

TIA Portal Efficient teamwork TIA Portal Multiuser Engineering

Siemens 2020

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TIA Portal supports working within a team throughout the entire workflow

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**Increase efficiency!
Minimize the amount of
coordination work!**

... through efficient cooperation in engineering and during commissioning

... through integrated versioning and synchronization

... through system-supported management in Teamcenter



Coordinated working within a team TIA Portal supports in different ways

Collaboration in a team

- + Promote and manage corporate standards**
... with global libraries shared in networks in TIA Portal
- + Connection to PLM tool Teamcenter**
... and manage TIA Portal versions flexible
- + Connection to SCM tools for versioning control**
... with TIA Portal Openness (more improvements V15.1/V16)
- + Work on a project jointly within the team**
... and manage it flexibly on a Multiuser server
- + Easily combine HMI and PLC expertise**
... by the use of the PLC Proxy
- + Shared online commissioning with S7-1500**
... with maximum five developers simultaneously on a PLC
... with SIMATIC Units for even faster download scenarios



... less
coordination
work thanks
to system-
supported
management
with perfect
fit for different
customers

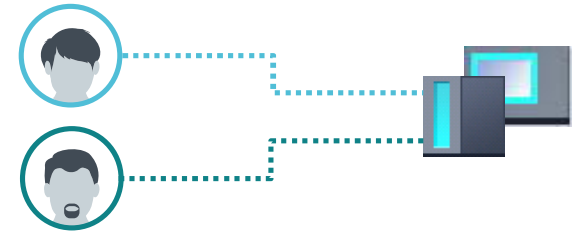


Coordinated collaboration within a team

Division of work based on automation tasks

1. Multiple developers share a device

Two developers work on the program of a PLC or an HMI device in parallel



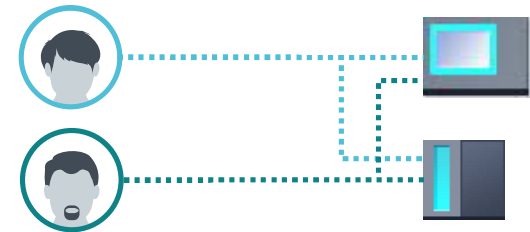
2. Developers work device-oriented

One developer works on the PLC, a second one on the HMI



3. Developers work technology-oriented

Every developer is responsible for a machine function and works on both the PLC and HMI part



TIA Portal Multiuser Engineering

Coordinated working within a team using TIA Portal

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Multiuser Engineering Chapter overview



- 1 **TIA Portal Project Server**
- 2 Working in a team in the engineering phase
- 3 Working in a team in the commissioning phase
- 4 Engineering and commissioning with Software Units
- 5 Wrap-up and further links



Multuser

TIA Portal project server – Overview

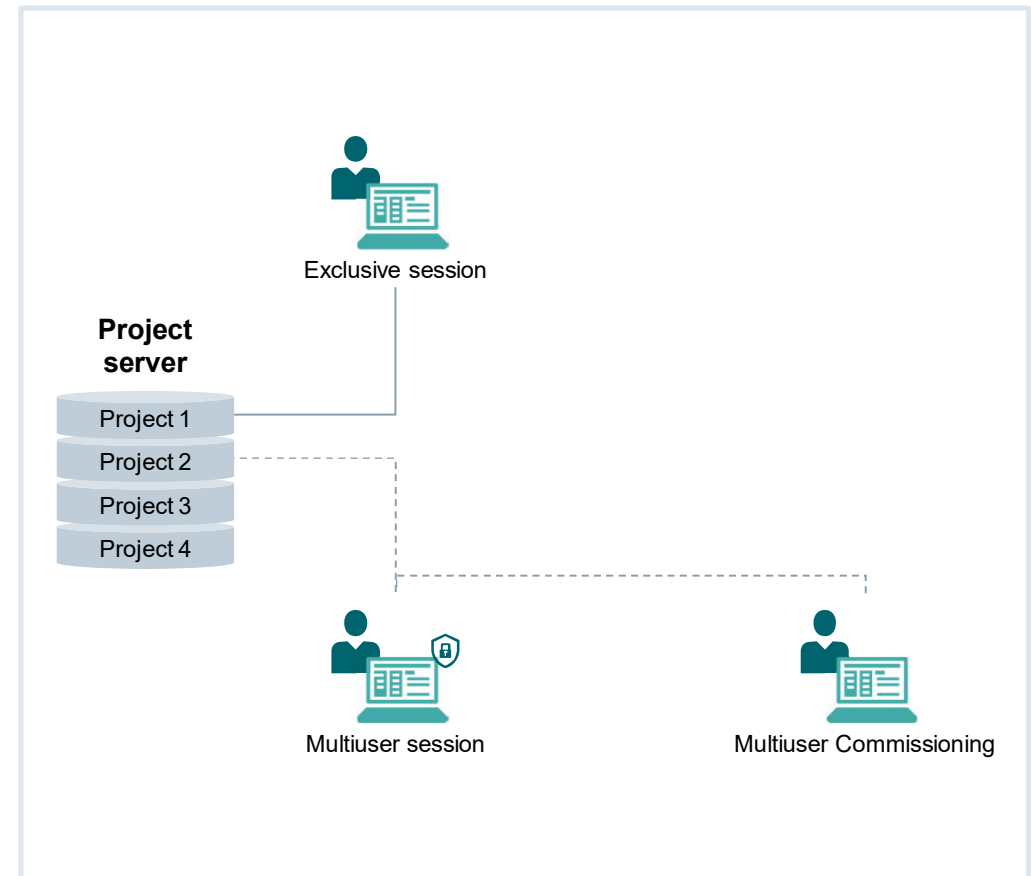
TIA Portal project server

- The project server enables convenient editing of TIA Portal projects with Multiuser Engineering, Multiuser Commissioning and Exclusive Engineering
- In addition to the dedicated project server, a local project server with restricted functionality is also available

Advantages of using the project server

- Central storage of projects in the network
- Secure communication over https
- Central user and access management, e.g. via Windows Domain
- Use of project revisions for
 - Interim backups
 - Project milestone archiving
 - Rollback
- Change log for the synchronized objects
- Automated execution of tasks with scripts

No license needed for the project server



Multuser Exclusive Engineering – Overview

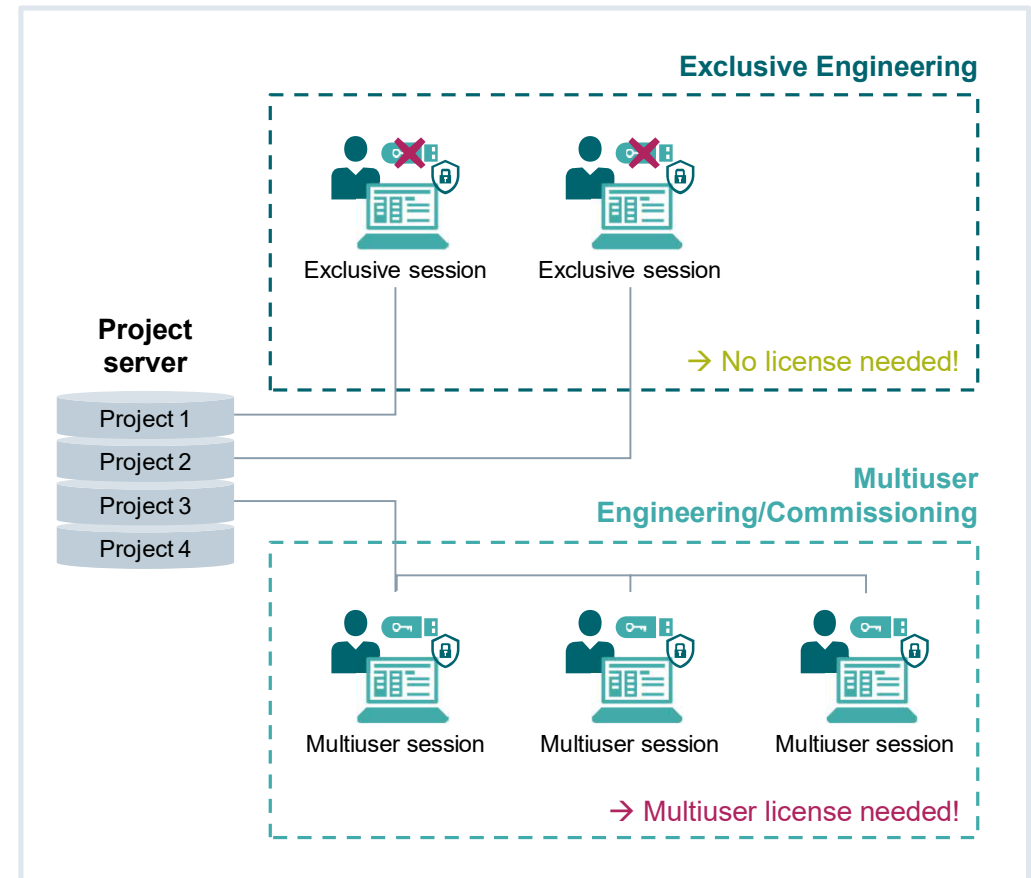
Use of the TIA Portal project server also
for Exclusive Engineering of projects

- Projects are stored centrally on the project server for Exclusive Engineering and for Multuser Engineering
- Optimized workflows for editing projects in Exclusive Engineering
- No functional restrictions in Exclusive Engineering

Advantages of using the project server

- Use of project revisions for interim backups and for archiving project milestones
- Change log for the edited objects
- Central user and access management
- Automated reporting and archiving

