



SQL SERVER INSTALLATION BEST PRACTICES

Recommendations for your stages installation

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Secure Global Solutions
www.secglobe.net



Introduction

Welcome to the world of stages™, the most comprehensive dispatch operations database systems in the world. By now, you have begun using stages and have seen the tremendous benefits it provides your central station operations. Today, you will build your production environment and configure it to provide you the best performance possible.

This guide is designed to advise you on the best practices used for your SQL Server installation. It is rooted in our experiences in developing our stages software and is based on real world practices of our customers. This document also contains information collected from industry database experts as well. This information is provided as guidance because each operations environment is unique and will need to be optimized as your business grows.

Naturally, we are constantly updating this document to make the best experience for our customers. You can download the latest version of this document at:

<http://www.secglobe.net/>

On behalf of the entire company, we thank you for selecting stages. Welcome to the SGS family.



Overview

The SQL Server installation is a crucial step in preparing your stages environment. Many of the settings used during the installation will have a profound effect on the performance of your stages software. By reviewing this document in its entirety BEFORE you begin your install, you will understand the installation process and be well prepared to make adjustments to your installation, as well as any ongoing system maintenance in the future.

There are three areas you need to address during your SQL Server installation: a) the hardware configuration, b) the SQL Server configuration, and c) the database configuration. Each of these areas will have specific best practices associated with it and you are strongly advised to understand these recommendations BEFORE you begin your stages installation.

As always, if you have questions about the content of this document, please do not hesitate to contact SGS. We are available to assist you before, during, and/or after your software installation.



Hardware Considerations

The stages application is data intensive and requires optimal performance for you to achieve the operational excellence you are striving for. The following recommendations are specific to the procurement of your hardware. Please consult our Recommended Hardware List for detailed specifications on the architecture of your hardware.

Best Practices:

- Your server hardware should be dedicated to the running a SINGLE INSTANCE of SQL Server.
- No other applications should be running alongside stages.
- Use quality servers with enough CPUs and RAM.
- A High I/O subsystem is essential for high performance.
- Establish a separate partition for the operating system of the server and allow for adequate space for Windows/SQL updates.
- Choose a high quality RAID card and enable the write cache for 100% if possible.
- RAID 10 provides the best performance for the operation of stages. However, RAID 10 also uses a mirrored implementation of the striped data set and is therefore the most expensive storage option.

Survival Tips:

- For best I/O performance, locate the database files (**.mdf**) and log files (**.ldf**) on separate spindles to isolate disk access patterns.
- If *tempdb* will be used heavily, you should place it on its own separate spindle.
- Be sure SQL Server is installed on an NTFS partition.
- Do not use NTFS file encryption (EFS) and/or compression on SQL database and log files.



SQL Server Configuration

The SQL Server installation should be completed after the hardware drivers and operating system has been updated with the latest versions of software.

Recommendation: Consult an experienced database analyst to discuss the installation process and configuration selections.

Survival Tips:

- SQL Server configuration settings should remain at their default selections. **SPECIAL NOTE:** Any changes from the default selections should ONLY be completed by an experienced database analyst (DBA) who understands the benefits and drawbacks of making any changes.
- Software updates for SQL Server should NOT be turned on. Software updates for SQL Server should be performed manually during a regularly scheduled maintenance window.
- If necessary, adjust your firewall settings to allow for proper SQL operation.

Best Practices:

- Change the "maximum server memory" to an amount that is less than the physical amount of RAM on your server.
- Disable any unneeded services on your server.
- The Server Start Mode should be set to Automatic.



Database Configuration Settings

The database configuration settings are important to the overall performance of stages and the health of your database. These best practices are not required but are highly recommended by SGS. If you have questions regarding these settings, please consult SGS.

Best Practices:

- Leave the "auto create statistics" and "auto update statistics" options ON for all user databases. There are very few cases where these should be turned off. Should you turn these settings OFF, you MUST manually update the statistics yourself.
- Do not use the "auto shrink" database option, as it can waste SQL Server resources unnecessarily and contribute to index fragmentation. The recommendation is to shrink your database through the manual approach.
- Do not turn on AUTOGROWTH to automatically manage the size of your databases. Instead, proactively monitor and alter database size as circumstances dictate. Only use AUTOGROWTH to deal with unexpected growth.



System Maintenance

After completing your initial stages installation, your systems will need to undergo periodic system maintenance and software updates. The following practices are recommended by SGS to ensure system stability, security, and optimization. **NOTE:** Please review this entire section before attempting to update any stages server or system.

General Recommendations:

- Only one server at a time should be updated. SGS recommends that you do not update another server until the first one has been completed successfully.

Server System Updates:

- Prior to updating any stages server, you should make sure the following conditions are met FIRST:
 - Terminate all user connections from the individual server being updated.
 - If the server is running the **active instance of stages**, the following steps should be taken:
 - the stages application should point to the other stages instance to be the active stages server.
 - that active stages application should be validated for proper operation PRIOR to performing any system updates on the first server.
- After taking the server OFFLINE, run any and all system updates on the server including:
 - Microsoft Updates
 - Security and AntiVirus/Malware updates
 - Hardware and firmware drivers
- After each update, you should **reboot** the server before performing the next update.

System Update Order

- First, updates should be run on redundant (secondary) systems FIRST
- Next, the updated redundant systems should be activated as the active stages servers.
- Finally, the previously active system should be updated.



Load Balancer Considerations:

- If you have implemented a load balancer in your stages configuration, you need to adjust your pre-configuration server pool to disconnect the server from the load balancer. If necessary, put the server in maintenance mode.

Post Update Process:

- Once you have completed updating all of your servers in the stages ecosystem, you should validate and reconfigure your load balancer URLs, removing them from maintenance mode.

System Optimization

Your stages implementation should be optimized periodically as conditions dictate. If you notice any excessive runaway processes, excessive wait times, or unusual slowness within the stages application, please consult SGS for recommendations or assistance.



Support

Support:

SGS provides an online trouble ticket system you can place a reported issue, feature request, or provide any customer feedback. This trouble ticket system is available at:

<https://ticket.secglobe.net/>

Customer Service:

SGS maintains a 24/7 Network Operations Center (NOC) which remains available to address any customer inquiries or concerns. If necessary, a trouble ticket will be created to address any customer request.

Survival Tips:

- Feel free to place feature requests, report your potential bug fixes, or even lodge a compliment with our NOC staff.

Appendix

Support Wiki:

- <https://www.secglobe.net/mediawiki/index.php>

Trouble Ticket System:

- <https://ticket.secglobe.net/>

Network Operations Center (for trouble tickets):

- **Phone (Toll-Free):** +1.877.240.1019 - Option 2
- **Phone (Toll):** +1.262.240.1019 – Option 2
- **Email:** noc@secglobe.net

Corporate Headquarters:

- **Phone:** 1.800.903.7068
- **Direct:** 1.949.502.5845
- **Website:** <http://www.secglobe.net/>

