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SQL SERVER HEALTH CHECK

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ALESON ITC PRESENTATION

Aleson ITC, S.L., is a company specialized in the Microsoft Data Platform, covering the entire data lifecycle, from the transactional engine to artificial intelligence, including data analytics.

As a technology company strongly linked to the Microsoft environment, it is designated as a **Microsoft Solution Provider** in the main key areas, standing out in specialization in Data Platform (Data & AI), design of infrastructures for the cloud (Cloud Infrastructure), integration of applications (Digital and App Innovation) and modern workplace (Modern Workplace), all that from the point of view of the exploitation of data.

It is important to highlight our commitment to security, both in the way we execute the services and in the implementation of the proposed solutions, trying to mitigate the client's risks and always thinking about the continuity and operability of the business.

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OUR DIFFERENTIAL VALUE

Database and Cloud Experts and Certified

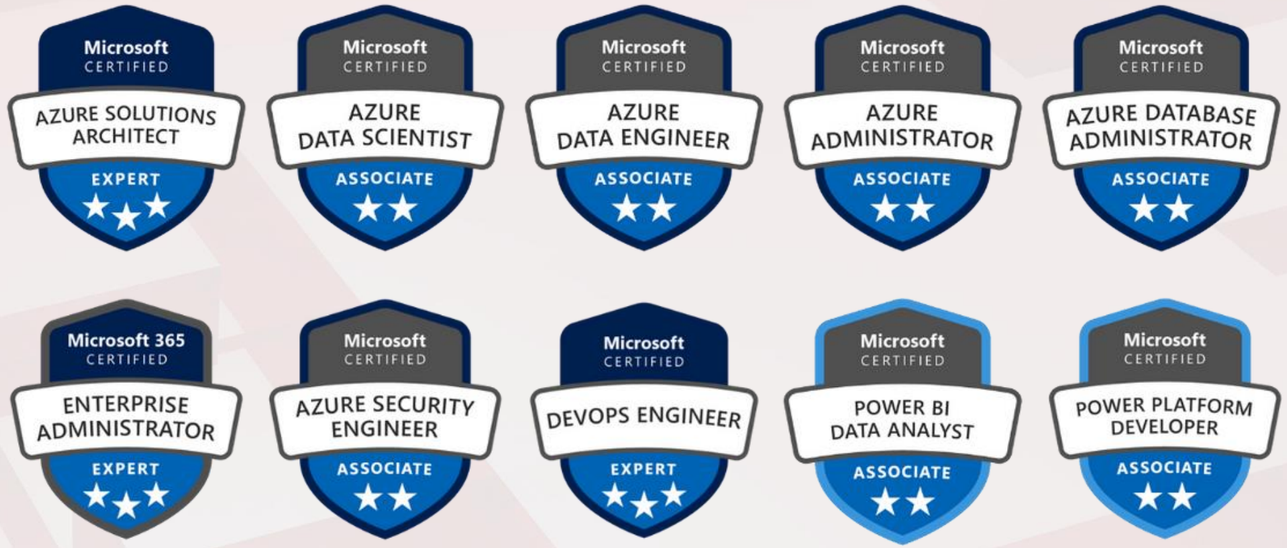
Microsoft Solutions Partner
Data & AI
Azure

