

The SYNECT Server

Guide

Release 2019-A – May 2019

How to Contact dSPACE

Mail:	dSPACE GmbH Rathenaustraße 26 33102 Paderborn Germany
Tel.:	+49 5251 1638-0
Fax:	+49 5251 16198-0
E-mail:	info@dspace.de
Web:	http://www.dspace.com

How to Contact dSPACE Support

If you encounter a problem when using dSPACE products, contact your local dSPACE representative:

- Local dSPACE companies and distributors: <http://www.dspace.com/go/locations>
- For countries not listed, contact dSPACE GmbH in Paderborn, Germany.
Tel.: +49 5251 1638-941 or e-mail: support@dspace.de

You can also use the support request form:

<http://www.dspace.com/go/supportrequest>. If you are logged on to mydSPACE, you are automatically identified and do not need to add your contact details manually.

If possible, always provide the relevant dSPACE License ID or the serial number of the CmContainer in your support request.

Software Updates and Patches

dSPACE strongly recommends that you download and install the most recent patches for your current dSPACE installation. Visit <http://www.dspace.com/go/patches> for software updates and patches.

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dSPACE GmbH
Rathenaustraße 26
33102 Paderborn
Germany

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About This Guide

Contents This guide introduces you to the SYNECT server.







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Conventions Used in dSPACE User Documentation

Symbols

dSPACE user documentation uses the following symbols:

Symbol	Description
 DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
 NOTICE	Indicates a hazard that, if not avoided, could result in property damage.
 Note	Indicates important information that you should take into account to avoid malfunctions.
 Tip	Indicates tips that can make your work easier.

Symbol	Description
	Indicates a link that refers to a definition in the glossary, which you can find at the end of the document unless stated otherwise.
	Precedes the document title in a link that refers to another document.

Naming conventions

dSPACE user documentation uses the following naming conventions:

%name% Names enclosed in percent signs refer to environment variables for file and path names.

< > Angle brackets contain wildcard characters or placeholders for variable file and path names, etc.

Special folders

Some software products use the following special folders:

Common Program Data folder A standard folder for application-specific configuration data that is used by all users.

`%PROGRAMDATA%\dSPACE\`

or

`%PROGRAMDATA%\dSPACE\`

Documents folder A standard folder for user-specific documents.

`%USERPROFILE%\My Documents\dSPACE\`

Local Program Data folder A standard folder for application-specific configuration data that is used by the current, non-roaming user.

`%USERPROFILE%\AppData\Local\dSPACE\`

Accessing dSPACE Help and PDF Files

Introduction

After you install and decrypt your dSPACE software, the documentation for the installed products is available as online help in dSPACE Help and as Adobe® PDF files.

Online help

There are various ways to open dSPACE Help.

Note

Not all the ways to open dSPACE Help are available for all dSPACE software products.


Opening from Windows You can open dSPACE Help on its home page:

- Via Windows Start Menu

Opening from dSPACE software with menu bar You can open dSPACE Help on a product's start page:

- Via the menu bar in a dSPACE product

Opening from dSPACE software with ribbons If you use dSPACE software with ribbons, you can open dSPACE Help:


- Via the Start page in dSPACE software
- Via the Backstage view in dSPACE software (leftmost ribbon tab)
- Via the  button

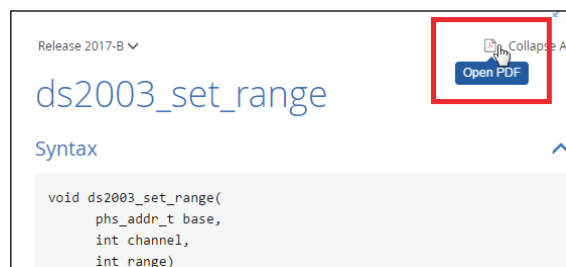
Opening context-sensitive help dSPACE Help provides context-sensitive help. You can open help on the active context in dSPACE software:

- Via **F1**
- Via the Help button


PDF files

You can open the PDF files as follows:

Opening from a topic in dSPACE Help You can access the PDF file with the current topic via the  button at the topic's top right. The following illustration shows an example:



The PDF document opens on its first page.

Opening from dSPACE software with ribbons If your dSPACE software has a user interface with ribbons, you can open a folder that contains the user documentation in PDF format via the  button in the Backstage view (leftmost ribbon tab).

Introduction to the SYNECT Server

Where to go from here**Information in this section**

[Basics on the SYNECT Server](#) 9

dSPACE SYNECT is data management and collaboration software with a special focus on model-based development and ECU testing.

[Basics on Configuring and Starting the SYNECT Server](#) 11

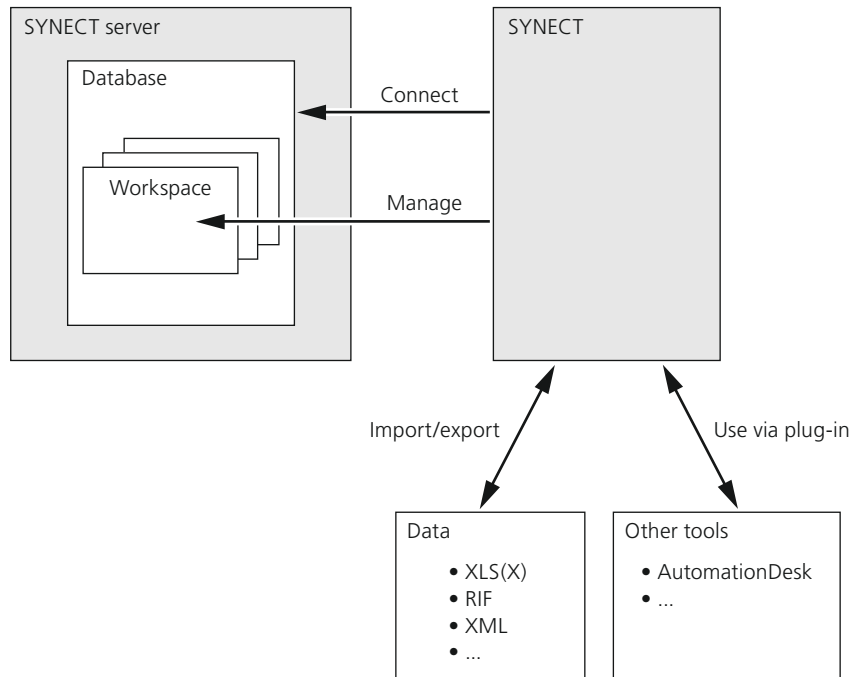
Before starting the SYNECT server, you have to configure it.

Basics on the SYNECT Server

Field of application

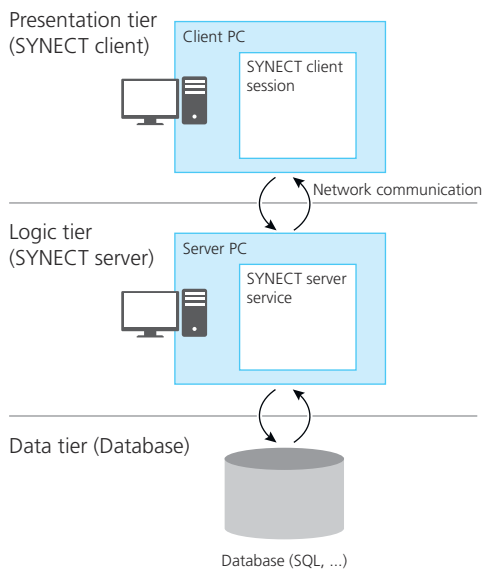
dSPACE SYNECT is data management and collaboration software with a special focus on model-based development and ECU testing.

SYNECT provides a server for working with a central database. With SYNECT's client, you can connect to the server database and import, manage, and export database items in a workspace.



Basics on the SYNECT server

The SYNECT server is a Windows service that allows SYNECT clients to use a central database. The following illustration shows a schematic.



Three-tier architecture SYNECT has a three-tier architecture. Each tier is a separate software product.

Presentation tier The *SYNECT client* is SYNECT's presentation tier. It is a user interface that provides SYNECT's features for model-based development and ECU testing.

The SYNECT client allows most *SYNECT users* to work with SYNECT without having to think about the SYNECT server or its database. All you need to know when using the SYNECT client is how to connect with the SYNECT server.

Logic tier The *SYNECT server* is SYNECT's logic tier. It is a Windows service that encapsulates SYNECT client requests for database items.

The SYNECT server is typically configured and maintained by a *server administrator*. SYNECT clients can connect with the SYNECT server, which itself is connected to a database for storing database items and configurations.

You can also operate the SYNECT server as an application using *Internet Information services (IIS)*. Contact dSPACE Support for additional information.

Data tier SYNECT's data tier is a *third-party database*.

The database for SYNECT is typically created and maintained by a *database administrator*. Only the SYNECT server requires access to the database.

Supported databases for SYNECT server

SYNECT server supports the following databases:

- SQL Server:
 - SQL Server 2008 and SQL Server 2008R2

Note

dSPACE support of SQL Server 2008 and SQL Server 2008R2 will end with dSPACE Release 2019-A (May 2019). Microsoft® is planning to end its support for SQL Server 2008 and SQL Server 2008R2. The extended support will end on July 09, 2019. Thereafter, Microsoft will no longer provide security patches and new support information. Therefore, dSPACE Release 2019-A will be the final software version that will be released for SQL Server 2008 and SQL Server 2008R2.

- SQL Server 2012
- SQL Server 2014
- SQL Server 2016
- SQL Server 2014 Express: This version is provided by the dSPACE Setup and can be used for development servers.

Basics on Configuring and Starting the SYNECT Server

Introduction

Before starting the SYNECT server, you have to configure it.

Configuring the SYNECT server

Server database SYNECT supports SQL Server databases. You have to configure the database to be used with the SYNECT server.

Server authentication and communication encryption Communication between the SYNECT server and SYNECT clients is always encrypted. You therefore have to select a certificate for the SYNECT server that authenticates the SYNECT server to SYNECT clients.

Server network protocol and URL SYNECT supports the HTTP network protocol. You have to specify the HTTP port that the SYNECT server listens to, which is a part of the URL you can use to connect SYNECT clients to the SYNECT server.

SYNECT license server Working on the SYNECT server is protected by license. You have to specify a SYNECT license server that the SYNECT server accesses to get license information. You can start a local SYNECT license server for this purpose or specify a remote SYNECT license server.

Starting the SYNECT server

The SYNECT server is a Windows service. You have to start it once after configuring it. It can then be started on automatically Windows startup. You can use Window's administrative tools to configure the *dSPACE SYNECT 2.7 Server Service*.

The SYNECT server Windows service uses the local system account named NT AUTHORITY\SYSTEM.

Working with SYNECT

To work with a SYNECT client in combination with the configured database, you have to install the SYNECT client and connect it with the SYNECT server.

For basic information and instructions on working with SYNECT clients, refer to the [SYNECT Guide](#).

Development and production servers

You can use the SYNECT server and SYNECT in different use scenarios such as the following:

Scenario	Description
Development server	<p>The SYNECT server and SYNECT are installed on the same PC. The SQL Server Express version that can be installed with the SYNECT server is used as a database.</p> <p>This scenario is useful for quick installation and configuration, testing, and development purposes.</p> <p>Do not use this scenario to cooperate with many users or work with large data. For instructions on quick server configuration, refer to Getting Started with the SYNECT Server on page 15.</p>
Production server	<p>The SYNECT server is installed on a server PC. SQL Server is used as a database. Typically, the system administration installs and configures the SYNECT server. Refer to Configuring Production Servers on page 29.</p>

Scenario	Description
Integrating system models	If you want to use SYENCT solely for integrating system models and to build OSA files, it is sufficient to install and configure the SYNECT server as a development server. Use a production server for all other use scenarios.

Configuring Development Servers

Getting Started with the SYNECT Server

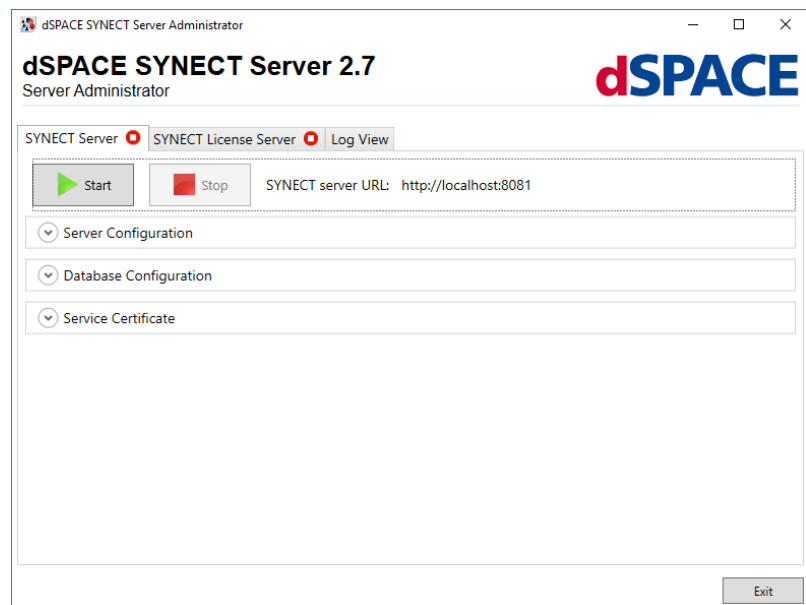
Objective To configure and start a server. You can connect to the server with a SYNECT client running on the same PC for getting started with SYNECT.

