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Multi-project/multi-user engineering

SIMATIC PCS 7 V9.0

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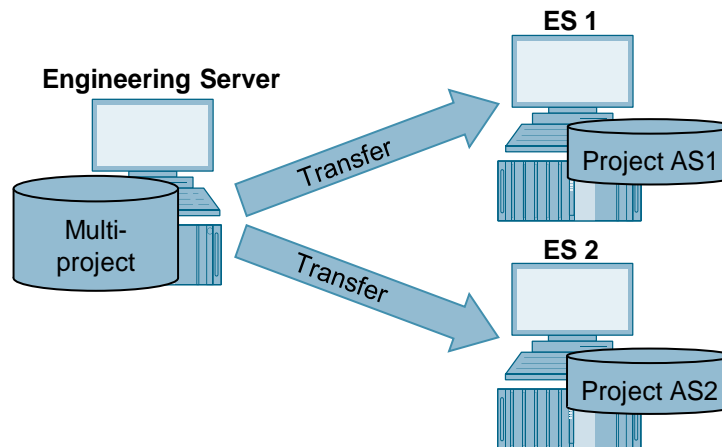
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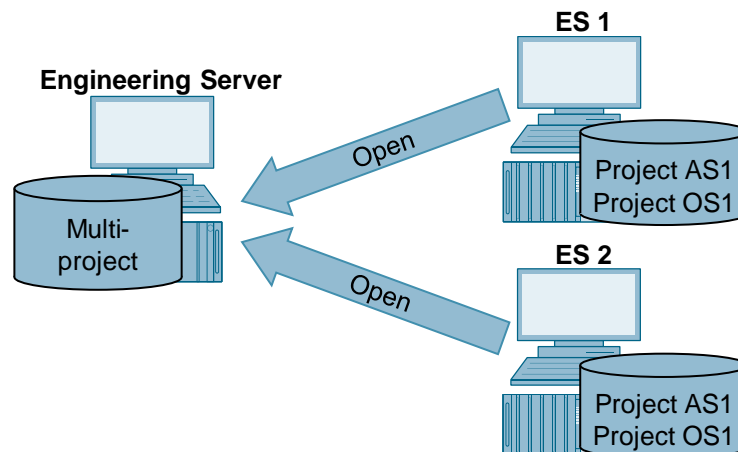
Preface

This document provides an overview of the different variants and positioning of multi-project and multi-user engineering.

Multiproject engineering allows systems to be configured flexibly and at several locations. To facilitate this, the automation solution is divided technologically into several projects. The projects are created in a multiproject on a central engineering station. In addition to the projects, the master data library is also managed here. It contains all shared objects. For decentralized processing, individual AS projects of the multi-project can be temporarily distributed to other engineering stations.



In addition, **multiuser engineering** offers the possibility of working on the same user program (CFC/SFC of an AS project) or OS project (different process pictures, reports) in parallel. This saves valuable time. The project in question can remain in its storage location. It is opened and processed simultaneously from several engineering stations via a network.



Both concepts are basically independent, but they combine to form efficient and flexible engineering.

1 Multiproject engineering

1.1 General information

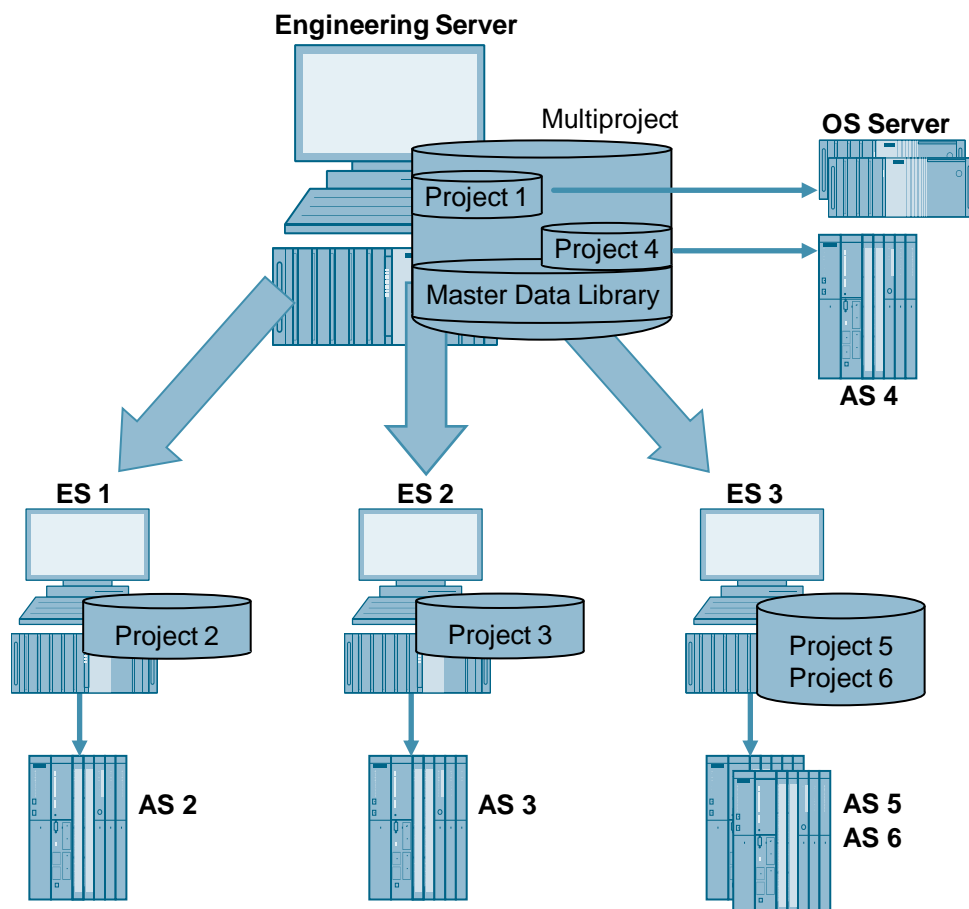
The multi-project functionality of SIMATIC PCS 7 offers the possibility of flexible and high-performance system planning. The focus is on time-saving, parallel processing of projects, which can be managed, separated and merged with system support.

The principle of a multiproject

The multi-project is a superimposed structure in the SIMATIC Manager of the central engineering server. It includes all projects of an automation solution with their subordinate objects (automation systems (AS), operator stations (OS), programs, plans, etc.) as well as the master data library.

To process the contained projects, they are distributed to decentralized engineering stations (ES). By using the additional memory resources and computer performance, the engineering process is optimized. The projects can remain in the multi-project or be detached for the duration of the processing. The engineering server on which the multi-project is stored also represents a fully-fledged engineering station on which a project or the master data library can be edited.

Figure 1-1



Despite the decentralized storage, projects can contain cross-project relationships such as S7 connections.

Benefits of the multiproject

If projects are part of a multi-project, they can be smaller and more manageable in scope. Cross-project mechanisms ensure that a multi-project is used as a single project.

Examples of such cross-project mechanisms are:

- Master data library for central data storage of block types, measuring point types and sample solutions for all projects
- Comparison of the technological hierarchy across all projects or for selected projects
- Consideration of all related AS and OS parts in the entire multi-project with the functions "Create/Update Device Symbols" and "Create/Update Diagnostic Images" (for TH structures of the same name)
- Merging of subnets and connections with textual references of all containing projects
- OS translation with project planning data of several projects
- Save As (copy of the multi-project with all projects)
- Archiving (ZIP archive of the multi-project with all projects)

Note

In the PCS 7 environment, it is always recommended to create a multi-project with master data library, even if only one project is included.

1.2 System requirements

Engineering Server

- For performance reasons, it is recommended to use a supported operating system of the type Windows Server on the Engineering Server.
- Write permissions must be set up for the project managers of the decentralized engineering stations on the Engineering Server and especially on the project folder.
- No administrator rights are required for engineering activities. These are only required to install software and to set up and customize the operating system. The exact user rights for a PCS 7 system are described in the manual "[SIMATIC Process Control System PCS 7 – PC Configuration \(V9.0 SP1\)](#)"
- Parts of the STEP 7 project planning data are stored in a database. Access to this data is executed and coordinated via the Sybase server. A running Sybase server is therefore absolutely necessary. After installing STEP 7, this Sybase server runs in the context of the logged in user and is automatically started when the user logs in. To avoid the constraints of a logged on user on the engineering server, you can use the "setsybserv.exe" application to set up the Sybase server as a service. The procedure is described in the manual "[SIMATIC Process Control System PCS 7 – PC Configuration \(V9.0 SP1\)](#)"
- For performance reasons, PCs with higher clock rates, main memory and faster disk drives (e.g. SSD) are recommended for the engineering stations. Further information on the recommended hardware expansion can be found in the readme file "[SIMATIC Process Control System PCS 7-Readme V9.0 incl. SP1 \(Online\)](#)"
- For performance reasons it is recommended to reduce the size of the SQL database file (*.ldf) of an OS project. Instructions can be found in the article "[How do you reduce the size of the transaction file \(*.LDF\) of the database of a WinCC project?](#)"

Distributed engineering stations

- The same PCS 7 version with the same options as installed on the engineering server must be installed on all engineering stations.
- With regard to HW Config and PDM, the same field device descriptions must be integrated on all ES.
- The licenses installed locally or non-occupied licenses used can be accessed via network (license type "Floating"). The floating licenses can be stored on the engineering server or on an additional license server. To test OS functions, the necessary RT licenses must be installed locally.
To use one editor on several ES at the same time, the corresponding license is required several times.

Network structure

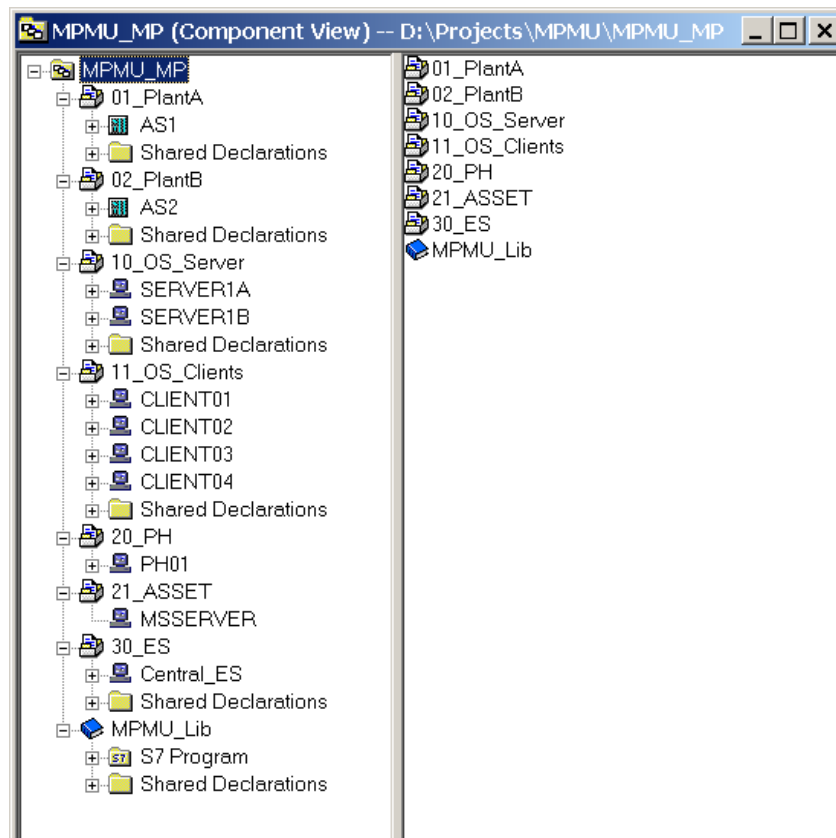
- To load the AS or to test OS functions, the engineering stations in question must be connected directly to the plant bus (routing through the Engineering Server is not possible).
- A stable network connection must exist between the engineering stations involved. All stations must see each other in the network environment or in SIMATIC Shell.
- Especially for parallel work with multi-user engineering, it is recommended to design the network between the engineering stations as Gigabit Ethernet.
- To avoid unnecessary network load, we recommend that you use a WINS server or maintain the LMHOSTS files for name resolution.

1.3 Project structures

The structure of a multi-project is essentially divided into project-specific and station-specific structures.

In practice, a combination of both variants is often recommended, as shown in the following example:

Figure 1-2



Note

For more information on creating a multiproject, see the document "[SIMATIC Process Control System PCS 7 Compendium Part A - Configuration Guidelines \(V9.0\)](#)" and in the manual "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)".

1.3.1 Boundary conditions

In order to be able to carry out the later project work as efficiently as possible, some preliminary considerations are necessary.

The question of how the overall task can be suitably separated into sub-projects requires consideration of the individual circumstances of the project itself, as well as those of the available engineering environment. Here are a few examples:

- **Number of project engineers:** How many automation systems must be planned and in what time? Where can ratio effects be used in project planning?
- **The number of available engineering stations:** Each project planner responsible for one or more automation systems has an ES available.
- **Networking of the engineering stations:** Normally, all ES should be connected to each other via the terminal bus.
- **Project complexity** How many trades are to be automated in the multi-project? In how many buildings will an ES or OS server be positioned? Which automation systems are assigned to which OS server?
- **Duration/expenditure of project planning:** The duration can be controlled by the number of scheduled project engineers.

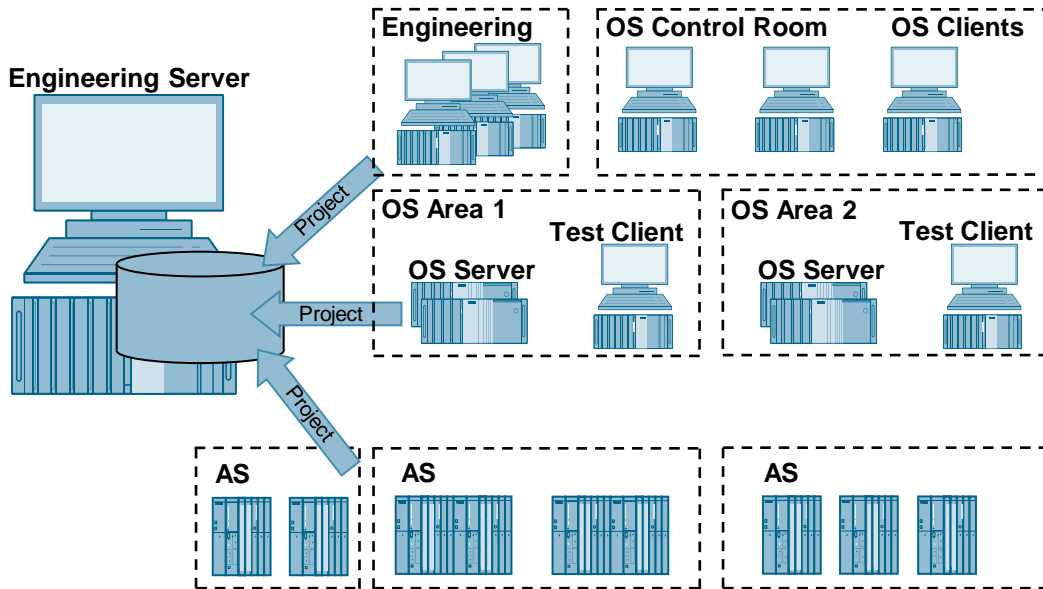
The following rules apply:

- Only those project components (AS, OS) should be temporarily moved to a decentralized ES that are required for the respective decentralized processing.
- Only entire projects can be moved to a decentralized ES. If you want to edit and test individual areas of the technological hierarchy separately from the project, you can use the "Branch & Merge" concept (see manual "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)").
- For each Operator Station an ES is defined from which the OS translation and OS project download is to be performed.

On the basis of these considerations and the background information from the above comparison, the structure of the multi-project can be determined.