No license needed for Exclusive
Engineering



Multiuser Engineering Chapter overview



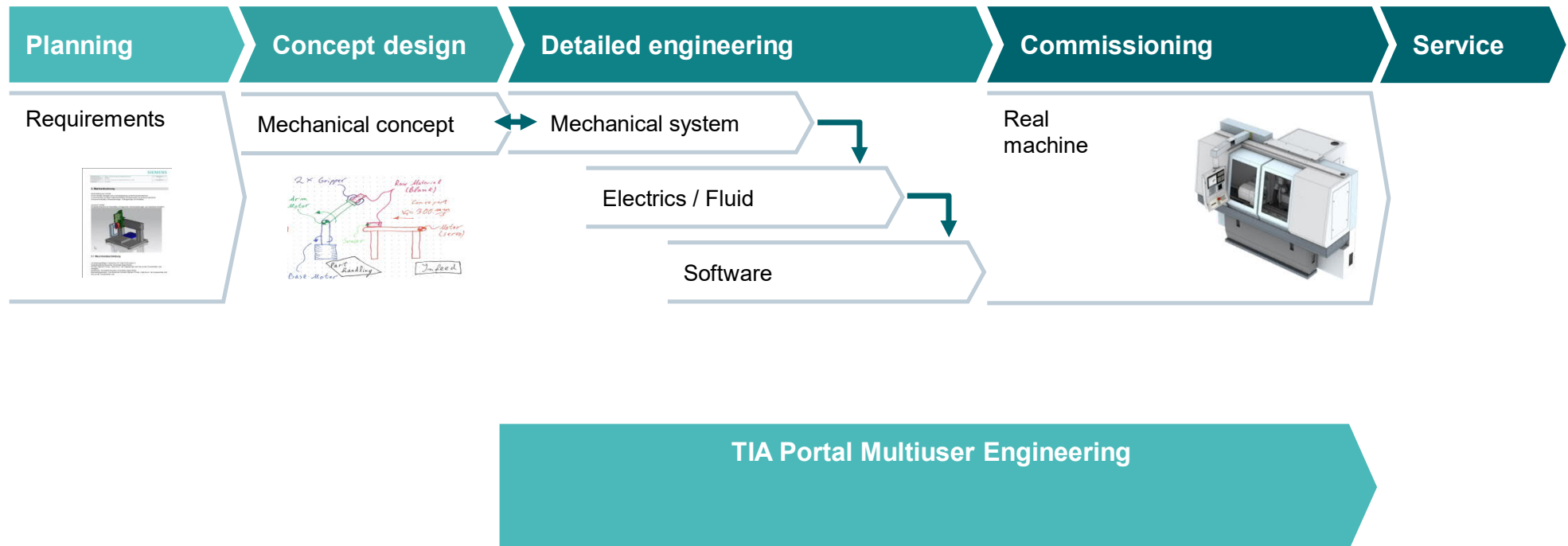
- 1 TIA Portal Project Server
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Working in a team in the engineering phase

TIA Portal Multiuser

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TIA Portal Multiuser Engineering

Simultaneous work on shared project in a team



A shared project

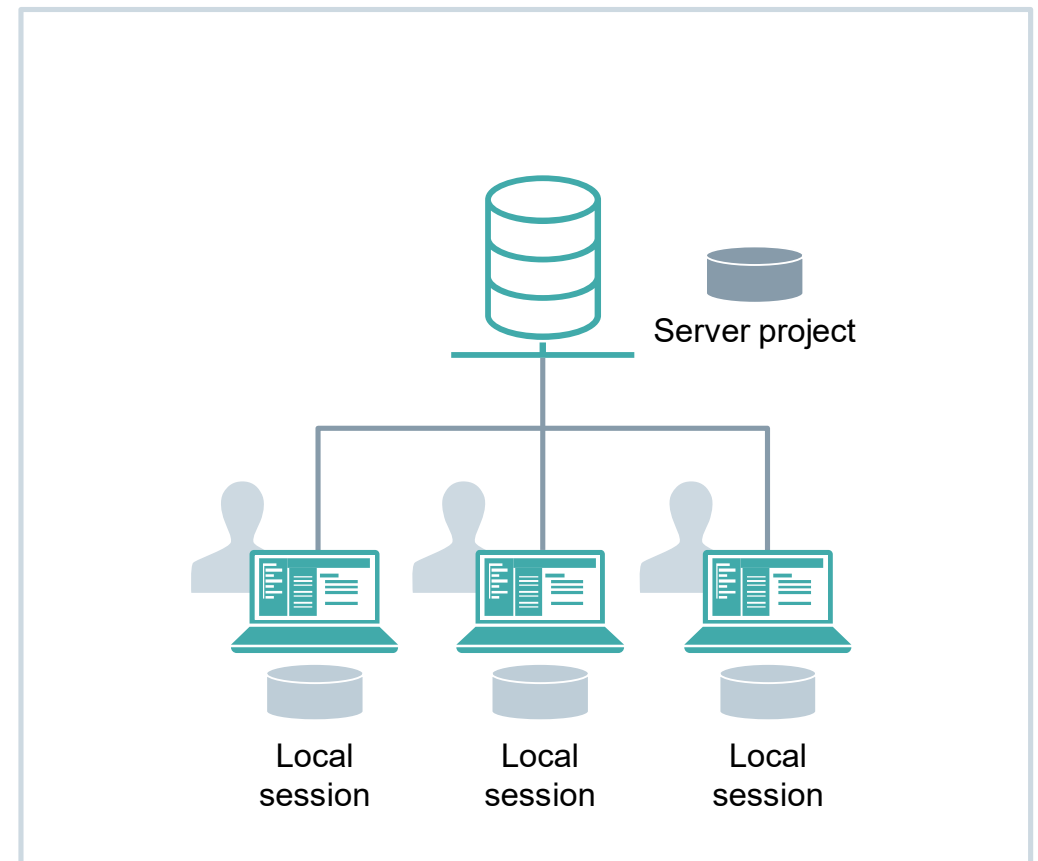
... stored centrally on a Project Server and thus flexibly accessible

For HMI and PLC

... enables device- or function-based work sharing

System-supported synchronization

... reduces the amount of coordination work in the team



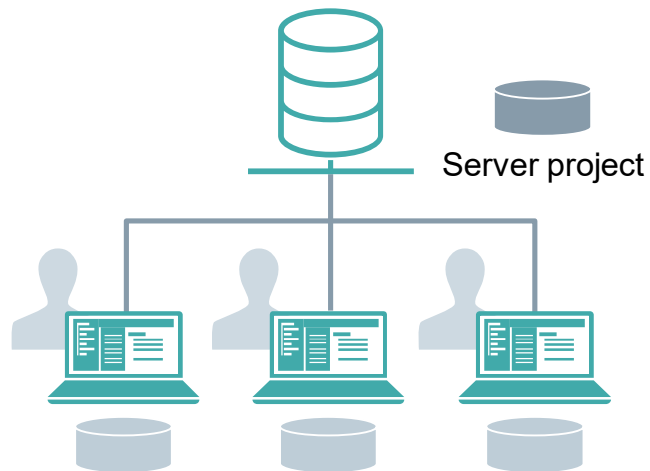
TIA Portal Multiuser Engineering

Flexible work concepts with flexible server configuration



Multiuser with separate servers

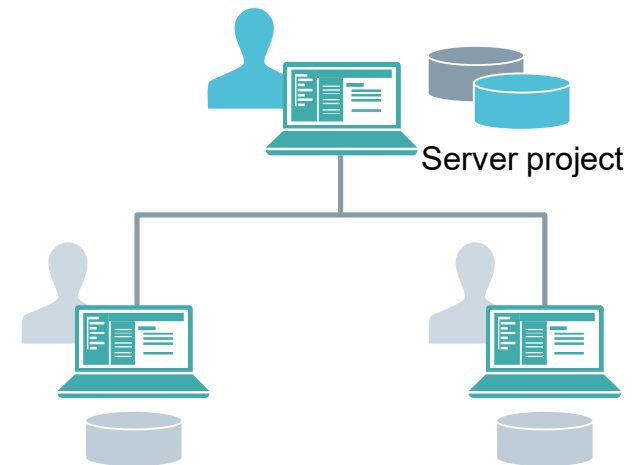
Project server on separate computers in the network



- The programmers work locally, e.g. in the office
- Shared project on a central server