Preconditions The SYNECT server must be installed. The SYNECT license server is always installed with the SYNECT server. Refer to [Installing dSPACE Software](#).

Method **To configure and start a server**

- 1 From the Windows Start menu, select Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7.

The Server Administrator opens.

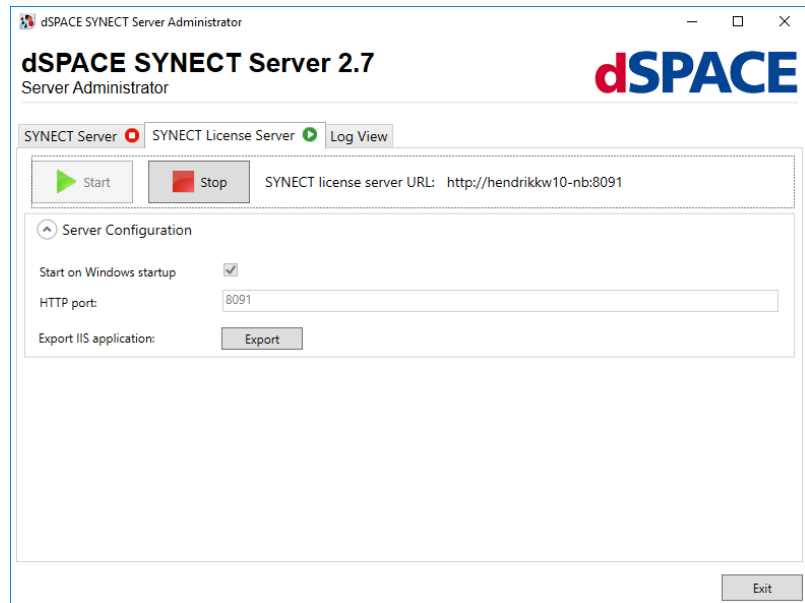


2 Select the SYNECT License Server page.

3 Click Start.

The SYNECT license server starts on the local PC and is accessed for license information.

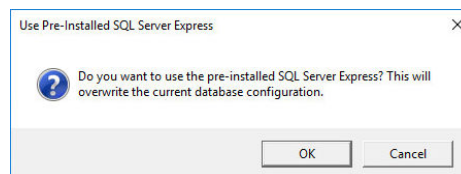
The CodeMeter Runtime on your PC must be configured to provide access to activated SYNECT licenses. Refer to [Working with CodeMeter Licensing Technology](#).



4 Select the SYNECT Server page.

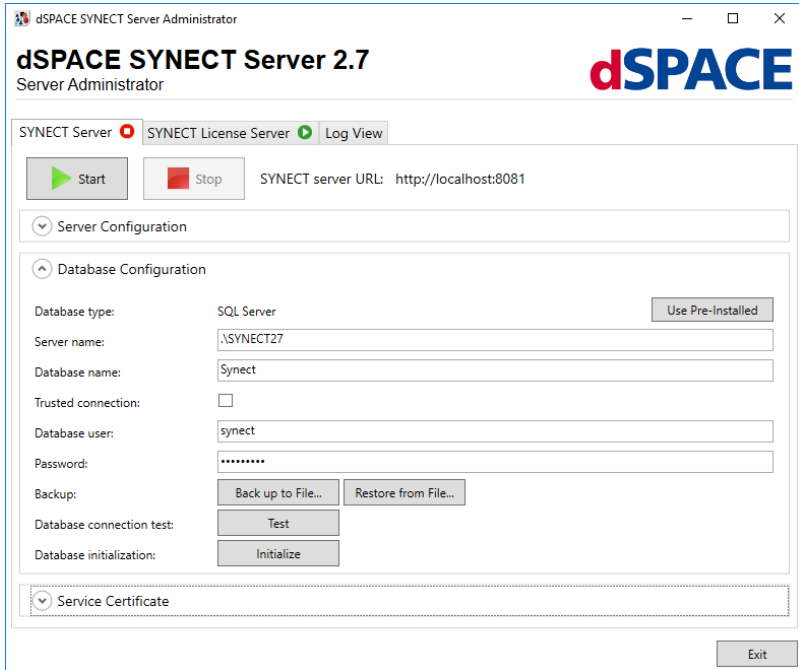
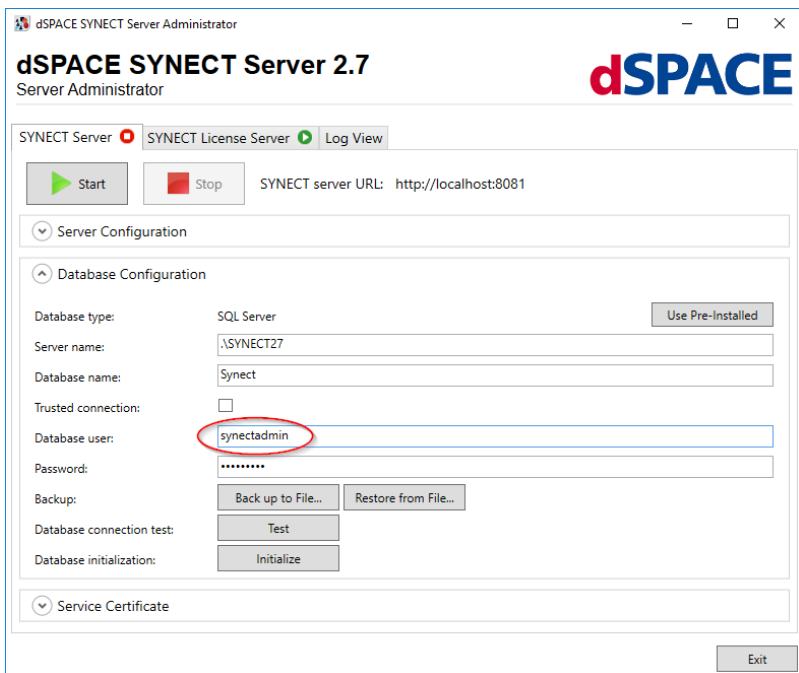
5 Expand Database Configuration, and click Use Pre-Installed.

The Server Administrator asks you to confirm using the pre-installed SQL Server Express.



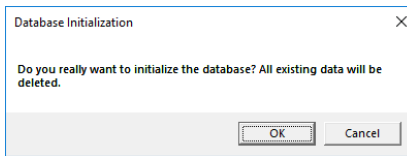
6 Click OK.

The Server Administrator configures the pre-installed SQL Server Express for you.

**7** In the Database user edit field, enter synectadmin.

8 Click Initialize.

The Server Administrator opens the Database Initialization dialog.



9 Click OK.

The Server Administrator initializes the database and informs you in a dialog when the initialization is finished.

10 Click OK.

11 In the Database user edit field, enter `synect`.

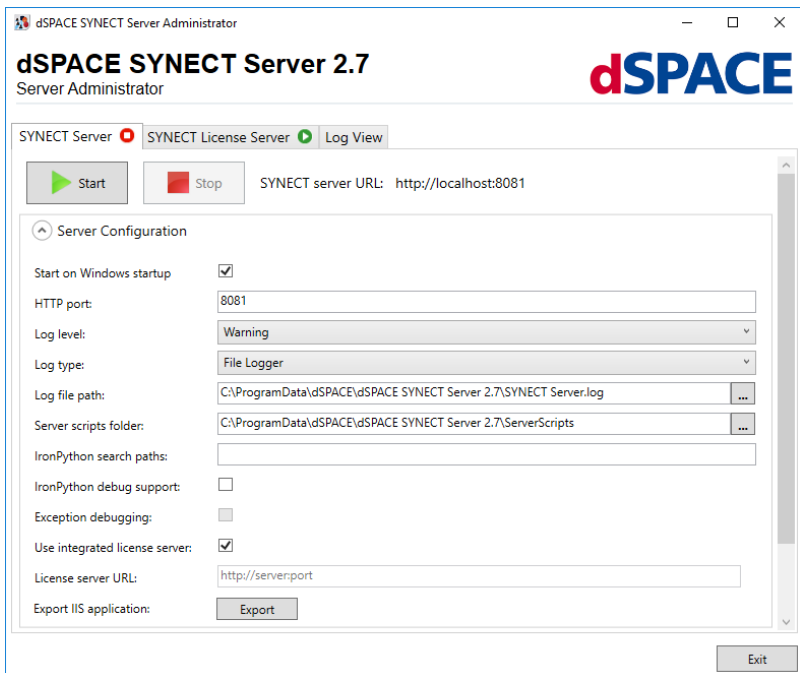
Note

It is recommended to use the `synect` database user for working with the database. The `synectadmin` database user is intended for initializing and migrating databases.

12 In the Server Administrator, expand Server Configuration.

13 Specify a port for SYNECT server's network communication via the HTTP protocol, such as 8081.

14 Specify a directory for server scripts or use the default configuration.

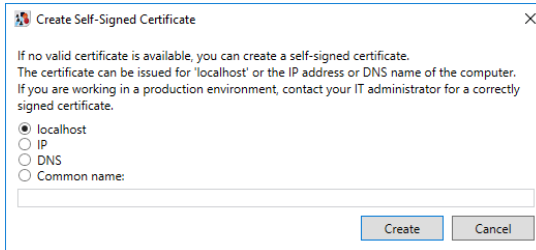


15 In the Server Administrator, expand Service Certificate.

16 Click Service Certificate – Create Self-Signed Certificate.

SYNECT opens a dialog.

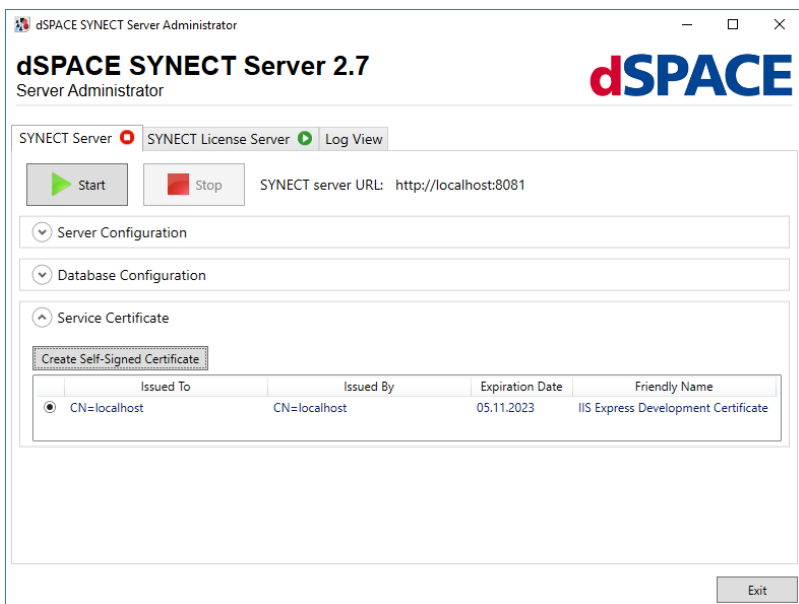
17 In the dialog, select localhost.




18 Click Create.

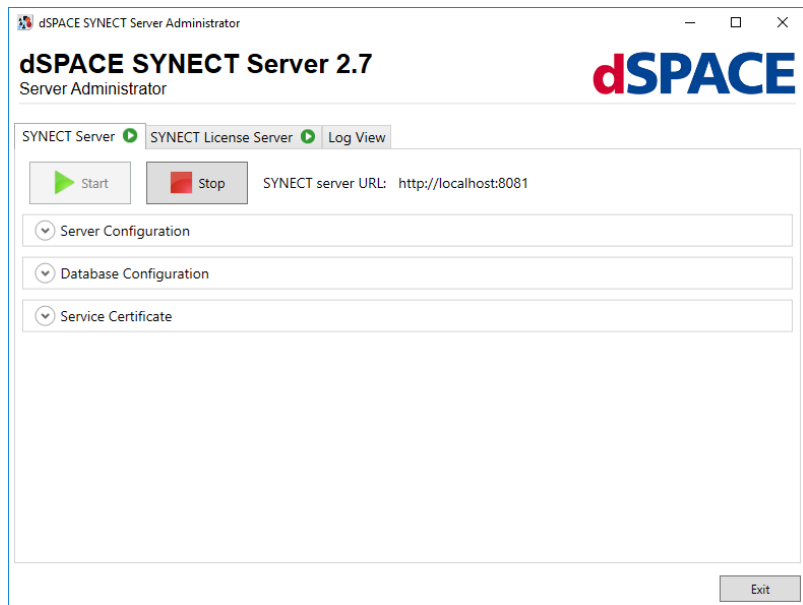
SYNECT adds a self-signed certificate to the local computer's certificate store.

