (2008 SP2, 2008 R2, 2008 R2 SP1)** | Cluster Hotfixes | High | Risk | Failed | IPV6 hotfix is not installed |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [The Cluster service takes about 30 seconds to fail over IPv6 IP addresses in Windows Server 2008](http://support.microsoft.com/kb/2578103)  [The Cluster service takes about 30 seconds to fail over IPv6 IP addresses in Windows Server 2008](http://support.microsoft.com/kb/2578113) |
| **The hotfix 2616514 is not installed (2008 SP2, 2008 R2 SP1)** | Cluster Hotfixes | High | Risk | Failed | The hotfix 2616514 for efficient use of network bandwidth on WSFC is not installed (2008 SP2, 2008 R2 SP1). |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Cluster service sends unnecessary registry key change notifications among cluster nodes in Windows Server 2008 or in Windows Server 2008 R2](http://support.microsoft.com/kb/2616514) |
| **The hotfix 2687741 is not installed (2008 R2 SP1)** | Cluster Hotfixes | High | Risk | Failed | Hotfix 2687741 to improve the performance of AlwaysOn Availability Groups failover to local replicas is not installed. |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [A hotfix that improves the performance of the "AlwaysOn Availability Group" feature in SQL Server 2012 is available for Windows Server 2008 R2](http://support.microsoft.com/KB/2687741) |
| **The hotfix 980915 is not installed (2003 and 2008 all versions)** | Cluster Hotfixes | High | Risk | Failed | The IPSec Connection delay hotfix 980915 is not installed (2008 all versions) |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [A long time delay occurs when you reconnect an IPSec connection from a computer that is running Windows Server 2003, Windows Vista, Windows Server 2008, Windows 7, or Windows Server 2008 R2](http://support.microsoft.com/kb/980915) |
| **The SQL Server configuration setting, scan for startup procs, has been changed from the default value.** | SQL Configurations | High | Risk | Resolved | The value for this option can be set by using sp\_configure; however, it will be set automatically if you use sp\_procoption, which is used to mark or unmark automatically run stored procedures. When sp\_procoption is used to mark the first stored procedure as an autoproc, this option is set automatically to a value of 1. When sp\_procoption is used to unmark the last stored procedure as an autoproc, this option is automatically set to a value of 0. If you use sp\_procoption to mark and unmark autoprocs, and if you always unmark autoprocs before dropping them, there is no need to set this option manually.  The Default Value: 0 | This is a vendor required configuration setting. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [scan for startup procs Option](http://msdn2.microsoft.com/en-us/library/ms179460.aspx)  [sp\_procoption (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms181720.aspx) |
| **The SQL Server configuration setting, user options, has been changed from the default value.** | SQL Configurations | High | Risk | Resolved | The SQL Server configuration setting user options has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | Vendor requirement. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188787.aspx)  [user options Option](http://msdn.microsoft.com/en-us/library/ms176031(SQL.105).aspx) |
| **The SQL Server Configuration setting, xp\_cmdshell, is enabled** | SQL Configurations | High | Risk | Resolved | The SQL Server configuration xp\_cmdshell has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | This has been disabled to bring it inline with the other two nodes. | SCMMAVM2P.CHOMP.ORG | [xp\_cmdshell (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms175046.aspx)  [xp\_cmdshell Server Configuration Option](http://technet.microsoft.com/en-us/library/ms190693.aspx)  [SAP with Microsoft SQL Server 2008 and SQL Server 2005](http://scn.sap.com/docs/DOC-1006) |
| **The Value configured for SQL Server Configuration, Max Degree of parallelism may impact your SQL Server instance performance.** | SQL Configurations | High | Risk | Resolved | The SQL Server configuration, max degree of parallelism option is not configured in conjunction with the number of CPU's within a NUMA node. | I have changed this configuration setting to bring it in line with the other nodes. | SCMMAVM2P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [max degree of parallelism Option](http://msdn2.microsoft.com/en-us/library/ms181007.aspx)[General guidelines to use to configure the MAXDOP option](http://support.microsoft.com/kb/329204)  [OLTP Blueprint - A Performance Profile of OLTP Applications](http://blogs.msdn.com/sqlcat/archive/2006/06/23/Tom-Davidson-SQLCAT-Best-Practices.aspx) |