Microsoft Solutions Partner
Infrastructure
Azure

Microsoft Solutions Partner
Digital & App Innovation
Azure

Microsoft Solutions Partner
Modern Work

Experts and certified in Workload Migrations to the Cloud



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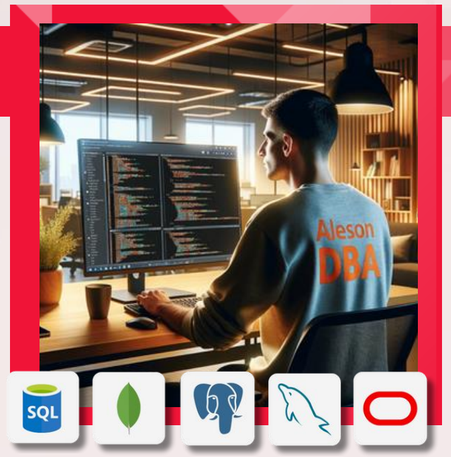
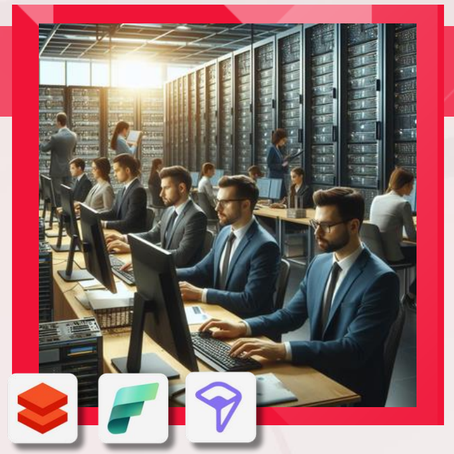
More than SQL Server...



Database Services



Data Analytics Services

Data Visualization Services

Generative AI Services

Cloud Services

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CUSTOMERS WHO TRUST US

holaluz
FLUIDRA
Sprinter
MRW
europ assistance
Planeta
BASÍLICA DE LA SAGRADA FAMÍLIA
ELIX POLYMERS A member of Sinochem International
SanLucar
SEAT
havaianas
jobandtalent
rtve
Boels RENTAL
RNB
CSQ Non stop shops
ISTOBAL Vehicle Wash & Care
ArcelorMittal
SPB
tucai

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BENEFITS OF SQL SERVER HEALTH CHECK

Performing a SQL Server Health Check offers multiple benefits that contribute to the optimization and stability of the databases and their respective operating environments. These are the key reasons that support the importance of performing a SQL Server Health Check:

Performance improvements

Preventing future problems

Compliance with standards and best practices

Resource optimisation and savings

Capacity planning

Documentation and knowledge

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SERVICE DEVELOPMENT

WEEK 1	WEEK 2	WEEK 3	WEEK 4
Server monitoring, Operative System, Instance and Database configuration analysis and creation of the HC document.	Submission of HC document with proposed changes at configuration and performance level.	After approval of the changes by te customer, the necessary changes will be implemented with a downtime of less than 30 minutes.	After the changes, the environment will be monitored again, some additional adjustments will be proposed and finally the final version of the document will be presented.

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MONITORING SOFTWARE

ANALYSIS OF PERFORMANCE COUNTERS

- Open Source Software (Telegraf) adaptation that collects information from Windows and SQL Server performance counters.
- Also, it can collect data from Linux, MySQL, Oracle, MongoDB, PostgreSQL...
- Processor metrics, memory, disk, network, PLE, cache hit ratio, waits, tempdb, logs...

SQL SERVER FORENSIC ANALYSIS

- Propietary Software (Coyote Monitor) that collects internal SQL Server data.
- Information about log error, Jobs status, backups status, AlwaysOn status, queries history, locks history, tempdb usage history, DB and tables growth, configuration changes...

