

Maintenance Guide

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Overview

The aim of this guide is to provide you with an overview of the general maintenance required by your 12d Synergy Server and to provide some information on how best to handle common failures and issues that may occur in day to day running or setup.

SQL Server Maintenance Tasks

12d Synergy itself requires very little maintenance. However, as it uses Microsoft SQL Server to manage all its meta data, SQL Server itself has some basic maintenance tasks that are required to ensure good database health.

Index Fragmentation

Indexes are used to speed up how an application works with a SQL Server database. However, over time and as more and more data is written in to database tables, the indexes may become fragmented. Like in disk drive fragmentation, this can have an impact on speed.

It is therefore important to rebuild or reorganise the indexes in your databases regularly. How often you should do this depends on the rate of data being added, but it could be as regularly as once a week or once a month.

Failing to do so can lead to timeouts and other unexpected behaviour.

Index Fragmentation with less than 30 users

Once a month, you should consider looking into fragmentation. The simplest way to do this is click the "Tune" button that is available in the 12d Synergy Administrator under General->Maintenance->Database.

You should do this out of hours when there is little or no activity. This will take about 5 minutes.

Index Fragmentation with more than 30 users

At least twice a month, you should consider rebuilding or reorganising your database tables. General practice is to only rebuild or reorganise for indexes with > 75% fragmentation and more than 500 pages. At this level of 12d Synergy usage, it would be recommended to use the SQL Server Agent to schedule in this operation rather than leaving it to a manual operation.

If you have a DBA on staff, they should be consulted for the best strategy.

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Transaction Log Truncation

SQL Server has two backup modes – SIMPLE and FULL.

When you use SIMPLE mode, you can only rollback to the last full or differential backup. If you are using SIMPLE mode, you do not have to truncate your transaction log.

When you use FULL mode, SQL Server keeps a full transaction log of all INSERTS, UPDATES and DELETES which can give you a to the minute rollback in case of disaster.

This is a very useful tool, but large transaction logs can be slow to write to or to grow.

If you are using FULL recovery mode, you must truncate your transaction log or it may lead to timeouts. Please see the guide on backup best practices, which is available here:

[http://www.12dsynergy.com/downloads/documentation/12d Synergy Server Best Practices Guide.PDF](http://www.12dsynergy.com/downloads/documentation/12d%20Synergy%20Server%20Best%20Practices%20Guide.PDF)

Troubleshooting

This document will guide you through common failures for both working with the 12d Synergy Master Server and the 12d Synergy File Replication Servers. This will cover:

1. Connectivity Errors
2. Authentication Errors
3. General Database Errors

This is not intended to be an exhaustive list, but is a good first port of call for general and common errors.

Master Server Failures

Service Starts and Then Stops

Usually, an automatic stop is caused by:

1. Credential issues for the service
2. The Microsoft .NET Framework being out of date
3. A corrupted installation
4. Incorrect settings after a migration / moving folders on disk

If the service immediately stops, there are two locations to check for more information.

If the service is unable to communicate with the database to work out where it should log to, you should check the Windows Event Viewer for any errors. The application log should contain at least one error regarding 12d Synergy.

If there are no errors, you should check the 12d Synergy File Log for any errors. If you are unable to connect to the server, see the appendix on how to find the file logs.

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Service Starts but LAN and WAN Users Can't Connect

Warm up Failures

When the service starts, it will attempt to:

1. Connect to the database
2. Connect to Active Directory, if active directory is being used

As these operations may take time, the service itself may start even if these processes fail.

As some of these services may be slower to start than the 12d Synergy Server, any attempts to connect that are met with failure will cause the service to sleep and try again after about thirty seconds.

This may give the appearance of the service starting, but it still may be in an initialisation or warm up phase.

Any errors during this phase will be visible in the Windows Application Event Viewer.

Once the server has started, you should expect to see the following in the logs:

12d Synergy Server is now operational!

Firewall Restrictions

If the 12d Synergy Server is operational, as per the file log, but users cannot connect, then make sure firewall exception for the installed ports are in place.

By default, 12d Synergy uses port 1212 and 1250 for communication.

You should test only using the LAN until you can determine if users are able to connect again.

LAN Users Can Connect but WAN Users Cannot

External Firewall / Router Restrictions

If Users on the LAN can connect but users outside the LAN cannot, then it is likely that a hardware or external firewall is the culprit.

Check any relevant external firewalls / routers to ensure the installed ports (default to 1212 and 1250) are allowed through, and are being forwarded to the correct machine.

Authentication / Login Issues

You may receive the following errors:

1. The username and password combination you supplied was not correct or not valid for this server.
2. You are not authorised to access this 12d Synergy server.

