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| --- | --- |
| **Basic Microsoft™ SQL Server Health check** | |
| Technical guidelines | |
|  | |
| This document details the tools required, their usage and the method of performing a ‘Basic’ Microsoft™ SQL Server Health check. | |
| **INTERNAL USE ONLY** | |
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| **Date :** | **28 August 2012** |
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| **Revision :** | **0.1** |



# Revision History

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Revision | Author | Email | Date | Status | Description | Comments |
| 0.1 | Andrew Mitchell | [Andrew.Mitchell@project-network.com](mailto:Andrew.Mitchell@project-network.com) | 01 August 2012 | Draft | First draft of document. Not for general use |  |

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# Executive Summary

Enter a brief summary of the execution and findings of the Basic SQL Server Healthcheck, this should provide details of tests, findings and recommendations without reading the whole report. This is also known as a management summary.

# Document Conventions

The following generic convention has been used throughout this document

|  |  |
| --- | --- |
| Convention | Used for |
| UPPERCASE | Transact-SQL keywords and SQL elements. |
| Initial Capitals | Paths and file names. |
| **Bold** | Database names, table names, column names, stored procedures, command-prompt utilities, menus, commands, dialog box options, programming elements, and text that must be typed exactly as shown. |
| *Italic* | User-supplied variables, relationships, and phrasing. |
| Monospace | Code samples, examples, display text, and error messages. |

Throughout the document each section has a RAG (Red Amber Green) status detailing any further actions.

# Introduction

The purpose of this document Is to provide a consolidated approach to the implementation of SQL Server health checks to ensure that consistent results are obtained across all consultants. This approach will lead to a set of documentation that is easy for both the partner and client to understand and action any points raised.

# Statement of work

The Basic Microsoft™ SQL Server Health Check offering is a diagnostic service that concentrates on the following:

* Gathering information about a Single server and up to three instances[[1]](#footnote-1) of Microsoft™ SQL Server 2000, 2005, 2008 or 2008R2 that are installed on that server.
* Determining if the configurations are set according to the Microsoft best practices.
* Reporting on all configurations, indicating settings that differ from recommendations.
* Indicating potential problems in the installed instance of SQL Server.
* Recommending solutions to potential problems.

The Basic Microsoft™ SQL Server Health Check provides the following results:

* Compliance results are returned when an instance of Microsoft™ SQL Server satisfies the conditions of a Best Practices rule. Non-compliance results are returned when an instance of SQL Server does not satisfy the conditions of a Best Practices rule.
* Impact of any non-compliance
* Recommendations based on the results of the Health check.
* Links to more detailed information, related topics and remediation steps

# Tools Required in order to perform the Health Check

The following tools are required for a “Basic” SQL Server Health check

* Microsoft™ SQL Server Management Studio.
* Powershell v1.0 installed on the server (this can be worked round but will take extra time to perform the health check and consolidate the findings).

# Site visit Prerequisites

Prior to a site visit the following information should be obtained

<< Pre Healthcheck Questionaire >>

The Statement of work should have been agreed and forwarded through by the project desk.

## Access Required

The following Access is required to the Server where the health check is to be performed.

* Local Administrator rights to the server.
* Sysadmin rights to the Microsoft ™ SQL Server Instances to be Health checked.

In addition access is required to a workstation

* from where an RDP session can be established to the Server to be Health Checked.
* With USB Devices enabled to Copy scripts to the Workstation / Server and copy the results off.

# Site Visit

## Escalation

Note: Any Issues that arise whilst on a client site should be raised through the Project desk who will then handle the escalation to the client via the associated partner contact.

## Kick off Meeting

The following actions should be performed during the kick off meeting:

1. Identify the Server where the health check is to be performed and confirm the details are correct as defined in the “Pre Health check Questionnaire”.
2. Identify the Microsoft™ SQL Server Instances to have a health check. up to three instances on a single server are covered by this health check[[2]](#footnote-2).
3. Identify user accounts and passwords required for access to the server and the workstation from where the health check will be run.

## Close out meeting

Prior to leaving site the following actions should be performed.