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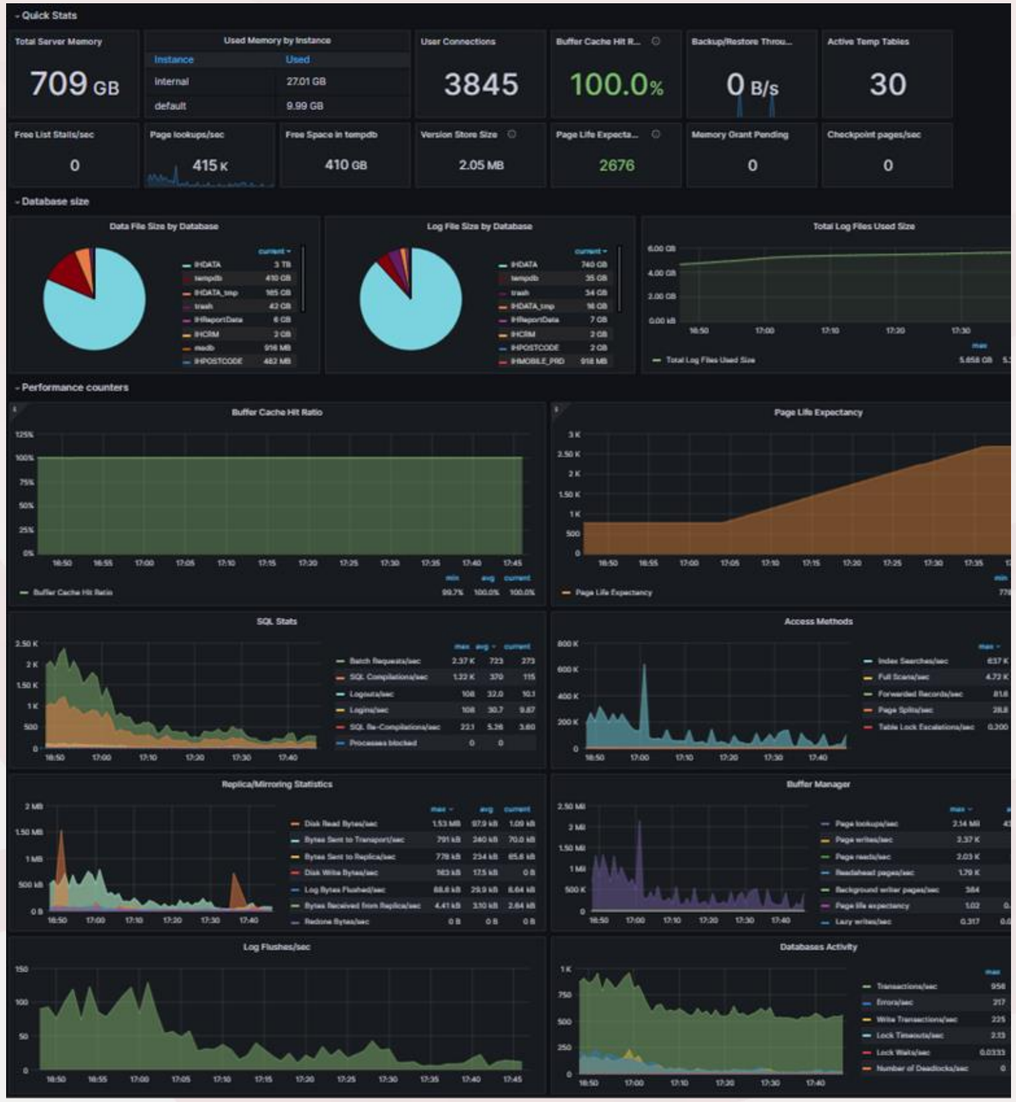
MONITORING DASHBOARDS

MONITORING

- Dynamic dashboards with relevant server information.
- Definition with the customer of alerts, their severity and their impact on the systems.
- Performance counter data is stored for 90 days.
- The customer shall be provided with access to monitoring panels.

DASHBOARDS

- Windows Performance Counters
- SQL Server Performance Counters
- SQL Server Health Check
- Process, locks and tempdb history
- DB and table growth history. Dimensioning
- (In Development) Jobs and time deviations history