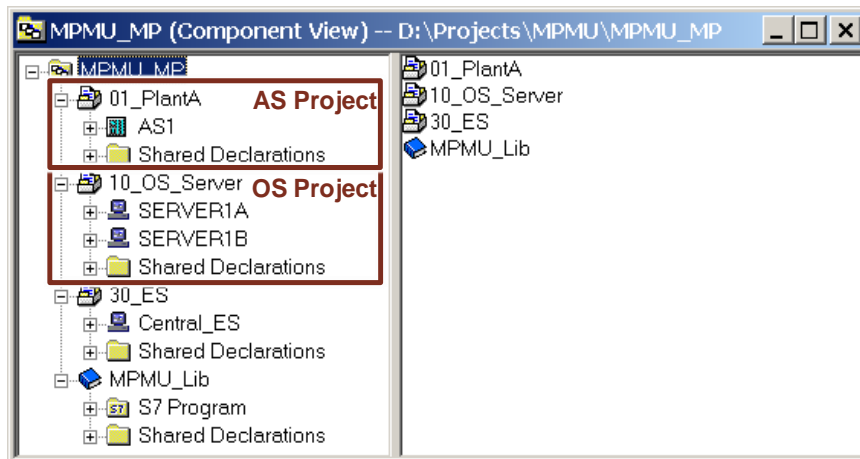
1.3.2 Station-specific structure

Figure 1-3



In the station-specific structure, an OS and the assigned AS are stored in separate projects. The distribution of the automation systems depends on the number of project engineers or the number of trades. For OS clients, e.g. in a central control room, a separate project is recommended, as well as for all engineering stations.

Figure 1-4

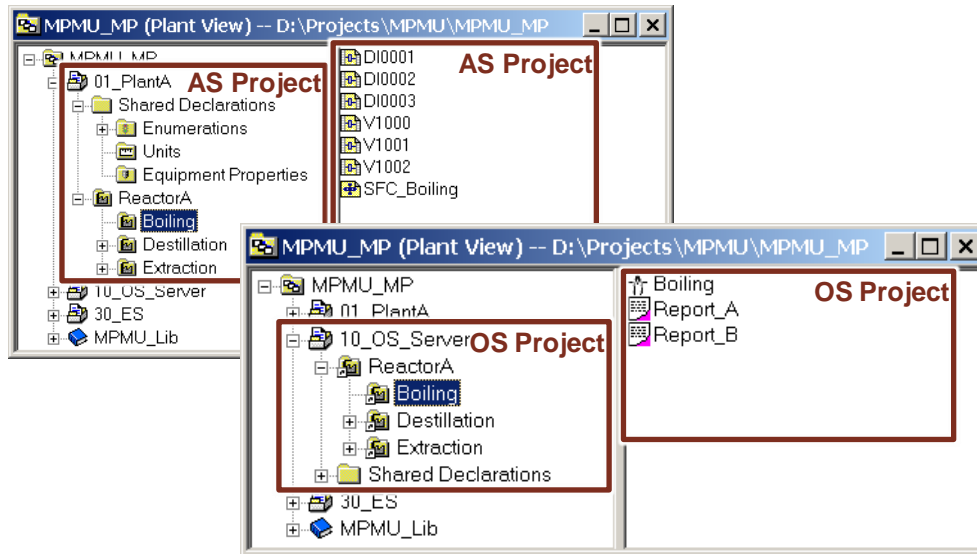


1 Multiproject engineering

1.3 Project structures

There are therefore no OS objects (images, reports,...) in the AS project and no AS objects (CFC, SFC,...) in the OS project.

Figure 1-5



Advantages

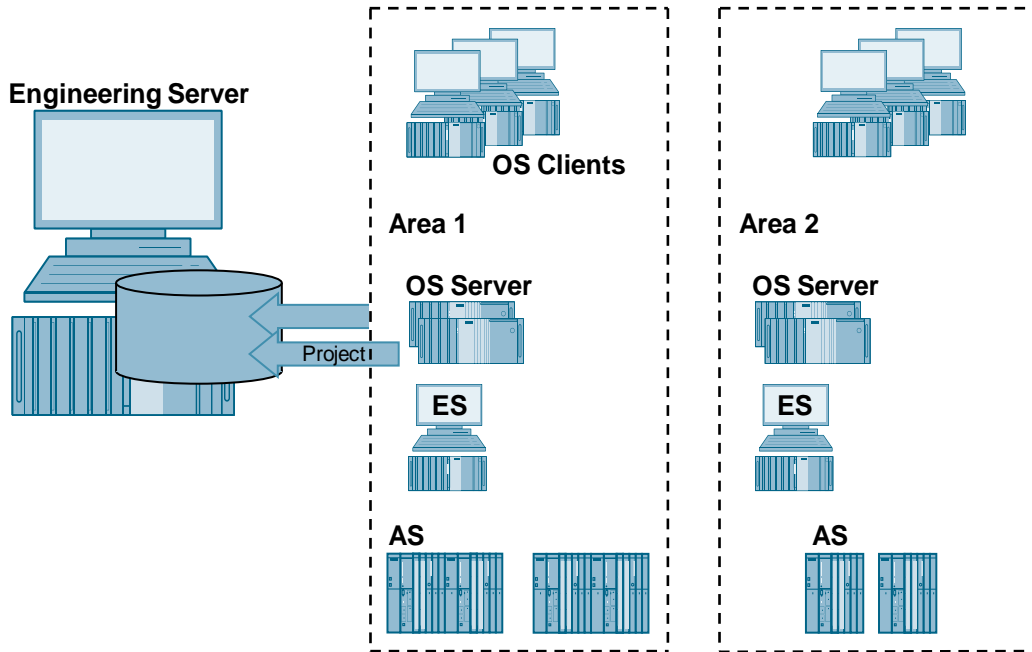
- The largest possible distribution ensures the highest flexibility in the assignment of individual projects to the project managers and also offers the best performance in processing speed.
- Engineering stations can be added or removed during commissioning (IBS) in order to be able to react flexibly to varying staff availability.

Please note

- Tests of AS and OS during project planning are performed on separate ES (if decentralization has taken place).
- Changes to the technological hierarchies (TH) of projects must be reconciled in the multi-project after processing.
- It is not possible to copy complete subsystems including the update of OS objects.

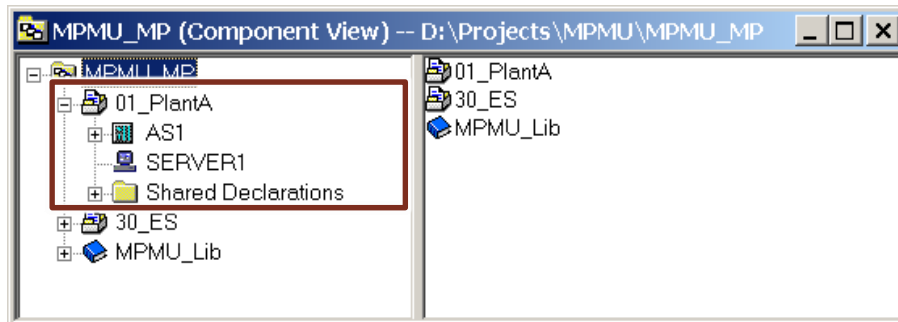
1.3.3 Project-specific structure

Figure 1-6



In the project-specific structure, a project includes all operating stations for an area as well as the assigned ASs. The area is completely independent. OS clients can be contained in the same project or in a separate project for a central control room.

Figure 1-7

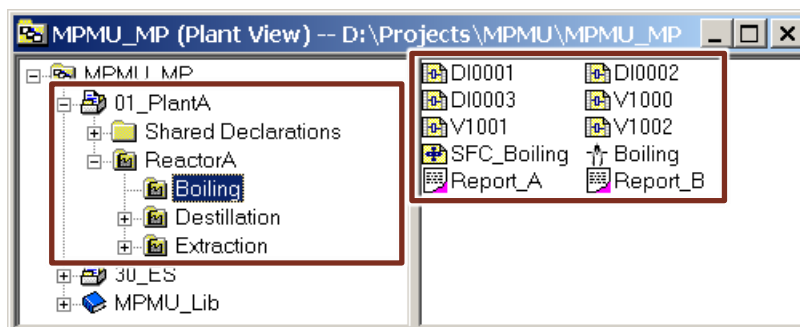


1 Multiproject engineering

1.3 Project structures

As the following figure shows, the project contains both AS objects (CFC, SFC,...) and OS objects (screens, reports,...) from a technological point of view.

Figure 1-8



Advantages

- It can be planned and tested completely in the project with AS and OS.
- The method of operation during project planning and commissioning is the same.
- Copying of complete subsystems including update of OS objects is possible.
- There is a unified view of the technological hierarchy that includes AS and OS in a project.

Please note

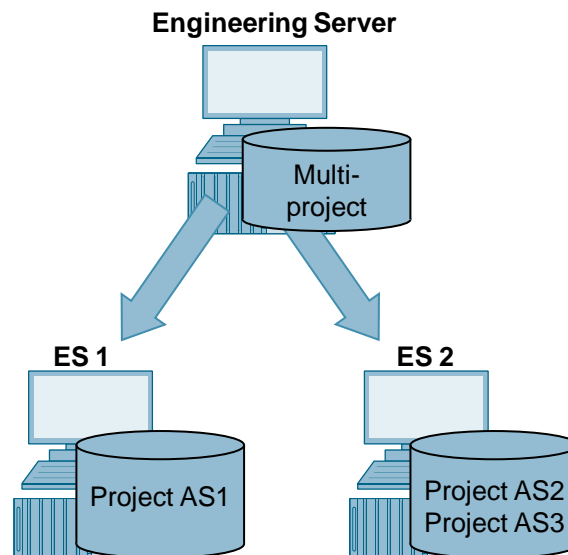
All AS plans can only be assigned to the available OS in the same project via the technological hierarchy.

A later separation (outsourcing of individual AS or OS from a project) requires detailed knowledge of the necessary work steps. Therefore, the project should be split as far as possible right from the start.

1.4 Decentralized project archive

Decentralized storage of projects is ideal for larger project planning work. The efficiency is higher if every project planner has the relevant project parts locally available on his computer. In this way, he can carry out the work assigned to him independently of the overall project.

Figure 1-9



For the period in which projects are outsourced, the availability of the communication partners must be taken into account, especially for cross-project actions such as setting up AS-AS communication or OS translation.

In the following, decentralized project planning with and without network connection is considered.

Note

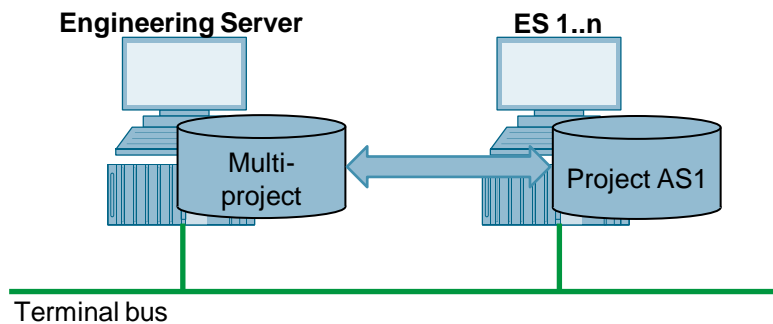
The steps for moving the projects can be found in the manual "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)".

1.4.1 Division within network connection

If the network is permanently available, project parts can be moved to decentralized engineering stations for processing and still remain in the multi-project.

The project engineers can access all components of the multi-project at any time. In addition to the necessary network connection, all PCs that manage such components must be switched on and released accordingly.

Figure 1-10



To move a project, use the system function "Save as..." with the option that the project included in the multi-project is replaced by the copy created.

Advantages

- An OS server can be translated at any time with the data from AS stations of other projects.
- All program parts used are in the master data library, which can be accessed via the network.
- The Engineering Server makes it easy to archive the entire project, including all decentralized projects.
- A largely station-specific project structure and its decentralized distribution with permanent network availability represent the most flexible project planning option.

Please note

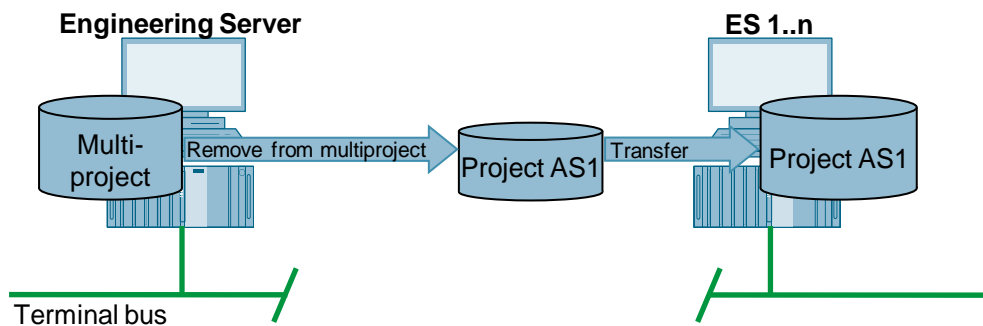
- If, contrary to expectations, a project is not available in the network, this leads to a corresponding waiting time.
- When performing cross-project functions, it must be agreed with the project managers to ensure that no work is being carried out on any of the projects involved at this time. Otherwise, this could lead to conflicts.

1.4.2 Division without network connection

The multi-project functions of SIMATIC PCS 7 are based on the permanent availability of all included projects.

If an ES is disconnected from the network and thus from the ES server, you release the projects for decentralized processing from the multi-project in advance. Reasons for this are, for example, that not all ES are permanently in the network or that the projects are deliberately processed outside. (e.g. award to engineering office / system integrator).

Figure 1-11



The projects can be removed using the system function "Remove from multi-project...". Projects can be integrated using the "Insert into multiproject..." function.

Advantages

- There are no unexpected delays and waiting times due to missing projects.
- You cannot accidentally access the project during decentralized processing (for example, when executing cross-project functions).

Please note

- When working with NetPro, warning messages can be generated due to the missing communication partners. New connections can only be created unspecified for the duration of the project split using references.
- To translate an OS server, all relevant projects (AS projects and corresponding OS project) must be reunited centrally.
- The master data library is not included in the project. Only the blocks already used, which are stored in the blocks folder, are available. To use the functions of the master data library on the decentralized ES, it must be managed as a local backup.
- The projects must be archived locally.

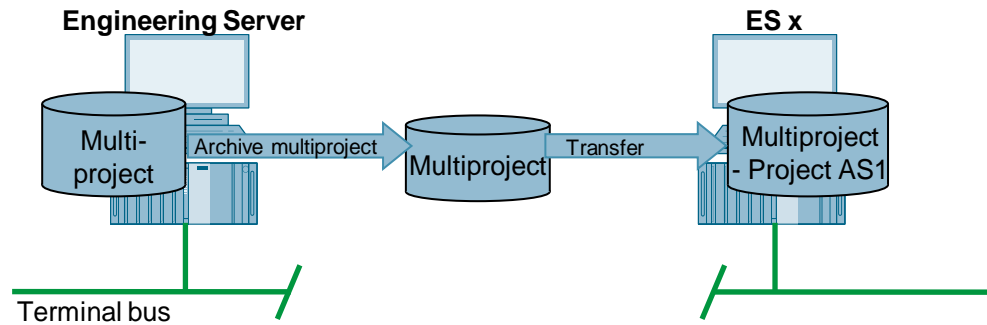
Note

It is recommended that cross-project functions are only performed if all user projects are resumed on the Engineering Server in the multi-project.

1.4.3 Distributing the multi-project without network connection

With this variant, you distribute the multi-project including the master data library and the project that the project planner is to plan.

Figure 1-12



To distribute the multi-project, archive it and move the generated ZIP archive to the decentral ES using Windows tools.

After archiving on the decentralized ES, remove the projects that are not required from the multiproject and delete them.

After processing, the project is removed from the multiproject on the decentralized ES, archived and reintegrated into the original multiproject on the Engineering Server.

Advantages

- The project developer can access the master data library.
- The functions of the Import/Export Assistant (IEA) are available.
- Control Module Types (CMT) are available.
- During decentralized processing, no unwanted accesses can occur on the engineering server (for example, by executing cross-project functions).