19 From the list of certificates, select the self-signed certificate.



20 In the Server Administrator, click Start.

The status switches from  to  and finally  if the SYNECT server starts.




Result

You configured and started a SYNECT server.

Note

Click Log view to inspect diagnostic messages of the SYNECT server.

Next steps

You can connect a SYNECT client with the server to get started with SYNECT. For details, refer to the  [SYNECT Guide](#).

Configuring SYNECT License Servers

Where to go from here

Information in this section

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Working with a SYNECT server is protected by license.	
Basics on Configuring a SYNECT License Server	23
The SYNECT server installation provides the SYNECT license server that you can configure with the SYNECT Server Administrator.	
Assigning SYNECT User Licenses	26
You have to assign SYNECT user licenses to specific SYNECT users or PCs to work on a SYNECT server.	
Topologies for Using Licenses	28
You can support different use cases by connecting SYNECT servers and SYNECT license servers.	

Basics on License Protection

Introduction

SYNECT licenses are checked by the SYNECT server when a client requests access to data or an operation of the SYNECT server.

This applies to operations such as the following:

- Opening a workspace or project.
- Reading and changing project data, such as test cases or models.

Note

Connecting with a SYNECT server is not protected by license. This allows you to log on to a SYNECT server to assign SYNECT user licenses for working with a SYNECT server.

SYNECT modules and licenses

SYNECT provides the following modules and licenses that let you use its features:

Module	License	Description
SYNECT Base	SYNECT_BASE	Lets you work with multiple SYNECT clients on a central SYNECT server.
SYNECT Test Management <ul style="list-style-type: none"> ▪ Test Development ▪ Planning & Execution 	<ul style="list-style-type: none"> ▪ SYNECT_TM_DEV ▪ SYNECT_TM_EXEC 	Lets you perform operations with data of specific domains.
SYNECT Model Management	SYNECT_MODEL_MGMT	
SYNECT Workflow Management	SYNECT_WORKFLOW_MGMT	
SYNECT Variant Management	SYNECT_VARIANT_MGMT	Lets you work with variant-dependent data such as test variants.

License types

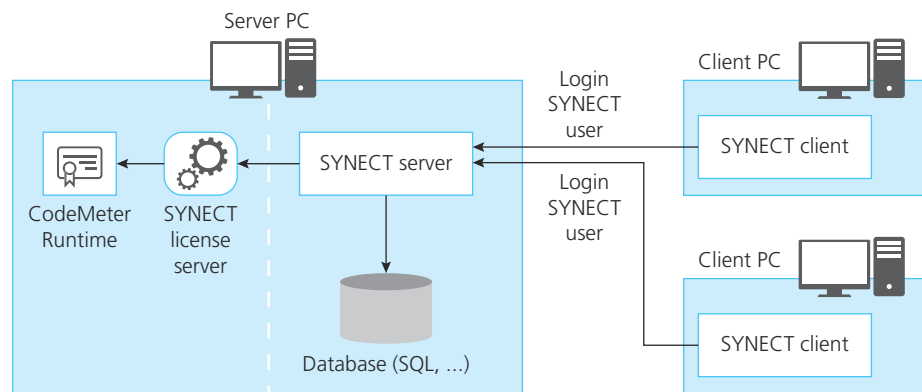
There are the following types of licenses for SYNECT:


Floating network licenses Floating network licenses let you work on a SYNECT server regardless of your SYNECT user login or the host name of the PC you are using. Floating network licenses limit the number of SYNECT users that can work on a SYNECT server concurrently.

SYNECT user licenses SYNECT user licenses let you work on a SYNECT server with a specific SYNECT user or from a PC with a specific host name. You have to assign SYNECT user licenses to specific SYNECT users or specific PCs before working on the SYNECT server.

Getting licenses

The following illustration shows how a SYNECT server gets licenses for a SYNECT user that works on a SYNECT server.




You can configure the CodeMeter Runtime with the CodeMeter WebAdmin to let the SYNECT license server access the available SYNECT licenses on the dSPACE license server. For details, refer to [Basics on Setting Up a License Server and the License Clients](#) ( [Working with CodeMeter Licensing Technology](#)).

The SYNECT license server is always installed with the SYNECT server and the SYNECT server is configured by default to use the local SYNECT license server. However, there can be situations where you want to use central dSPACE and SYNECT license servers for multiple SYNECT servers. You can configure the used SYNECT license server in the SYNECT Server Administrator in such a case. Refer to [Topologies for Using Licenses](#) on page 28.

Using SYNECT licenses

To use SYNECT licenses, you have to fulfill the following preconditions:

1. The CodeMeter WebAdmin, which you want to access with the SYNECT license server must run on the same PC and have access to activated SYNECT licenses. Refer to  [Working with CodeMeter Licensing Technology](#).
2. The SYNECT server must be configured to access the SYNECT license server, which provides the licenses. Refer to [Basics on Configuring a SYNECT License Server](#) on page 23.
3. You have to assign SYNECT user licenses to specific SYNECT users or PCs to work on a SYNECT server. Refer to [Assigning SYNECT User Licenses](#) on page 26.

However, floating network licenses are automatically reserved when you work on a SYNECT server.

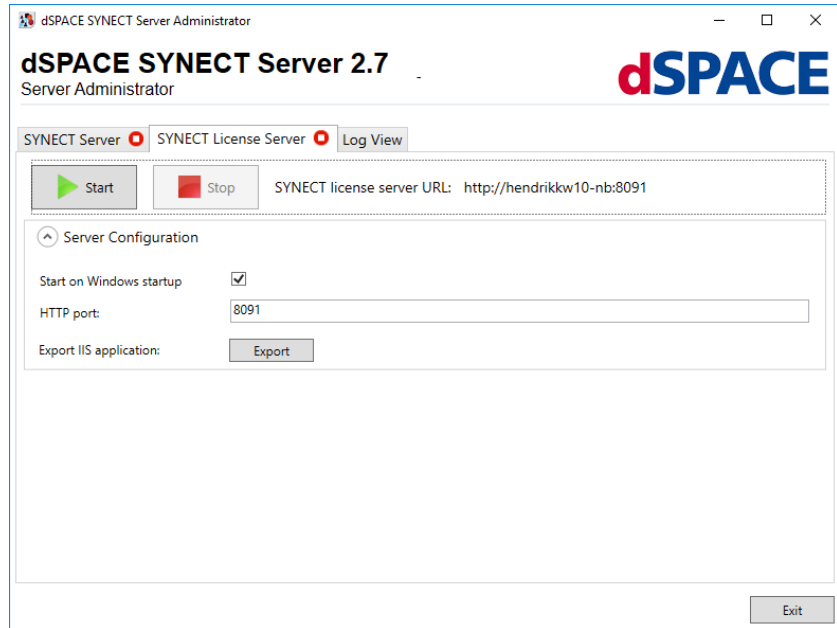
Basics on Configuring a SYNECT License Server

Introduction

The SYNECT server installation provides the SYNECT license server that you can configure with the SYNECT Server Administrator.

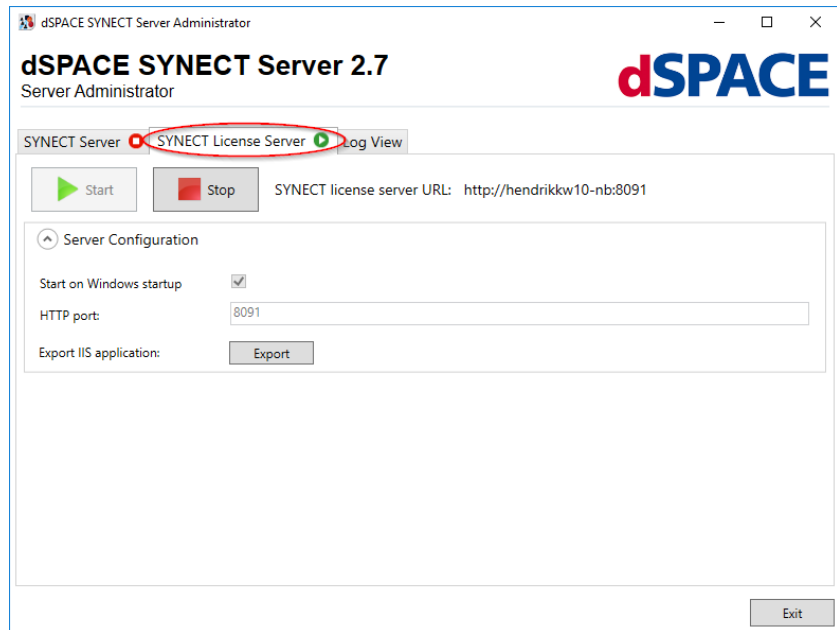
Configuring and starting a SYNECT license server

You can configure the port that can be used to access the SYNECT license server and let the related Windows service be started automatically.



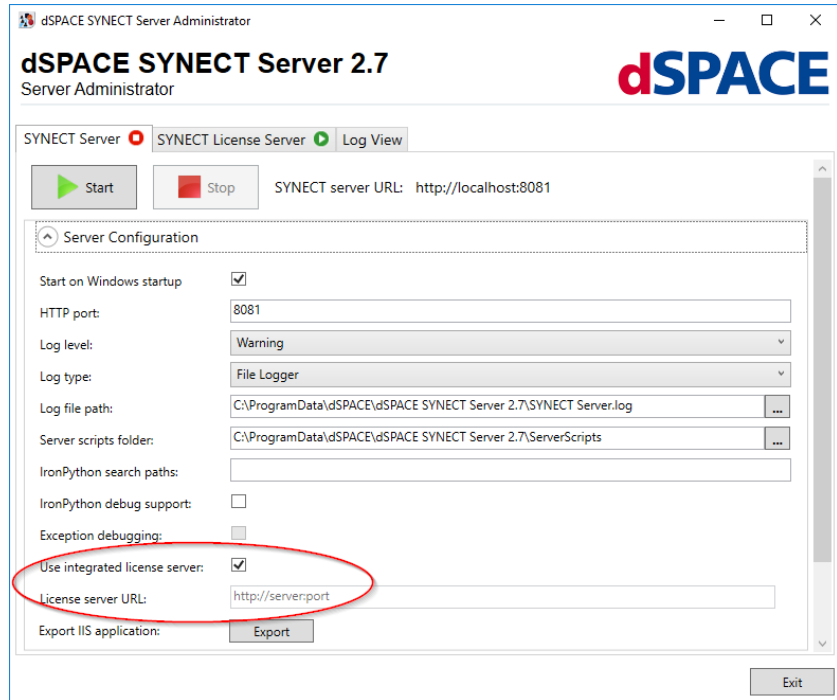
Click Start to start the SYNECT license server.

The License Server page of the SYNECT Server Administrator indicates the state of the SYNECT license server.



Selecting the SYNECT server

You can specify for the SYNECT server whether to use a local SYNECT license server or a remote SYNECT license server.



This allows you to work in a specific network topology. Refer to [Topologies for Using Licenses](#) on page 28.

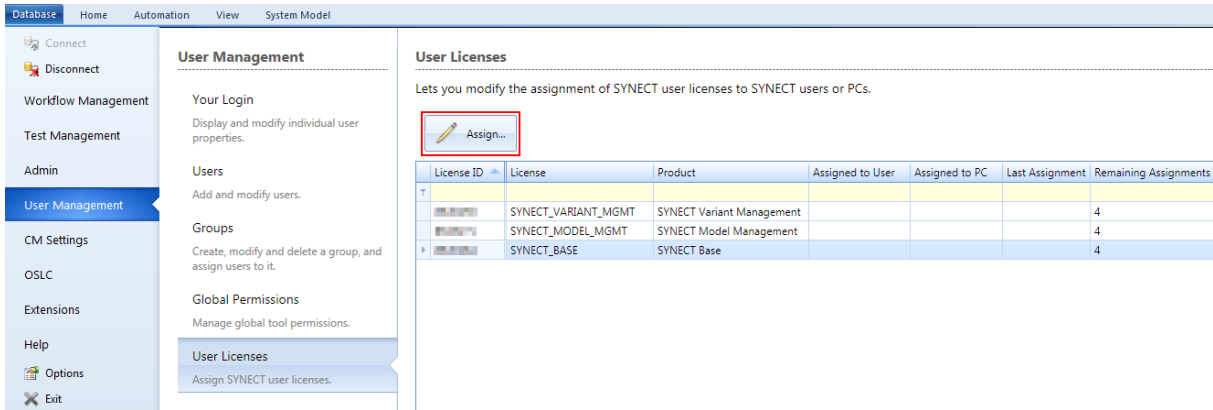
Assigning SYNECT User Licenses

Introduction

You have to assign SYNECT user licenses to specific SYNECT users or PCs to work on a SYNECT server.