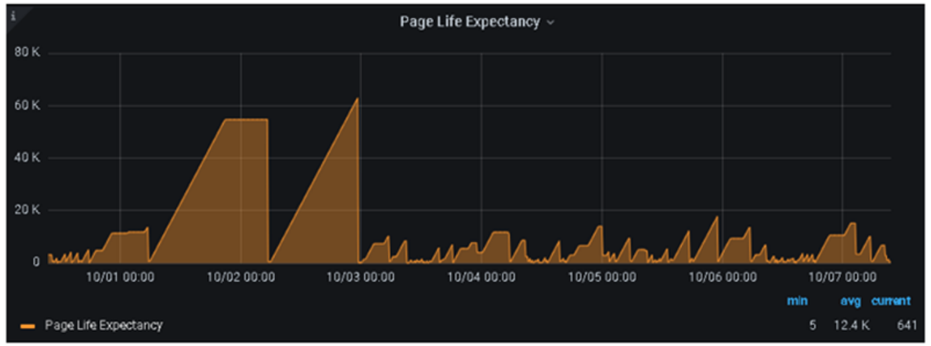


HEALTH CHECK DOCUMENT - MONITORING

PART 1

The first part of the document corresponds to monitoring, where information will be given and the main metrics of CPU, Memory, Disk and Network will be analysed.

4.2.4 Page Life Expectancy



Counter description

The Page Life Expectancy counter shows the number of seconds a page will remain in the buffer pool without references.

In simple words, if a page stays longer in the buffer pool (cache area), the PLE will be higher, which leads to higher performance since every time a request comes in there is a chance that it will find the data in the cache (logical read) instead of going to disk to read the data (physical read).

When there is enough memory on the server, pages have a high life expectancy. Normal values are above 1000 seconds, and the trend line should be stable. Constant crashes every few seconds indicate memory problems.

Server counter status

The average values are 12.4K seconds which is apparently a good value, however, these values fall from 23:00, which may be related to the processes that take enough CPU at night and remain very low until 5:00, where some peaks are evident and then return to maintain constant levels. With the increase of the SQL Server memory and the changes that we make, these values should improve. It is also evident in the graphs that during the weekend is when there are not so many requests producing very high values, compared to a production day.

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HEALTH CHECK DOCUMENT - CONFIGURATION

PART 2

The second part of the document is the configuration analysis of the Operating System, Instance and Databases.

In each section, details of the reviewed configuration and its status are given.

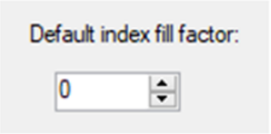
5.2.2 Index Fill Factor

INCORRECT

It checks if the instance has a correct Fill Factor configuration.

Fill Factor indicates what percentage of the index size will be left free when a REBUILD operation is performed. This option is a Best Practice because leaving enough free space for the internal growth of the index, we will ensure that all the pages are in the same sector of the disk, thus avoiding fragmentation.

Why is it INCORRECT?



The Fill Factor value is misconfigured, so right now the indexes will be having a higher fragmentation. Additionally, the reindexing maintenance plans will have more work pending so their execution will be increased using resources.