| **The Windows 2008/R2 and later OS power saving setting may affect the CPU performance** | OS Configurations for SQL | High | Risk | Failed | The Windows 2008/R2 and later OS power saving setting may affect the CPU performance. |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Windows Server 2008 Power Savings](http://technet.microsoft.com/en-us/library/dd353192(v=Office.12).aspx)  [Degraded overall performance on Windows Server 2008 R2](http://support.microsoft.com/kb/2207548) |
| **There are foreign keys with no supporting indexes** | Database Indexes | High | Risk | Failed | One or more tables found, with foreign key constraint defined but no supporting indexes created on the foreign key columns. |  | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES; SCMMAVM1P.CHOMP.ORG;ELinkCore; SCMMAVM1P.CHOMP.ORG;ELinkQueues; SCMMAVM1P.CHOMP.ORG;Prod61; SCMMAVM1P.CHOMP.ORG;Prod61\_img; SCMMAVM1P.CHOMP.ORG;Prod61\_mnc; SCMMAVM1P.CHOMP.ORG;ReportServer; SCMMAVM1P.CHOMP.ORG;ReportServerTempDB; SCMMAVM1P.CHOMP.ORG;RTScheduler; SCMMAVM1P.CHOMP.ORG;XAES | [FOREIGN KEY Constraints](http://msdn.microsoft.com/en-us/library/ms175464.aspx) |
| **There is only one active network on the node of a cluster.** | Cluster Resource | High | Health | Failed | There is only one active network on the node of a cluster. |  | SCMSQLP.CHOMP.ORG | [Windows Server 2008 Failover Clusters: Networking (Part 2)](http://technet.microsoft.com/en-us/library/cc730919%28WS.10%29.aspx) |
| **“Allow log on locally” user right may have granted for non-administrative members.** | SQL Security | Medium | Risk | Failed | “Allow log on locally” user right may have granted for non-administrative members.  The rule fires for any other users or groups except Administrators, Backup Operators and Power Users |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Allow log on locally](http://technet.microsoft.com/en-us/library/cc756809.aspx) |
| **Application Event Log: Microsoft Operations Manager: 26009: No connection could be made because the target computer actively refused it.** | Event Log Analysis | Medium | Risk | Failed | This event may indicate that there are problems with a MOM agent. |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Event ID: 26009 occurs after a MOM 2005 agent tries to fail over to the secondary MOM 2005 server](http://support.microsoft.com/kb/934441)  [(http://support.microsoft.com/kb/934441)](http://support.microsoft.com/kb/934441) |
| **Data and Transaction Log files are not on separate drives for user databases** | Database Files | Medium | Risk | Resolved | This issue is fired when our assessment locates one or more disk volumes host both the SQL Server Database data files and Transaction log files belong to one or more user databases. | It's a known fact for the user database. | SCMMAVM3P.CHOMP.ORG | [Place Data and Log Files on Separate Drives](http://technet.microsoft.com/en-us/library/bb402876.aspx)  [Separate database and transaction log files on different drives for optimal performance and disaster recovery](http://support.microsoft.com/kb/2033523)  [Moving Database Files](http://msdn.microsoft.com/en-us/library/ms189133(v=SQL.100).aspx) |
| **Database(s) identified with page verify option not set to CHECKSUM** | Database Options | Medium | Risk | Resolved | One or more User databases were found with page verify not set to CHECKSUM option | I switched from 'page verify' to 'checksum' on the listed databases. | SCMMAVM3P.CHOMP.ORG:SXASECTRACKING; SCMMAVM3P.CHOMP.ORG:DART; SCMMAVM3P.CHOMP.ORG:cpm\_StageCDC; SCMMAVM3P.CHOMP.ORG:cpm\_Stage; SCMMAVM3P.CHOMP.ORG:CPM\_MetaData; SCMMAVM3P.CHOMP.ORG:cpm\_AcuteCare; SCMMAVM3P.CHOMP.ORG:Argent | [ALTER DATABASE SET Options (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb522682.aspx) |