Engineering station as multiuser server

One developer of the project assumes the server functions on his or her computer



- Fast and flexible configuration of the server

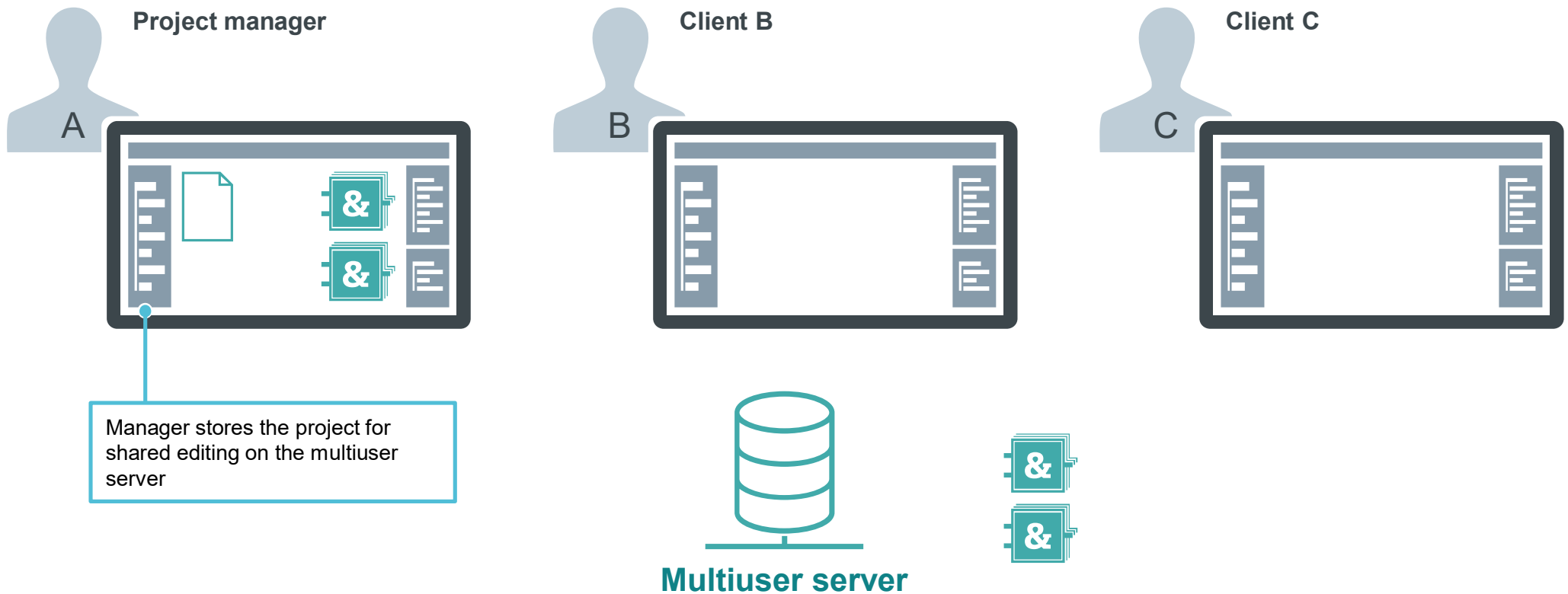
Long-term collaboration

Temporary collaboration



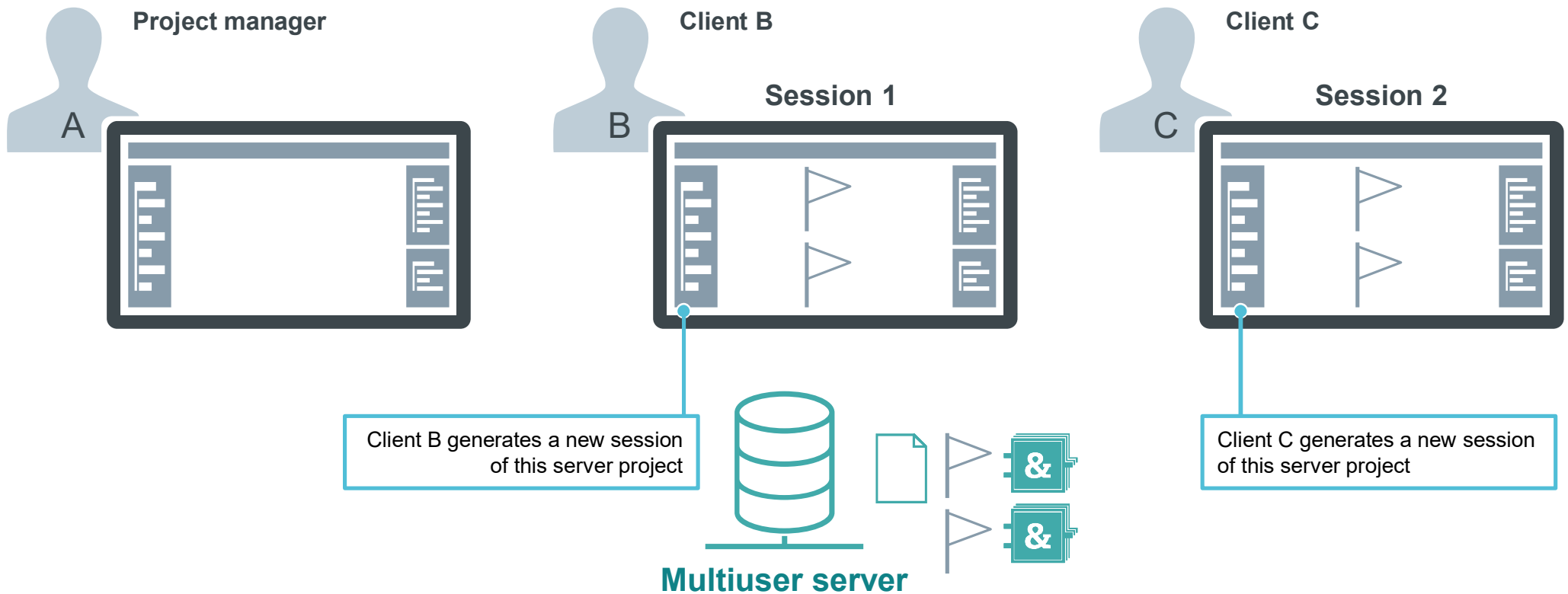
TIA Portal Multiuser Engineering

Fundamental principle in the workflow



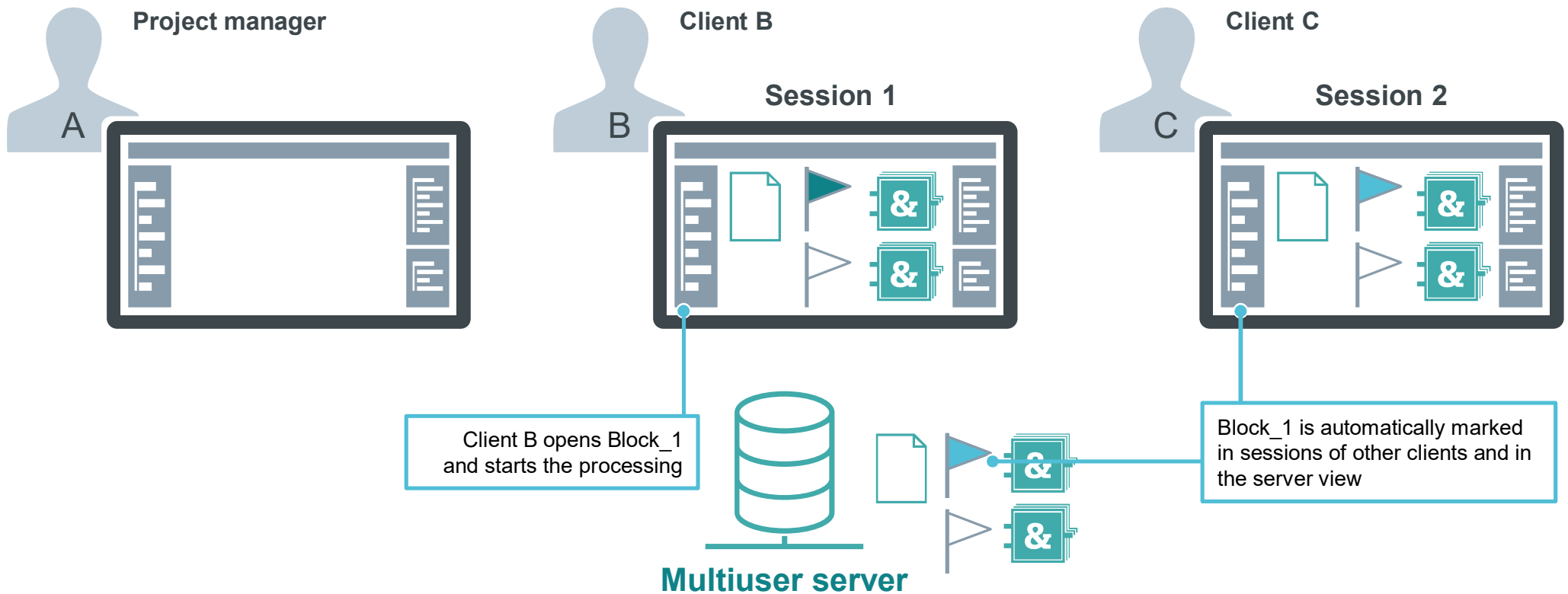
TIA Portal Multiuser Engineering

Fundamental principle in the workflow



TIA Portal Multiuser Engineering

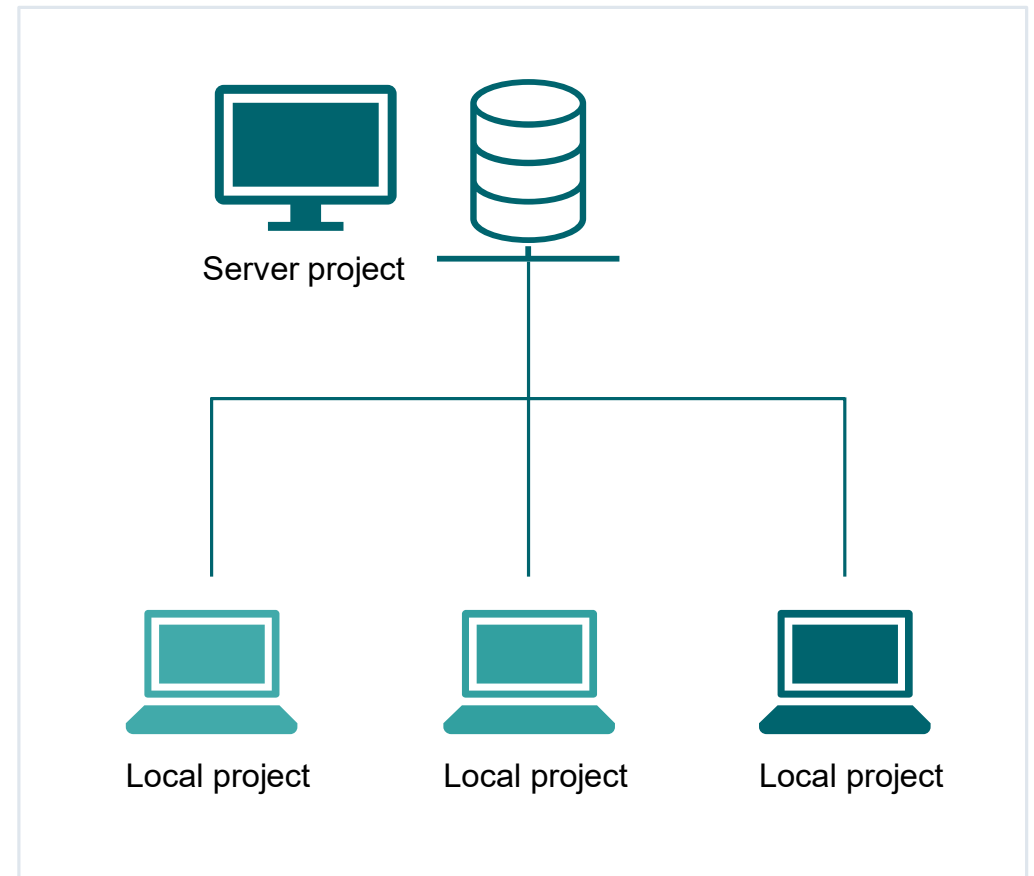
Fundamental principle in the workflow



TIA Portal Multiuser Engineering Support for fail-safe controllers

Function

- Safety Administration Editor
 - Central administration via the server project
- Commissioning
 - Takes place via the server project
 - Limited to one F-user for safety reasons



TIA Portal Multiuser Engineering

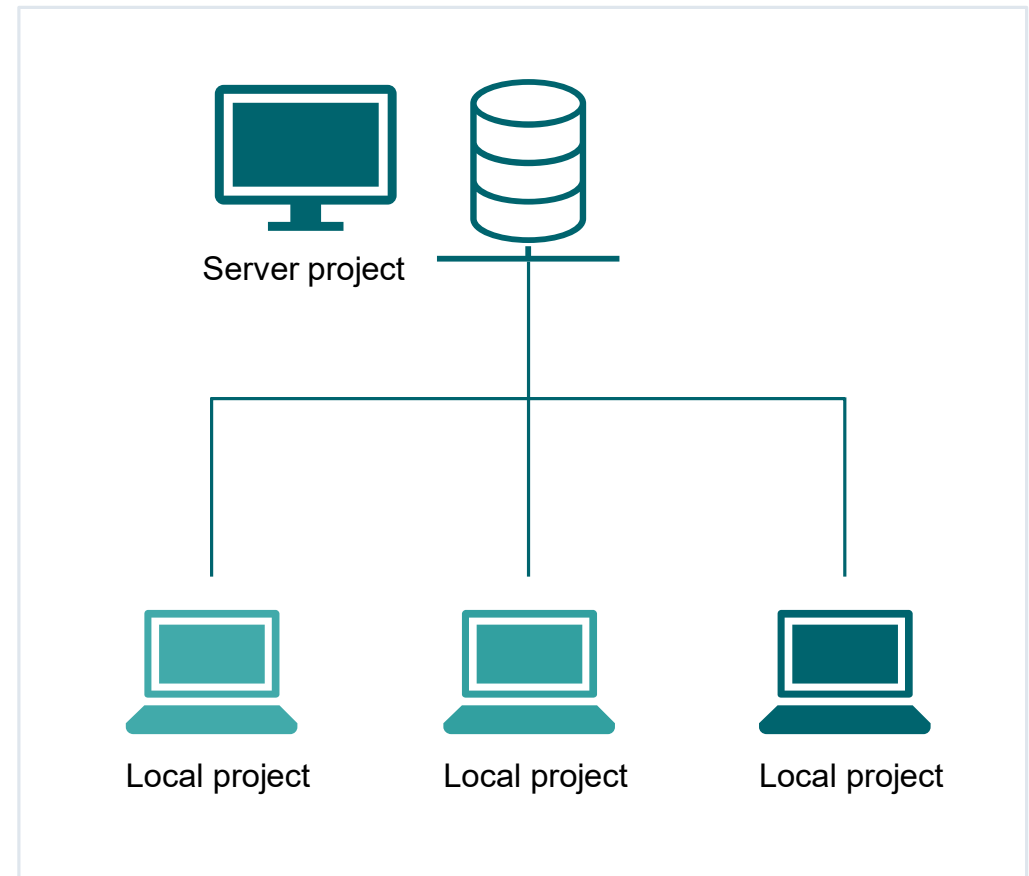
Overview of functions

Function

- Automatic selection of multiuser objects
- Working offline is possible with multiuser engineering
- Extended check-in and comment functions
- Project server with extended change history and restore functions

Customer benefits

- Multiuser engineering also possible without active server connection
- Enhanced usability for quick overview of changed objects and conflict detection
- Project history can be tracked on the multiuser server (what was modified when and by whom?)
- Project milestones can be commented on and saved
- Project history can be exported for evaluation



TIA Portal Multiuser Engineering

Enhanced check-in functions in the multiuser server



Check-in

- Extended comment option during check-in
- New filters for fast conflict detection
- Changed objects are saved to a check-in
- Exporting the project history in XML for additional evaluations

The screenshot displays the TIA Portal Multiuser Engineering interface. Key features and annotations include:

- Filter for conflict detection:** Located at the top of the Check-in window, showing options like 'Show pending changes' and 'Start check-in'.
- Check-in comment:** A text field where users can enter comments for their check-ins.
- Display of the project history:** A table showing the history of changes, including revision numbers, computer names, creation dates, and comments.
- Display of the scope and type of the changes:** A section showing details of the selected revision, including a list of changed items with their names, change types, and object IDs.
- XML project history:** A table at the bottom showing the project history in XML format, including columns for creation date, created by, comment, name, change, and object type.

Revision number	Computer name	Created by	Creation date	Comment
10	MD1MQRCQ	ho4020	03.07.2017 17:23:48	New output signal "STATE_VALVE"
9	MD1MQRCQ	ho4020	03.07.2017 17:10:10	HMI start screen adapt