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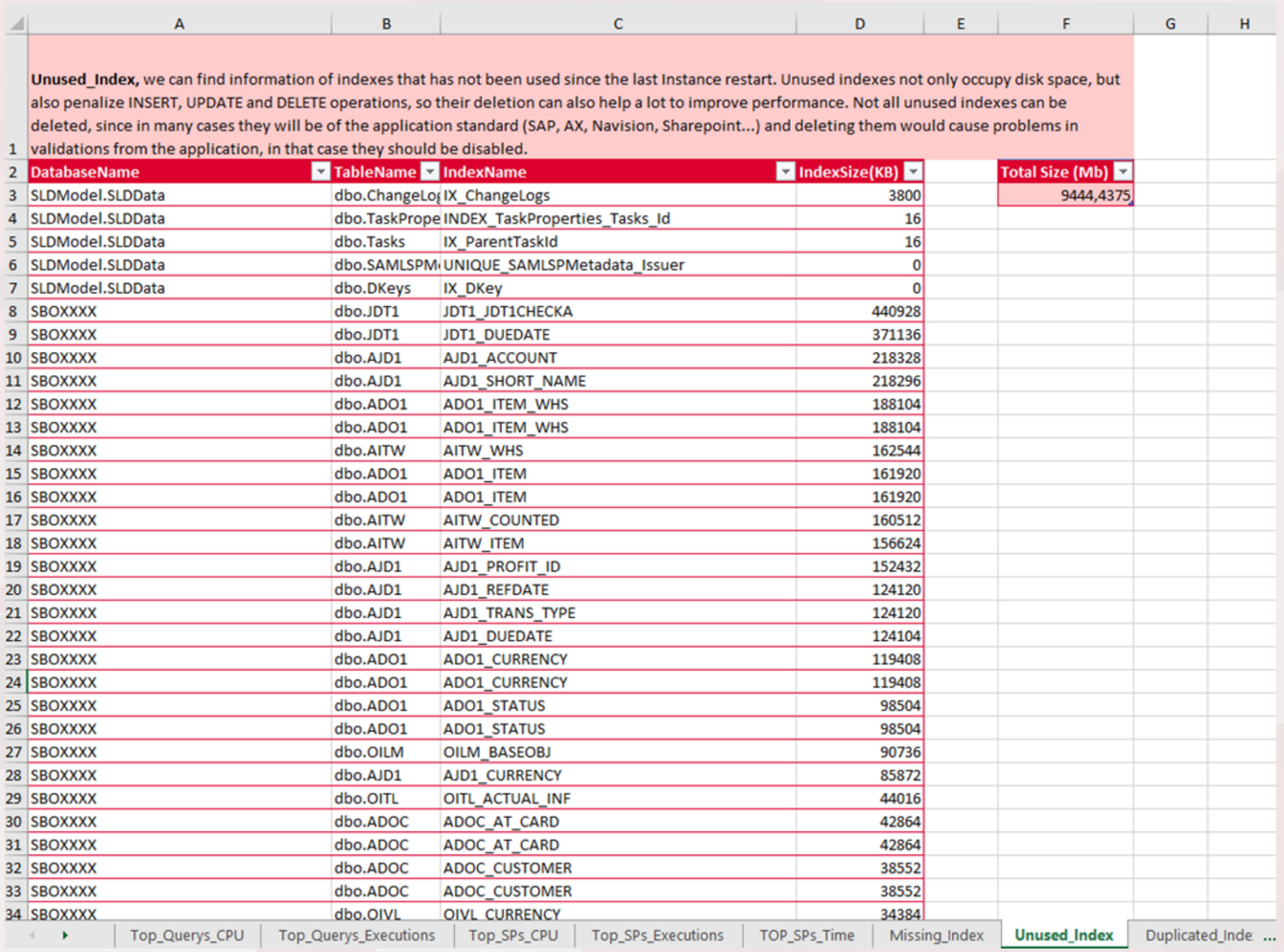
HEALTH CHECK DOCUMENT - PERFORMANCE

PART 3

In the third part of the document, you will find two Excel files where the main queries and procedures by CPU, executions and time, index status, statistics, compression, waiting times, latencies, etc. are analyzed.



Unused_Index, we can find information of indexes that has not been used since the last Instance restart. Unused indexes not only occupy disk space, but also penalize INSERT, UPDATE and DELETE operations, so their deletion can also help a lot to improve performance. Not all unused indexes can be deleted, since in many cases they will be of the application standard (SAP, AX, Navision, Sharepoint...) and deleting them would cause problems in validations from the application, in that case they should be disabled.