Assigning licenses

From the Database ribbon, select User Management – User Licenses. The User Licenses list displays all the SYNECT user licenses that are available.



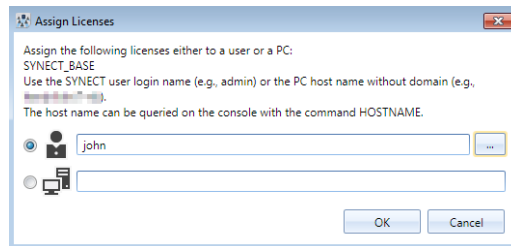
To assign a SYNECT user license to a user or a specific PC click Assign. This opens the Assign User License dialog that lets you perform the assignment.

Note

The permission for managing users and groups is required to assign SYNECT user licenses.

Assigning licenses to SYNECT users

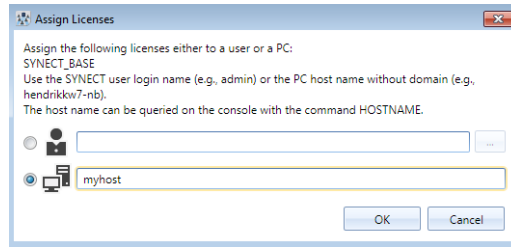
You can select the SYNECT user to assign a license to.



The selected user can work with data on the SYNECT server from any location. Therefore, licenses are reserved when an operation is requested by the user and released after the user disconnects from the server.

Assigning licenses to PCs

You can enter the host name of a PC to assign a license to it.



SYNECT users that use the PC can log on a SYNECT server. Therefore, licenses are reserved when an operation is requested by a SYNECT user that uses the PC and released after the user disconnects from the server.

Note

You have to enter the host name without its domain name.

You can run the `hostname` command in the Windows Command window to get the host name of your PC.

Rules for assignments of SYNECT user licenses


The following rules apply for assignments of SYNECT user licenses:

- The assignment is confirmed after a period of 30 minutes. During the 30 minute period, you can reassign the SYNECT user license or correct errors as required.
- You can reassign confirmed assignments no more than four times in 365 days.

The User Licenses list provides information on the number of remaining assignments of a license. The number is updated when an assignment is confirmed. If no assignment remains the list displays the number of days that you have to wait.

User Licenses

Lets you modify the assignment of SYNECT user licenses to SYNECT users or PCs.



License ID	License	Product	Assigned to User	Assigned to PC	Last Assignment	Remaining Assignments
T						
	SYNECT_VARIANT_MGMT	SYNECT Variant Management				4
	SYNECT_MODEL_MGMT	SYNECT Model Management				1
	SYNECT_BASE	SYNECT Base				4

Topologies for Using Licenses

Introduction

You can support different use cases by connecting SYNECT servers and SYNECT license servers.

Use cases

You can support the following use cases:

Use Case	Description	SYNECT License Server	SYNECT Server	Database Server
Production server	A typical SYNECT production server for a workgroup or SYNECT users at one location.	Central	Central	Central
Load balancing	Extensive data has to be provided by one database.	Central	Multiple SYNECT servers for load balancing of network traffic.	Central
Different countries	Users from different countries, such as SYNECT users from Germany and Japan access the same database.	One license server for each country. ¹⁾	At least one SYNECT server for each country.	Central
Test server	A SYNECT server that is used for testing purposes on a local PC.	Localhost	Localhost	Localhost

¹⁾ SYNECT licenses are region-bound.

Note

Due to the server performance you have to run all the servers, i.e., the SYNECT license server, SYNECT server, and database server, in the same data center.

Configuring Production Servers

Where to go from here

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Configuring the Database for the SYNECT Server

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You can use SQL Server databases with SYNECT.	
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To initialize a database for using it with SYNECT to store SYNECT items.	
How to Configure the SYNECT Server for Using a Database	36
To configure the SYNECT server for using a database with SYNECT.	

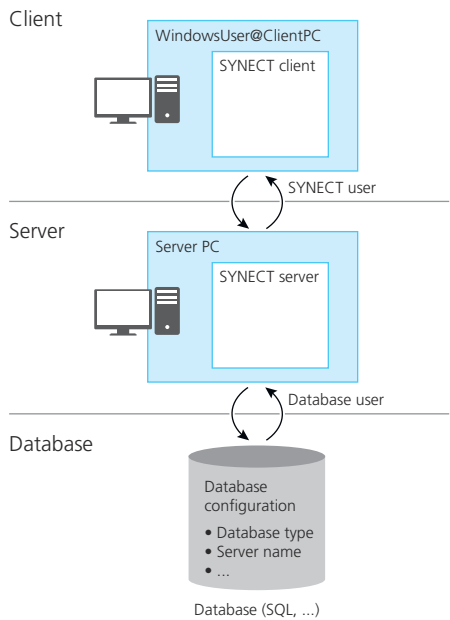
Basics on Configuring a Database

Purpose

To configure the database that is to be used via the SYNECT server.

Supported databases

SYNECT supports SQL Server databases. You have to specify which database to use via the SYNECT server. You also have to manage the used database, for example, by creating or initializing it or creating database backups.



Managing a database

Note

To manage a database for use with SYNECT, you have to install additional database software from the database provider and use it to set up a database server.

If you install the SYNECT server, you automatically also install the SYNECT Server Administrator and the SYNECT Server Migrator for additional management tasks.

During the life cycle of a database, you have to perform the following tasks:

Task	Description	Tool
Creating a database	You have to create a database for use with SYNECT and configure settings such as: <ul style="list-style-type: none"> ▪ Database name and settings ▪ Database users and their settings ▪ ... 	A tool from the database provider, e.g., Microsoft SQL Server Management Studio. The SQL Server 2014 Express version that you can install with the SYNECT server has a preconfigured database that you can use for development servers.
Initializing a database	Before using a database, you have to initialize it for work with SYNECT. SYNECT deletes all the existing database tables during initialization and creates new tables for SYNECT's data.	<i>SYNECT Server Administrator</i>
Configuring the SYNECT server to use a database	To store SYNECT data, you have to configure the database and the database user for the SYNECT server. During operation the SYNECT client passes data via the SYNECT server to the database.	<i>SYNECT Server Administrator</i>
Starting the SYNECT server	To work with SYNECT, you have to start the SYNECT server.	<i>SYNECT Server Administrator</i>
Migrating a database	To work with the data of the previous SYNECT version, you can migrate existing databases. For details, refer to Migrating Databases from Previous SYNECT Versions on page 55.	<i>SYNECT Server Migrator</i>
Creating a database backup	You should back up databases to avoid loss of data.	A tool from the database provider, e.g., Microsoft SQL Server Management Studio. For development servers, you can use the SYNECT Server Administrator to create backups.

Database user

The SYNECT server connects with the configured database via a single database user.

The SYNECT server requires access to the database for the following tasks:

- Initializing the database for work with SYNECT
- Working with SYNECT
- Migrating the database for work with a new version of SYNECT

The database user for initializing/migrating the database does not have to be identical with the database user for working with SYNECT.

Trusted connection You can configure databases to allow trusted connections or Windows login.

The Server Administrator and the Database Migrator use the following identities:

- For initializing/migrating a database: The Windows identity of the user that runs the Server Administrator/Database Migrator
- For working with SYNECT: The local system account named NT AUTHORITY\SYSTEM

Creating database backups

You should create backups of databases using tools of the database provider to avoid loss of data.

Server scripts In addition to creating backups of databases, you should also backup server script files as they are not contained in the database. Specify a Server scripts folder in the Server Administrator for this and create backups of the folder.

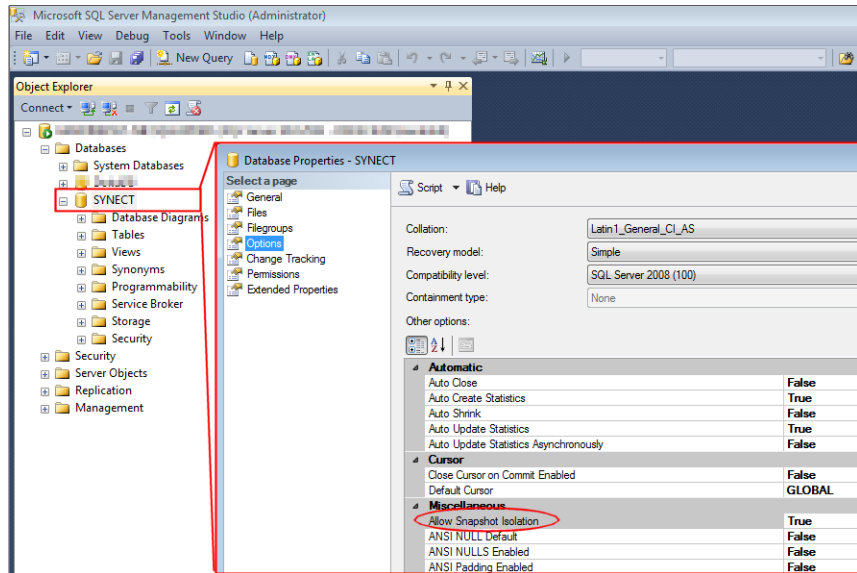
Development servers SYNECT lets you write a backup of a development server to a file and restore the database from the file via the SYNECT Server Administrator. For reference information, refer to [Server Administrator 2.7 User Interface](#) on page 61.

Basics on Using SQL Server Databases

Using SQL Server databases

You can use SQL Server databases with SYNECT.

To do so, you have to install database software, set up a database server with it, and create a database. For this you have to use tools that are provided by the database software provider, e.g., Microsoft SQL Server Management Studio. To use a database with SYNECT, you have to activate Snapshot Isolation.



Initializing, configuring and migrating databases

SYNECT provides the *SYNECT Server Administrator* for initializing a database and configuring it for the SYNECT server. You can migrate existing databases by using the *SYNECT Database Migrator*.

Initializing, migrating and working with a database requires qualified database users that you have to select when using the SYNECT Server Administrator or SYNECT Database Migrator.

Required roles for initializing a database

To initialize an SQL database, you have to specify a database user that performs the task.

The database user, that you use to initialize databases requires the following database roles:

- db_datareader
- db_datawriter
- db_ddladmin

A database user with the db_owner database role is also sufficient, because the database role includes the above-mentioned database roles.

Required roles for using a database

To use the SQL Server database with the SYNECT server, you have to start the SYNECT server and connect SYNECT (client) with it. The SQL Server user that you use to connect with the SQL database when starting the SYNECT server does not require the db_ddladmin role. The db_datareader and db_datawriter roles and the Execute permission are sufficient.

You can either revoke the db_ddladmin role from the SQL Server user that you used to initialize the database or use a different SQL Server user for using the database in conjunction with the SYNECT server.

Required roles for migrating a database

To migrate an SQL database, you have to specify a database user that performs the task. The user requires the same roles as for initializing a database. Refer to Required roles for initializing a database.

Preconfigured SQL Server Express database

The SYNECT server installation also provides Microsoft SQL Server Express with a preconfigured database. You can use it with the following settings for the Database Configuration in the *SYNECT Server Administrator*:

Option	Setting
Server name	. \SYNECT27
Database name	Synect
Trusted connection	cleared
Database user	synect
Password	Dohikoco\$

You can use the Use Pre-Installed button to auto-fill these settings for the Database Configuration.

For instructions, refer to [How to Configure the SYNECT Server for Using a Database](#) on page 36.

Initializing the preconfigured SQL Server Express database The database user that you use to initialize or migrate the preconfigured SQL Server Express database must have additional database roles. You can use the `synectadmin` database user for this:

Option	Setting
Database user	synectadmin
Password	Dohikoco\$

Note

It is recommended to use the `synect` database user for working with the database. The `synectadmin` database user is intended for initializing and migrating databases.

How to Initialize a Database

Objective To initialize a database for using it with SYNECT to store SYNECT items.

Preconditions You can access a database that is supported by SYNECT. You should contact your system administrator for information on the database server address and database users.

Method

To initialize a database

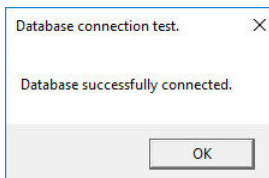
- 1 From the Windows Start menu, select **Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7**.
The SYNECT Server Administrator opens.
- 2 Specify the database server.
- 3 Enter the login data of the database user, you want to use for initializing the database.

Note

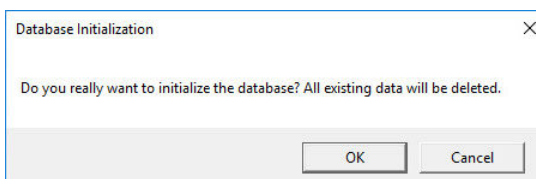
Initializing a database requires more database permissions than using the database with SYNECT.

The database user that initializes the database and the database user that you specify for using the database with SYNECT do not have to be identical.

- 4 Click **Test** to verify your database configuration.
SYNECT displays a dialog with the test result.