8	MD1MQRCQ	ho4020	03.07.2017 17:04:20	Open valve optimized (Network 2)
7	MD1MVNMC	br3029	03.07.2017 16:52:48	Activate webserver on PLC
6	MD1MVNMC	br3029	03.07.2017 16:50:03	Change consistency of error handling behavior
5	MD1MVNMC	br3029	03.07.2017 16:48:38	- Grouping of general objects

Name	Change	Type	Object id
Color_Filling_Station_1516_V15_12\Color_Mixing_CPU\W	Create	Watch table	5f3a24ba-1555-4034-b23d-d94bb50a6937
Color_Filling_Station_1516_V15_12\Color_Mixing_HMI\H	Create	HMI_Tag	860E29e8-6849-478b-b67b-ed7544e6358b
Color_Filling_Station_1516_V15_12\Color_Mixing_HMI\Sc	Edit	Screen	b3bf1388-192b-4E8c-b822-92f79363d705

creationDate	created	comment	name	change	objectType
8 15:04:20.4347985Z	ho4020	Open valve optimized (Network 2)	\LAD_Control_Color_Valves	Edit	Function block
9 15:10:10.0654719Z	ho4020	HMI start screen adapt	\Start screen	Edit	Screen
9 15:10:10.0654719Z	ho4020	Watch table applied	\Watch table_1	Create	Watch table
9 15:10:10.0654719Z	ho4020	HMI tag for Chanal Y1 inserted	\VALVE_COLOR_Y_1	Create	HMI_Tag
10 15:23:48.6772796Z	ho4020	New output signal "STATE_VALVE"	\SCL_Valve_Conveyor	Edit	Function block
11 15:55:46.6413260Z	ho4020	Operating mode selection changed	\Main	User	Organization block

TIA Portal Multiuser Engineering Advanced project management in the Project Server



Project management

- No restriction of number of project revisions that can be stored in the circular log
- Project revisions can be archived and are thus excluded from the circular log
 - Project milestones can be selected in this way (commissioning start, machine transfer, functional expansions, ...)
- Rollback of saved versions (since V14)

Server management

- Project server V16 also supports V14, V15 & V15.1 TIA Portal projects
- Side-by-side installation of multiuser server V14, V15 & V16 is possible
- External multiuser tools are now available in all TIA Portal languages

The screenshot displays the 'TIA Portal Multiuser Server - Administration' window. The left sidebar shows a tree view with 'Administration' and 'Settings' sections. The main area shows a table of project revisions for 'Color_Filling_Station_1516_V15_112'. The table has columns: Availability, Revision number, Computer name, Created by, Creation date, Comment, and Notes. Revision 7 is highlighted. Below the table, there are buttons for 'Rollback to selected revision', 'Export selected revision', 'Export history', 'Retain revision', and 'Show Details'. A 'Details' tab is active, showing the comment for Revision 7: 'Activate webserver on PLC'. A 'Notes' section below the comment shows a note added on 7/3/2017 5:35:00 PM: 'Startup commissioning'. Three blue callout boxes with arrows point to specific features: 'No limitation for the circular log' points to the 'Rollback to selected revision' button; 'Project versions that can be stored' points to the revision table; 'Version comments can be added at any time' points to the 'Notes' section.