1. Take the client through the findings in a simplistic manner and explain that it will all be detailed in the Health Check Report. Discuss any further actions that they may need to take. Ensure that the Items are prioritised in accordance with the actual usage of the system.. I.e a system that has a low user base on a high spec server may not benefit from having 1 tempDB File per processor core.
2. Explain that although the site visit is complete it will take a couple of days to get the report to them as it will have to be written up and go through an internal QA process prior to being released to them.
3. **Obtain a signature** **on the Sign off sheet.**
4. Ensure that the client is happy

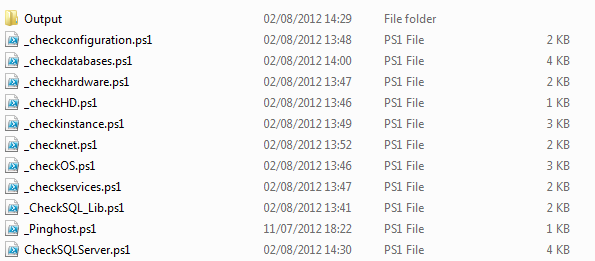
# Performing the health check

## Assemble the tools

Download the Basic Health check toolkit from <Download Location>

Expand the toolkit to a folder on the machine where the data will be collected.

The folder should contain the following items



## Run the Script

Start powershell

Navigate to the directory

.\CheckSQLServer.ps1 TPN-01195 TPN-01195\SQLEXPRESS,TPN-01195\SQLEXPRESS

Usage:

CheckSQLServer <Computer[,Computer]> <Instance>

<Computer[,Computer]> Single computer for standalone server

List of nodes for Clustered Server

<Instance> Instance name of SQL Server Instance to be checked

An Output Directory should be created.

The structure of the output directory is as follows

|  |  |  |
| --- | --- | --- |
| Folder | Subfolder comments | Contents |
| .\Output | <Server Name> | CSV and XML Results files for the <Server> |
| .\Output\<Server Name> | <Instance Name> | CSV and XML Results files for the <Instance> |

### Output Files

#### Server Files

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| File Name CSV | File Name XML | Contents | Comments | Document TemplateSection |
| CheckALLServices.CSV | CheckALLServices.XML | Details of All Services |  |  |
| CheckSQLServices.CSV | CheckSQLServices.XML | Details of SQL Server related Services |  |  |
| CheckHardware.CSV | CheckHardware.XML | Details of Hardware configuration |  |  |
| CheckOS.CSV | CheckOS.XML | Details of the OS Configuration |  |  |
| CheckDrives.CSV | CheckDrives.XML | Details of drives presented to the OS |  |  |
| CheckNet.CSV | CheckNet.XML | Details of Network Configuration | Note: this details all hard and soft Network cards. Filter on PhysicalAdapter=True for Physical cards |  |
| CheckDatabases-AgentJobs.CSV | CheckDatabases-AgentJobs.XML | Details of SQL Server Agent Jobs | Separate versions for each edition of SQL Server | 7.5 |

#### Instance Files

|  |  |  |  |
| --- | --- | --- | --- |
| File Name CSV | File Name XML | Contents | Comments |
| CheckConfiguration.CSV | CheckConfiguration.XML | Results of SP\_Configure | Uses Instance\_Configuration-${SQLVersion}.SQL |
| CheckDatabases-DataSpace.csv | CheckDatabases-DataSpace.XML | Results of sp\_spaceused |  |
| CheckDatabases-LogSpace.csv | CheckDatabases-LogSpace.XML |  | Uses Database\_LogSpace-${SQLVersion}.SQL |
| CheckDatabases-Properties.CSV | CheckDatabases-Properties.XML |  | Uses Database\_Properties-${SQLVersion}.SQL |
| CheckInstance.CSV | CheckInstance.XML |  | Uses Instance\_Properties-${SQLVersion}.SQL |
|  |  |  |  |

## Populating the template

### Template Section 4 (Hardware)

|  |  |
| --- | --- |
| Server Host Name | File: CheckHardware Property: \_\_SERVER |
| Host Domain Name | File: CheckHardware Property: Domain |
| Server Type | Manual : Physical or Virtual |
| Server Make/Model | File: CheckHardware Property: Manufacturer  File: CheckHardware Property: Model |
| Server Processor Type/Speed | File: CheckHardware Property: NumberOfProcessors File: CheckProcessor Property: NumberOfLogicalProcessors  File: CheckProcessor Property: Name |
| Server Ram | File: CheckHardware Property: TotalPhysicalMemory |
| Server Disk Storage | File: CheckDrives Property: DeviceID  File: CheckDrives Property: Size File: CheckDrives Property: VolumeName File: CheckDrives Property: FileSystem |