DatabaseName	TableName	IndexName	IndexSize(KB)	Total Size (Mb)
SLDModel.SLDData	dbo.ChangeLo	IX_ChangeLogs	3800	9444,4375
SLDModel.SLDData	dbo.TaskPrope	INDEX_TaskProperties_Tasks_Id	16	
SLDModel.SLDData	dbo.Tasks	IX_ParentTaskId	16	
SLDModel.SLDData	dbo.SAMLSPM	UNIQUE_SAMLSPMetadata_Issuer	0	
SLDModel.SLDData	dbo.DKeys	IX_DKey	0	
SBOXXXX	dbo.JDT1	JDT1_JDT1CHECKA	440928	
SBOXXXX	dbo.JDT1	JDT1_DUEDATE	371136	
SBOXXXX	dbo.AJD1	AJD1_ACCOUNT	218328	
SBOXXXX	dbo.AJD1	AJD1_SHORT_NAME	218296	
SBOXXXX	dbo.ADO1	ADO1_ITEM_WHS	188104	
SBOXXXX	dbo.ADO1	ADO1_ITEM_WHS	188104	
SBOXXXX	dbo.AITW	AITW_WHS	162544	
SBOXXXX	dbo.ADO1	ADO1_ITEM	161920	
SBOXXXX	dbo.ADO1	ADO1_ITEM	161920	
SBOXXXX	dbo.AITW	AITW_COUNTED	160512	
SBOXXXX	dbo.AITW	AITW_ITEM	156624	
SBOXXXX	dbo.AJD1	AJD1_PROFIT_ID	152432	
SBOXXXX	dbo.AJD1	AJD1_REFDATE	124120	
SBOXXXX	dbo.AJD1	AJD1_TRANS_TYPE	124120	
SBOXXXX	dbo.AJD1	AJD1_DUEDATE	124104	
SBOXXXX	dbo.ADO1	ADO1_CURRENCY	119408	
SBOXXXX	dbo.ADO1	ADO1_CURRENCY	119408	
SBOXXXX	dbo.ADO1	ADO1_STATUS	98504	
SBOXXXX	dbo.ADO1	ADO1_STATUS	98504	
SBOXXXX	dbo.OILM	OILM_BASEOBJ	90736	
SBOXXXX	dbo.AJD1	AJD1_CURRENCY	85872	
SBOXXXX	dbo.OITL	OITL_ACTUAL_INF	44016	
SBOXXXX	dbo.ADOC	ADOC_AT_CARD	42864	
SBOXXXX	dbo.ADOC	ADOC_AT_CARD	42864	
SBOXXXX	dbo.ADOC	ADOC_CUSTOMER	38552	
SBOXXXX	dbo.ADOC	ADOC_CUSTOMER	38552	
SBOXXXX	dbo.OIVL	OIVL_CURRENCY	34384	

Top_Querys_CPU | Top_Querys_Executions | Top_SPs_CPU | Top_SPs_Executions | TOP_SPs_Time | Missing_Index | Unused_Index | Duplicated_Inde ...