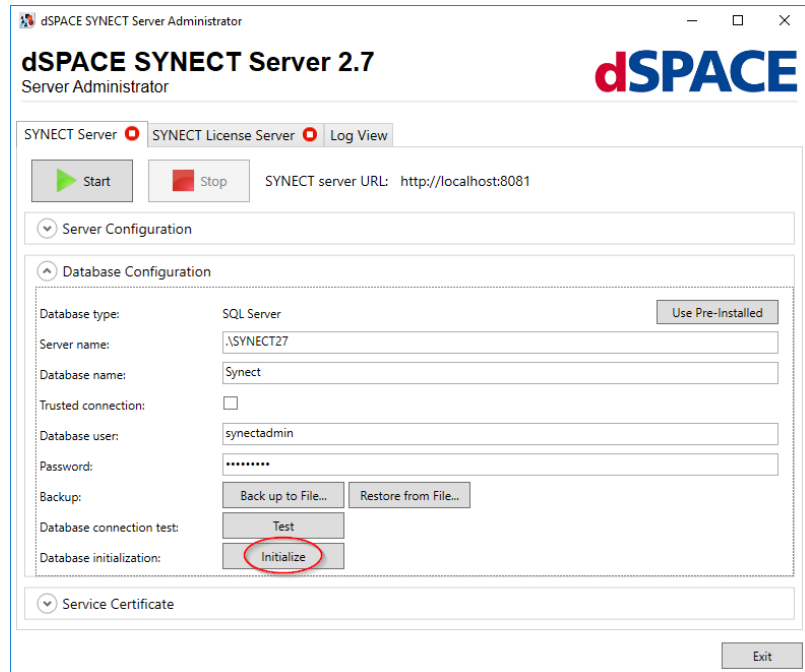


- 5 In the dialog, click **OK**.
- 6 Click **Initialize**.
SYNECT asks for confirmation because all the existing data will be deleted.



7 In the dialog, click OK.

SYNECT deletes all the existing database tables and creates new tables for SYNECT's data.



Result You initialized the selected database.

Next steps You can configure the SYNECT server to use the database with SYNECT. For instructions, refer to [How to Configure the SYNECT Server for Using a Database](#) on page 36.

How to Configure the SYNECT Server for Using a Database

Objective To configure the SYNECT server for using a database with SYNECT. For using the database with SYNECT, you have to connect a SYNECT client with the SYNECT server.

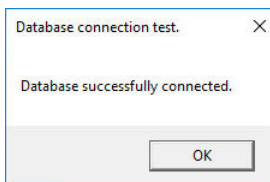
Preconditions You must have access to a database that is ready for use. For this you either:

- Initialized a database. For instructions, refer to [How to Initialize a Database](#) on page 35.

- Migrated a database from the previous SYNECT version. For details on migrating databases, refer to [Migrating Databases from Previous SYNECT Versions](#) on page 55.

Method**To configure the SYNECT server for using a database**

- 1 From the Windows Start menu, select Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7. The Server Administrator opens.
- 2 In Database Configuration, specify the database server.
- 3 Enter the login data of the database user, you want to use for working with the database.
- 4 Click Test to verify your database configuration. SYNECT displays a dialog with the test result.

**Note**

Testing the database configuration with the SYNECT Server Administrator does not guarantee that the SYNECT server can connect with the database.

This is because the SYNECT Server Administrator uses your user account but the SYNECT server service uses a local system account.

- 5 In the dialog, click OK.

Result

You configured the SYNECT server for using a database.

Next steps

- You can configure the URL for accessing the SYNECT server. For instructions, refer to [How to Specify the Port for the SYNECT Server](#) on page 47.
- You can configure the server authentication of the SYNECT server. For instructions, refer to [How to Select Certificates](#) on page 44.
- You can start the SYNECT server if server authentication and the URL are configured. For instructions, refer to [How to Start the SYNECT Server](#) on page 48.

Configuring Certificates

Where to go from here

Information in this section

Basics on Server Authentication	38
To authenticate the SYNECT server to the SYNECT client for secure and encrypted data transfer.	
Basics on Creating Certificates for Productive Servers	40
To create a certificate for a productive SYNECT server that all SYNECT clients trust.	
How to Create Self-Signed Certificates	43
To create a self-signed certificate for a development server.	
How to Select Certificates	44
To select a certificate that the SYNECT server uses for authentication and encryption.	

Basics on Server Authentication

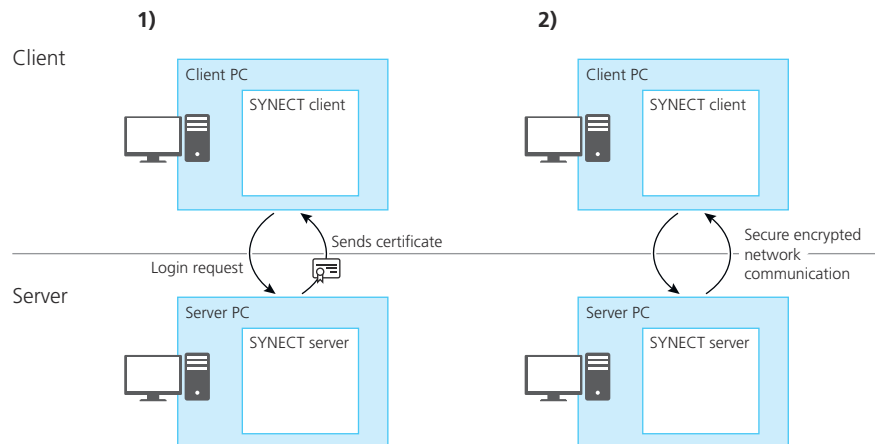
Purpose

To authenticate the SYNECT server to the SYNECT client for secure and encrypted data transfer.

Server authentication

Server authentication is the process of establishing confidence for a client in the server identity. The Windows method for this uses certificates that the server sends to the client for verification.

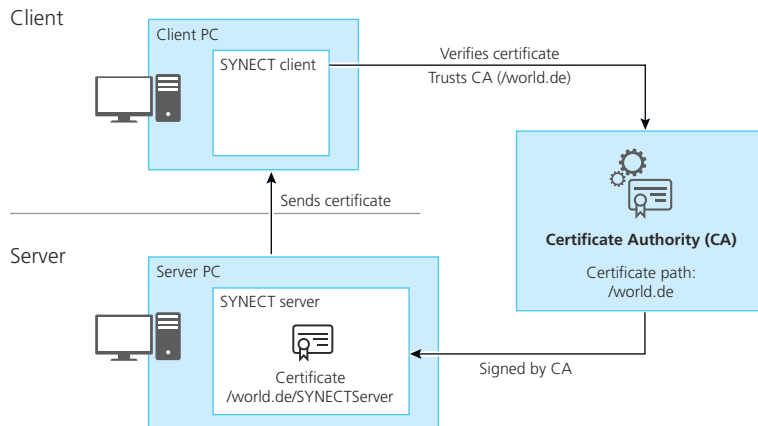
The following illustration shows the Windows server authentication process for the SYNECT server:



Verifying certificates

The verification of certificates requires a certificate authority that the client trusts. A certificate authority can issue certificates with a certificate path that states the certificate authority. For verification, the client uses the certificate path. If the client trusts the certificate authority of the server certificate path, the certificate is trusted, i.e., the certificate verification is successful.

The following illustration shows the certificate verification process:



Creating certificates

For server authentication you have to create a certificate that all the SYNECT clients trust. This requires a server certificate that is trusted by all the client PCs that run the SYNECT client.

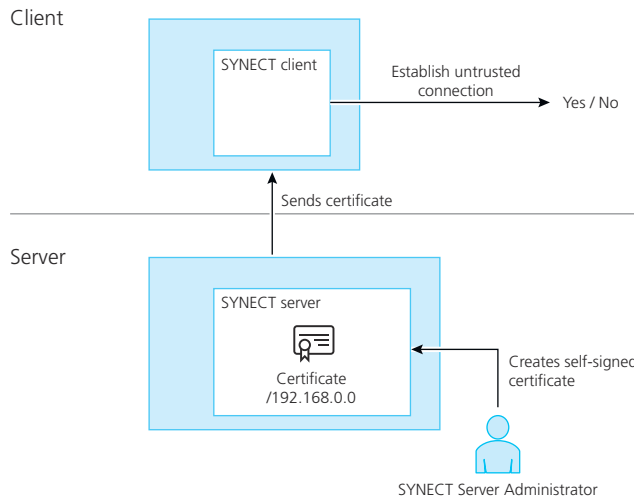
Note

If you want to create a certificate for a productive SYNECT server, contact your system administrator.

You have to note the configuration of some certificate properties that are required for use with the SYNECT server. For details, refer to [Basics on Creating Certificates for Productive Servers](#) on page 40.

Creating certificates for development servers If you want to configure a SYNECT server for development, the SYNECT Server Administrator provides the functionality to create self-signed certificates. This lets you establish untrusted but still encrypted network communication between the SYNECT server and SYNECT clients.

The following illustration shows the development server scenario in which self-signed certificates are used for server authentication.



Basics on Creating Certificates for Productive Servers

Purpose To create a certificate for a productive SYNECT server that all SYNECT clients trust.

Creating certificates To create a certificate, you have to note the configuration of some certificate properties that are required for use with the SYNECT server.

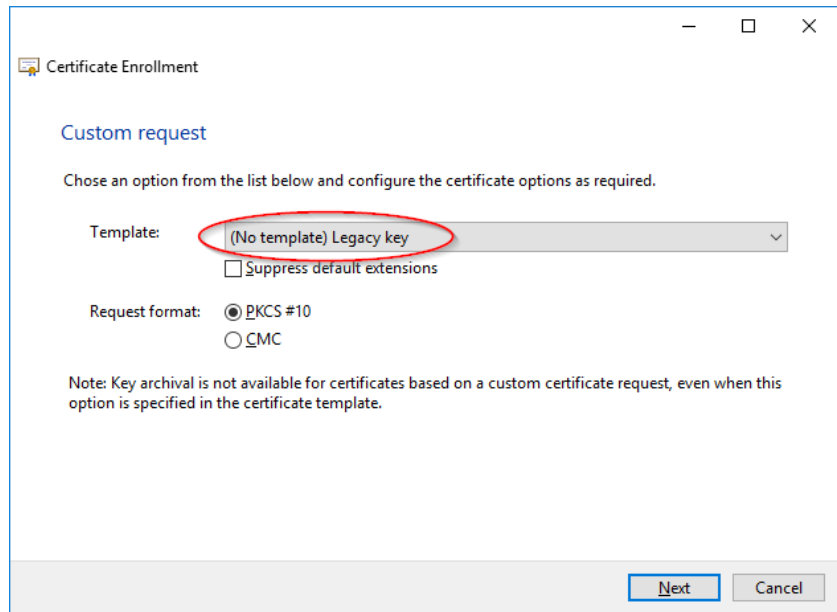
Note

Typically a system administrator creates certificates. However, you can also create a custom certificate request and specify required certificate properties.

To learn more on certificates, refer to Microsoft Windows Help on Certificates.

Using legacy keys You have to create a certificate with key pairs generated by legacy cryptographic service providers.

The following image shows configuring a custom request for a certificate with legacy keys.

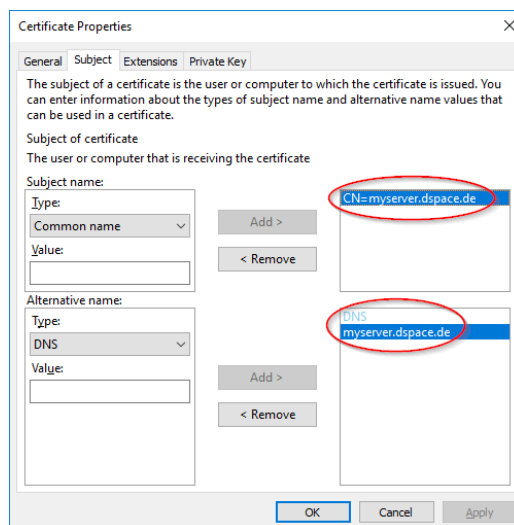


Configuring certificate properties

When creating a certificate, you have to configure the following certificate properties for use with the SYNECT server.

Subject You have to specify the name or IP address of one PC only. This is due to a bug in Microsoft's WCF framework that evaluates one subject value only. For specifying an alternative name, you should also provide the name or IP address of the PC.

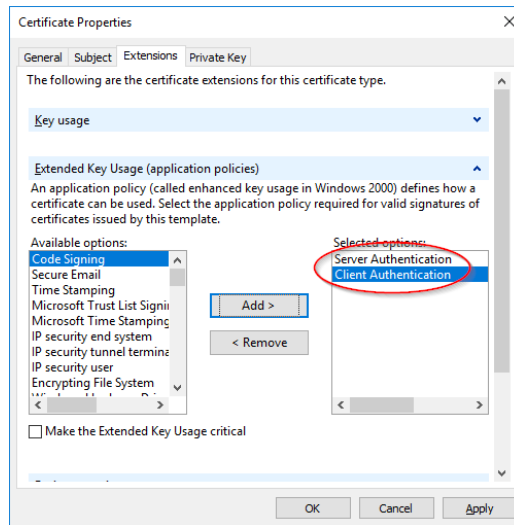
The following image shows configuring Subject properties of a certificate.