Availability	Revision number	Computer name	Created by	Creation date	Comment	Notes
	10	MD1MQRC	ho4020	03.07.2017 17:23:48	New output signal "STATE_VALVE"	
	9	MD1MQRC	ho4020	03.07.2017 17:10:10	HMI start screen adapt	
	8	MD1MQRC	ho4020	03.07.2017 17:04:20	Open valve optimized (Network 2)	
	7	MD1MVNMC	br3029	03.07.2017 16:52:48	Activate webserver on PLC	1 Notes
	6	MD1MVNMC	br3029	03.07.2017 16:50:03	Change consistency of error handling behavior	
	5	MD1MVNMC	br3029	03.07.2017 16:48:38	- Grouping of general objects	
	4	MD1MVNMC	br3029	03.07.2017 16:39:09	- grouping mixer blocks	
	3	MD1MQRC	ho4020	03.07.2017 15:25:16	some string	
	2	MD1MQRC	ho4020	03.07.2017 15:23:38	some string	
	1	MD1MQRC	ho4020	03.07.2017 15:23:38	some string	

Revision 7






Details | Changed Items

Comment:
Activate webserver on PLC

Notes:
Add note
ho4020, 7/3/2017 5:35:00 PM
Startup commissioning

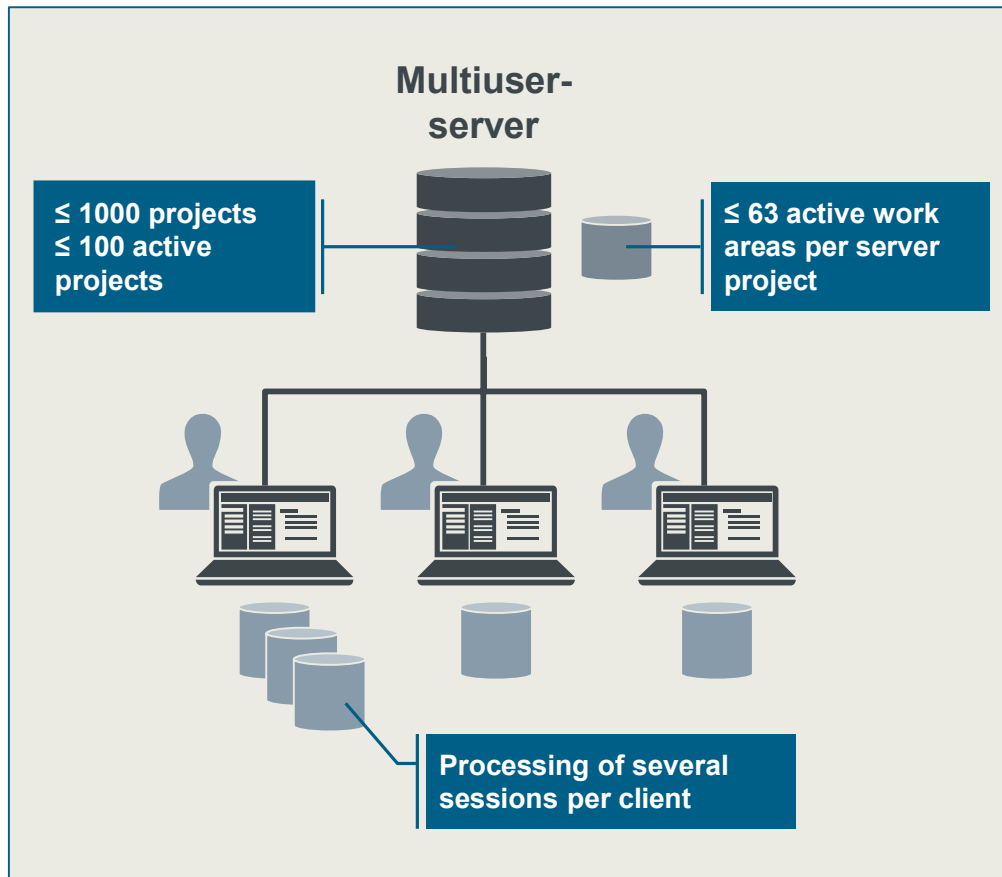


TIA Portal Multiuser Engineering - Meaning of markings

Symbol	Meaning
	Markable object
	Own marked object
	Object marked by other clients
	Object with conflict (marked by more than one client)
	New version of the object is available



TIA Portal Multiuser Engineering - Scope of functions in ≥V15



Multiuser configuration

Distributed structure, client/server structure

Server

- Independent of TIA Portal installation
- User authentication is performed via Windows mechanisms

Client

- Multiuser is an integral component of the TIA Portal
- Processing of local sessions is possible offline

The TIA Portal system requirements regarding operating system, memory and processor apply



Multiuser – Scope of functions

The following objects are supported

STEP 7

- **Blocks, PLC data types**
- **Software Units**
- **Technology objects**
(no support of the S7-1500 Motion Control TOs)
- **PLC variables**
- **PLC alarms and monitoring**
- **Text lists**
- **Traces and measurements**
- **Watch tables**
- **OPC-UA configuration**

WinCC

- **Screens**
- **HMI variables**
- **Scripts**
- **HMI alarms**
- **Text and graphics lists**

More objects

- **Library elements**
(types and copy templates)

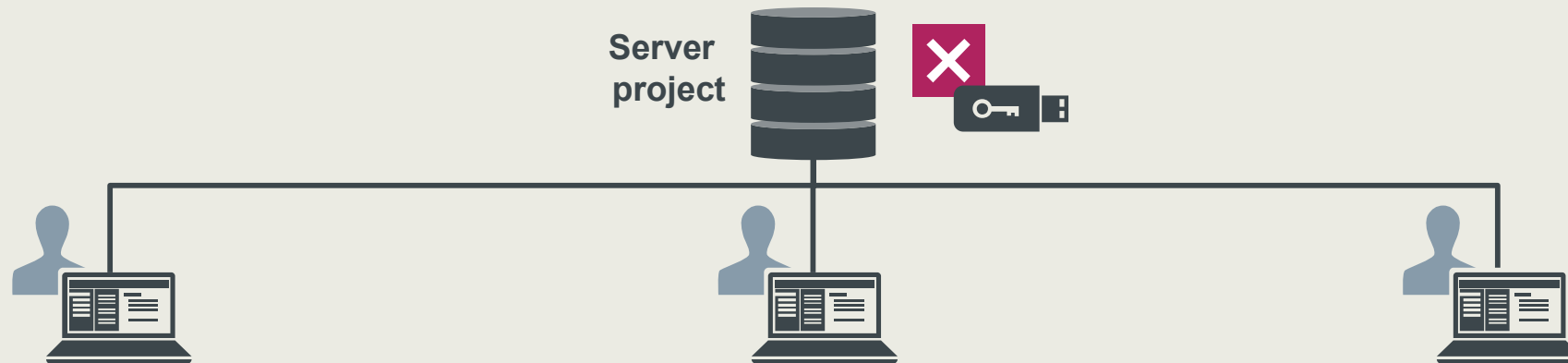
Expansions in ≥V15/16

- **System-aided selecting of multiuser objects**
- **Working without multiuser server connection**
- **Extended check-in**
 - Scope and type of the changes are also saved
 - Complete project history available
- **Extended project administration**
 - Increasing the number of project versions
 - Archiving of project versions
- **Release of multiuser server for virtualization**

All other changes must be performed in the context of the server project



TIA Portal Multiuser Engineering - Licensing concept



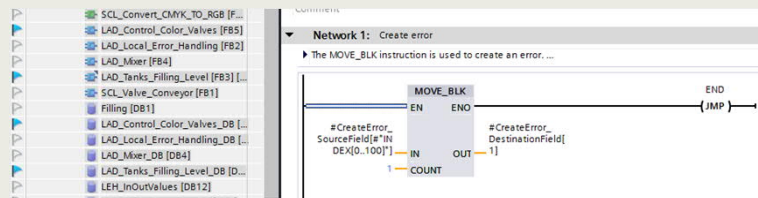
No license required for

- Adding project to the multiuser server
- Export to a single-user project
- Creating a local session




License required for

Opening and editing a local multiuser session



- Floating license
- Tied to TIA Portal version

 No MU license necessary

 MU license necessary





Engineering in a team with TIA Portal Multiuser



Multiuser Engineering Chapter overview



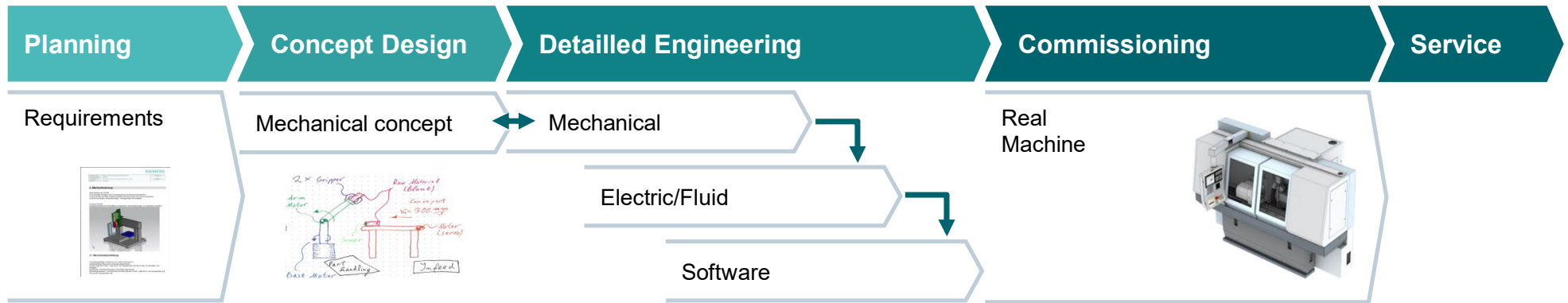
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Working in a team during commissioning TIA Portal Multiuser »Commissioning Mode«