12d Synergy has three modes of authentication, which will be tried in the following order:

1. Windows Authentication against AD
2. Windows Authentication against Local User Accounts on the server

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3. Custom Login Authentication, if set up

Windows Authentication will use Active Directory first if your server is on a domain. The Active Directory setting in 12d Synergy refers only to Group Management. If the server is attached to a domain, AD will be used for authentication as a first attempt.

Next, 12d Synergy will try look at local Windows Logins.

At this point, if Windows Single Sign On is not successful, the user will be prompted for a user name or password.

This may occur if they are logging in from a computer whose credentials do not match the credentials for the server, or if there are custom logins.

If Custom Logins are not set up, and the user cannot login, this is a problem with the windows environment and their credentials should be checked.

Turning on security audit logging on the Windows Server may yield more information.

Receiving the error message **“The username and password combination you supplied was not correct or not valid for this server”** typically means Windows has failed to authenticate you.

If you receive a message indicating **“You are not authorised to access this 12d Synergy server”**, it means that Windows has authenticated you but 12d Synergy cannot find information about your User Identity.

Your Administration should check your identity settings for your account to make sure they match. 12d Synergy Identities should not contain domain information.

Certificate Problems

If you are using custom logins, you may receive this message:

"Identity check failed for outgoing message. The expected DNS identity of the remote endpoint was 'YourServer' but the remote endpoint provided DNS claim 'XYZ'. If this is a legitimate remote endpoint, you can fix the problem by explicitly specifying DNS identity 'XYZ' as the Identity property of EndpointAddress when creating channel proxy."

Future versions will remove this error message as it is needlessly technical.

This problem arises because Windows has failed to authenticate the user, and is now attempting to use custom logins. However, custom logins require the use of an X509 / SSL Certificate.

Certificates have two purposes:

1. Encryption
2. Identity

In this case, the client cannot confirm the identity of the server. This has probably occurred because the address they have entered does not match the identity encoded in the certificate.

The certificate subject or address must match the address the user enters to verify identity.

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It is possible to turn off identity checks on a per client basis, by setting a Windows Environment Variable named **Skip12dSynergyIdentityCheck** to **1**.

See the Appendix for how to set a Windows Environment Variable.

Timeout Errors or Event Cancellations

From time to time, users may receive errors about timeouts or their events may be cancelled, with accompanying errors in the logs about timeouts. If this takes place, this means there is a problem with the database server.

There are several things to look at.

Latency

Every time 12d Synergy needs to know something from the database, or to write something to the database, it sends a query and retrieves a result. The time it takes is known as the round tripping time. If there is significant latency between the 12d Synergy Service and the SQL Server service, this may result in timeouts. Ensure that latency between the two systems is < 10 ms, but < 1 ms is optimal. Latency is not an issue if the 12d Synergy Server Service and the SQL Server Service are on the same physical machine.

Available Memory

SQL Server is very sensitive to memory. You must meet our minimum requirements, but more so, you must ensure there is ample memory available to SQL Server on the server. There must be ample room for SQL Server to grow its memory as required – SQL Server is very good at managing its memory, assuming there are no other greedy services (such as Domain Controllers, Microsoft Exchange or even other SQL Servers) on the same machine.

Once SQL Server runs out of available memory, it will start a process known as paging to disk, which can slow down queries significantly.

If you have over 75% of available memory being used, and you are experiencing timeouts, you may wish to:

1. Increase the RAM on your server
2. Investigate other services that may be consuming your resources

Index Fragmentation

Databases use Indexes to speed up how they look for information. However, on each write to a table, indexes must be adjusted. Over time, these can become significantly fragmented which will slow down queries to the table and updates/inserts to the data.

It is the responsibility of the SQL Server owner to manage this, and to rebuild / recalculate index statistics appropriately.

For smaller servers, the 12d Synergy Administrators offers an option to 'tune' the database. This should be done out of hours when usage is low, but will attempt to defragment and rebuild your indexes.

Should you need more finely tuned fragmentation, please see your Database Administrator.

A query for checking fragmentation and for recalculating has been included in the appendix for your reference.

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Transaction Log Truncation

SQL Server operates with two recovery modes: Simple or Full.

Simple Recovery mode means that you are responsible for every backup – if there is a failure, you may use only the last full or differential backup. This requires less maintenance, but has greater risk.

Full Recovery mode uses a transaction log that can give you to the second recovery if required. However, this requires more maintenance.

The transaction log must be backed up and truncated regularly – as the log fills and grows, subsequent writes will slow down and can lead to timeouts. A large transaction log file is not a problem if it is mostly empty, but a large and full file is a problem.

See the appendix for more information on how to backup and truncate your transaction log properly.

File Replication Server Failures

Service Starts and Then Stops

Usually, an automatic stop is caused by:

1. Credential issues for the service
2. The Microsoft .NET Framework being out of date
3. A corrupted installation
4. Incorrect settings after a migration / moving folders on disk

If the service immediately stops, there are two locations to check for more information.