### Template Section 5 (Operating System)

|  |  |
| --- | --- |
| Server Host Name | File: CheckOS Property: \_\_SERVER |
| Host Domain Name | File: CheckHardware Property: Domain |
| OS & Service Pack | File: CheckOS Property: Caption |
| Installed Applications/Software | File: CheckOS Property: CSDVersion |

### Template Section 5.1 (Network Settings)

| Team Name or Network Card Name | IP Address (IP v4) | Subnet Mask | Default Gateway | Preferred DNS | Alternate DNS |
| --- | --- | --- | --- | --- | --- |
| File: CheckNetworkAdapterconfiguration Property: Caption | File: CheckNetworkAdapterconfiguration Property: IPAddress | File: CheckNetworkAdapterconfiguration Property: IPSubnet | File: CheckNetworkAdapterconfiguration Property: DefaultIPGateway | File: CheckNetworkAdapterconfiguration Property: DNSHostNAme | File: CheckNetworkAdapterconfiguration Property: IPSubnet |

### Template Section 5.2 (Lock Pages in Memory)

|  |  |
| --- | --- |
| Server | Lock pages in memory |
| **Server Name** | Manual Entry from Local Security Policy |

### Template Section 5.3 (Perform Volume maintenance tasks)

|  |  |
| --- | --- |
| Server | Perform Volume maintenance |
| **Server Name** | Manual Entry from Local Security Policy |

### Template Section 5.4 (Partition alignment)

Proper configuration of I/O subsystems is critical to the optimal performance and operation of SQL Server systems. Here are some recommendations for disk, volumes, data files, and filegroups:

**Disk**

* Disks formatted with 1 megabyte (MB) starting offset
* Disks formatted with 64 kilobyte (KB) default file allocation unit size
* Verify that the following algorithms result in an integer value:
  + PARTITION\_OFFSET / STRIPE\_UNIT\_SIZE
  + STRIPE\_UNIT\_SIZE / FILE\_ALLOCATION\_UNIT\_SIZE
* Place log files on RAID 1+0 (or RAID 1) disks for better protection from hardware failure and better write performance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DISK | PARTITION | PARTITION\_OFFSET | STRIPE\_UNIT\_SIZE | PARTITION\_OFFSET / STRIPE\_UNIT\_SIZE |
| File:CheckDiskPartitionAlignment Property: DeviceID | File:CheckDiskPartitionAlignment Property: Name | File:CheckDiskPartitionAlignment Property: StartingOffsett | **From Storage configuration prerequisites** |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DISK | PARTITION | STRIPE\_UNIT\_SIZE | FILE\_ALLOCATION\_UNIT\_SIZE | STRIPE\_UNIT\_SIZE / FILE\_ALLOCATION\_UNIT\_SIZE |
| File:CheckDiskPartitionAlignment Property: DeviceID | File:CheckDiskPartitionAlignment Property: Name | **From Storage configuration prerequisites** | File:CheckDiskPartitionAlignment Property: BlockSize |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

### Template Section 5.5 (Operating system Status)

< To be defined> i.e what goes here

### Template Section 6.1 (Installed SQL Server Services)

Detail here the three services to be included as part of the health check. it is acceptable to detail populate the service account details below for all services installed.

NOTE: all details for this section are from the file : CheckSQLServices

### Template Section 6.1.1 SQL Server Database Engine

Name = MSSQLSERVER for default instance or instance name for named instance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Instance | Version | Log On as | Startup | Status |
| Server name | Instance name | <manually populate> | Property: Startname | Property: Startmode | Property: status |

### Template Section 6.1.2 SQL Server Agent

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Instance | Version | Log On as | Startup | Status |
| Server name | Instance name | <manually populate> | Property: Startname | Property: Startmode | Property: status |

### Template Section 6.1.3 SQL Server Analysis Services

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Instance | Version | Log On as | Startup | Status |
| Server name | Instance name | <manually populate> | Property: Startname | Property: Startmode | Property: status |