| **Databases identified with auto-growth set to percentage growth** | Database Files | Medium | Risk | Resolved | This rule verifies the data and log files for all user databases and the TempDB system database if the auto grow setting is set to % growth. | These database have been configured with fixed size file growth. | SCMMAVM3P.CHOMP.ORG;SXASECTRACKING;File: SXASecTracking\_Log; SCMMAVM3P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Log; SCMMAVM3P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Data; SCMMAVM3P.CHOMP.ORG;DARTData;File: DARTData\_log; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer;File: CPM\_ReportServer\_log; SCMMAVM3P.CHOMP.ORG;cpm\_EPMPortal;File: cpm\_EPMPortal\_log; SCMMAVM2P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Log; SCMMAVM2P.CHOMP.ORG;Prod61\_MT;File: Global\_Vantage\_Data; SCMMAVM2P.CHOMP.ORG;EToolkit;File: EToolkit\_log; SCMMAVM1P.CHOMP.ORG;XAES;File: XAES\_log | [Considerations for the “autogrow” and “autoshrink” settings in SQL Server](http://support.microsoft.com/kb/315512)  [ALTER DATABASE (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms174269.aspx) |
| **Define a process to monitor and track resource usage.** | Monitoring | Medium | Risk | Resolved | Define a process to monitor and track resource usage. | SCOM is in place. |  | [Establish a Performance Baseline](http://technet.microsoft.com/en-us/library/ms190943.aspx)  [Monitor and Tune for Performance](http://msdn.microsoft.com/en-us/library/ms189081.aspx)  [Operations Manager](http://technet.microsoft.com/en-us/library/hh205987.aspx)  [SQL Server Utility Features and Tasks](http://msdn.microsoft.com/en-us/library/ee210548.aspx)  [SQL Server 2005/2008 Performance Statistics collection scripts](http://sqlnexus.codeplex.com/wikipage?title=Sql2005PerfStatsScript&referringTitle=Home)  [TechNet Webcast: SQL Server Performance Counter Guidance (Level 300)](https://msevents.microsoft.com/cui/EventDetail.aspx?culture=en-US&EventId=1032357640&CountryCode=US) |
| **Disk Read response times are too long.** | SQL Performance | Medium | Risk | Resolved | Disk Read response times are too long. Disk sec/Read was outside of recommended values.  Avg. Disk sec/Read is the average time, in seconds, of a read of data from the disk.  Reads  Excellent less than 08 Msec ( .008 seconds )  Good less than 12 Msec ( .012 seconds )  Fair less than 20 Msec ( .020 seconds )  Poor greater than 20 Msec ( .020 seconds ) | False positive...customer wants to re-validate the finding using perfmon over an extended period of time. | SCMMAVM3P.CHOMP.ORG\H:\; SCMMAVM3P.CHOMP.ORG\E:\; SCMMAVM1P.CHOMP.ORG\E:\ |  |
| **Fragmented indexes were found** | Database Indexes | Medium | Health | Failed | This issue is raised when the average logical fragmentation exceeds 10% and also the table contains more than 500 SQL Server pages. |  | SCMMAVM1P.CHOMP.ORG; CHOMP\_TABLES; SCMMAVM1P.CHOMP.ORG; ELinkQueues; SCMMAVM1P.CHOMP.ORG; Prod61; SCMMAVM1P.CHOMP.ORG; PROD61\_MT; SCMMAVM1P.CHOMP.ORG; Prod61\_vm; SCMMAVM1P.CHOMP.ORG; ReportServer; SCMMAVM1P.CHOMP.ORG; ReportServerTempDB; SCMMAVM1P.CHOMP.ORG; RTScheduler; SCMMAVM1P.CHOMP.ORG; XAES; SCMMAVM1P.CHOMP.ORG; xaes\_EAS | [ALTER INDEX (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms188388.aspx)  [sys.dm\_db\_index\_physical\_stats](http://msdn.microsoft.com/en-us/library/ms188917.aspx)  [Reorganizing and Rebuilding Indexes](http://msdn.microsoft.com/en-US/library/ms189858(v=SQL.90).aspx)  [SQL Server Settings That Should Not Be Changed [BizTalk]](http://msdn.microsoft.com/en-us/library/ee308910(v=bts.10).aspx) |
| **Non-Default logins are provisioned to SQL Server sysadmin server role.** | SQL Security | Medium | Risk | Failed | One or more SQL Server instances found with Non-Default logins are provisioned to SQL Server sysadmin server role. |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [How to impede Windows NT administrators from administering a clustered instance of SQL Server](http://support.microsoft.com/kb/263712)  [SQL Server 2008 R2 Security Changes](http://technet.microsoft.com/en-us/library/cc280562(SQL.105).aspx) |
| **One or more user database files are placed on the same volume as TempDB database files** | Database Files | Medium | Risk | Resolved | This issue is fired when our assessment locates one or more disk volumes host both the SQL Server user Database data files and tempdb data files | Reportservertempdb is on the Tempdb drive and it is okay. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Optimizing tempdb Performance](http://msdn.microsoft.com/en-us/library/ms175527(v=sql.105).aspx)  [Move System Databases](http://technet.microsoft.com/en-us/library/ms345408.aspx) |