Extensions You have to specify the following options for using the certificate:

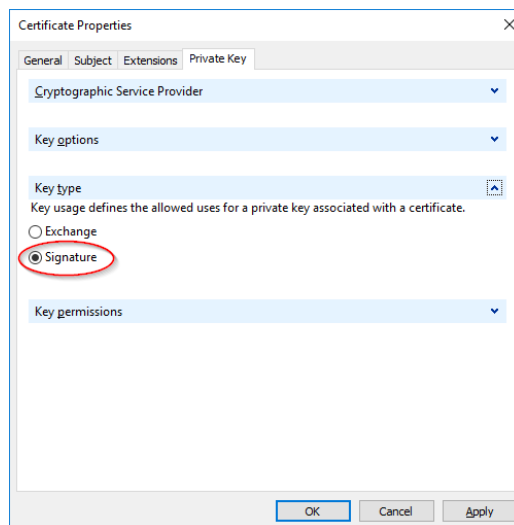
- Server Authentication (1.3.6.1.5.5.7.3.1)
- Client Authentication (1.3.6.1.5.5.7.3.2)

The following image shows configuring Extended Key Usage properties of a certificate.



Private key You have to specify Signature for the Key Type.

The following image shows configuring Key Type properties of a certificate.



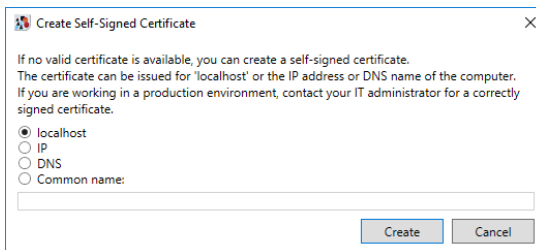
How to Create Self-Signed Certificates

Objective To create a self-signed certificate for a development server.

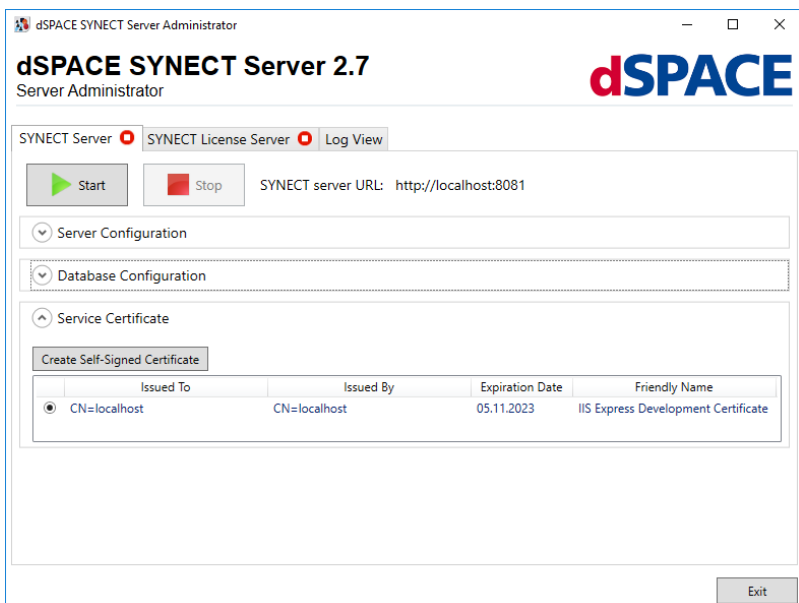
Method

To create self-signed certificates

- 1 From the Windows Start menu, select Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7.
The SYNECT Server Administrator opens.
- 2 Expand Service Certificate and click Create Self-Signed Certificate.
SYNECT opens a dialog.
- 3 In the dialog, select how your machine is identified in the certificate that you want to create.



- 4 Click Create.
SYNECT adds a self-signed certificate to the local computer's certificate store.



Result

You created a certificate that you can use for a development server.

Next steps You can select the self-signed certificate to configure a SYNECT server. For instructions, refer to [How to Select Certificates](#) on page 44.

Related topics

References

Server Administrator 2.7 User Interface	61
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How to Select Certificates

Objective To select a certificate that the SYNECT server uses for authentication and encryption.

Preconditions You must have a certificate that is trusted by all the SYNECT clients that have to be able to connect to the SYNECT server.

There are the following major use cases for configuring a SYNECT server:

- The SYNECT server is configured for *production* and must be accessible by clients that trust certificate authorities (CAs) for a domain.

You require a certificate that is trusted by all the SYNECT clients. To create such a certificate, contact your system administrator.

- The SYNECT server is configured for *development*.

You can create a self-signed certificate to establish untrusted network communication. For instructions, refer to [How to Create Self-Signed Certificates](#) on page 43.

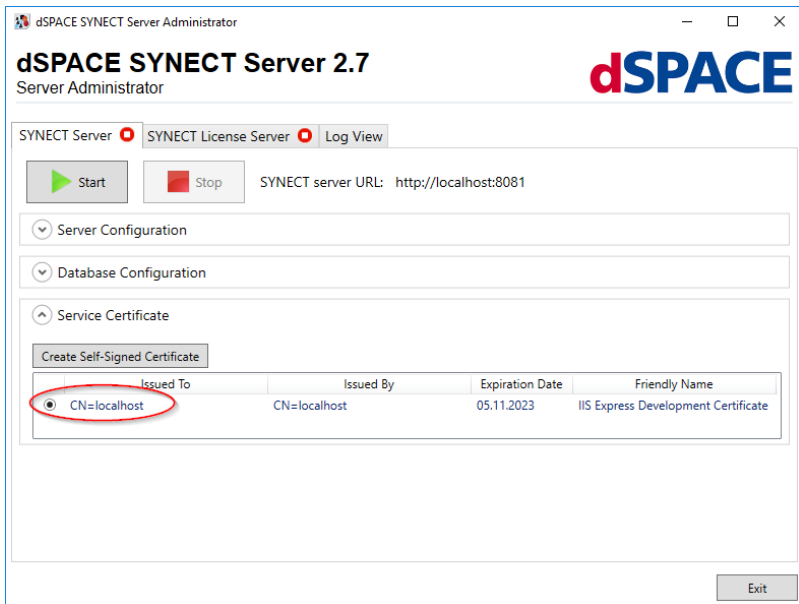
Method

To select certificates

- 1** From the Windows Start menu, select Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7.

The Server Administrator opens.

- From the list of certificates, select the certificate you want the SYNECT server to use.

**Result**

You selected the certificate that the SYNECT server uses for encrypting the communication between the SYNECT server and SYNECT clients.

Specifying the Port for Accessing the SYNECT Server

Where to go from here

Information in this section

Basics on URLs	46
To allow SYNECT clients to access the SYNECT server, you have to specify a port the server listens to.	
How to Specify the Port for the SYNECT Server	47
To specify the HTTP port that the SYNECT server listens to.	

Basics on URLs

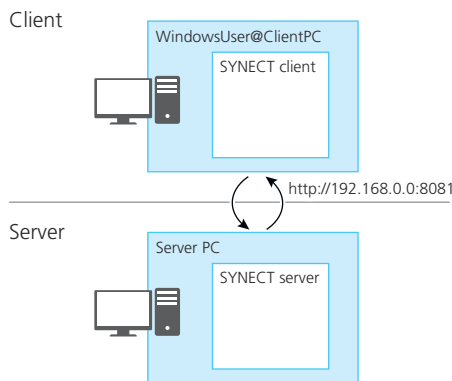
Introduction

To allow SYNECT clients to access the SYNECT server, you have to specify a port the server listens to.

URLs for accessing the SYNECT server

A URL specifies how a SYNECT client can access the SYNECT server.

The following illustration shows a schematic:



Protocol A schema that is used for encoding the data to be communicated. The SYNECT server supports the standard HTTP network protocol. SYNECT encrypts the entire network communication at the message level. For basic information on configuring the authentication of the SYNECT server to the SYNECT client for secure and encrypted data transfer, refer to [Basics on Server Authentication](#) on page 38.

IP address The location of the server, i.e., the server's Internet protocol address (IP address). You specify the server IP address via the server certificate that you select for secure and encrypted data transfer. A server certificate is issued to a certain PC

that is identified by its IP address, name in a domain name system (DNS) or by the localhost variable.

Port The port the server listens for incoming communication. You can specify a standardized port (such as 8081 for HTTP) or any other port available.

How to Specify the Port for the SYNECT Server

Objective To specify the HTTP port that the SYNECT server listens to.

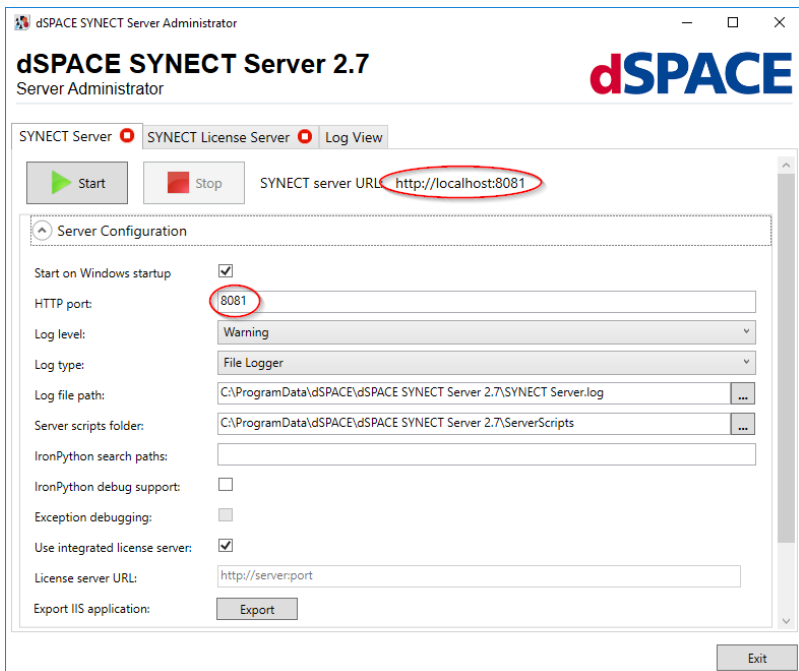
Preconditions You require the following information:

- The ports that your IT service opened for communication

Method

To specify the port for the SYNECT server

- 1 From the Windows Start menu, select Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7. The SYNECT Server Administrator opens.
- 2 In the Server Configuration, specify HTTP port.



Result You specified a port for the SYNECT server.

Starting the SYNECT Server

How to Start the SYNECT Server

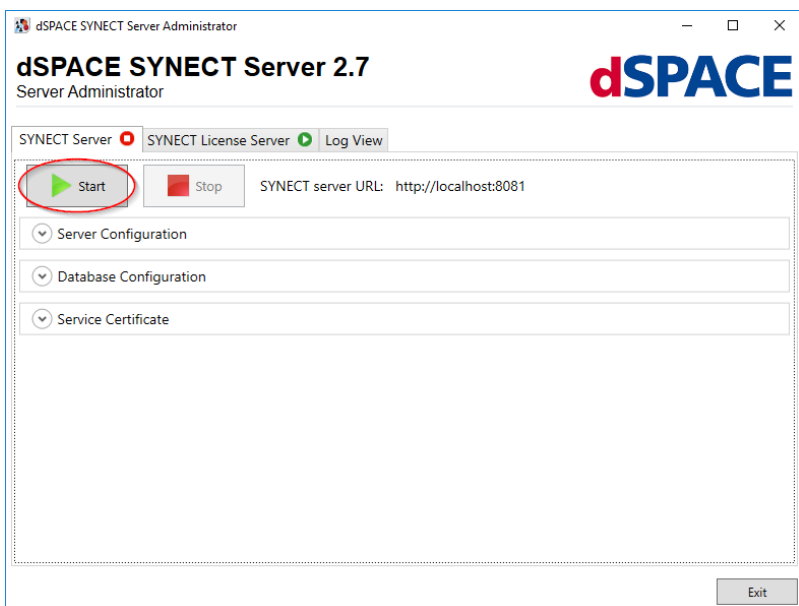
Objective To start the SYNECT server that lets SYNECT clients work with a central database by connecting with the SYNECT server.




Preconditions

- You must have specified a remote SYNECT license server or started a local SYNECT license server. Refer to [Configuring SYNECT License Servers](#) on page 21.
- You must have configured the SYNECT server.

Method **To start the SYNECT server**

- 1 From the Windows Start menu, select Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7.
The Server Administrator opens.