New in V15.1

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TIA Portal Multiuser Engineering

TIA Portal Multiuser Commissioning Mode

Working in a team during commissioning TIA Portal Multiuser »Commissioning Mode«



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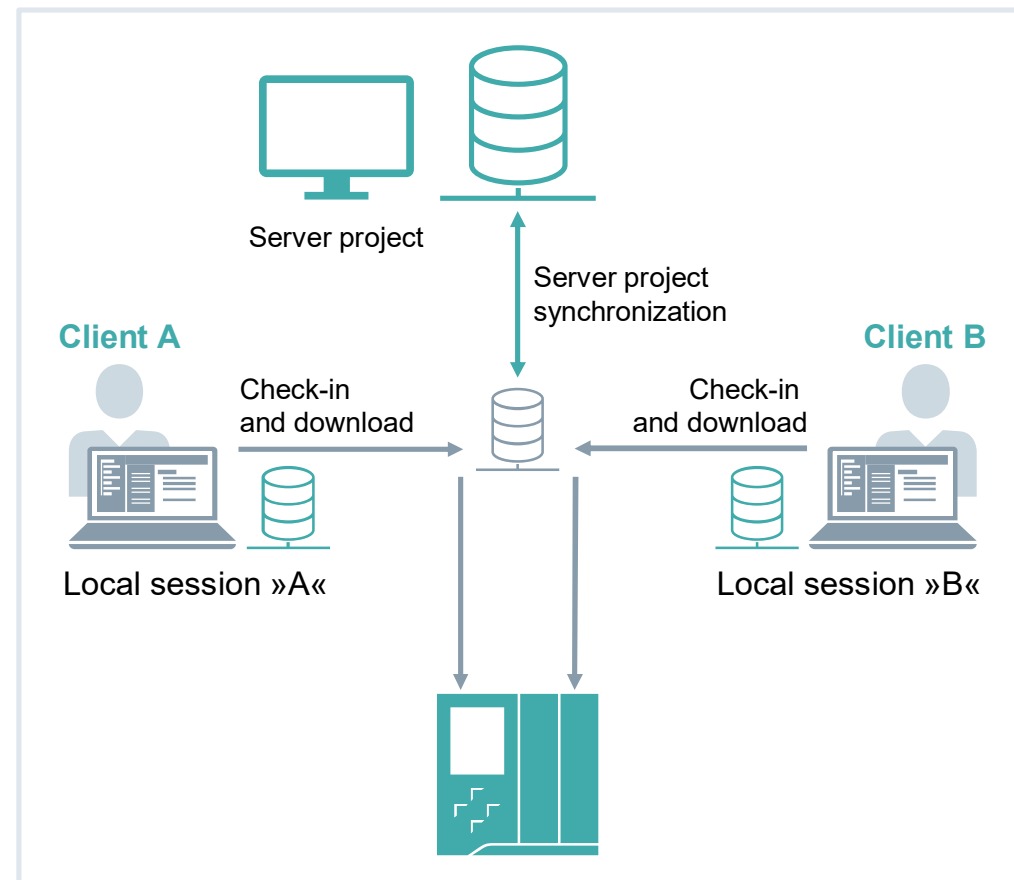
Shared commissioning in a team

Downloads are synchronized via the server project.
This enables a consistent status between device
and server project.

Characteristics of the commissioning mode

In commissioning mode, the changes are automatically checked into the server project, compiled and loaded into the device when downloaded from the local session.

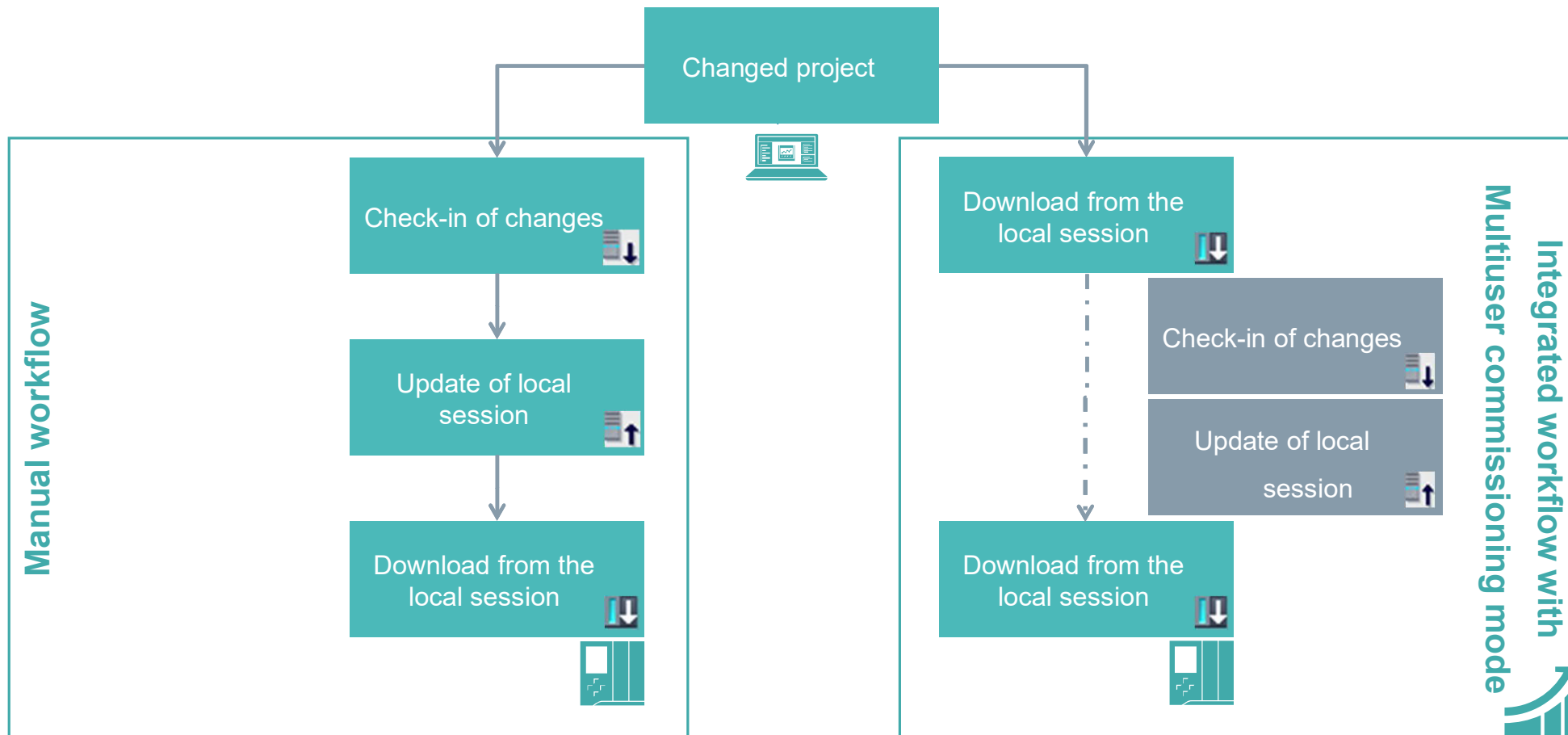
- Selectable project-granular via the multi-user administration tool
- A selected commissioning mode applies to all connected multiuser clients
- No change of the download workflow
- Local session, server project and the device having the same version after downloading



Working in a team for commissioning TIA Portal Multiuser "Commissioning mode"

New in
V15.1

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Multiuser Commissioning – New in V16

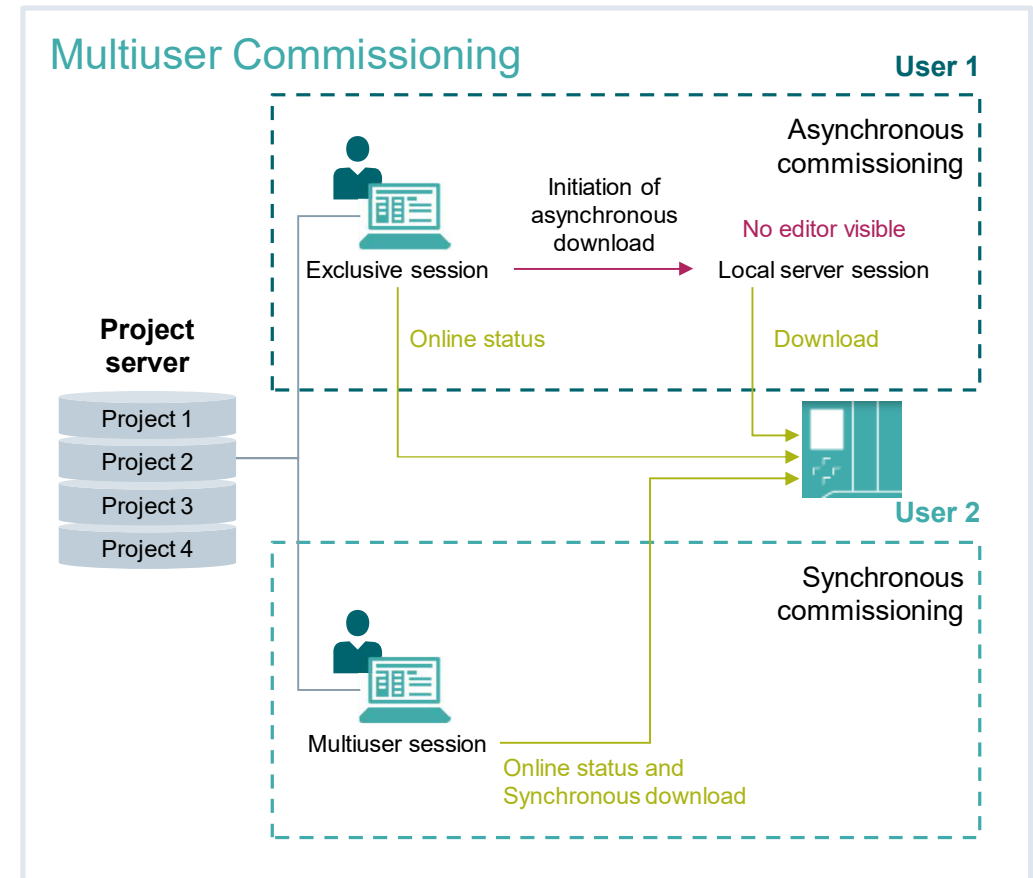
In V16, an extended Multiuser Commissioning Mode is available for commissioning