| **SQL Error Log: 1105: Could not allocate space for objects, file group is full.** | SQL Error Log | Medium | Health | Resolved | Could not allocate space for object in database because the filegroup is full, Create disk space by deleting unneeded files, dropping objects in the filegroup, adding additional files to the filegroup, or setting autogrowth on for existing files in the filegroup. | Known issue. | SCMMAVM3P.CHOMP.ORG | [MSSQLSERVER\_1105](http://msdn.microsoft.com/en-us/library/aa337441.aspx) |
| **SQL Server Configuration: Backup Compression Default is set to a non-default value.** | SQL Configurations | Medium | Risk | Resolved | The SQL Server configuration Backup Compression has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | Customer is aware of the side effects. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Backup Compression (SQL Server)](http://technet.microsoft.com/en-us/library/bb964719.aspx)  [View or Configure the backup compression default Server Configuration Option](http://technet.microsoft.com/en-us/library/bb933863.aspx)  [Use Resource Governor to Limit CPU Usage by Backup Compression (Transact-SQL)](http://technet.microsoft.com/en-us/library/cc280384.aspx) |
| **SQL Server Configuration: Optimize For Ad hoc Workload is set to a non-default value.** | SQL Configurations | Medium | Risk | Resolved | The SQL Server configuration Optimize For Ad hoc Workload has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | Vendor requirement. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [optimize for ad hoc workloads Server Configuration Option](http://msdn.microsoft.com/en-us/library/cc645587.aspx)  [Top 10 SQL Server 2008 Features for ISV Applications (7 - Optimize for Ad hoc Workloads Option)](http://sqlcat.com/sqlcat/b/top10lists/archive/2008/11/24/top-10-sql-server-2008-features-for-isv-applications-burzin.aspx) |
| **SQL Server infrastructure changes do not go through formal security reviews.** | Security | Medium | Risk | Failed | SQL Server infrastructure changes do not go through formal security reviews. |  |  | [Reference Page - Microsoft Operations Framework 4.0](http://technet.microsoft.com/en-us/library/cc506049.aspx)  [Download Page - Microsoft Operations Framework 4.0](http://www.microsoft.com/en-us/download/details.aspx?id=17647)  [Change and Configuration Service Management Function](http://technet.microsoft.com/en-us/library/cc543211.aspx) |
| **SQL Server logins identified that do not adhere to Windows password polices** | SQL Security | Medium | Risk | Resolved | This issue is fired when one or more SQL Server standard logins not enforced with “Password Complexity” and “Password Expiration” policies by leveraging the Windows password policy mechanisms. | Vendor requirement. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Password Policy](http://msdn.microsoft.com/en-us/library/ms161959(v=SQL.105).aspx)  [Understanding Password Policy for SQL Server Logins](http://support.microsoft.com/kb/2028712)  [CREATE LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189751.aspx)  [ALTER LOGIN (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms189828.aspx) |
| **System Event Log: DCOM: 10009: DCOM was unable to communicate with the computer using any of the configured protocols.** | Event Log Analysis | Medium | Risk | Failed | This indicates a potential failure of DCOM calls. |  | SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [BUG: COM+ Incorrectly Lets You Configure Datagram Protocol](http://support.microsoft.com/kb/245197)  [(http://support.microsoft.com/kb/245197)](http://support.microsoft.com/kb/245197)   [Event ID 10009 — COM Remote Service Availability(Windows 2008)](http://technet.microsoft.com/en-us/library/cc774368(WS.10).aspx)  [(http://technet.microsoft.com/en-us/library/cc774368(WS.10).aspx)](http://technet.microsoft.com/en-us/library/cc774368(WS.10).aspx) |