### Template Section 6.1.4 SQL Server Browser

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Instance | Version | Log On as | Startup | Status |
| Server name | Instance name | <manually populate> | Property: Startname | Property: Startmode | Property: status |

### Template Section 6.1.5 SQL Server Full Text Search

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Instance | Version | Log On as | Startup | Status |
| Server name | Instance name | <manually populate> | Property: Startname | Property: Startmode | Property: status |

### Template Section 6.1.6 SQL Server Integration Services

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Instance | Version | Log On as | Startup | Status |
| Server name | Instance name | <manually populate> | Property: Startname | Property: Startmode | Property: status |

### Template Section 6.1.7 SQL Server Reporting Services

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Instance | Version | Log On as | Startup | Status |
| Server name | Instance name | <manually populate> | Property: Startname | Property: Startmode | Property: status |

### Template Section 6.1.8 Database Engine Configuration

Populated from CheckConfiguration

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Minimum | Maximum | Config Value | Run Value |
| Property:name | Property:minimum | Property:maximum | Property:config\_value | Property:run\_value |

### Template Section 6.1.9 Database default Settings

<manual at the moment>

|  |  |
| --- | --- |
| Setting | Value |
| DefaultData |  |
| DefaultLog |  |

### Template Section 6.1.10 Model Database configuration

Data obtained from file Database-Model

|  |  |
| --- | --- |
| Setting | Value |
| Recovery | Property: Recovery |
| Collation | Property: Collation |
| Data File Growth | Property: max\_size where Type\_desc = ROWS |
| Growth Increment | Property: growth where Type\_desc = ROWS |
| Log File Growth | Property: max\_size where Type\_desc = LOG |
| Growth Increment | Property: growth where Type\_desc = LOG |

Database settings obtained from File: checkDatabases-Properties where Database\_Name =’Model’

|  |  |
| --- | --- |
| Setting | Value |
|  |  |

NOTE: Open CheckDatabases-Properties in Excel.

1. Transpose the columns
2. Format the 1/0 columns with a custom format of [Red][=0]û;[Blue][=1]ü
3. Format the 1/0 columns as wingdings
4. Paste the settings for the Model Database into the Table

Note: Settings differ between versions of SQL

### Template Section 6.1.11 Product Lifecycle

The data for this section can be obtained from

<http://support.microsoft.com/gp/lifeselectindex>

### Template Section 7 Database Settings

Details from File: Database-Settings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Database | Size | Owner | Recovery Model | Collation | State |
|  |  |  |  |  |  |

### Template Section 7.1 Physical Database File Locations

### Template Section 7.1.1 System Databases

Details from File: Database-Files where Database is master, model, msdb or tempdb

Split into one section per database

| Name | Filename | Size |
| --- | --- | --- |
| master |  |  |

### Template Section 7.1.2 User Databases

Details from File: Database-Files where Database is not master, model, msdb or tempdb

Split into one section per database

| Name | Filename | Size |
| --- | --- | --- |
| master |  |  |

### Template Section 7.1.3 Database Backups

Details from File: Database-BackupStatus

### Template Section 7.1.3 Database Configuration

Database settings obtained from File: checkDatabases-Properties

One Column per Database

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Database\_Name | master | tempdb | model | msdb | CPS | HLM | ANPRBOF |
| Allow Snapshot Isolation |  |  |  |  |  |  |  |

NOTE: Open CheckDatabases-Properties in Excel.

1. Transpose the columns
2. Format the 1/0 columns with a custom format of [Red][=0]û;[Blue][=1]ü
3. Format the 1/0 columns as wingdings
4. Paste the settings for the Model Database into the Table

Note: Settings differ between versions of SQL

### Template Section 7.3.1 Number of Processor Cores

Value obtained from File: CheckHardware Property: NumberOfLogicalProcessors

|  |  |
| --- | --- |
| Setting | Value |
| Logical Processor Count | Property: NumberOfLogicalProcessors |

### Template Section 7.3.2 Temp DB Data files

Value obtained from File: CheckDatabases-TempDBFiles

| Name | Filename | Size |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

### Template Section 7.4.1 Maintenance Plans

Value obtained from File: CheckInstance-MaintenancePlans

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Description | Owner | CreateDate |
|  |  |  |  |