Please note

- Changes to the master data library may only be made on the Engineering Server. The changes must then be made to all decentralized ES.
- If all unneeded projects have been deleted after the recommendation, warning messages can be generated when working with NetPro due to the missing communication partners. New connections can only be created unspecified for the duration of the project split using references.
- To translate an OS server, all relevant projects (AS projects and corresponding OS projects) must be reunited centrally.

1.5 Distributed editing

General information on cross-project activities

The actual processing of projects is decentralized. Cross-project data synchronization and functions, however, are always performed in the SIMATIC Manager of the central engineering server, where the multi-project is managed. These activities can be carried out before the project is distributed or after the projects have been reintegrated into the multi-project, i.e. when all projects are in the multi-project and no work is being done on them.

Whether the projects to be processed decentrally remain in a multi-project or are detached depends on the extent to which a stable network between the PCs can be guaranteed.

Overview of the configuration steps

An overview of the work processes required in multi-project engineering is to be given here. We recommend the following workflow, but it can vary according to individual circumstances and experience. These steps are described in more detail in the following chapters.

Table 1-1

	Activity	Location
1.	Project planning: <ul style="list-style-type: none"> • Determining the number of project engineers • Determining the available ES -PCs • Connecting the ES PCs to the network • Determining the complexity of the project 	
2.	Project set-up: <ul style="list-style-type: none"> • Creating the multiproject • Configuring the SIMATIC and PC stations • Creating and synchronizing the technological hierarchy (TH) • Generating cross-project networks • Creating cross-project connections • Mass data engineering 	Engineering Server
3.	Dividing the projects: <ul style="list-style-type: none"> • Moving projects within the network • Removing projects from the multiproject • Distributing the project including the multiproject 	Engineering Server
4.	Decentralized project editing <ul style="list-style-type: none"> • Editing and completing charts 	Decentralized ES
5.	Merging the projects: <ul style="list-style-type: none"> • Moving projects back to the multiproject • Reconnecting projects in the multiproject 	Engineering Server
6.	Final project operations: <ul style="list-style-type: none"> • Adjustment of the Technological Hierarchy (TH) • Merging referenced connections • Checking cross-project consistency • Compiling and loading 	Engineering Server

Note

The individual work steps are described in detail in the manual "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)"

1.5.1 Project planning

You have determined the following sizes using the boundary conditions in chapter 1.3

- Number of automation systems
- Number of operator stations or OS servers
- Number of project engineers
- Number of available engineering stations
- Connecting the engineering stations
- Configuration duration

You have now decided on the site-specific or project-specific structure of the multi-project.

1.5.2 Preparatory project work

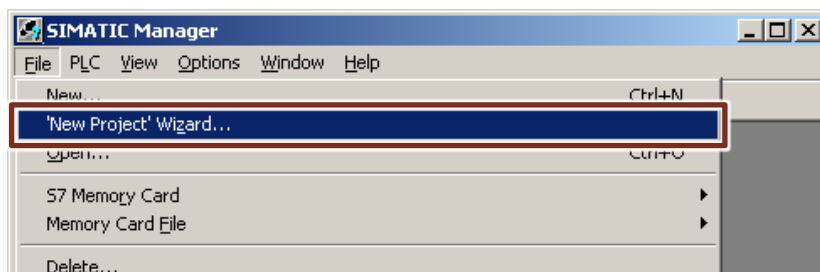
Create new multi-project

The PCS 7 Assistant creates a multi-project with a subproject whose objects (AS, OS, programs, plans, etc.) can be integrated using user queries if required. In addition, a master data library is created with the following content:

- An S7 program with the folders for sources, blocks and plans (component view)
- One folder each for measurement loop types and sample solutions (technological hierarchy)
- Shared declarations

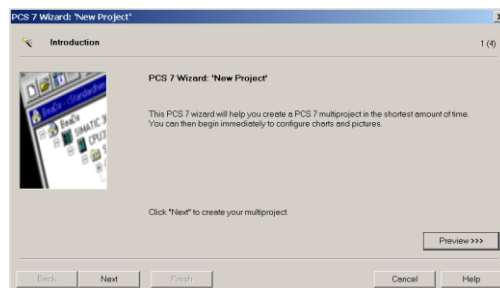
Start the PCS 7 Wizard via "File >'New Project' Wizard...").

Figure 1-13



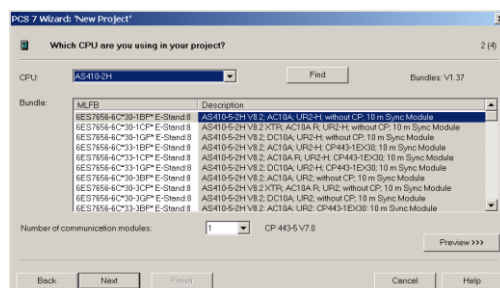
The wizard guides you through 4 steps to create the multi-project.

1. Introduction and project preview



2. Configure the automation system

Here you can select an existing AS of your system in advance.

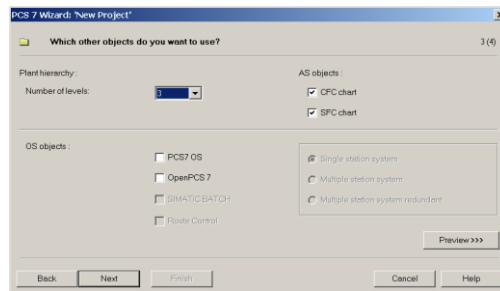


3. Technological hierarchy and operator station

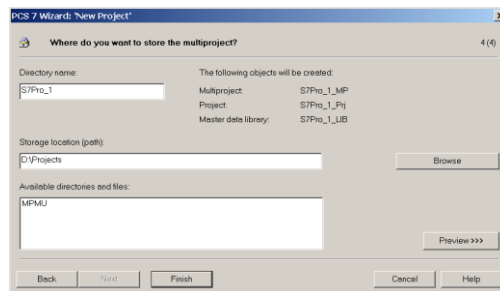
In this step you determine the number of hierarchy levels and can also determine whether an OS is created. If you want to set up your multi-project on a station-specific basis, do not select a PCS 7 OS here.

1 Multiproject engineering

1.5 Distributed editing



4. Project name and storage location
In this step, name your project and select the directory for saving the multi-project.

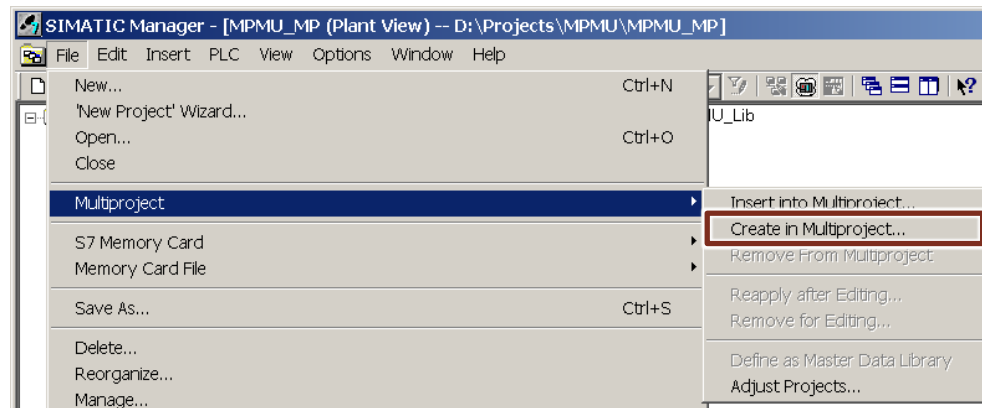


Note

It is recommended to choose a directory that is not on the system partition (C:).

Use the planned structure to create further projects in the multi-project. Select the menu function "File > Multiproject > Create in Multiproject...". In addition, you can select the multiproject and select it via the context menu "Multiproject > Create in Multiproject..." to create a new project.

Figure 1-14

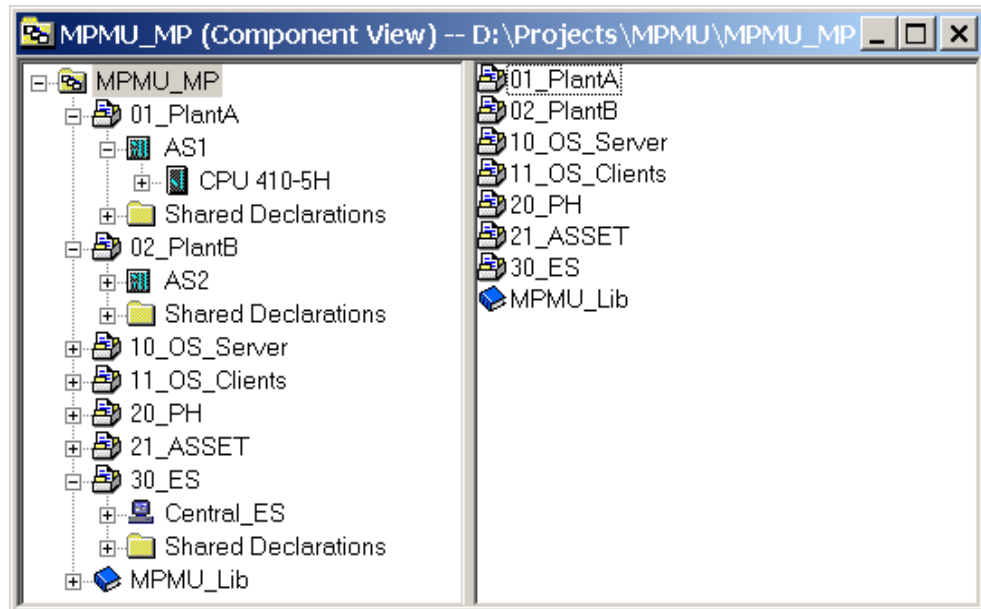


Configuring SIMATIC and PC stations

Configure the individual stations and their network connection according to your project planning and the hardware conditions.

Create the required stations with the menu function "Insert > Station > ...", or use the PCS 7 wizard "Insert > Preconfigured Station...".

Figure 1-15



Note

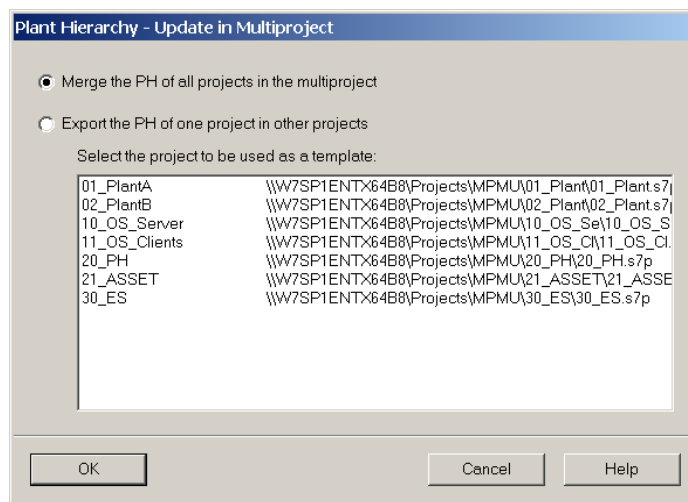
You can also use the PCS 7 Assistant for manually created projects to create preconfigured stations. For existing projects start the wizard with the menu function "Insert > Preconfigured Station...".

Projecting a Technological Hierarchy

Starting with version 6.1 of PCS 7, handling of the TH in a multi-project is simplified. If the folders of the TH are to be created identically, at least in parts, in all or individual projects of the multi-project, this step is only necessary once in a project. The other projects then take over the TH when carrying out a comparison.

In the individual projects, hierarchy folders with different names are newly created and provided with the properties of the template folder. Hierarchy folders of the same name are recognized and not newly created, but also receive the properties of the template folders.

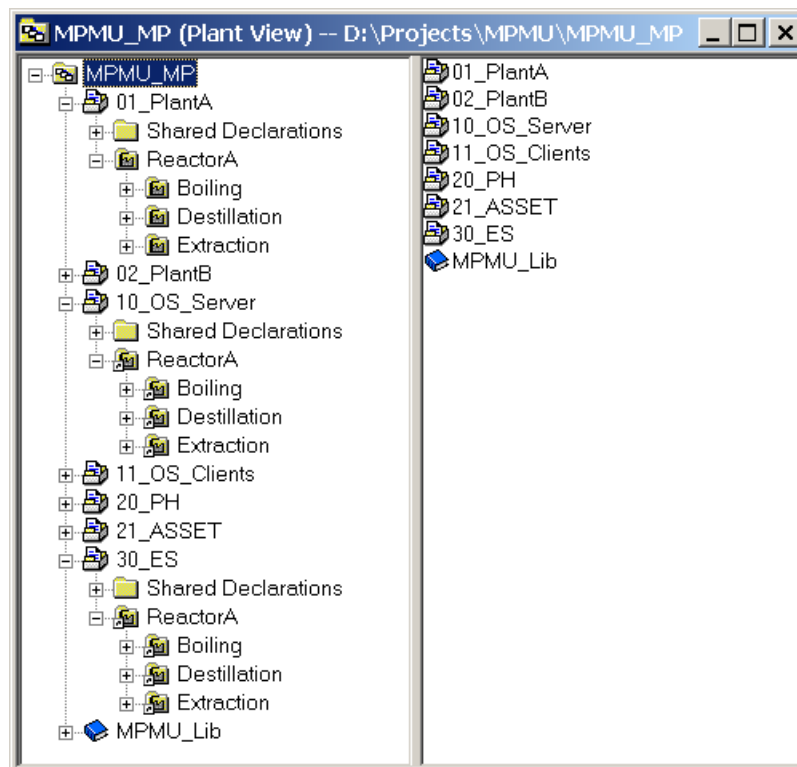
1. Project the complete technological hierarchy in one project.
2. Select the multi-project and select the menu function "Tools > Technological hierarchy > Synchronize in multi-project...". ("Options > Plant Hierarchy > Update in the Multiproject...").



Two options are available for comparing the technological hierarchy:

- "Merge the TH of all projects in the multiproject"
The TH is calibrated throughout the entire multi-project.
- "Export the PH of one project in other projects"
The TH of a selected project is compared with the TH of the target projects.

Figure 1-16



If the technological hierarchy of referenced projects is to be changed, the link must first be removed. You can do this with the function "Tools > Technological hierarchy > Remove link" ("Options > Plant Hierarchy > Cancel Assignment"). You can deselect the multiproject-wide TH link by selecting the multiproject or deselecting the corresponding project.

Generating cross-project networks

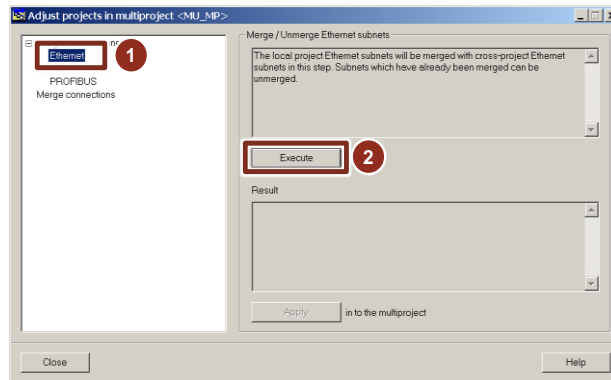
In order for the stations of the individual projects to communicate with each other in PCS 7, their subnets must be merged. Cross-project networks are created for this purpose in the multi-project.