| **Tables and indexed views have been identified that have duplicate indexes.** | Database Indexes | Medium | Risk | Failed | Tables identified with duplicate indexes. This rule is raised against the tables, when table has multiple indexes defined on the same columns. |  | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES; SCMMAVM1P.CHOMP.ORG;ELinkCore; SCMMAVM1P.CHOMP.ORG;Prod61; SCMMAVM1P.CHOMP.ORG;Prod61\_vm; SCMMAVM1P.CHOMP.ORG;ReportServer; SCMMAVM1P.CHOMP.ORG;ReportServerTempDB; SCMMAVM1P.CHOMP.ORG;RTScheduler; SCMMAVM3P.CHOMP.ORG;Argent; SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer | [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [DROP INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176118.aspx) |
| **Tables and/or indexed views have been identified that have redundant indexes.** | Database Indexes | Medium | Risk | Failed | This rule checks if there are any redundant indexes created on tables or indexed views. Two or more indexes is considered redundant if those indexes have the same subset of index columns and ordinal positions. For example, an index on col1 and another index on col1 and col2 is considered redundant. There is no need for a separate index on col1. |  | SCMMAVM1P.CHOMP.ORG;Prod61; SCMMAVM1P.CHOMP.ORG;RTScheduler; SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare; SCMMAVM3P.CHOMP.ORG;cpm\_Stage; SCMMAVM3P.CHOMP.ORG;SXASECTRACKING | [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [DROP INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms176118.aspx) |
| **Tables have been identified that do not have a clustered index.** | Database Indexes | Medium | Risk | Failed | A heap is a table without a clustered index. One or more nonclustered indexes can be created on tables stored as a heap. Data is stored in the heap without specifying an order. |  | SCMMAVM1P.CHOMP.ORG;ELinkCore; SCMMAVM1P.CHOMP.ORG;Prod61; SCMMAVM1P.CHOMP.ORG;PROD61\_MT; SCMMAVM1P.CHOMP.ORG;ReportServer; SCMMAVM1P.CHOMP.ORG;XAES; SCMMAVM2P.CHOMP.ORG;Prod61\_MT; SCMMAVM3P.CHOMP.ORG;Argent; SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare; SCMMAVM3P.CHOMP.ORG;CPM\_MetaData; SCMMAVM3P.CHOMP.ORG;CPM\_ReportServer | [General Index Design Guidelines](http://msdn.microsoft.com/en-us/library/ms191195(v=SQL.105).aspx)  [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [Heaps (Tables without Clustered Indexes)](http://technet.microsoft.com/en-us/library/hh213609.aspx) |
| **Tables have been identified that do not have any indexes.** | Database Indexes | Medium | Health | Resolved | Effective indexes are one of the best ways to improve performance in a database application. Use indexes on tables with numerous rows, on columns that are used in the WHERE clause of queries or in table joins, and on columns used in ORDER BY and GROUP BY queries. | Most of the tables are staging or test purposes only. | SCMMAVM1P.CHOMP.ORG;CHOMP\_TABLES; SCMMAVM1P.CHOMP.ORG;ELinkCore; SCMMAVM1P.CHOMP.ORG;Prod61; SCMMAVM1P.CHOMP.ORG;PROD61\_MT; SCMMAVM1P.CHOMP.ORG;RTScheduler; SCMMAVM1P.CHOMP.ORG;Tlkernel; SCMMAVM1P.CHOMP.ORG;XAES; SCMMAVM1P.CHOMP.ORG;xaes\_EAS; SCMMAVM2P.CHOMP.ORG;EToolkit; SCMMAVM2P.CHOMP.ORG;Prod61\_MT | [CREATE INDEX (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms188783.aspx)  [General Index Design Guidelines](http://msdn.microsoft.com/en-us/library/ms191195(v=SQL.105).aspx) |
| **Tables have been identified that have more indexes than columns.** | Database Indexes | Medium | Risk | Failed | Tables have been identified that have more indexes than columns.  During Inserts, Updates and Deletes every index on a table has to be evaluated and potentially updated. If too many indexes exist, SQL Server will spend unnecessary resources maintaining indexes that may not be used. |  | SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare | [Index-Related Dynamic Management Views and Functions (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms187974.aspx) |
| **The latest service pack or hotfix for SQL Server is not installed** | SQL Server Info | Medium | Health | Failed | Service packs are the main delivery vehicle for fixes, security patches, and general improvements to the SQL Server system. These updates can protect you from as well as provide you with solutions to known issues. |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [How to obtain the latest service pack for SQL Server 2008 R2](http://support.microsoft.com/kb/2527041)  [How to obtain the latest service pack for SQL Server 2008](http://support.microsoft.com/kb/968382)  [An Incremental Servicing Model is available from the SQL Server team to deliver hotfixes for reported problems](http://support.microsoft.com/kb/935897) |