### Template Section 7.5.1 SQL Server Agent Jobs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SQL job name | Category | Owner | Description | Schedules | Notifications |
|  |  |  |  |  |  |

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1. Sample Statement of Work.
2. Pre Health check Questionnaire

|  |  |
| --- | --- |
|  | Basic Microsoft™ SQL Server Health check Questionnaire |

|  |  |
| --- | --- |
| **Client Details** | |
| Client Name : |  |
| Client Address : |  |
| Contact Name : |  |
| Email : |  |
| Telephone Number : |  |

|  |  |
| --- | --- |
| **Server Details** | |
| Server Name : |  |
| Server Make : |  |
| Server Model : |  |
|  |  |

|  |  |  |
| --- | --- | --- |
| **Storage Details** | | |
| Storage Name : |  | |
| Storage Make : |  | |
| Storage Model : |  | |
| Storage Configuration : |  | Include volume names, raid configuration, stripe sizes, subsystem configuration e.t.c |

|  |
| --- |
| **SQL Server Instances** |

|  |  |  |
| --- | --- | --- |
| **Instance 1** | | |
| Instance Name : |  | |
| Instance Type : |  | **Reporting Services / Integration Services / Analysis Services / Database Engine** |
| Instance Version : |  | |

|  |  |  |
| --- | --- | --- |
| **Instance 2** | | |
| Instance Name : |  | |
| Instance Type : |  | **Reporting Services / Integration Services / Analysis Services / Database Engine** |
| Instance Version : |  | |

|  |  |  |
| --- | --- | --- |
| **Instance 3** | | |
| Instance Name : |  | |
| Instance Type : |  | **Reporting Services / Integration Services / Analysis Services / Database Engine** |
| Instance Version : |  | |
|  |  | |

|  |
| --- |
| **Site visit Prerequisites** |

| **TOOLS SERVER** | | **Health Check** | **Confirmed** |
| --- | --- | --- | --- |
| Correct .NET Libraries Installed : | .NET Framework version 4.0 (Full) must be installed to ensure Tools are able to perform properly. | All |  |
| Operating System Memory : | Check to determine if the minimum recommended amount of memory (2GB) is installed on the Tool Server. Having less memory may result in the number of test cases fail with "Out of Memory" errors. | All |  |
| Operating System Processor : | Checks to determine if the minimum processor speed is available in the Tool Server (2Ghz). | All |  |
|  |  |  |  |
|  |  |  |  |

| **TARGET SYSTEM** | | **Health Check** | **Confirmed** |
| --- | --- | --- | --- |
| SysAdmin on Databases : | Checks to verify that the current user is a sysadmin on the content database instances. This is required in order to run many of the required tests | All |  |
| Windows Update Service : | Validates the Automatic Updates/Windows Updates service is running on each target system. This service is required in order to evaluate the target systems for missing security updates. If this service is disabled intentionally for security reasons as of now, consider enabling the service for brief time during the Health Check. | Intermediate / Advanced |  |
| Wmi Check (Win32\_ComputerSystem) : | Validate the specified WMI class is available on each target system. Most of the data collection methods used rely upon WMI. If WMI is unavailable either because of lack of connectivity or permissions it is effectively as if the target system is completely unreachable from a data collection and analysis perspective. | All |  |
| Latest Version of Windows Update Agent Installed : | Windows Update Agent (WUA) framework must be installed on the target servers in order the MBSA test case could scan the target servers for missing updates. | Intermediate / Advanced |  |
| Remote Registry Access : | Validate remote Registry access is available by connecting to the HKEY\_LOCAL\_MACHINE Registry hive of each target system. | All |  |

1. Sign off Sheet
2. SQL Server Script Details

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. Microsoft™ SQL Server Database Engine, Microsoft™ SQL Server Integration Services™, Microsoft™ SQL Server Analysis Services and Microsoft™ SQL Server Reporting Services are considered to be separate instances for the purpose of this document. [↑](#footnote-ref-1)
2. Microsoft™ SQL Server Database Engine, Microsoft™ SQL Server Integration Services™, Microsoft™ SQL Server Analysis Services and Microsoft™ SQL Server Reporting Services are considered to be separate instances for the purpose of this document. [↑](#footnote-ref-2)