1 Multiproject engineering

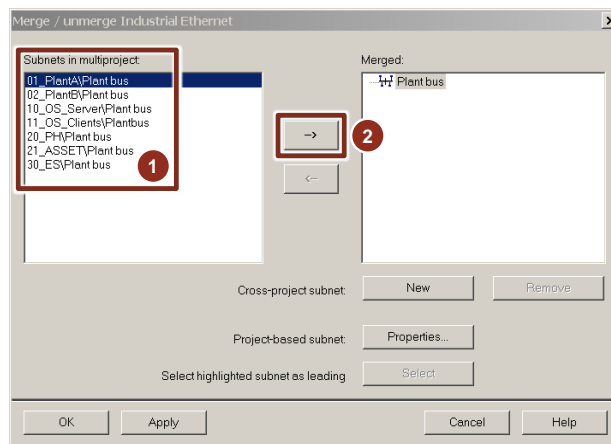
1.5 Distributed editing

You reach the dialog for merging subnets via the menu function "File > Multiproject > Synchronize projects..." ("File > Multiproject > Adjust Projects...") or from within NetPro via "Edit > Merge / Unmerge Subnets > ...".

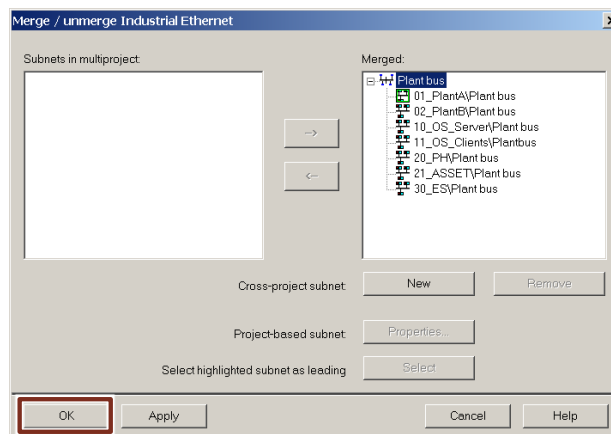
1. Select the option "Merge / Disconnect Subnets > Ethernet-" ("Industrial Ethernet" ("Ethernet") (1). Click the "Run" button (2).



2. Select the subnets that you want to merge into a global network (1). Use the "-">" (right arrow) button (2) to add it to the global network.



3. Click "OK" to confirm your selection.



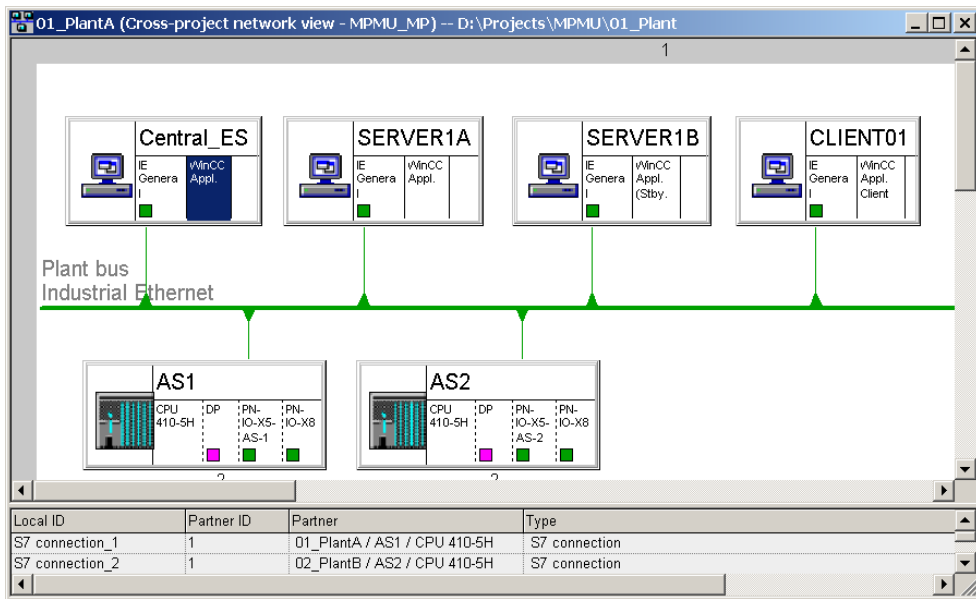
Creating cross-project connections

You can now create the cross-project connections between AS - AS, OS - AS or ES - AS (to test the function of the OS on the ES using the OS simulation) as usual.

If the subsequent decentralized project planning takes place in a multi-project, the connections can also be created after the projects have been split.

If projects remote from the multi-project are to be processed, we recommend that you create the known connections in advance. Later, you can add unspecified connections using textual references. The links can be closed on the central engineering server after the projects have been included in the multi-project.

Figure 1-17



1.5.3 Dividing the projects

Depending on whether the decentralized processing of the projects is to take place in a multi-project with network connection, in a multi-project without network connection or without a multi-project and without network connection (project only), three ways of project distribution are described in the following.

However, we recommend that you use the variant in which you copy and distribute the multiproject.

Distributing a project including the multiproject

This option describes how you distribute the multiproject among the decentralized ES. This has the advantage that the project planner has unlimited access to the master data library and can use the Import/Export Assistant (IEA) for project planning.

In this variant, a copy of the multi-project is distributed. The projects that are not required are then removed from the multi-project on the decentralized ES. Proceed as follows:

1. Archive the multi-project via "File > Archive...".
2. Copy or move the archived multi-project to an external data carrier. On the decentralized ES unpack the multiproject via "File > Retrieve...".
3. Remove all projects from the multiproject that the project developer does not need via "File > Multiproject > Remove from Multiproject" ("File > Multiproject > Remove From Multiproject").

Note

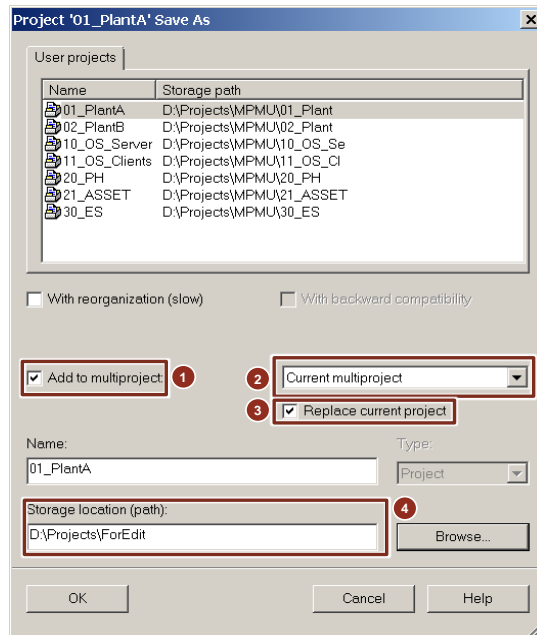
You must not change the master data library on the decentralized ES, since it can no longer be returned to the multi-project of the Engineering Server.

The master data library should only be changed on the Engineering Server by an authorized person. After a change has been made, it must be redistributed to the decentralized ES.

Moving a project within the network

A project within a multi-project is then moved from the central engineering server via the network to a remote ES. A copy of the project is created on the remote ES and included in the multi-project. The original is removed from the multi-project and can physically remain on the hard disk of the central engineering server as a backup copy.

1. Select the project that is to be moved to a decentral ES in the SIMATIC Manager.
2. Select the menu command "File > Save As...".



3. Make the following settings in the "Save As" dialog:
 - Set the option "Add to multiproject" (1)
 - "Select "Current multiproject" from the drop-down menu (2)
 - Set the option "Replace Current project" (3)
 - Select storage location (4)
4. Save the project with the "OK" button.

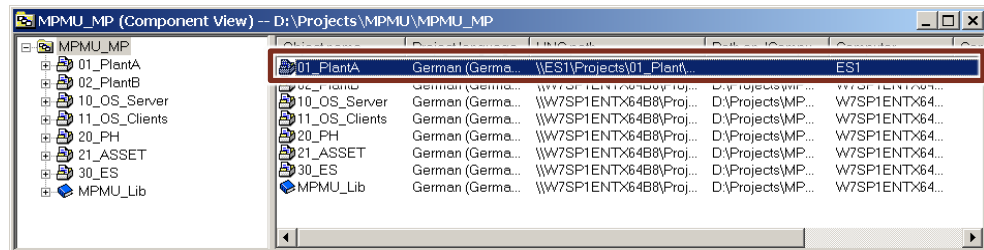
The existing original project was removed from the multi-project and stored on the central engineering server. It can remain there for backup or be deleted. The backup copy can be removed using the menu item "File > Delete..." of the SIMATIC Manager .

1 Multiproject engineering

1.5 Distributed editing

The component view provides you with an exact overview of which projects are included in the multi-project. The "UNC path" column provides information on which ES the projects are stored.

Figure 1-18



Note

The UNC path must be set for each project in the notation \\Computername\ShareName\... must be filled in correctly so that moving the projects in the network works. Please also note the system requirements for networking in chapter 2.2.

Removing a project from the multiproject

This removes a project from the multi-project. The remote project can then be moved to an external data carrier for transport purposes.

1. Select the project to be removed from the multi-project.
2. Select the menu command "File > Multiproject > Remove From Multiproject".

Even if the project has been removed from the multi-project, it is still stored as a project in the folder created during creation. To transfer the project to an external medium, it must be archived.

3. Execute the menu function "File > Archive...".
4. Select the project in the "Multiprojects" tab.
5. Start archiving with the "OK" button.

After these steps, the project removed from the multi-project is on the drive on which it was created, both in its original form and as a ZIP archive. Both can remain here as backup copies or be deleted. The original project can be deleted using the menu item "File > Delete...". You can delete, move or save the ZIP archive using Windows tools.

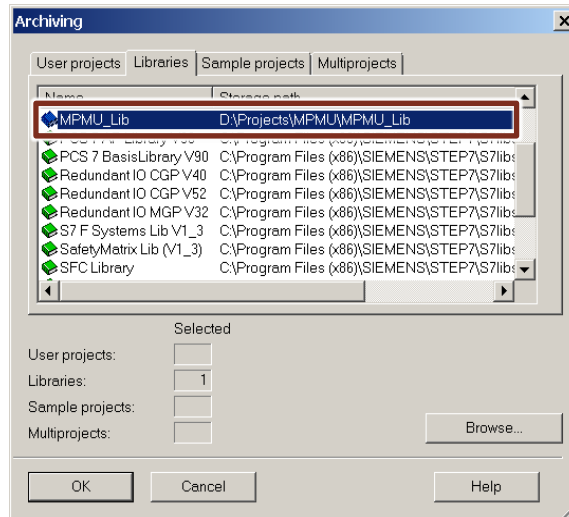
To enable the project planner on the decentralized ES to access the master data library, you must also copy this to the decentralized ES. However, changes to the master data library should only be made to the Engineering Server. The library must then be redistributed to the decentralized ES.

1 Multiproject engineering

1.5 Distributed editing

You can distribute the master data library as follows:

1. Execute the menu function "File > Archive...".
2. In the "Libraries" tab, select the master data library of the multi-project. Master data libraries are marked with a blue book symbol.
3. Start archiving with the "OK" button.



You can copy the ZIP archive of the master data library to all decentralized ES via an external data carrier as usual. After archiving to the decentralized ES, you can use the master data library like a normal library.

Note

For temporary network connections between the engineering stations, SIMATIC Manager provides additional functionality.

If the project is selected, it can also be moved to the remote ES via "File > Multiproject > Remove for editing..." and simultaneously removed from the multiproject. In the multi-project, the project is marked as "Project removed for editing" and displayed in gray.

On the one hand, you save the deletion process and, on the other, the resumption after processing is simplified because the original storage path is remembered (reduction of administrative effort).

1.5.4 Decentralized project editing

Editing projects without network connection

These functions are possible when processing projects on the decentralized ES:

- Functions that do not span across projects
- Editing processes
- Compiling and loading an AS via a fixed parameterized PG/PC interface (e.g. CP1613[ISO])

If you want to load the AS from the decentralized ES via the "PC internal (local)" interface module, you must first carry out the following work:

1. Insert a local PC station with suitable CP into the project.
2. Configure the S7 connection between AS and OS

If you want to test an OS on the decentralized ES in process operation (OS simulation), you must adapt the computer name in WinCC Explorer.

Note

Before the project is copied or moved back to the Engineering Server, the changes you made for loading (via "PC internal (local)") must be undone.

Editing projects within network connection

The decentralized processing of projects of a multi-project with permanent and fast network connection largely corresponds to the processing of several projects on one and the same engineering station.

The backup of the multi-project on the engineering server also includes the distributed projects. During archiving, no work is allowed at the decentralized engineering stations on the project.

As of PCS 7 V6.1 SP1, the Version Trail option package is also available. This allows project data, i.e. complete multi-projects, single projects or libraries, to be archived and the data to be given a version identification and a comment. Furthermore, you can unarchive and reuse project data that has already been versioned. Version Trail also takes over the complete administration of the version history. This means, for example, that you can no longer change a version once it has been completed.

As of PCS 7 V8.1, automatic archiving is possible after successful loading of the user program (version trail must be available).

1.5.5 Merging the projects:

After the projects have been processed decentrally, they must be combined again in the multi-project.

Moving a project within the network

A project within a multi-project is then moved from a remote ES to the Engineering Server. A copy of the decentrally processed project is created on the engineering server and included in the multi-project. The decentrally processed project on the remote ES is removed from the multi-project and can physically remain on the hard disk of the decentralized ES as a backup copy.

Note

The project must be located "physically" on the decentralized ES and be integrated in the multi-project on the engineering server.

The decentralized ES is accessible via the network.

1. If necessary: Delete the existing project of the same name (status before moving to the decentralized ES) on the engineering server.
2. Open the project from the Engineering Server on the decentralized ES with the menu command "File > Open..." ("File > Open...") in the SIMATIC Manager.
3. Click on the "Browse..." button.
4. In the "Browse" menu in the "Find in directory" field, enter the path of the project to be moved in "UNC notation".
5. Click the "Start search" button. The project is displayed in the "User projects" tab.
6. Select the required project in this tab and click "OK". The project opens.
7. Select the menu command "File > Save As...".
8. Select the following settings:
 - Activate the "With reorganization (slow)" option box.
 - Activate the "Add to multiproject" option box.
 - Select the entry "Current multiproject" in the corresponding drop-down list.
 - Activate the "Replace current project" option box.
9. Click the "OK" button.

Adding and reintegrating a project into a multiproject

A project that has been edited on a remote ES is then re-inserted into the multi-project. A distinction is made between the methods "Insert into multiproject" and "Restart after editing".

Note The choice of insert/record method depends on the method used to remove from the multi-project. See chapter [1.5.3](#) "Dividing the projects"

Reintegrate the project after editing:

1. On the Engineering Server, select the project marked as "Project removed for editing" (grayed out).
2. Select the menu command "File > Multiproject > Reapply after Editing".

Note A temporary network connection between the remote ES and the Engineering Server is required for the resumption.

Insert the project into a multi-project:

3. Archive the edited user project on the decentralized ES.
4. Copy the repository to the engineering server.
5. Select the menu command "File > Retrieve" on the Engineering Server in the SIMATIC Manager.
6. Select the project to be dearchived from the menu ("Retrieving - Select an archive"). Then click "Open".
7. Select the directory in which your multi-project is stored in the "Select destination directory" menu and click "OK".
8. On the Engineering Server in the SIMATIC Manager, open the multi-project into which the user project is to be inserted.
9. Select the multiproject and select the menu command "File > Multiproject > Insert into Multiproject...".
10. In the "Add to Multiproject" menu, select the user project you want to insert and click "OK".

1.5.6 Final project work

After you have merged the decentralized projects, you can complete the overall project planning by executing cross-project functions for the first time or repeatedly.

Adjusting the Technological Hierarchy (TH)

If you want to keep the TH of all projects identical, but changed it during decentralized processing in a project (for example, by inserting a new hierarchy folder), you can adjust the other projects with it again.

Select the multi-project and select the menu function "Tools > Technological hierarchy > Synchronize in multi-project...". (Options > Plant Hierarchy > Update in the Multiproject...").