| **The SQL Server Agent service is not using a recommended account** | SQL Security | Medium | Risk | Failed | The SQL Server Agent service is not using a recommended account. |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Guidelines on choosing Service Accounts for SQL Server Services](http://support.microsoft.com/kb/2160720)  [Selecting an Account for the SQL Server Agent Service](http://msdn.microsoft.com/en-us/library/ms191543(v=SQL.100).aspx)  [Change the Service Startup Account for SQL Server (SQL Server Configuration Manager)](http://msdn.microsoft.com/en-us/library/ms345578.aspx)  [Configure Windows Service Accounts and Permissions](http://technet.microsoft.com/en-us/library/ms143504.aspx) |
| **The SQL Server configuration setting, Ad Hoc Distributed Queries, has been changed from the default value.** | SQL Configurations | Medium | Risk | Resolved | The SQL Server configuration Ad Hoc Distributed Queries has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | Vendor requirement. | SCMMAVM3P.CHOMP.ORG | [Ad Hoc Distributed Queries Option](http://msdn2.microsoft.com/en-us/library/ms187569.aspx)  [Linking Servers](http://msdn2.microsoft.com/en-us/library/ms188279.aspx)  [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx) |
| **The SQL Server configuration setting, clr enabled, has been changed from the default value.** | SQL Configurations | Medium | Risk | Resolved | The SQL Server configuration clr enabled has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | This has been disabled. | SCMMAVM1P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [clr enabled Option](http://msdn2.microsoft.com/en-us/library/ms175193.aspx) |
| **The SQL Server configuration setting, show advanced options, has been changed from the default value.** | SQL Configurations | Medium | Risk | Resolved | The SQL Server configuration show advanced options has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | This has been disabled on both nodes. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [show advanced options Option](http://msdn2.microsoft.com/en-us/library/ms188265.aspx) |
| **User Databases found that have collations different from master database** | Database Options | Medium | Risk | Resolved | One or more User Databases found that have collations different from master database | These are reporting services databases and collation is different as per MS. | SCMMAVM3P.CHOMP.ORG:CPM\_ReportServerTempDB; SCMMAVM3P.CHOMP.ORG:CPM\_ReportServer; SCMMAVM1P.CHOMP.ORG:ReportServerTempDB; SCMMAVM1P.CHOMP.ORG:ReportServer | [Set or Change the Database Collation](http://msdn.microsoft.com/en-us/library/ms175835.aspx)  [Set or Change the Column Collation](http://msdn.microsoft.com/en-us/library/ms190920.aspx) |
| **Backup schedules are not set to minimize impact on performance.** | Disaster Recovery | Low | Health | Failed | Backup schedules are not set to minimize impact on performance. |  |  | [Introduction to Backup and Restore Strategies in SQL Server](http://msdn.microsoft.com/en-us/library/ms191239(SQL.105).aspx)  [The Transaction Log (SQL Server)](http://technet.microsoft.com/en-us/library/ms190925.aspx)  [Transaction Log Backups (SQL Server)](http://technet.microsoft.com/en-us/library/ms191429.aspx)  [Back Up a Transaction Log (SQL Server)](http://msdn.microsoft.com/en-us/library/ms179478.aspx)  [Tail-Log Backups (SQL Server)](http://technet.microsoft.com/en-us/library/ms179314.aspx)  [Create a Differential Database Backup (SQL Server)](http://msdn.microsoft.com/en-us/library/ms188248.aspx)  [Manage the Size of the Transaction Log File](http://msdn.microsoft.com/en-us/library/ms365418.aspx)  [Optimizing Backup and Restore Performance in SQL Server](http://msdn.microsoft.com/en-us/library/ms190954(SQL.105).aspx) |
| **Cluster does not have a network whose role is configured as Internal Cluster Communications Only (private network).** | Cluster Resource | Low | Risk | Failed | Cluster does not have a network whose role is configured as Internal Cluster Communications Only (private network). |  | SCMSQLP.CHOMP.ORG | [Recommended Private "Heartbeat" Configuration on a Cluster Server](http://support.microsoft.com/kb/258750/en-us) |