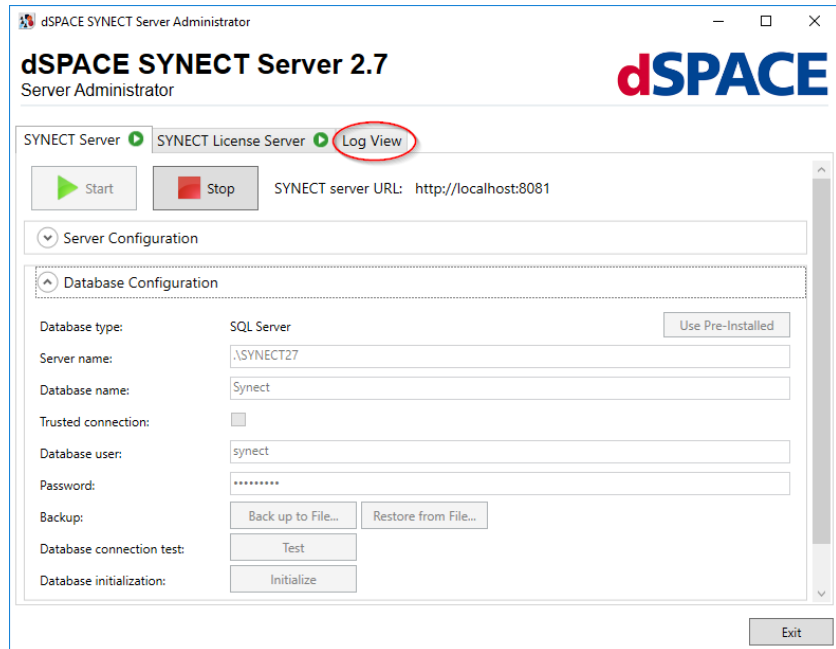
- 2 In the dSPACE SYNECT Server Administrator, click Start.
The status switches from  to  and finally  if the SYNECT server starts.

Result

You started the SYNECT server.

Note

Click Log view to inspect diagnostic messages of the SYNECT server.

**Next steps**

You can connect the SYNECT client to the SYNECT server to work on the central database that you configured for SYNECT.

Configuring the SYNECT Server

Where to go from here

Information in this section

[Basics on Configuring the SYNECT Server for Server Scripts](#) 51

You can configure the SYNECT server for programming SYNECT.

[Basics on Limiting Query Results](#) 52

You can specify a limit for the number of database items that the SYNECT server returns for a search with queries.

Basics on Configuring the SYNECT Server for Server Scripts

Introduction

You can configure the SYNECT server for programming SYNECT.

Configuring a directory for storing server scripts

For programming SYNECT, you can upload server scripts to the SYNECT server.

Specify a directory to which the SYNECT server copies the contents of uploaded server script directories. The server creates a subdirectory for each uploaded server script directory. Specify a **Server scripts** folder in the **Server Administrator** for this.

Note

Back up the server directory, because server script files are not contained in the database.

Configuring the server's IronPython search path

You can configure the IronPython search path of the SYNECT server's internal IronPython interpreter to use libraries that you installed on the SYNECT server in

server scripts. Specify IronPython search paths in the Server Administrator for this.

The SYNECT server must have access to the directory you installed the libraries in.

Configuring debugging support

The SYNECT server supports debugging of server scripts. For debugging, select IronPython debug support in the Server Administrator. This lets you attach Microsoft Visual Studio to the process of the SYNECT server.

For debugging exceptions, you can configure the SYNECT server to break the debugger when exceptions occur. Select Exception debugging in the Server Administrator for this.

For details, refer to [Basics on Debugging Server Scripts](#) ( SYNECT Guide).

Basics on Limiting Query Results

Introduction

You can specify a limit for the number of database items that the SYNECT server returns for a search with queries.

Searching database items

You can use queries to search SYNECT's database in the following situations:

- Searching database items using SYNECT's global search
- Filtering items in data grids

Limiting the number of returned database items

You can limit the number of database items that the SYNECT server returns by setting a query result limit in the SYNECT `Server.config` file. The file is located in the Common Program Data folder on the SYNECT server at `C:\ProgramData\dSPACE\dSPACE SYNECT Server 2.7\SYNECT Server.config`.

The following listing shows how to specify a query result limit in the SYNECT `Server.config` file:

```
<appSettings>
  <add key="queryLimit" value="10000" />
  <add key="logSeverity" value="Info" />
  <add key="logger" value="dSPACE.Synect.Framework.Logging.FileLogger, SNFramework" />
  <add key="logFilePath" value="C:\ProgramData\dSPACE\dSPACE SYNECT Server 2.7 Debug\SYNECT Server.log" />
  ...
</appSettings>
```

Query result limits

The following applies for query result limits:

Value	Description
The <code>queryLimit</code> tag is missing.	SYNECT uses a default query result limit of 100000 database items.
A specific value such as 10000.	The value is used.
0	SYNECT does not limit the number of database items that are returned for a search with queries.

Note

Query result limits do not apply if you execute queries via the server API.

Migrating Databases from Previous SYNECT Versions

Where to go from here

Information in this section

[Migrating a Database to SYNECT 2.7](#) 55

You have to migrate SYNECT's database to use the data of SYNECT 2.0 - SYNECT 2.6 with SYNECT 2.7.

[How to Migrate Databases to SYNECT 2.7](#) 57

To migrate databases you can use the *SYNECT Database Migrator*.

Migrating a Database to SYNECT 2.7

Introduction

You have to migrate SYNECT's database to use the data of SYNECT 2.0 - SYNECT 2.6 with SYNECT 2.7.

SYNECT provides a server for working with a central database. Migrating SYNECT's database therefore affects all of the SYNECT (client) users that connect to the SYNECT server. This means you have to migrate the database in a central process.

To migrate an SQL Server database, you have to copy the database and test the migration with the database copy. The database in use is called the live database.

Note

Contact dSPACE Support if you want to migrate SYNECT versions earlier than SYNECT 2.0.

Central migration process

A central process for migrating SYNECT's database to SYNECT 2.7 should have the following steps:

1. Installing a new SYNECT server version that is parallel to the existing SYNECT server version.
The SYNECT server installation provides the *Database Migrator*, which lets you migrate SYNECT databases.
2. Copying the live database with the tools that are provided by the database distributor.
3. Migrating the database copy.
4. Starting the SYNECT server 2.7 with the database copy.

Note

To use both SYNECT servers in parallel, they must have different TCP ports.

For instructions, refer to [How to Migrate Databases to SYNECT 2.7](#) on page 57.

5. Installing the new SYNECT (client) version.
You can install more than one SYNECT (client) version, such as SYNECT 2.0 and SYNECT 2.7, in parallel.
6. Connecting the new SYNECT (client) to the SYNECT server 2.7 with the migrated database.
This lets you analyze the migrated database.

Note

Contact dSPACE Support if the database was not migrated successfully.

7. Setting a date for the SYNECT server version change.
The procedure for changing the SYNECT server version is as follows:
 - All SYNECT (client) users must close their connections to the SYNECT server.
 - After all SYNECT (client) users have disconnected from the SYNECT server, you can stop it.
 - Create a backup copy of the live database.
 - Migrate the database.
 - Start the SYNECT server 2.7 with the migrated database.
 - Install SYNECT (client) for all the users and connect the new SYNECT (client) version to the SYNECT server 2.7.

Reconfiguring the directory for storing server scripts

After migrating a database, you have to reconfigure the directory for storing server scripts, because the default setting is to SYNECT's (new) installation folder.

Thus, you have to do either one of the following steps:

- Adjust the settings in the Server Administrator to the C:\ProgramData\dSPACE\dSPACE SYNECT Server 2.x\ServerScripts folder.
- Copy all the contents from the C:\ProgramData\dSPACE\dSPACE SYNECT Server 2.x\ServerScripts folder to the C:\ProgramData\dSPACE\dSPACE SYNECT Server 2.7\ServerScripts folder.

Refer to [Basics on Configuring the SYNECT Server for Server Scripts](#) on page 51.

Related topics

HowTos

[How to Migrate Databases to SYNECT 2.7](#) 57

How to Migrate Databases to SYNECT 2.7

Objective

To migrate databases you can use the *SYNECT Database Migrator*.

Preconditions

The database user that you use to migrate databases requires the following database roles:

- db_datareader
- db_datawriter
- db_ddladmin

A database user with the db_owner database role is also sufficient, because the database role includes the above-mentioned database roles.

Method

To migrate databases to SYNECT 2.7

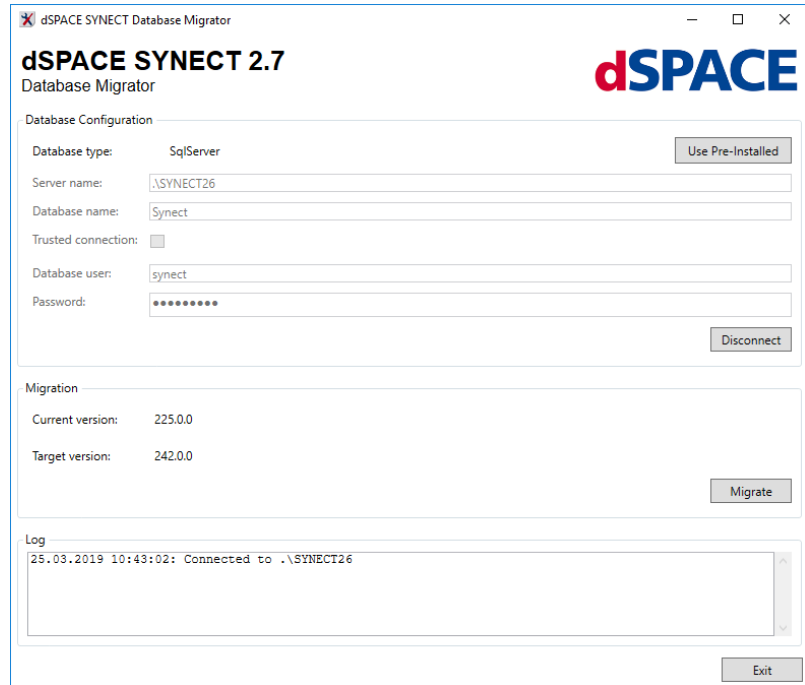
- 1** From the Windows Start menu, select Programs – dSPACE SYNECT Server 2.7– dSPACE SYNECT Database Migrator 2.7. The Database Migrator opens.
- 2** In the Database Migrator, specify connection settings for the database to migrate (SYNECT 2.0 - SYNECT 2.6):

Setting	Description
Server name	Specify the SQL server name, such as .\SYNECT26 or .\SQLEXPRESS.
Database name	Specify the name of the SQL database to be migrated.
Trusted connection	Select if your current Windows login is used for connecting with the specified database (<i>Windows authentication</i>).

Setting	Description
Database user	(Only available if Trusted connection is cleared) Enter a user name for connecting with the SQL server.
Password	(Only available if Trusted connection is cleared) Enter the password of the database user for the SQL server.

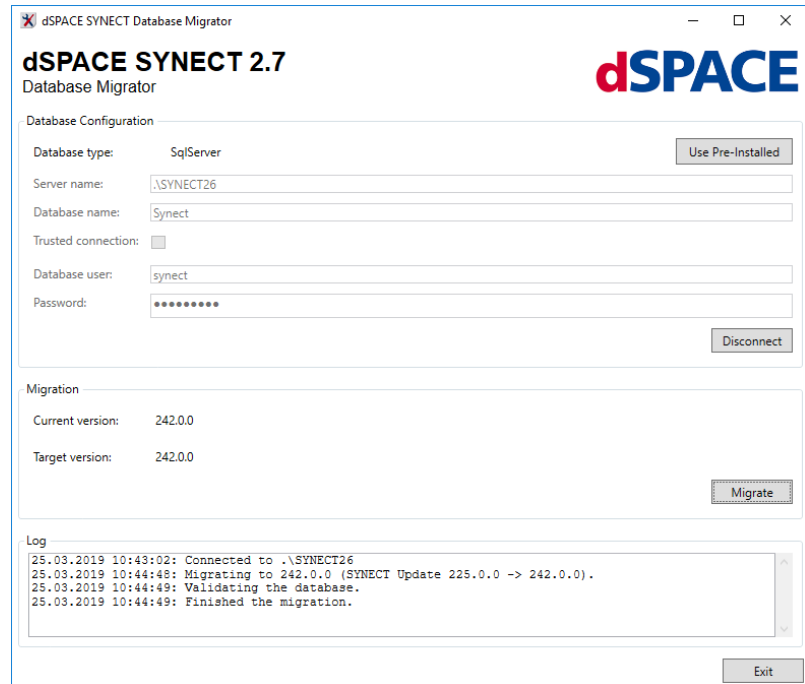
3 Click connect.

The Database Migrator connects with the database to migrate.



4 Click Migrate.

The Database Migrator migrates the database and displays the migration status in the Log field.

**Result**

You migrated SYNECT's SQL Server database.

Related topics**Basics**

[Migrating a Database to SYNECT 2.7](#) 55

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Server Administrator 2.7 User Interface

Access

You can start the Server Administrator via **Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Server Administrator 2.7**.