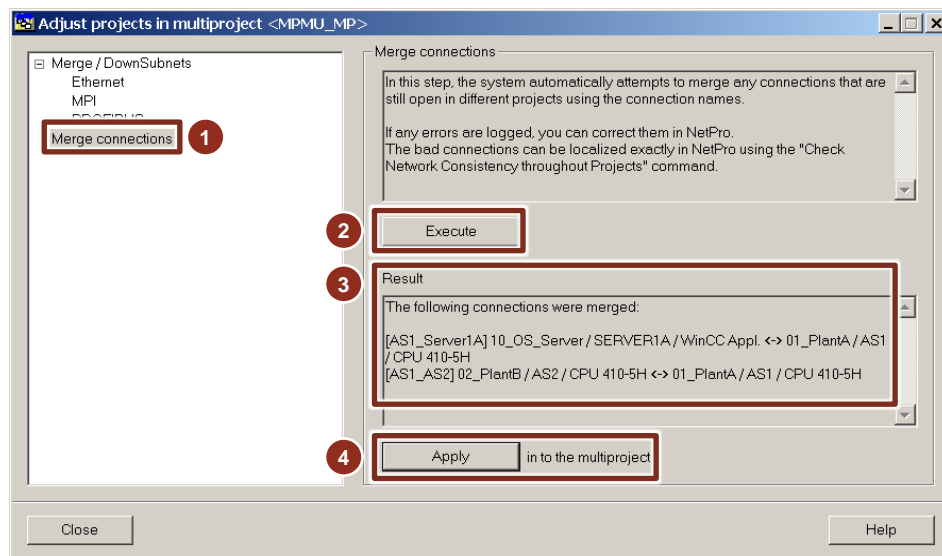
Merge cross-project connections

Connections that were created at the decentralized engineering stations with a text reference can be closed on the Engineering Server after the projects have been integrated into the multi-project:

There are two procedures for merging cross-project connections.

To merge the cross-project connections across multiple projects, proceed as follows:

1. Select the menu command "File > Multiproject > Synchronize projects..." in the SIMATIC Manager. (File > Multiproject > Adjust Multiproject...").
2. In the tree view, select the entry "Merge connections" (1).
3. Click "Execute" (2) The "Result" section (3) displays all cross-project connections that can be merged.
4. Click on the "Apply" button (4). This will merge all displayed connections.

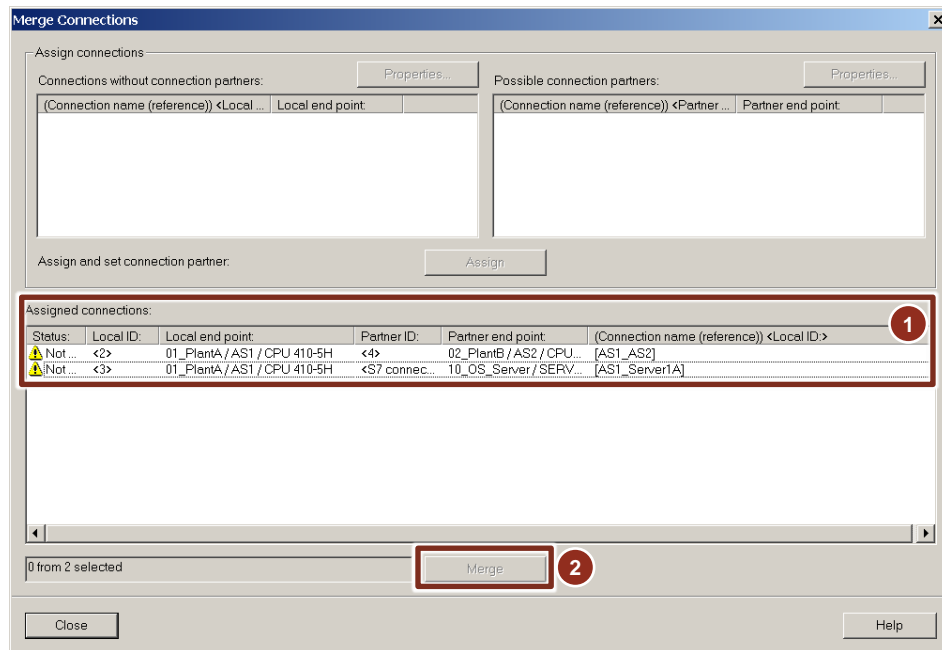


To merge the cross-project connections of individual projects, proceed as follows:

1. Select the project whose connections you want to merge in the SIMATIC Manager.
2. Start "NetPro".
3. Select the menu command "Edit > Merge Connections...".
4. Select the connections you want to merge (1) and click the "Merge" button (2).

1 Multiproject engineering

1.5 Distributed editing



After the connections have been successfully merged, the status changes to Merged.

Status	Local ID	Local end point	Partner ID	Partner end point	(Connection name (reference)) <Local ID>
▶ Merged	<2>	01_PlantA/AS1 / CPU 410-5H	<4>	02_PlantB / AS2 / CPU...	[AS1_AS2]
▶ Merged	<3>	01_PlantA/AS1 / CPU 410-5H	<S7 connec...	10_OS_Server / SERV...	[AS1_Server1A]

Compiling and loading

Perform the following activities in accordance with the manual ["SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)"](#)

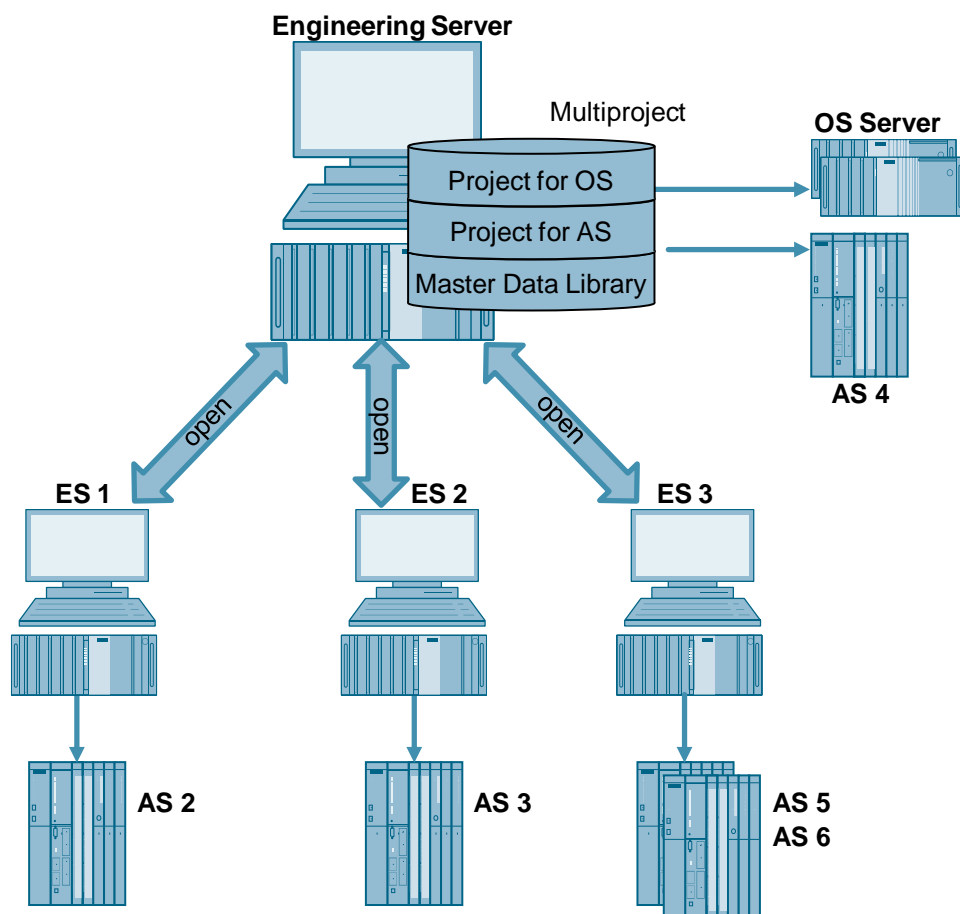
1. AS Program compilation
You can skip this step if the program has already been translated to the decentral ES.
2. Compiling the OS servers with access to the associated AS components
3. Assigning the OS server to the OS clients
(Must be carried out once manually. When the OS clients are loaded onto the target computers, the OS server data is also loaded. Subsequent changes to server configuration are automatically applied to the clients)
4. Downloading all target systems

2 Multiuser engineering

2.1 Function mechanisms

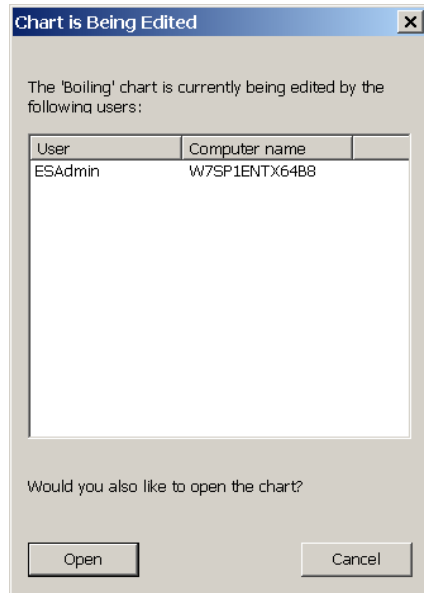
In multi-user engineering, several project engineers work on one and the same project, regardless of the selected project structure and distribution. The corresponding project is located on an Engineering Server, which allows access to individual engineering stations via network. It does not matter whether it is part of a multi-project or whether it was hung out and moved for editing (e.g. to decentralized ES).

Figure 2-1



Real multi-user engineering is currently only available for processing CFC/SFC. These objects can be changed in parallel by different project designers, whereby changes are written directly to the system database. If a plan is opened by one project engineer and another project engineer wants to open this plan, he receives a message indicating that this plan is already open by another project engineer.

Figure 2-2



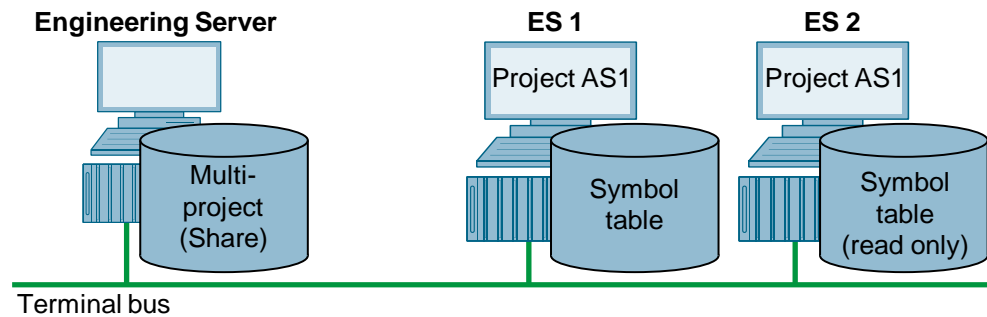
If two projectors have opened the same schedule at the same time and one of them makes changes, the other will only see these changes when he updates the display (F5 key).

When editing different objects (e.g. CFC plans), there is usually no conflict in the same project. However, caution is required when performing project-wide actions such as AS translation. If a project developer tries to change a CFC plan while the AS program is being translated, a conflict occurs with a corresponding message window.

The following applies for all other objects in the PCS 7 project: If several project engineers access the same object, e.g. the symbol table, it can only be edited by one project engineer. The other projectors can only open the symbol table read-only.

It does not matter how an object is opened. You can open the symbol table from the component view, the process object view, or the menu option of an editor (for example, SCL editor). The table is always displayed and edited in the symbol editor.

Figure 2-3



Basically, all objects can be opened in read mode by all users, but may only be edited in write mode by one user. The user who first made a change has the right to save the change made. All other users receive the message that the object is already being edited and that you can only save your changes using the "Save as..." function. Only after the change has been saved by the project engineer can the object in question be edited again by another user.

Starting with PCS 7 V8.1, the multi-user engineering function can be activated for the OS project. If this function is activated, the OS project can be opened several times remotely. A distinction is made between file-based and database-based access.

Project

- On each station, either the multi-project or the individual project is opened via network. It is important that the network share has already been activated before creating the multi-project.
- To increase performance, projects with AS stations can be stored on their own ES for the duration of the project planning using the "Save as" function without being removed from the multi-project. This increases the performance. If the "Save As" option is unfavorable due to the project situation, performance can also be increased by remote access to the ES Server (see also chapter 3.4 Remote access to the Engineering Server).

Note

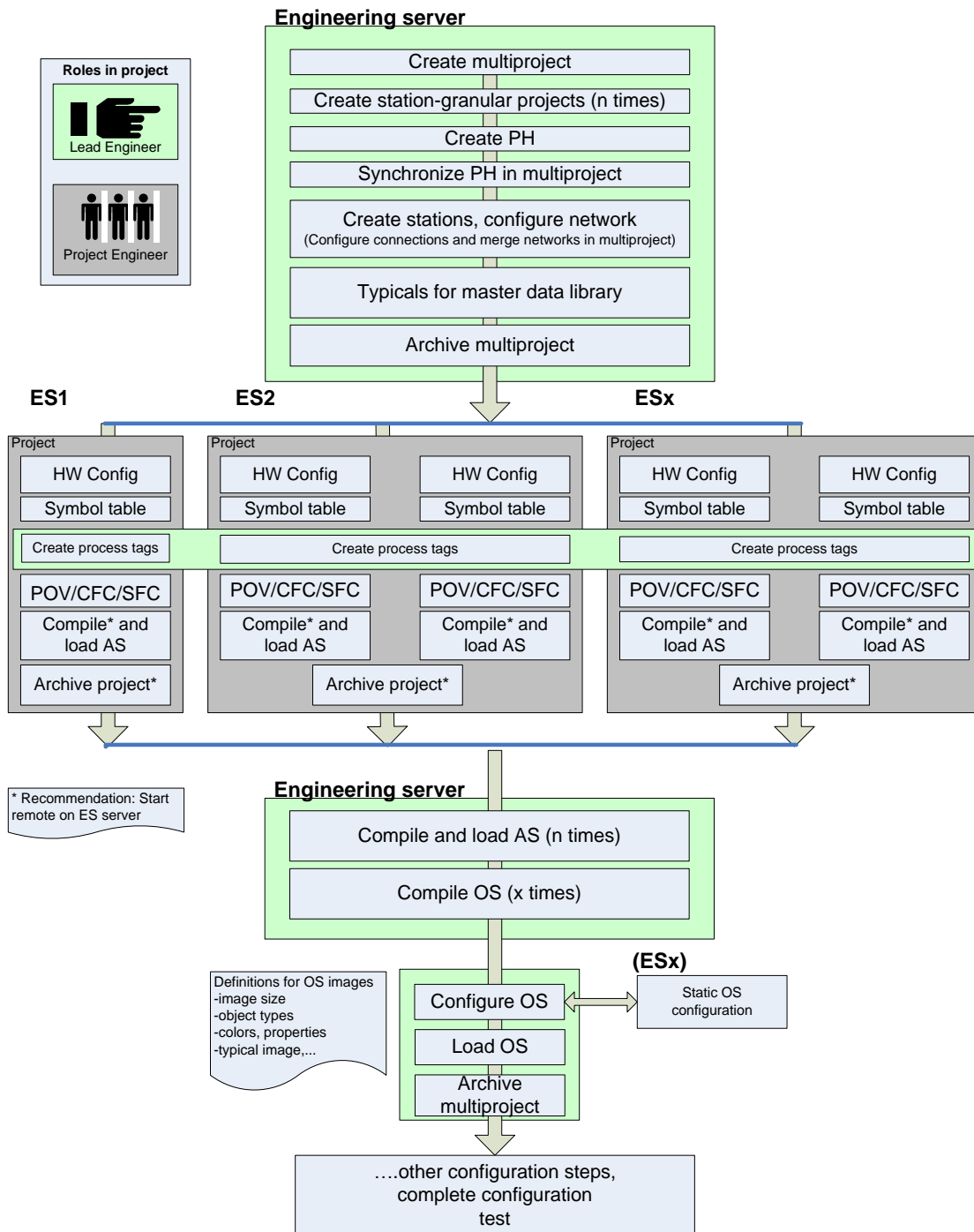
Working over a network increases the potential risks for a smooth workflow. If the network connection fails during a write operation, long waiting times and possible inconsistencies in data storage may occur. In this case, close all open projects in SIMATIC Manager before you continue working.