| **Databases have been identified with maximum file size set on one or more files** | Database Files | Low | Risk | Resolved | This rule verifies the auto grow settings of data and log files for all system and user databases. The rule is raised when the maximum size is set for one or more data or log file. | The databases listed have experienced uncontrolled growth in the past so we have capped them to prevent them from filling up the disks they reside on. | SCMMAVM3P.CHOMP.ORG;CPM\_ReportServerTempDB; SCMMAVM3P.CHOMP.ORG;cpm\_AcuteCare; SCMMAVM1P.CHOMP.ORG;xaes\_EAS; SCMMAVM1P.CHOMP.ORG;ReportServerTempDB; SCMMAVM1P.CHOMP.ORG;Prod61 | [Manage the size of the Transaction Log File](http://msdn.microsoft.com/en-us/library/ms365418.aspx)  [Troubleshooting Insufficient Data Disk Space](http://msdn.microsoft.com/en-us/library/ms366198(v=sql.105).aspx)  [ALTER DATABASE (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms174269.aspx) |
| **Databases identified that have not had a full database backup in the last 7 days** | SQL Server maintenance | Low | Risk | Failed | This rule checks if the database has been backed up within 7 days. To recover a database to the time of failure or to a specific point in time, you must restore the most recent full database backup, restore the most recent differential database backup, restore all transaction log file backups that are more recent than the last full or differential database backup, and manually initiate recovery. The time required to fully recover a database depends on the number and size of these backup files. To decrease the number of these files and improve the total recovery time, it is important to perform frequent full database backups. |  | SCMMAVM2P.CHOMP.ORG;Prod61\_MT; SCMMAVM2P.CHOMP.ORG;EToolkit | [Introduction to Backup and Restore Strategies in SQL Server](http://msdn.microsoft.com/en-us/library/ms191239(v=SQL.105).aspx)  [Backup (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms186865.aspx) |
| **Hardware that is needed for disaster recovery is not readily available.** | Environmental Dependencies | Low | Risk | Failed | Hardware that is needed for disaster recovery is not readily available. |  |  |  |
| **No measure of the progress and success level of security updates deployment** | Update Management | Low | Risk | Failed | After your security update management process is established and running, you will want to ensure effectiveness, monitor performance, and improve results over time. Even with proper planning, there may be improvements to the process that you can identify through monitoring and assessment.  The primary areas of importance within security update management that you may want to measure and improve upon are:  • Improving security releases  • Improving security policy enforcement  • Improving emergency security response. |  |  |  |
| **Non-Default users are provisioned to db\_owner database role.** | SQL Security | Low | Risk | Failed | Non-Default users are provisioned to db\_owner database role for one more databases. |  | SCMMAVM3P.CHOMP.ORG:SXASECTRACKING; SCMMAVM3P.CHOMP.ORG:Prod61\_MT; SCMMAVM3P.CHOMP.ORG:DARTData; SCMMAVM3P.CHOMP.ORG:DART; SCMMAVM3P.CHOMP.ORG:cpm\_StageCDC; SCMMAVM3P.CHOMP.ORG:cpm\_Stage; SCMMAVM3P.CHOMP.ORG:CPM\_ReportServerTempDB; SCMMAVM3P.CHOMP.ORG:CPM\_ReportServer; SCMMAVM3P.CHOMP.ORG:CPM\_MetaData; SCMMAVM3P.CHOMP.ORG:cpm\_EPMPortal |  |
| **Ownership issues in SQL Server Agent jobs and/or steps.** | SQL Security | Low | Risk | Failed | There are SQL Agent jobs owned by the SA account or member of sysadmin role |  | SCMMAVM3P.CHOMP.ORG\XAES Update Statistics\_Run HVCUpdateStatisticsPr; SCMMAVM3P.CHOMP.ORG\Test job that fails\_query; SCMMAVM3P.CHOMP.ORG\SuspendedIDAlert\_EXEC dbo.CHOMP\_SuspendedIDAlert; SCMMAVM3P.CHOMP.ORG\SCA CDC Extract Job\_PopulateCDCTables; SCMMAVM3P.CHOMP.ORG\HVC xaes\_EAS Update Statistics\_Step 1; SCMMAVM3P.CHOMP.ORG\HVC xaes\_EAS Auditing Purge Job\_Step 1; SCMMAVM3P.CHOMP.ORG\HVC xaes\_EAS Audit Monitor\_Step 1; SCMMAVM3P.CHOMP.ORG\HVC Prod61\_vm Update Statistics\_Step 1; SCMMAVM3P.CHOMP.ORG\HVC Prod61\_mnc Update Statistics\_Step 1; SCMMAVM3P.CHOMP.ORG\HVC Prod61\_img Update Statistics\_Step 1 | [Security Administration](http://technet.microsoft.com/library/Cc966507)  [Select an Account for the SQL Server Agent Service](http://msdn.microsoft.com/en-us/library/ms191543.aspx)  [Implement SQL Server Agent Security](http://msdn.microsoft.com/en-us/library/ms190926.aspx) |