Purpose

To configure the SYNECT server and start or stop it as a Windows service.

Description

SYNECT Server The SYNECT server is a Windows service to which you can connect a SYNECT client to work on a central database.

The Server Administrator lets you administer the SYNECT server.




You can:

- Start or stop the SYNECT server
- Configure the server in terms of network port, logging, and programming support
- Configure the database that you can access using the SYNECT server
- Specify a certificate for authorization and data encryption that is sent to the SYNECT client

SYNECT License Server The SYNECT license server is a Windows service that lets the SYNECT server access license information from a CodeMeter license server. The SYNECT license server is always installed with the SYNECT server. You can start and use the SYNECT License Server on the same PC where you configured and started the SYNECT server. However, you can also use a remote SYNECT license server.

Status

The SYNECT Server page and the SYNECT License Server page let you start and stop the related Windows services.

Icons display the current status of the Windows service (, , )

Start (Available only if the service is not already running) Lets you start the Windows service for the server.

Stop (Available only if the service is running) Lets you stop the Windows service for the server.

Server URL Displays the server URL. You can copy the URL to the Clipboard.

SYNECT Server page

To administer the SYNECT server.

Server configuration

To configure the SYNECT server in terms of network port, logging, and programming support.

Start on windows startup Lets you configure whether the Windows operating system starts the Windows service for the SYNECT server automatically.

HTTP port Lets you specify a port for the server. You can specify a default port (such as 8081 for HTTP) or any other free port available.

Log level Lets you select the level of messages that the server logs. The SYNECT server logs the messages of the level you specified and all messages of higher levels, i.e., if you select **Warning**, the server logs warning and error messages.

Log type Lets you select where the SYNECT server provides logging information.

- **File Logger:** The SYNECT server writes logging information to a file.
- **Windows Event Logger:** The SYNECT server writes logging information to Window's standard event logging mechanism.

Log file path Lets you specify a path for the log file that the SYNECT server writes logging information to if you selected **File Logger**.

Server scripts folder Lets you specify a location to which the SYNECT server copies the contents of uploaded server script directories. The server creates a directory for each uploaded server script directory.

Note

Specify a server script folder for debugging server scripts.

IronPython search paths Lets you add server PC directories to the IronPython search path for importing Python modules to server scripts.

IronPython debug support If selected, you can attach the SYNECT server process to Microsoft Visual Studio for debugging.

Exception debugging If selected, you can debug exceptions with Microsoft Visual Studio.

Use integrated license server (Selected by default) You have to configure and start the SYNECT license server on the SYNECT License Server page of the SYNECT Administrator.

License server URL (Available if Use integrated license server is deselected) Lets you specify the URL of the SYNECT license server that you want to use for getting SYNECT licenses.

Specify the server URL in the following form: `http://server:port`

Export IIS application Lets you export an IIS application for operating the SYNECT server as an application in IIS.

Database configuration

To configure the database for the SYNECT server.

Database type Displays SQL Server.

Use Pre-Installed Lets you select to use the pre-installed SQL Server Express. The Server Administrator fills in the settings for the pre-installed SQL Server Express.

SQL server database configuration You can specify the following settings for SQL server databases:

Option	Description
Server name	Lets you specify the name of the SQL server you want to connect with.
Database name	Lets you specify the name of the SQL database.
Trusted connection	If selected, your current Windows login is used for connecting with the specified database (<i>Windows authentication</i>). Database user and Password are disabled in this case.

Option	Description
Database user	<p>(Only available if Trusted connection is cleared) Lets you enter a user name for connecting with the SQL server database.</p> <div style="background-color: #f0f0f0; padding: 10px;"> <p>Note</p> <ul style="list-style-type: none"> ▪ The database user that you use to initialize databases requires the following database roles: <ul style="list-style-type: none"> ▪ db_datareader ▪ db_datawriter ▪ db_ddladmin ▪ A database user with the db_owner database role is also sufficient, because the database role includes the above-mentioned database roles. ▪ For working with SYNECT, the <i>db_ddladmin</i> role is not required. The <i>db_datareader</i> and <i>db_datawriter</i> roles and the Execute permission are sufficient for the database user. </div>
Password	<p>(Only available if Trusted connection is cleared) Lets you enter the password of the database user.</p>

Backup (Only available if the SYNECT server is not running) Lets you write a backup of a development server database to a file and restore it from the backup file.

Note

- You should use database software to make backups of production server databases. SYNECT's backup feature is intended for development server databases only.
- Only available for the local preconfigured SQL Server Express database that you can install with the SYNECT server.

Option	Description
Backup to file	Opens a dialog that lets you specify a SYNECT backup file (BAK) for database backup.
Restore from file	Opens a dialog that lets you select a SYNECT backup file for restoring the database that you made a backup from. SYNECT overwrites the currently configured database with the database backup.

Database connection test Lets you test the specified database configuration.

SYNECT connects to the database and shows the result of the connection test in a dialog.

Note

Testing the database configuration with the SYNECT Server Administrator does not guarantee that the SYNECT server can connect with the database. This is because the SYNECT Server Administrator uses your user account but the SYNECT server service uses a local system account.

Database initialization Lets you initialize the specified database for use with SYNECT.

Note

You are recommended to initialize only new databases, because SYNECT deletes all the existing data in the database.

Service certificate

To select a certificate for data encryption.

Create self-signed certificate Lets you create a certificate for testing purposes.

SYNECT opens the Create Self-Signed Certificate dialog for you to specify who the certificate should be issued to.

SYNECT creates a certificate with the following properties in the selected certificate store:

Property	Value
Issued to	IP address, DNS name, localhost variable, or a common name (such as <code>mysynect.mydomain.com</code> or <code>10.0.1.2</code>) of your PC as specified in the Create Self-Signed Certificate dialog
Issued by	
Expiration date	One year from today
Intended purposes	dSPACE SYNECT Server

Certificate list Lets you select a certificate from the local computer certificate store.

Property	Description
Issued to	Displays the PC user or PC the certificate was issued to.
Issued by	Displays the person, organization or PC the certificate was issued by.
Expiration date	Displays the date at which the certificate expires.
Intended purposes	Displays the purpose of the certificate.

SYNECT License Server page

To administer the SYNECT license server.

Server Configuration

Start on windows startup Lets you configure whether the Windows operating system starts the Windows service for the SYNECT license server automatically.

HTTP port Lets you specify a port for the server. You can specify a default port (such as 8091 for HTTP) or any other free port available.

Export IIS application Lets you export an IIS application for operating the SYNECT license server as an application in IIS.

Log view Lets you view the logging of diagnostic messages of the SYNECT server.

Database Migrator 2.7 User Interface

Access You can start the Database Migrator via Programs – dSPACE SYNECT Server 2.7 – dSPACE SYNECT Database Migrator 2.7.

Objective To migrate databases from SYNECT 2.0 - SYNECT 2.6 to SYNECT 2.7.

Description To migrate a database, you first have to create a database backup copy. Then you migrate the copied database (SYNECT 2.0 - SYNECT 2.6) to the new database (SYNECT 2.7).

Database configuration To specify settings for accessing the database to migrate.

Database type Displays SQL Server.

Use Pre-Installed Lets you select to use the pre-installed SQL Server Express. The Database Migrator fills in the settings for the pre-installed SQL Server Express.

SQL Server database configuration You can specify the following settings for SQL databases:

Option	Description
Server name	Lets you specify the name of the SQL server you want to connect with for migration.
Database name	Lets you specify the name of the SQL server.
Trusted connection	If selected, your current Windows login is used for connecting with the specified database (<i>Windows authentication</i>). Database user and Password are disabled in this case.

Option	Description
Database user	<p>(Only available if Trusted connection is cleared) Lets you enter a user name for connecting with the SQL database to be migrated.</p> <div style="background-color: #f0f0f0; padding: 10px;"> <p>Note</p> <ul style="list-style-type: none"> ▪ The database user that you use to migrate databases requires the following database roles: <ul style="list-style-type: none"> ▪ db_datareader ▪ db_datawriter ▪ db_ddladmin ▪ A database user with the db_owner database role is also sufficient, because the database role includes the above-mentioned database roles. ▪ To work with SYNECT, the <i>db_ddladmin</i> role is not required. The <i>db_datareader</i> and <i>db_datawriter</i> roles and the Execute permission are sufficient for the database user. </div>
Password	(Only available if Trusted connection is cleared) Lets you enter the password of the database user for the SQL server.
Connect	Lets you connect to the SQL Server database to be migrated.

Migration**Current version** Displays the database's current version.**Target version** Displays the target version that the database is migrated to.**Migrate** Lets you start database migration.**Log**

Displays information about the migration process.

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Frequently Asked Questions

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Hardware and Software Requirements

Which versions of Windows are supported?

Refer to [Operating System](#) ( [Installing dSPACE Software](#)).

How much RAM is required for the server?

Refer to [Host PC Hardware](#) ( [Installing dSPACE Software](#)).

Is it possible to run the SYNECT server on virtual machines?

Yes, you can run the SYNECT server on virtual machines.

Does the SYNECT server run on Linux? No, SYNECT only supports Windows operating systems.

Is it possible to run the SYNECT server and SQL server in different data centers? It is recommended to run both servers in the same data center.
The SYNECT server and the SQL server must communicate in a low latency network with a latency less than 1 ms.

Database

Which database types are supported? SYNECT supports Microsoft SQL Server only. No other database types are supported by SYNECT.

Which versions of SQL Server are supported? Refer to [Supported databases for SYNECT server](#) on page 11.

What is the typical size of a SYNECT database? The size of the database depends on the number of stored items and their attributes.

Refer to the following example:

	Database Size/Size per Item		
	<ul style="list-style-type: none"> ▪ Name ▪ Long description ▪ No attributes 	<ul style="list-style-type: none"> ▪ Name ▪ Long description ▪ 9 attributes without list attributes 	<ul style="list-style-type: none"> ▪ Name ▪ Long description ▪ 18 attributes including list attributes
10,000 items	28 MB / 1.3 kB	62 MB / 4.8 kB	137 MB / 12.5 kB

You can calculate with 5 kB per item as an average size. Typically, a database with 1,000,000 test case results needs 4.8 GB of storage.

Is it possible to replicate the database? No, SYNECT currently does not support database replication. You always have to use a central database server.

Installation

Is it possible to install the SYNECT server on other drives than C:?

No, the SYNECT server is always installed on C: drive.

Is it possible to install the SYNECT server on Windows Server Core?

No, the SYNECT server setup does not support Windows Server Core.

Is it possible to use a Java-based application server

No, the SYNECT server does not support Java-based application servers such as Tomcat or WebSphere.

You can use one of the following scenarios:

- Windows service (self-hosted)
 - Microsoft IIS (Internet Information Services)
-

Is it possible to run two or more instances of the SYNECT server on the same machine?

Yes, you have to use the Microsoft IIS (Internet Information Services). The Windows service (self-hosted) supports only a single instance of the SYNECT server.

Is it possible to use different versions of the SYNECT client with a single server?

No, you have to use exactly matching versions of the SYNECT server and the SYNECT client.

Is it possible to use a load balancer with the SYNECT server?

Yes, you have to host multiple SYNECT server services in IIS that work on the same SQL Server database.

Network

Which network protocols and ports are used?

The protocol used by the SYNECT server is HTTP. The SYNECT server opens a single TCP port that you can configure with the SYNECT Server Administrator.

Is it possible to use HTTPS instead of HTTP?

Yes, SYNECT supports HTTPS communication. You have to host the SYNECT server service in Microsoft IIS (Internet Information Services).

Is the communication between the SYNECT client and the SYNECT server encrypted?

Yes, the communication between the SYNECT server and the SYNECT client is always encrypted using the certificate that you selected in the SYNECT Server Administrator.

- HTTP: The individual messages are encrypted (message level encryption).
- HTTPS: The complete TCP communication is encrypted (transport level encryption).

Do I have to configure the SYNECT server to be used with CM systems?

No, the communication with CM systems, such as PTC or Subversion, is handled by the SYNECT client.

Is it possible to use an LDAP server?

SYNECT supports Windows Authentication using Active Directory. However, SYNECT does not support arbitrary LDAP servers.

What is the standard response time between the SYNECT client and server?

SYNECT is not sensitive to low latency networks and can be used with network latencies above 100ms. A bandwidth of more than 10 Mbit between client and server is recommended.

Troubleshooting

Troubleshooting

Installing SQL Server 2014 Express on a PC with SQL Server 2012 Native Client

Problem The SYNECT server installation optionally provides Microsoft SQL Server 2014 Express.

The installation of SQL Server 2014 Express might fail if SQL Server 2012 Native Client is already installed.

Solution Perform the following steps:

1. Uninstall the SYNECT server if you performed the installation on a PC with SQL Server 2012 Native Client.
2. Uninstall SQL Server 2012 Native Client.
3. Install the SYNECT server with SQL Server 2014 Express.

The installation of SQL Server 2014 Express also provides the SQL Server 2012 Native Client. You do not have to install it manually.