2.2 Overview of the configuration steps

In general, the first project planning steps, such as creating the multi-project, must take place on the Engineering Server.

The following workflow is recommended, but may vary according to individual circumstances and experience.

Figure 2-4 Procedure Multiuser engineering



2 Multiuser engineering

2.2 Overview of the configuration steps

Define a team leader (lead engineer) who is responsible for cross-project functions and manages the ES Server.

Working over the network can increase the risk of data inconsistencies. Therefore, a stable network connection between the engineering stations is absolutely essential for multi-user engineering.

We recommend that you perform cross-project functions on the Engineering Server where the project or multi-project is managed.

- Creating and Adjusting the Technological Hierarchy (TH)
- Managing the master data library
- Merging subnets and connections
- Creating and updating the block symbols
- Compiling and loading all contained components (AS, OS, ...)

Note

When you execute cross-project functions, you need to make arrangements, since you cannot work on the projects at this point. The individual work steps are described in detail in the manual "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)".

2.3 Working in parallel

For the parallel work of several projectors, the multi-project, or individual projects of the multi-project, is opened via network access at several engineering stations. The engineering server on which the project is stored can also serve as a work computer.

Access scenarios / special features

There are different cases for editing objects in the same project:

- Different objects at several engineering stations
- Different objects of an AS at several engineering stations
- The same object at different engineering stations
- Different objects of one OS at several engineering stations

When machining different objects at several engineering stations, no obstruction is to be expected for AS Engineering.

However, if several projectors are working on the same plan, this can lead to mutual obstruction. For example, if two project designers are in the same input mask at the same time within a CFC plan, its action is executed, the last to press "Apply" or the dialog ends with "OK". This procedure is therefore not recommended.

When working with different objects of one OS at several stations, no obstructions are to be expected. The individual editors or images can only be opened by one user at a time. In some cases, Read-Only mode is also possible for viewing the configured data when editors are already open.

CAUTION	If several project engineers are working on the same object, update the view by pressing F5 before carrying out any further steps. This ensures that the real actual state is displayed.
----------------	---

Try to avoid this mode of operation by coordinating the work. You should not access the same resources simultaneously, for example, parameterizing the same connections of a particular device type. In the case of long read or write actions, the project engineers must coordinate with each other.

Tools

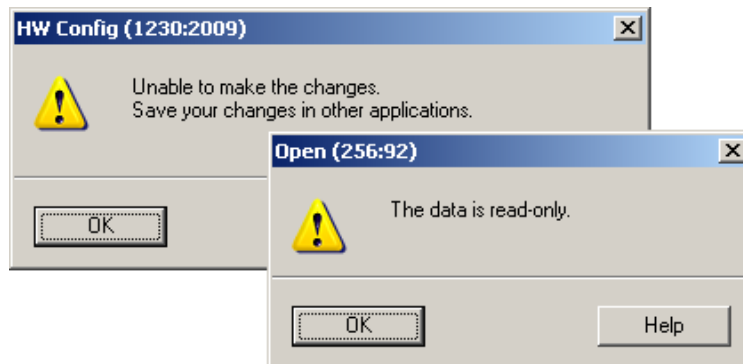
PCS 7 offers various tools for editing plans of the same station or in the same project, the use of which can considerably reduce possible conflicts:

- **Version:** Activate the versioning of the plans in order to recognize whether something has changed in the plan based on the version number and the change date.
- **Author:** Register as the author of the plans if you are responsible for them or are working on them.
- **Write protection:** Activate the write protection on a single chart or all charts together as soon as certain areas are finalized.
- **Change log:** Activate the ES change logbook when using SIMATIC Logon (for details see manual "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)").
- **Access control:** Use SIMATIC Logon Role Administration to define who may open which project (for details see manual "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)").

Conflict handling

A typical conflict situation is, for example, a parallel change to the same object. The project engineer always has the right to save the change that made it first. All other projectors usually receive a message that the object is write-protected or occupied by another process.

Figure 2-5



Opening (reading) objects or their properties in parallel usually does not lead to a conflict and can be performed by all users.

2.3.1 Charts (CFC/SFC)

Summary

Table 2-1

Action	Restrictions
Processing of different plans of an AS at different ES.	None
Editing the same charts of an AS on various ES.	Restricted, changes of the other project engineer only visible after updating the view (F5 key).

Prioritizing actions

The individual transactions are assigned different priorities. Basically, the higher-priority action is always executed in the event of an access conflict. The low-priority action is terminated in this case. A short read action has the lowest priority and a long write action has the highest priority.

Table 2-2

Action type	Read/write action	Behavior
Short read actions (without resource allocation) are:	<ul style="list-style-type: none"> Opening charts Opening run sequence Opening dialog boxes 	<p>If further short read actions are carried out in addition, no impairments are to be expected.</p> <p>If a short or long write action is performed in parallel, an access conflict can occur, that is, the short read action is terminated.</p>
Short write actions (without resource reservation):	<ul style="list-style-type: none"> Instantiation, parameter assignment, interconnection, etc. Close dialog box with OK 	<p>If a short or long write action is performed in parallel, an access conflict may occur for the action started later.</p>
Long read actions (with resource allocation) are:	<ul style="list-style-type: none"> AS-OS data transfer (OS compilation) 	<p>If an access conflict does not occur immediately when the long read action is triggered, for example, because a write action is already being performed in parallel, this action runs through without an access conflict.</p>

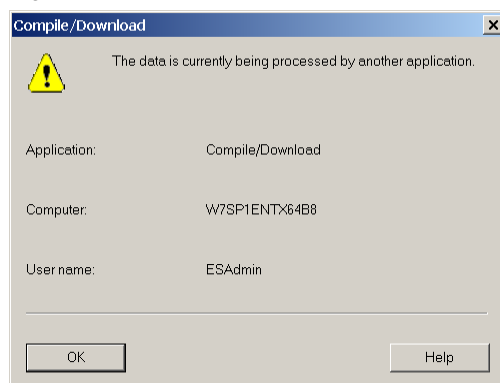
Action type	Read/write action	Behavior
Long write actions (with resource allocation) are:	<ul style="list-style-type: none"> Optimizing the run sequence Compiling and downloading (AS and OS) Type import and block type update or clean-up Synchronizing shared declarations Generating module drivers Reading back Creating block icons Creating diagnostics screens Synchronizing TH in multiproject Import/Export Functions of the IEA and the Process Object View Import/export functions of ES objects of the VCM 	If an access conflict does not occur immediately when the long write action is triggered, for example, because a write action is already being performed in parallel, the action runs without an access conflict.

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Signaling conflicts

The same plan (CFC or SFC) can theoretically be worked on by several projectors at the same time. However, only one project developer can write to the database at any one time. If an action cannot be executed, the following message appears, for example:

Figure 2-6



Due to the short time required to write to the database, such conflicts are extremely rare.

Note

How CFC/SFC processing works

When opening an already opened CFC/SFC, a message box appears stating that the chart is already open. The project developer must then decide whether to open the plan again.

If projectors are working on the same CFC/SFC plan at the same time, they should coordinate with each other.

In general, project engineers should coordinate their work on the same CFC/SFC plans. In the event of a conflict at the latest, the project engineers must decide among themselves which changes are to be saved.

Long read and long write operations are better only performed on the ES Server, or where the respective project is stored, after consultation with all project managers. This prevents conflicts automatically.

Access conflicts

If access conflicts occur outside the CFC/SFC, the operation is rejected (no multi-user-compliant message). Simultaneous working in the SIMATIC Manager outside the PCS 7 ES is not supported.

Conflict behavior

Further information on how the system reacts to conflicts can be found in the function manual "[SIMATIC Process Control System PCS 7 CFC for SIMATIC S7 \(V9.0 SP1\)](#)" in Chapter 7 "Multi-user Engineering" under the heading "Notes on system behavior".

Here you will find information about:

- Conflicts when accessing the same resources outside the CFC
- Conflicts when using the test mode

CAUTION

Ensure that all work has been completed on the AS program when loading the automation system. This guarantees that when compiling, a consistently checked S7 program is downloaded to the AS.

CAUTION

A selective downloading of charts is possible since PCS 7 V8.1. When downloading an edited chart, the depending charts are also downloaded. This increases the risk that one of the dependent charts is currently being edited by a different project engineer. Coordinate the activity with the other project engineers. You will find more detailed information on this topic in the function manual "[SIMATIC Process Control System PCS 7 CFC for SIMATIC S7 \(V9.0 SP1\)](#)".

With regard to projects that have been created from the very beginning with PCS 7 V8.1, there should be no dependencies.

Interlocking mechanism

Each transaction has an ID and is backed up (allocated) using it. This means that further write actions are locked in the same place in the database.

Note

In the process object view, the actions for the individual program units are allocated line by line.

2.3.2 Process object view

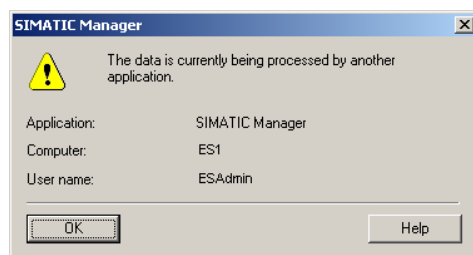
Description

Two project engineers can make changes to different objects simultaneously in the process object view without interfering with each other. The input field in the process object view is a simple field; the change is only saved when you leave the field (Return, Tab, arrow keys, and so on).

Note that the values are not automatically updated when working on the same plans. Projector 1 can change a value and Projector 2 can immediately change the value again.

Restrictions

- Case 1: Obstructions only occur when both project managers have access to the same plan. For example, the project engineer on ES1 changes values in plan A and the project engineer on ES2 also changes values in plan A. If the same field is accessed simultaneously at random, the message "Data can only be read" appears.
- Case 2: Several project engineers add a new comment in chart A. The project engineer of ES1 starts the action first. The project engineer of ES2 starts the action first. The configurator on ES2 receives the message "The data are currently being processed by another application, Application: SIMATIC Manager, Computer: ES1, User name: Login name of the project engineer on ES1". The data edited on the ES1 is saved. The data processed on ES2 is discarded.



- Case 3: Editing plans of different ASs on different ASs is possible without hindrance if only one project planner processes an AS at a time.

Note

If you are working on the same plan simultaneously in the process object view and in the CFC editor, data update problems occur.

Summary

Table 2-3

Action	Restrictions
Editing of different objects of a project on different ES.	None
Editing of different objects of an AS on different ES.	None
The same object of an AS is processed at different ES.	Restricted, changes of the other configurator only visible after updating the view (F5 key)

2.3.3 NetPro

NetPro is best edited from the central engineering station after creating the multi-project. This prevents possible inconsistencies and restrictions when compiling from NetPro.

Applications

- Project-wide configuration in NetPro on ES Server
- Changes can only be carried out at one station

Summary

Table 2-4

Action	Constraint
Edit NetPro configurations of different projects on different ES.	None
Edit the same NetPro configuration of a project on different ES.	Restricted. The first person to open the NetPro configuration can edit the configuration. All other projectors get read access. Changes visible after updating the view (F5 key).

2.3.4 HW Config

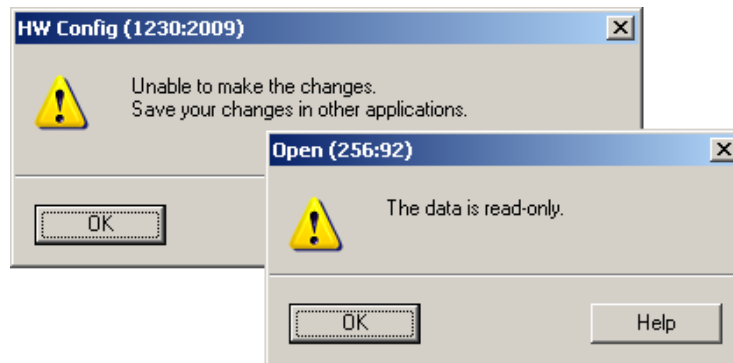
In principle, it is possible to allow several project engineers to configure and edit the hardware components. If a hardware object is opened and changed in HW Config, this object is locked against changes by other configuration engineers. They can only open the object as write-protected.

As long as the HW Config changes on the ES1 are not stored, the message *"Unable to make the changes. Save your changes in other applications"* is displayed on the ES2 and the actions are locked on the ES2.

Changes on the ES2 are only possible after the HW Config has been saved on ES1.

Alternatively, the person accessing the HW Config receives the message *"The station has been changed by another application and will now update"* and an automatic update follows.

Figure 2-7



Note

We recommend to always change the hardware configuration of an AS on one ES. Other ES can be used in parallel, both offline and online, for read-only access. If you want to download a configuration, no other ES may have established an online connection to the AS.

CAUTION

If CiR is enabled, then the work must be conducted in accordance with the CiR conditions. (See "[SIMATIC Process Control System PCS 7 Engineering System \(V9.0 SP1\)](#)")

Summary

Table 2-5

Action	Restrictions
Edit different HW config of a project on different ES.	None
Edit the same hardware config on different ES.	Restricted. The first person to open the object in HW Config can edit the configuration. All other projectors have read access. Write access is only possible after saving the change. Changes can only be done apply after updating the view (F5 key).

2.3.5 Icon table

The following cases may occur during project planning

- Project engineers on ES1 and project engineers on ES2 want to edit the symbol table of AS1 at the same time.
- Projector on ES1 opens the AS1 symbol table and makes a change.
- Projector on ES2 also opens the AS1 symbol table and receives the message "the symbol table is occupied by another process".

Summary

Table 2-6

Action	Restrictions
Editing various icon tables of a project on several ES.	None
Editing the same icon table on several ES.	Restricted. The first person to open the symbol table has full access. All other project engineers gain read-only access. Changes are only visible after updating the view (F5 key).

2.3.6 Process Device Manager (SIMATIC PDM)

The following applications can occur with SIMATIC PDM

- Different field devices from different AS can be processed on several ES.
- Different field devices from one AS can be processed independently on several ES.
- Working on the same field device on several ES: Under PCS 7 V7.1 (PDM V6) this is prevented by SIMATIC PDM. A device can only be opened on one ES. As of PCS 7 V8.0 (PDM V8.0) it is possible to open a field device several times and to perform online reading functions on the field device. Write operations in the field device or in the project are prevented by a message box. This is only possible if only one ES opens the field device with PDM.
- Restrictions apply when inserting or deleting devices, see the chapter entitled "HW Config".
- It is recommended to open existing devices via PDM device view or PDM network view to avoid dependencies with HW Config.

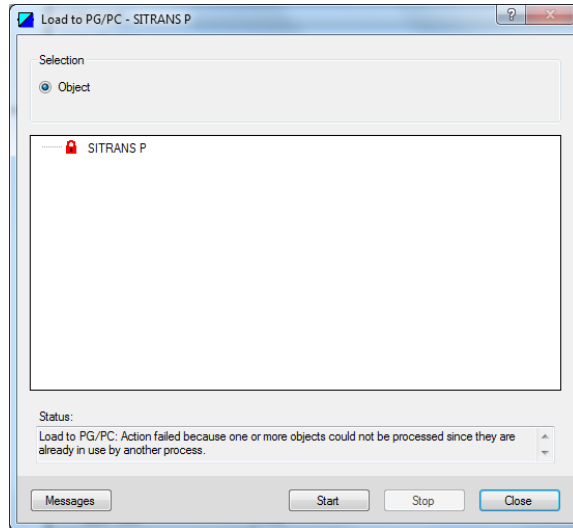
Requirement

To parameterize a field device with PDM, the necessary device configuration file must be installed on each ES in the same way. If the project with configured PDM device is loaded on an ES without an installed device configuration file, a message indicating the missing software appears when opening the HW Config. The HW Config can then only be opened with read access. Changes in the HW Config cannot be saved.