| **Security Updates deployed less frequently than every month** | Update Management | Low | Risk | Failed | Microsoft recommends the deployment of urgent updates in the shortest possible timeframe, and the deployment of standard updates in a maximum of one month timeframe. |  |  | [Update Management Process](http://technet.microsoft.com/en-us/library/cc700845.aspx) |
| **SQL Server is running on third-party OS Virtualization.** | OS Configurations for SQL | Low | Risk | Failed | SQL Server is running on third-party OS Virtualization. |  | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [Support policy for Microsoft SQL Server products that are running in a hardware virtualization environment](http://support.microsoft.com/kb/956893)  [Support policy for Microsoft software running in non-Microsoft hardware virtualization software](http://support.microsoft.com/kb/897615)  [Server Virtualization Validation Program](http://windowsservercatalog.com/svvp.aspx?svvppage=svvp.htm) |
| **The SQL Server configuration setting, Database Mail XPs, has been changed from the default value.** | SQL Configurations | Low | Risk | Resolved | The SQL Server configuration Database Mail XPs has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | We are using database mail to email for some custom alerts. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [Database Mail XPs Option](http://msdn2.microsoft.com/en-us/library/ms191189.aspx) |
| **The SQL Server configuration setting, min server memory, has been changed from the default value.** | SQL Configurations | Low | Risk | Resolved | The SQL Server configuration setting min server memory has been modified from default value on one or more SQL Server instances.  The Default Value: 0 | The min server setting has been configured in order to mitigate any potential issues between SQL Server and the VM-ware memory balloon process. | SCMMAVM3P.CHOMP.ORG; SCMMAVM2P.CHOMP.ORG; SCMMAVM1P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [Server Memory Options](http://msdn2.microsoft.com/en-us/library/ms178067.aspx) |
| **The SQL Server configuration setting, OLE Automation Procedures, has been changed from the default value.** | SQL Configurations | Low | Risk | Failed | The SQL Server configuration setting OLE Automation Procedures has been modified from default value on one or more SQL Server instances.  The Default Value: 0 |  | SCMMAVM3P.CHOMP.ORG | [sp\_configure (Transact-SQL)](http://msdn2.microsoft.com/en-us/library/ms188787.aspx)  [OLE Automation Procedures Option](http://msdn2.microsoft.com/en-us/library/ms191188.aspx) |
| **User database is set to compatibility level lower than the default installation level.** | Database Options | Low | Risk | Resolved | User database is set to compatibility level lower than the default installation level. | I set the database compatibility levels to 2012 for the listed databases. | SCMMAVM3P.CHOMP.ORG:SXASECTRACKING; SCMMAVM3P.CHOMP.ORG:Prod61\_MT; SCMMAVM3P.CHOMP.ORG:DARTData; SCMMAVM3P.CHOMP.ORG:DART; SCMMAVM3P.CHOMP.ORG:Argent; SCMMAVM2P.CHOMP.ORG:Prod61\_MT; SCMMAVM1P.CHOMP.ORG:RTScheduler; SCMMAVM1P.CHOMP.ORG:PROD61\_MT; SCMMAVM1P.CHOMP.ORG:CHOMP\_TABLES | [Database Compatibility Level Option](http://msdn.microsoft.com/en-us/library/ms191137.aspx)  [ALTER DATABASE Compatibility Level (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb510680.aspx) |
| **Database(s) identified with AUTO\_UPDATE\_STATISTICS\_ASYNC option enabled** | Database Options | Informational | Risk | Failed | User database has AutoUpdateStats Async enabled on one or more user databases. |  | SCMMAVM1P.CHOMP.ORG:xaes\_EAS | [Statistics](http://msdn.microsoft.com/en-us/library/ms190397.aspx)  [ALTER DATABASE SET Options (Transact-SQL)](http://msdn.microsoft.com/en-us/library/bb522682.aspx) |
| **Index Fragmentation data collection is either skipped or failed on one or more user databases** | Database Indexes | Informational | Risk | Failed | Index fragmentation data collection will be skipped for databases of size more than 1TB as the data collection may take long time or impact the target SQL Server instances.  The index fragmentation data collection also skipped for the SQL Server instances hosting more than 200 databases. |  | SCMMAVM1P.CHOMP.ORG;TermRuntimeDB; SCMMAVM1P.CHOMP.ORG;TermUsageStatsDB | [Reorganizing and Rebuilding Indexes](http://technet.microsoft.com/en-us/library/ms189858.aspx) |