Synchronous commissioning mode (since V15.1)

- Downloading is performed synchronously with configuration
- No further activities are possible during the download
- Maximum synchronism of the data between local session, server project and PLC

Asynchronous commissioning mode (new with V16)

- In asynchronous commissioning, the data is downloaded to the device by a second TIA Portal instance in the background
- This significantly reduces load times
- The TIA Portal instance running in the foreground can be operated again immediately
- Feedback to the user if actions or decisions on downloading to the device are necessary



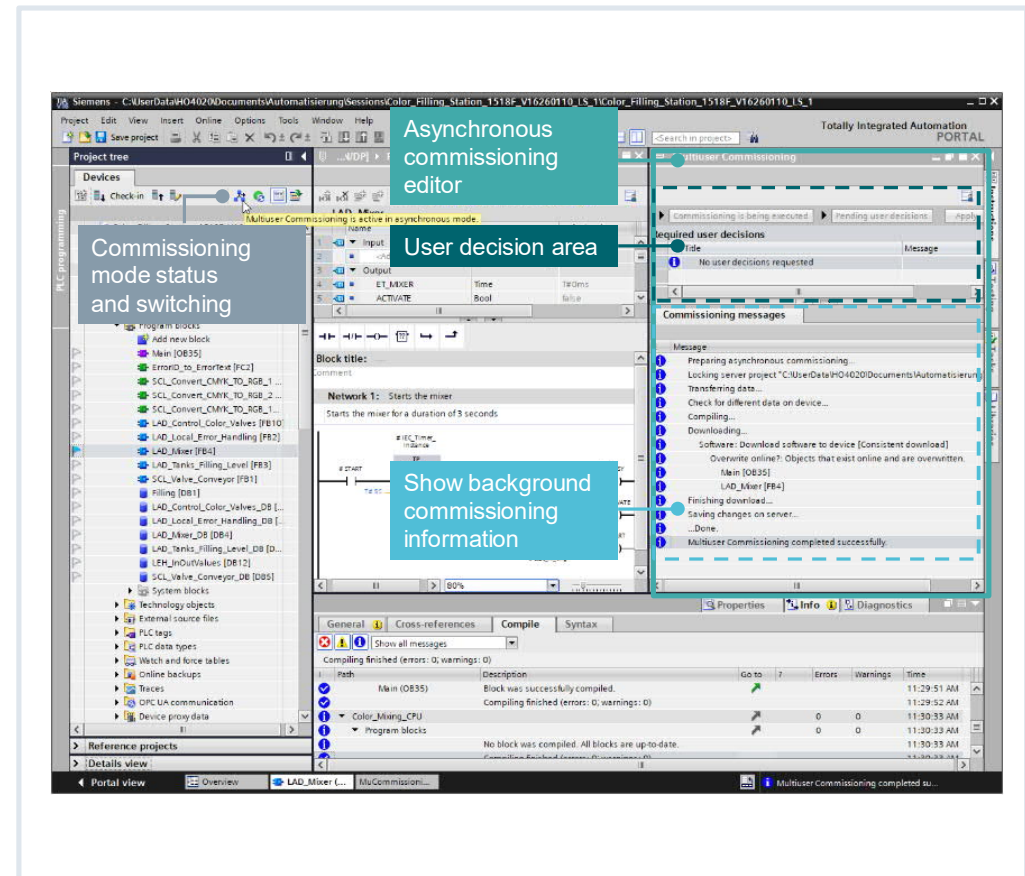
Multiuser Asynchronous commissioning – Benefits

- Fast download of the modified objects to the PLC
- Local Multiuser Session is immediately ready for editing after transfer of the download
- Download requirements and necessary user decisions are displayed in the new asynchronous Commissioning Editor
- No automated refresh after the download
- Direct switching between synchronous and asynchronous commissioning is possible at any time in the TIA Portal, depending on the commissioning situation

Restrictions in V16

Program modifications which require a safety password and PLC with set protection level password must be downloaded in synchronous commissioning mode.

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Multiuser Engineering Chapter overview

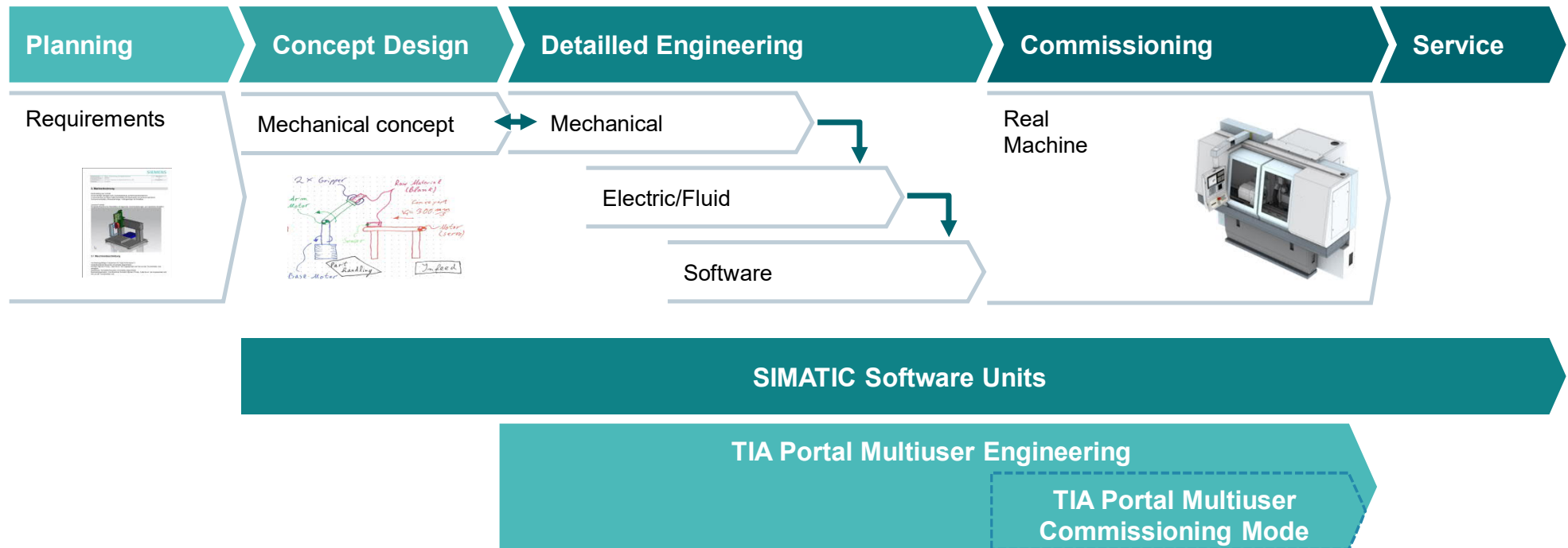


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Engineering and commissioning in a team

SIMATIC Software Units



Engineering and commissioning in a team

Software units for programming structuring



Function

S7-1500 ✓

S7-1200 ✗

S7-300/400/WinAC ✗

- Free splitting of the program into software units
- Separate loading of the software units into the PLC
- Defined interfaces between the software units
- Purely optimized programming and data storage