Parameter assignment

A specific field device that has been configured with the Process Device Manager can only be opened for editing by a project engineer. Other project engineers can only open the device configuration as read-only.

Figure 2-8 PDM V8.0



Recommendation

If you open the field device via a SIMATIC Manager PDM view instead of via HW Config, you avoid restrictions in the HW Config on another ES.

Summary

Table 2-7

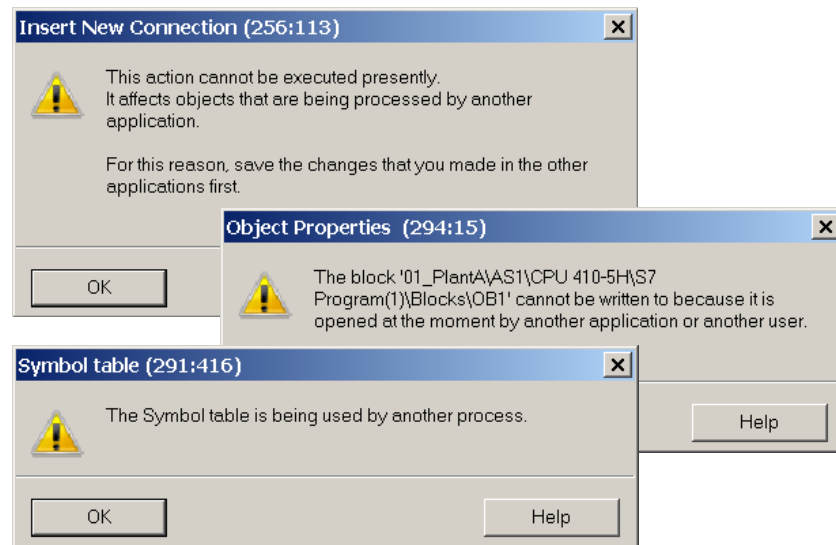
Action	Restrictions
Editing various field devices of a project on several ES.	None
Editing various field devices of an AS on several ES.	None
Editing the same field device of an AS on several ES.	Restricted as of PCS 7 V8.0 (PDM V8.0). As of PDM V8.0, simultaneous read access to the same field device is possible from several ES. When writing from one ES to a field device, only one ES may open the field device via PDM.

2.3.7 Additional ES components

For the following objects in the PCS 7 project, the project engineer who was the first to make a change can save the change. As long as the change is not saved, all other project engineers only get read-only access to the object. This is indicated by an appropriate message.

- Connections
- Sources (AWL, SCL, KOP, FUP)
- Blocks
- Icon table

Figure 2-9



2.3.8 OS project

Since PCS 7 V8.1 it is possible to open an OS project remotely from all connected engineering stations. This functionality must be activated in the SIMATIC Manager for the OS projects contained in the multi-project.

Summary

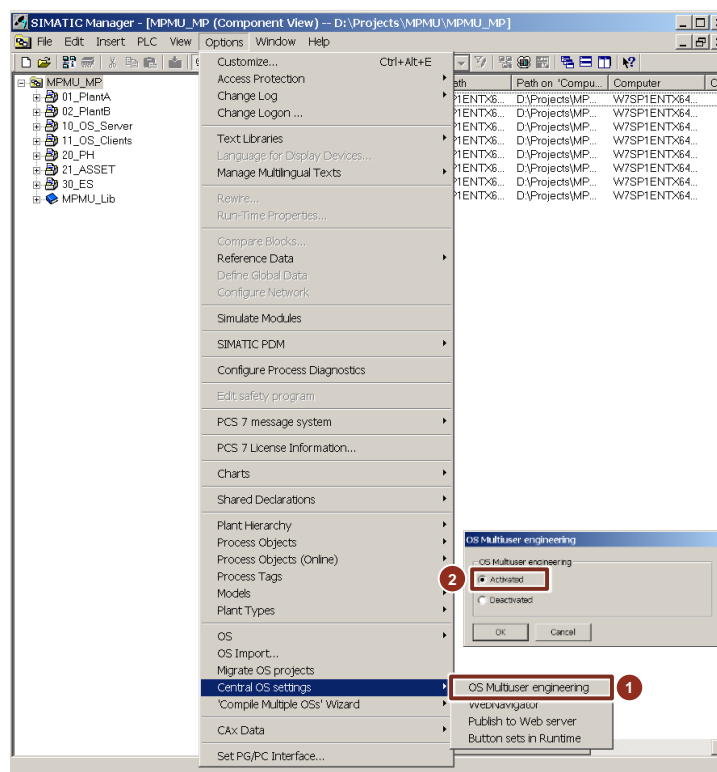
Table 2-8

Access scenario	Remarks
Opening of database-based resources (e.g. variable budget)	The first computer to open the resource has full access. The others gain no access or read-only.
Open file-based resources (e.g. process images).	Files that are already open cannot be accessed.

Activating the OS multiuser engineering

You activate the "OS Multiuser Engineering" functionality in the SIMATIC Manager at the engineering station where the multi-project is located (Engineering Server). This is done via "Tools > Central OS Settings > OS Multi-User Engineering" ("Options > Central OS settings > OS Multiuser engineering")

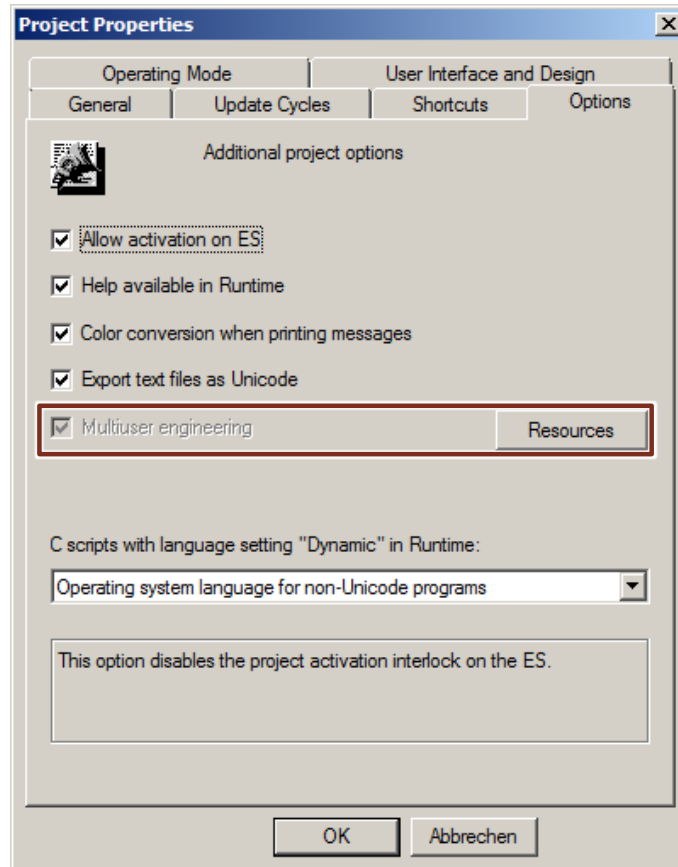
Figure 2-10



After the activation of OS Multiuser Engineering in the SIMATIC Manager, the checkbox "Multiuser Engineering" in WinCC Explorer is automatically activated in the project properties of the Operator Station.

Note The checkbox "Multiuser engineering" cannot be activated or deactivated in WinCC Explorer.

Figure 2-11



Data consistency

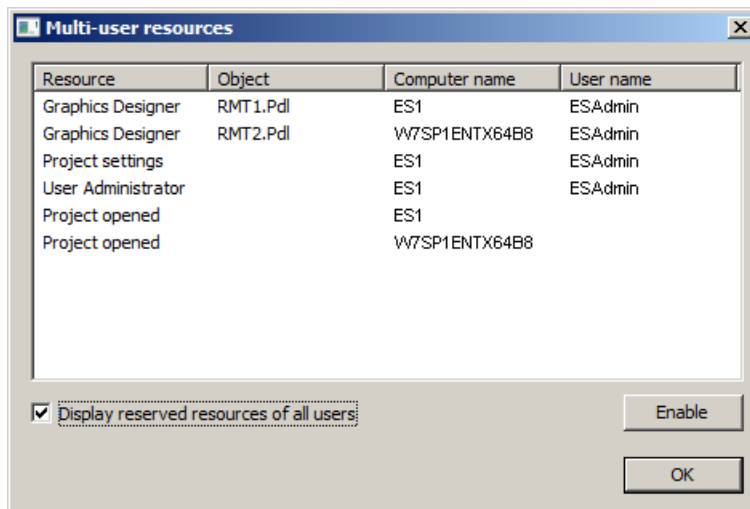
Data consistency is ensured by marking resources used as reserved in the database. This ensures that no data can be changed by two users at the same time.

In the project properties the currently used resources can be displayed via the "Resources" button. Reserved resources are marked with user names and host names.

In special circumstances, resources may be marked as reserved even though they are not. In this case, the resources can be released manually using the "Enable" button.

Note To avoid inconsistencies in the data, make sure that the resources are actually no longer being used before manual release.

Figure 2-12



Opening the OS project

To open an OS project on another engineering station, navigate in the SIMATIC Manager under "File > Open..." via the network to the Engineering Station where the project is stored. Select the storage location and select the project using the "Browse..." button.

Figure 2-13

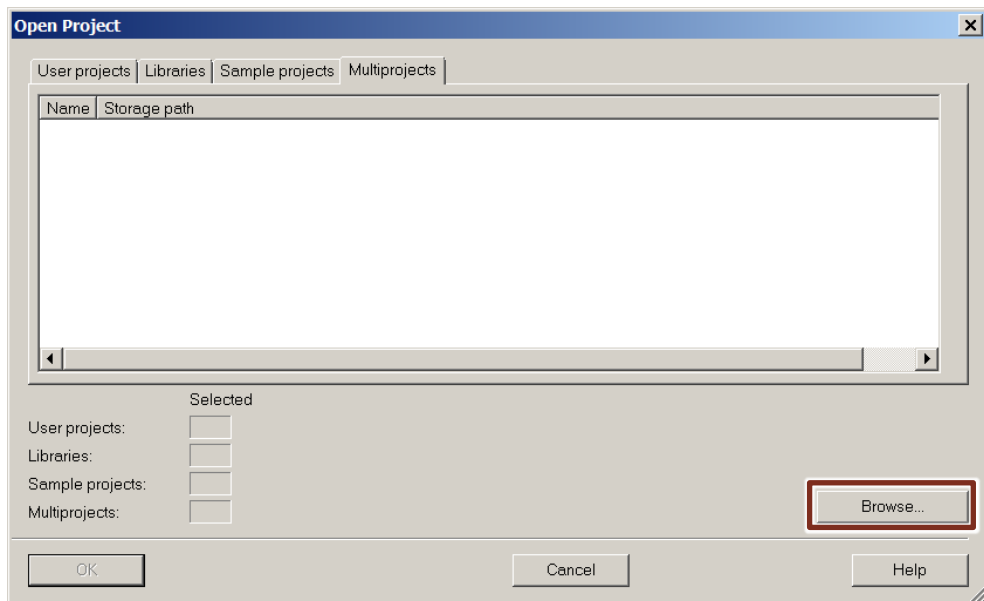
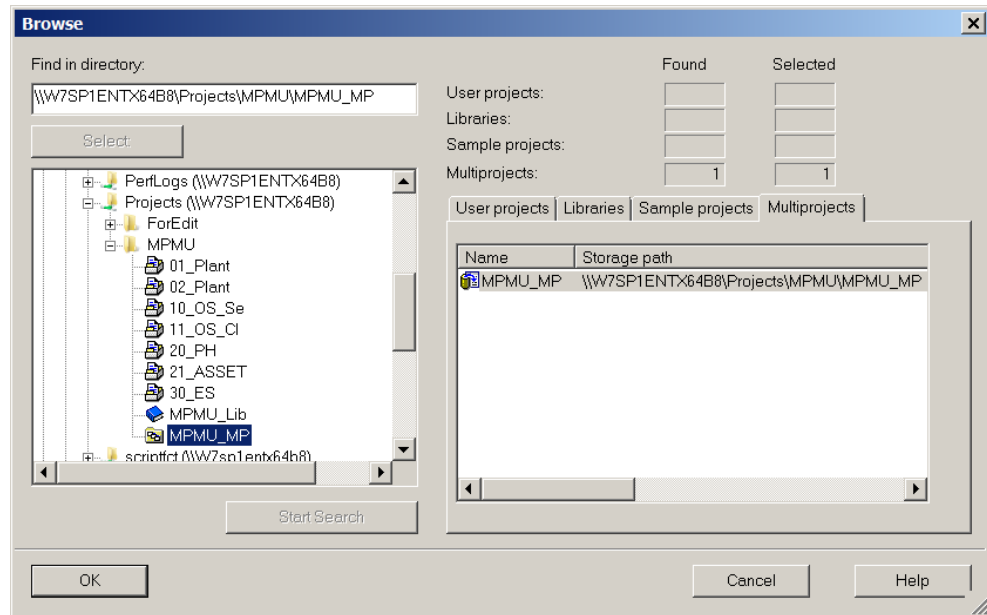


Figure 2-14



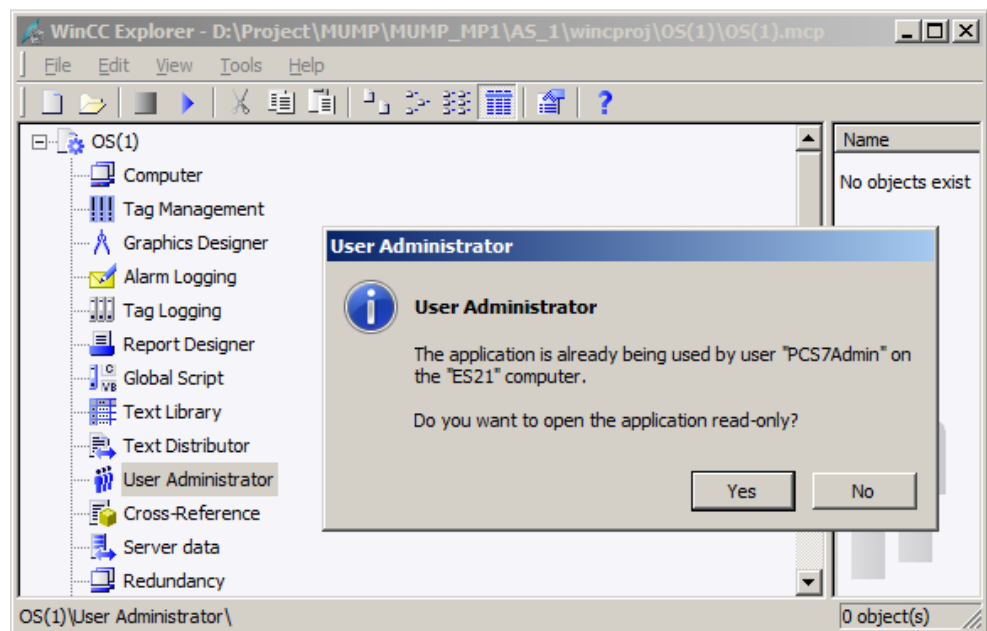
Engineering the OS project

After connecting to the Remote Engineering Station in the SIMATIC Manager, you can now open and edit the OS project in WinCC Explorer.

The system ensures that no resource can be opened by two projectors at the same time.

Depending on the desired resource, the resource can then be opened read-only. The project engineer is informed by which user and from which computer the resource is already occupied.

Figure 2-15

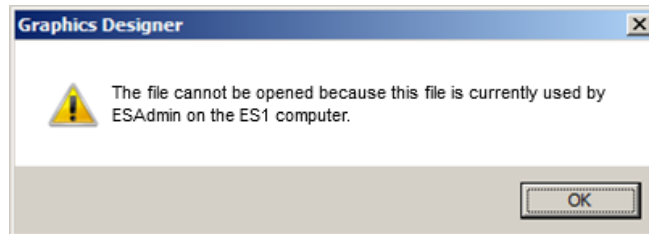


2 Multiuser engineering

2.3 Working in parallel

Plant images can only be opened by a project engineer. If, when attempting to open a system image remotely, this image is already opened by another engineering station, it cannot be opened. The following message is shown.