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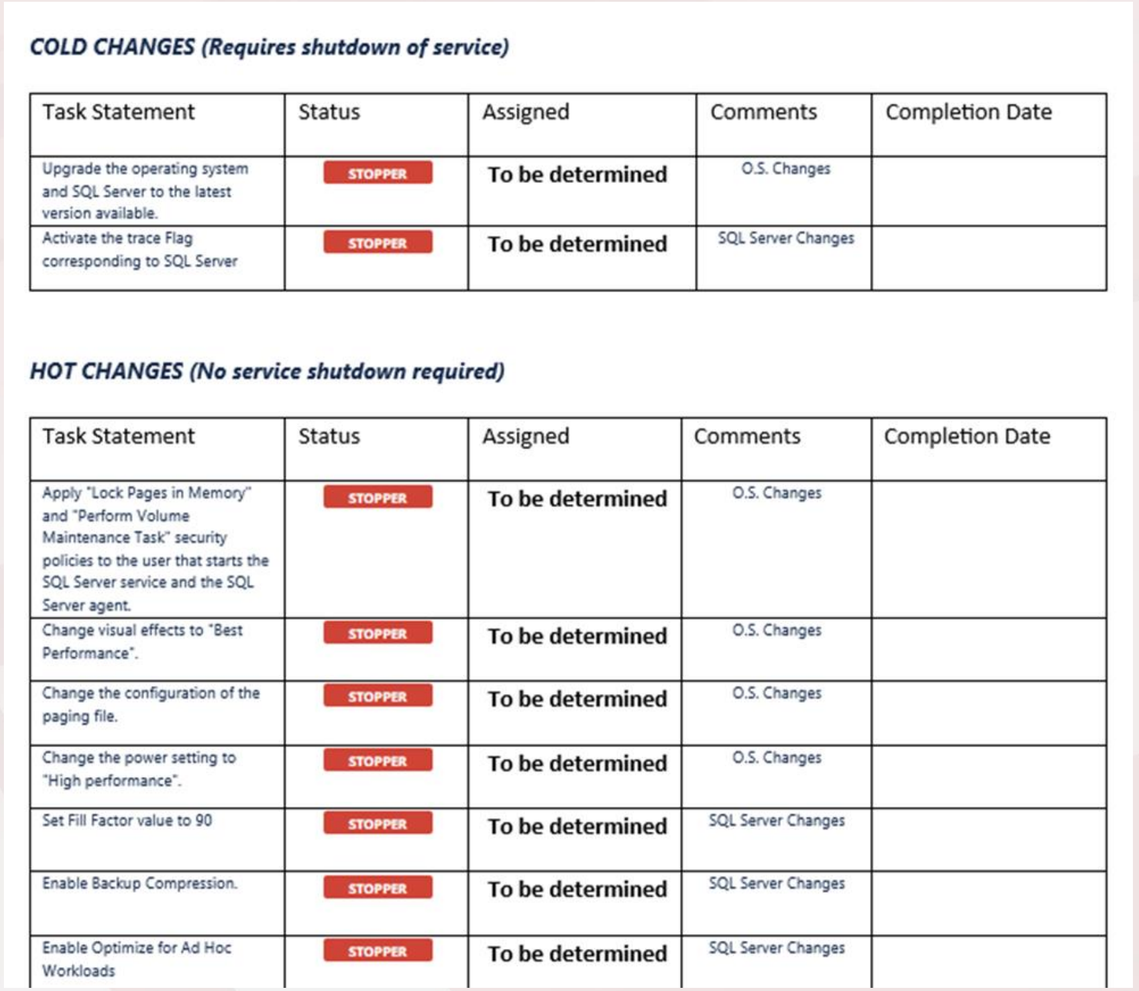
HEALTH CHECK DOCUMENT - RECOMMENDED CHANGES

PART 4

The last part of the document is a summary of all the changes proposed by our side.



COLD CHANGES (Requires shutdown of service)

Task Statement	Status	Assigned	Comments	Completion Date
Upgrade the operating system and SQL Server to the latest version available.	STOPPER	To be determined	O.S. Changes	
Activate the trace Flag corresponding to SQL Server	STOPPER	To be determined	SQL Server Changes	

HOT CHANGES (No service shutdown required)

Task Statement	Status	Assigned	Comments	Completion Date
Apply "Lock Pages in Memory" and "Perform Volume Maintenance Task" security policies to the user that starts the SQL Server service and the SQL Server agent.	STOPPER	To be determined	O.S. Changes	
Change visual effects to "Best Performance".	STOPPER	To be determined	O.S. Changes	
Change the configuration of the paging file.	STOPPER	To be determined	O.S. Changes	
Change the power setting to "High performance".	STOPPER	To be determined	O.S. Changes	
Set Fill Factor value to 90	STOPPER	To be determined	SQL Server Changes	
Enable Backup Compression.	STOPPER	To be determined	SQL Server Changes	
Enable Optimize for Ad Hoc Workloads	STOPPER	To be determined	SQL Server Changes	

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TASKS TO BE PERFORMED

PHASE	TASKS
Project Management	• Tasks related to project and meeting management
Architectural review	• Monitoring installation • O.S. Configuration Analysis • SQL Server Configuration Analysis • Database Configuration Analysis • Performance Analysis: Resource Usage • Performance Analysis: Database Usage • Analysis of data obtained from monitoring • SQL Server Health Check document creation
Implementation of changes	• Implement O.S. changes • Implement SQL Server changes • Implement Database changes • Implement changes for performance improvement
Analysis after changes	• Improvement of customer processes • Analysis of monitoring data • Finish of SQL Server Health Check document • Uninstall monitoring

CONTACT US

alesonITC
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support@aleson-itc.com

+34 962 681 242

www.aleson-itc.com