If the service is unable to communicate with the database to work out where it should log to, you should check the Windows Event Viewer for any errors. The application log should contain at least one error regarding 12d Synergy.

If there are no errors, you should check the 12d Synergy File Log for any errors. If you are unable to connect to the server, see the appendix on how to find the file logs.

Service Starts but LAN and WAN Users Can't Connect

Warm up Failures

When the service starts, it will attempt to:

1. Connect to the database
2. Connect to the Master Server for settings and configuration

As these operations may take time, the service itself may start even if these processes fail.

As some of these services may be slower to start than the FRS, any attempts to connect that are met with failure will cause the service to sleep and try again after about thirty seconds.

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This may give the appearance of the service starting, but it still may be in an initialisation or warm up phase.

Any errors during this phase will be visible in the Windows Application Event Viewer.

Once the server has started, you should expect to see the following in the logs:

File replication server is now ready for connections

Firewall Restrictions

If the File Replication Server is operational, as per the file log, but users cannot connect, then make sure firewall exception for the installed ports are in place.

By default, the 12d Synergy FRS uses port 1212 for inbound connections.

However, the 12d Synergy FRS uses a network of servers – it will communicate with the Master Server over its default transfer port (1250), and to any other FRS' in your network.

You need to add the relevant exceptions to any software or hardware firewalls.

Common Failures

Running Out of Disk Space

While users may only see that their event has been cancelled, server logs may reveal errors indicating that there is not enough disk space.

This can be an issue in two separate places:

File Stores

File Stores are where 12d Synergy Stores its files. Jobs use rules that dictate which files get stored in which File Store. Consider using expandable storage, or add new file stores as necessary.

Temporary Storage

When files are uploaded, these are stored in a temporary location until they can be moved into the relevant file store. By default, this is the Windows Temporary Directory. 12d Synergy's temp space is cleaned up regularly, including after a restart, but in some cases, files may exceed the available space.

You can set a new path by setting the windows environment variable, **12dSynergyTempPath**, to a more appropriate path with more space.

See the Appendix for details on how to set a windows environment variable. Setting this will require a restart of the relevant service.

Appendix

Finding the File Logs

If you can't connect to the server, and need to find the file logs, you should follow these steps

1. Open SQL Server Studio Manager
2. Connect to your 12d Synergy Database
3. Find the Settings table
4. Right click to select top 1000 rows
5. Find the row called FileLogPath

Setting a Windows Environment Variable

To add a Windows Environment Variable, follow these steps:

1. Go to the Start Button in Windows
2. Type in: Environment Variables
3. Select: Edit the Environment Variables for the User
4. Click Environment Variables, if the option is available
5. In the "User Variables" section, click new
6. Enter the required settings
7. Click OK until all windows are closed
8. Restart the relevant application, as Environment Variables are only loaded when the application starts

Database Fragmentation Queries

Determining Fragmentation Levels

In general, highly fragmented tables are only a problem where there are more than 500, or in some cases, 1000 pages. The following query will show tables with over 75% fragmentation and more than 500 queries. This should be run in SQL Server Management Studio.

```
SELECT dbtables.[name] as 'Table', max(indexstats.avg_fragmentation_in_percent)
FROM sys.dm_db_index_physical_stats (DB_ID(), NULL, NULL, NULL, NULL) AS indexstats
INNER JOIN sys.tables dbtables on dbtables.[object_id] = indexstats.[object_id]
INNER JOIN sys.schemas dbschemas on dbtables.[schema_id] = dbschemas.[schema_id]
INNER JOIN sys.indexes AS dbindexes ON dbindexes.[object_id] = indexstats.[object_id]
AND indexstats.index_id = dbindexes.index_id
WHERE indexstats.database_id = DB_ID() and indexstats.avg_fragmentation_in_percent > 75 and
indexstats.page_count > 500 group by dbtables.[name]
```

Cleaning up Fragmentation

The following query can be used to rebuild your indexes, but may take some time. It should be run out of hours to avoid deadlocks or other issues. Note that this is a brute force mechanism to rebuild indexes on all tables, and may not be ideal for your specific rollout. For larger enterprises, we recommend you consult with your DBA first.

```
exec sp_msforeachtable 'ALTER INDEX ALL ON ? REBUILD;'
exec sp_updatestats
DBCC FREEPROCCACHE
```

Backing up and Truncating the Transaction Log

As per Microsoft Guidelines, we recommend the following backup schedule:

1. One FULL backup at midnight every day
2. One DIFFERENTIAL backup at noon every day
3. A transaction log backup with truncation every 30 minutes.

To achieve this, you will need a scheduling tool – either a third party database backup tool, or SQL Server Agent for Standard and Enterprise editions of SQL Server.