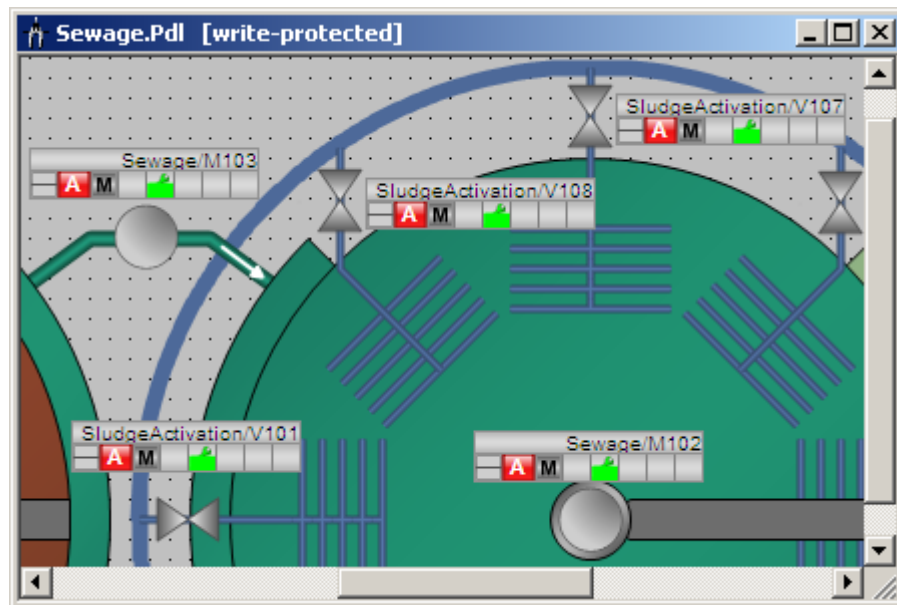
Figure 2-16



Note

Parallel read-only opening of the image from the Graphics Designer of another OS project is possible.

Figure 2-17



Note

Always perform OS engineering for an OS project at the same engineering station. During the project planning phase, this should be the ES server.

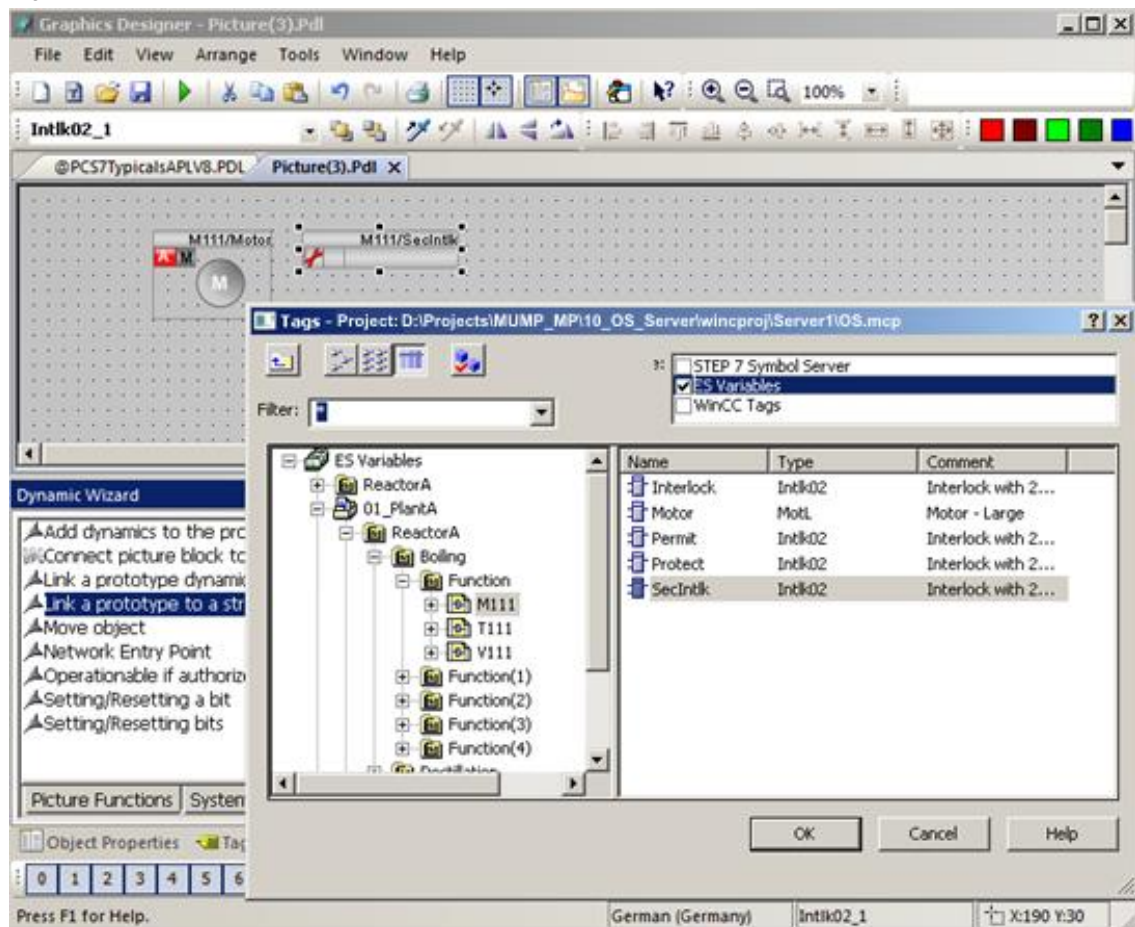
2.3.9 Parallel AS and OS engineering

Application case

One or more project engineers are busy with AS Engineering, while another project engineer updates or completes the process images in the corresponding OS in the Graphics Designer.

In doing so, the OS project planner can access blocks already configured in the AS, even if they have not yet been explicitly and completely created using OS translation. It uses the so-called "ES variables" in the Graphics Designer variable selection.

Figure 2-18



This means that there are no delays in the project planning due to a pending OS translation. This can be done after the AS project planning has been completed.

Note

Implicit translation by selecting ES variables is only available for station-specific structure and not for project-specific structure. This means that AS and OS must be included in different projects.

Name changes in the TH are not automatically updated when ES variables are used.

2.3.10 Compiling and downloading objects

Options

In PCS 7 you can start the functions for translating and loading from various editors. There are differences in the range of functions. The following table gives you an overview of the options for translating and loading PCS 7 components:

Table 2-9

Editor	Function
HW Config	Compiling and downloading the hardware configuration
NetPro	Translation and loading of network and connection planning and hardware configurations
Charts (CFC/SFC)	Compiling and downloading the AS program
SIMATIC Manager	Translate and load individual or all objects of a multi-project via selection window

After the initial total translation and total loading, a change translation is usually sufficient.

Compiling and downloading individual stations

Basically AS-Translation and -Loading is possible on different ES. For performance reasons, we recommend that you perform AS translation and loading on the ES that stored the project in question locally - usually the ES server. For better performance, remote access to the ES Server is recommended, as described in the chapter 3.4.

The OS change translation should always be performed by the same station, select the ES Server during the configuration phase.

Before each AS translation, stop working on the relevant AS on other ES to avoid conflicts.

Selection window " Compile and load objects "

The "Translate and load objects" selection window in the context menu of a project/multi-project allows you to translate and load all connections and programs project-wide or, if required, multi-project-wide. At the same time, the status / operating status of the target stations can also be checked.

Especially for an OS change loading to be done, you can use it to translate and load all changed plans and the associated OS project the changes in one process.

For large multi-projects, we recommend selecting the "Translate and load objects" dialog only for the project in question and not for the entire multi-project.

Note We recommend that you always translate and load all objects from the Engineering Server. Talk to the other project managers as well. The multi-project or the integrated projects must not be open on all ES, otherwise a conflict will occur and the overall translation will be terminated.

Note Always compile and load the OS for an OS project at the same engineering station.

3 Overriding Topics

3.1 Central operating station for several PCS 7 systems

Depending on the installed PCS 7 versions, SIMATIC PCS 7 offers two different approaches for operating several PCS 7 systems from a common control room. It is assumed that a separate multi-project exists for each plant.

Cross-multiproject OS clients

If the PCS 7 versions in the systems are identical, the central control room, for example, can be equipped with multi-project OS clients. The following article is available for the project planning of these special OS clients:

["In PCS 7, how do I configure multi-project cross-project access to OS servers \(multi-client operation\) for an OS client?"](#)

Web server / web client

If different PCS 7 versions are used in the systems, the control room can be set up via a Web Server/Web Client solution. A web server of the appropriate PCS 7 version is added to each system. The higher-level Web client can connect to all Web servers if it is compatible with the most current Web server.

As an example, a Web Client based on PCS 7 V9.0 SP1 can connect to the following stations:

- Web Server V8.x
- Without the use of SFC functions
- Web Server V7.x

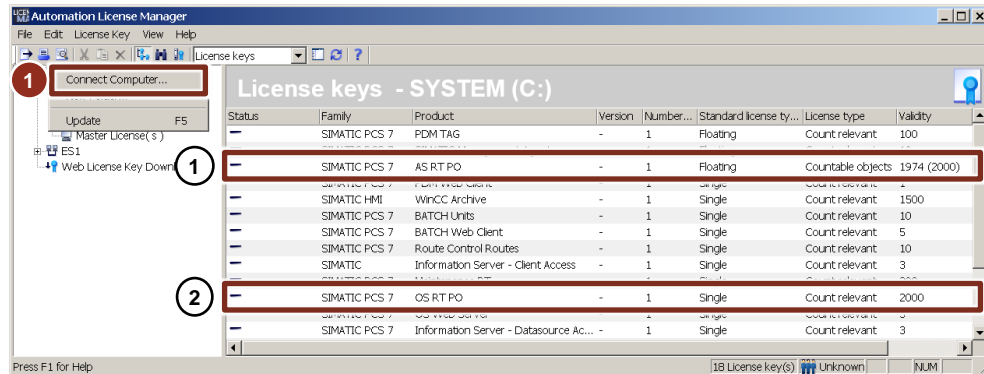
The setting up of PCS 7 web servers and web clients is described in the manual "[SIMATIC Process Control System PCS 7 Web Option for OS \(V9.0 SP1\)](#)"

3.2 Licensing

The PCS 7 Engineering licenses are of the "Floating" type (1), i.e. they can be used by several ES over a network. They can also be cumulated and are visible in the "Number" column of the Automation License Manager.

All licenses for one operator station are of the "Single" type (2), i.e. they must be available on the respective target station.

Figure 3-1 Function "Connect computer..." in PCS 7 V8.0 environment



Applications

For larger systems, it is a good idea to set up the ES Server as a central license station from which to manage all licenses.

In the Automation License Manager of the ES Server, add the other ESs using the "Connect Computer..." function. ("Connect Computer...". In this way, the required "Single" type licenses can then be transferred to the operating stations.

In Automation License Manager, add the ES Server as an additional computer to each ES so that floating licenses can be used for engineering on the other ES over the network.

When engineering several project engineers simultaneously, however, a complete license set must be available on the ES server for each ES.

3.3 Archiving

Archive the project status regularly in a defined location. To do this, adjust the settings in SIMATIC Manager with regard to archiving to your requirements in advance.

Due to the division into projects, it is sufficient to save only the respective project in case of changes within a project, instead of archiving the entire multi-project. This is only necessary if cross-project functions have been performed.

Application cases for the ES server

- Archiving of the multi-project in intervals to be defined when all work is stopped and all projects are available
(Recommendation: all projects are stored locally.)
- Archiving a project, e.g. daily, when all work has been stopped or after each AS change load.

Application cases for a decentralized ES

- Archiving a project stored in the decentralized ES
This usually only applies to projects with AS.

General notices

If you receive a message when archiving projects that objects are still locked. You can find out which objects are locked by clicking on "Details". The following objects are often the cause of the message:

- The SIMATIC PDM ASSET service is not in the "Stopped" state.
 - Under Details you will find the entry that "pdmdata.db" or "pdmlock.db" files are used by another application.
 - Open the "SIMATIC PDM ASSET Service Manager" tool.
 - Click on "Stop" in the "SIMATIC PDM Asset Service Manager" menu.
 - Restart the archiving process.
- OS database files are not yet separated from the SQL server.
 - Under Details you will find the entry that "*.ldf" or "*.mdf" files are used by another application.
 - Open the corresponding OS project again in WinCC Explorer.
 - Close the project in WinCC Explorer using the menu command "File > Close".
 - Close WinCC Explorer.
 - Restart the archiving process.

You can also find information about locked files in the Windows computer management under "Shared folders > Open files > Number of locks column". Here, the value should not be greater than "0".

For performance reasons it is recommended not to archive projects/multiprojects of the ES Server via network. Instead, you can open a VNC connection to the ES Server and use it to start archiving on the ES Server (see also chapter 3.4 [Remote access to the Engineering Server](#)).

3.4 Remote access to the Engineering Server

Tools

The PCS 7 Version Trail option allows you to create version statuses of multi-projects, projects and libraries. Further functions of the Version Trail are automatic archiving and automatic readback.

Reference

- Project engineering manual "[SIMATIC PCS 7 Engineering System](#)"
- Article "[Why is it sometimes impossible to archive a PCS 7 project via the SIMATIC Manager or SIMATIC Version Trail?](#)"

3.4 Remote access to the Engineering Server

In certain situations - e.g. you are not working on the ES server yourself - it is advantageous to start certain actions on the ES server while you are already working on another ES. This saves time and network load.

To connect to the ES Server, RealVNC can be used in PCS 7 V9.0 SP1, for example.

Possible functions

The following actions can be started remotely on the ES Server, for example, if you follow the instructions described in the chapter 2.3 "Working in parallel".

- AS compiling and downloading
- Compiling the OS
- Archiving the project

For all cross-project functions, e.g. archiving multi-projects, it is generally recommended not to work in parallel and to exit all editors in advance.

Reference

The installation and parameterization of RealVNC can be found in the article: "[How do you access WinCC and PCS 7 plants with "RealVNC"?](#)"

4 Appendix

4.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

<https://support.industry.siemens.com>

Technical Support

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Our range of services includes the following:

- Plant data services
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- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

<https://support.industry.siemens.com/cs/sc>

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:

<https://support.industry.siemens.com/cs/ww/en/sc/2067>

4.2 Links and literature

Table 4-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the entry page for the Application Example https://support.industry.siemens.com/cs/ww/en/view/22258951
\3\	Manual "SIMATIC Process Control System PCS 7 CFC for SIMATIC S7 (V9.0 SP1)" https://support.industry.siemens.com/cs/ww/en/view/109755021
\4\	Manual "SIMATIC Process Control System PCS 7 Engineering System (V9.0 SP1)" https://support.industry.siemens.com/cs/ww/en/view/109754984
\5\	SIMATIC Process Control System PCS 7 Compendium Part A - Project Planning Guide (V9.0) https://support.industry.siemens.com/cs/ww/en/view/109756485
\6\	Multiproject Engineering with SIMATIC BATCH https://support.industry.siemens.com/cs/de/en/view/23785345

4.3 Change documentation

Table 4-2

Version	Date	Modifications
V1.0	09/2007	First edition on the PCS 7 V7.0 SP1 DVD
V2.0	11/2009	Layout adjustment on applications & tools design
V3.0	11/2011	Multi-user engineering for CFC/SFC extended by additional ES/OS components
V3.1	07/2012	Base PCS 7 V7.1 SP3: Chapter supplemented or extended
V4.0	07/2013	Basic PCS 7 V8.0 SP1: Revised version
V5.0	05/2015	Base PCS 7 V8.1: Revised version, chapter supplemented or extended
V6.0	06/2016	Base PCS 7 V8.2: Revised version
V7.0	07/2018	PCS 7 V9.0 SP1 Revision