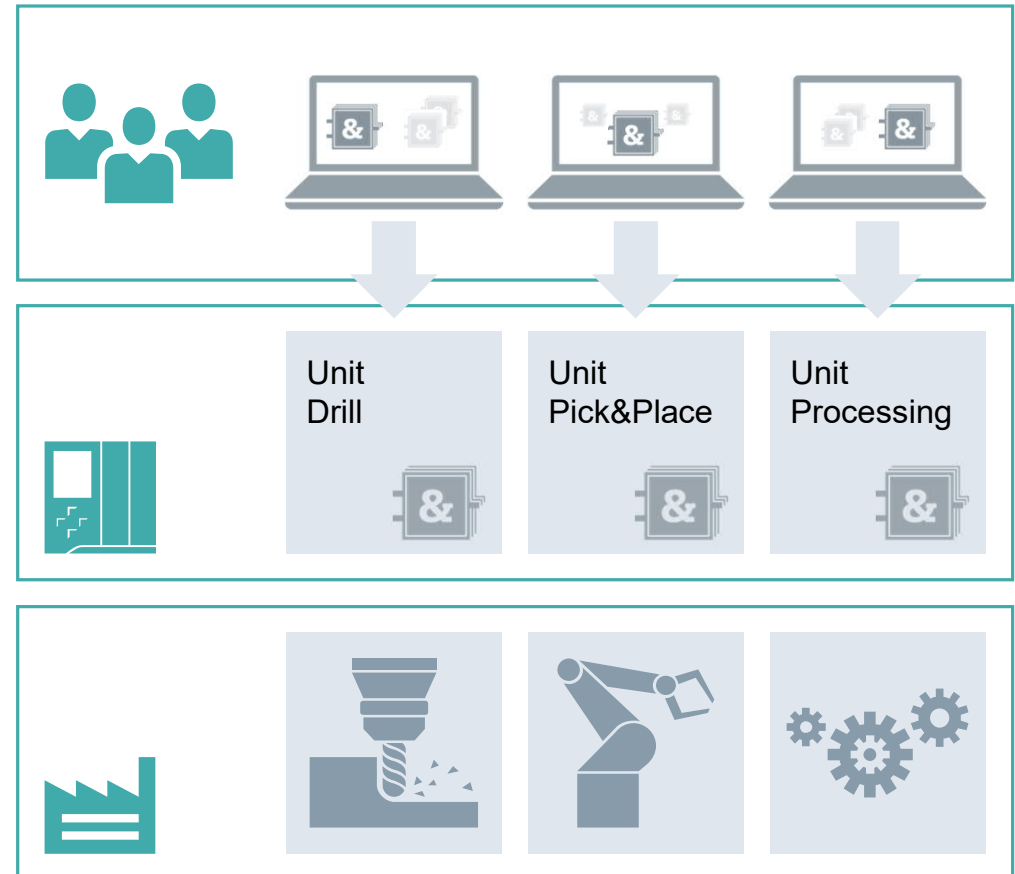
Benefits

Offline

- Program structuring (including OBs, FBs, FCs, DBs, UDTs and tags)
- Storage and exchange of software units via libraries

Online

- Every user can load his software units into the PLC independently of other users/units
- Minimization of download times for team engineering



Engineering and commissioning in a team

Properties of software units

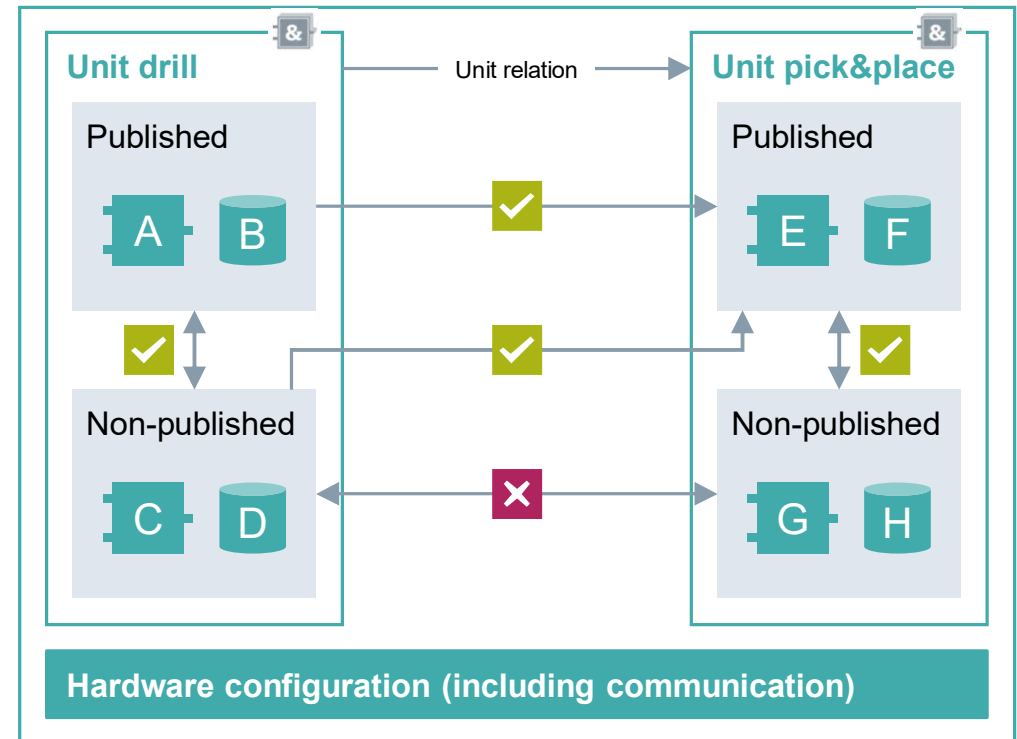
Components of software units

- Program blocks
- Data blocks
- Data types
- Tag tables
- Supervisions (ProDiag)
- Text lists

Published

PLC global configuration

- Hardware configuration
- OPC UA interfaces
- Failsafe program
- Watch tables, trace, etc.



User-defined unit relationships for clear structuring and modularization of the program



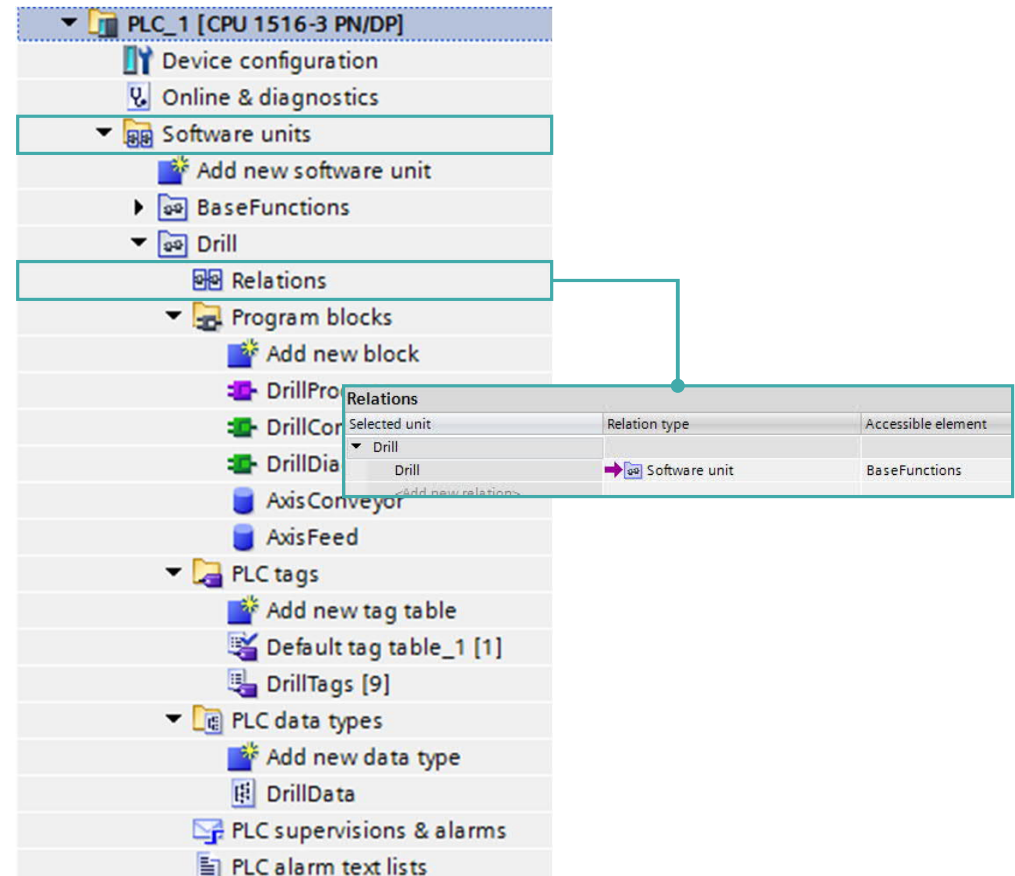
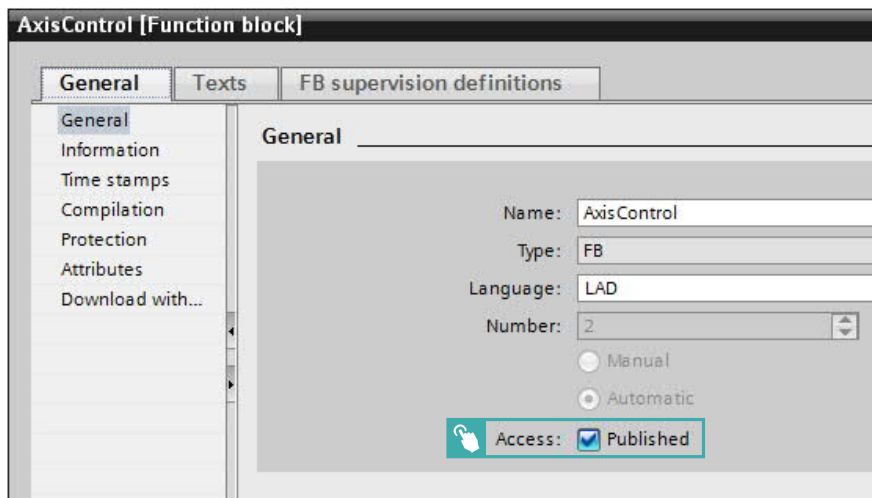
Engineering and commissioning in a team

Software units structure



Function

- New system folder for software units (in addition to the previous program, for S7-1500 from FW V2.6)
- Definition of relations for the block call between units
- Setting the »Published« access attribute in the object properties or as a bulk operation in the block overview (detail view)

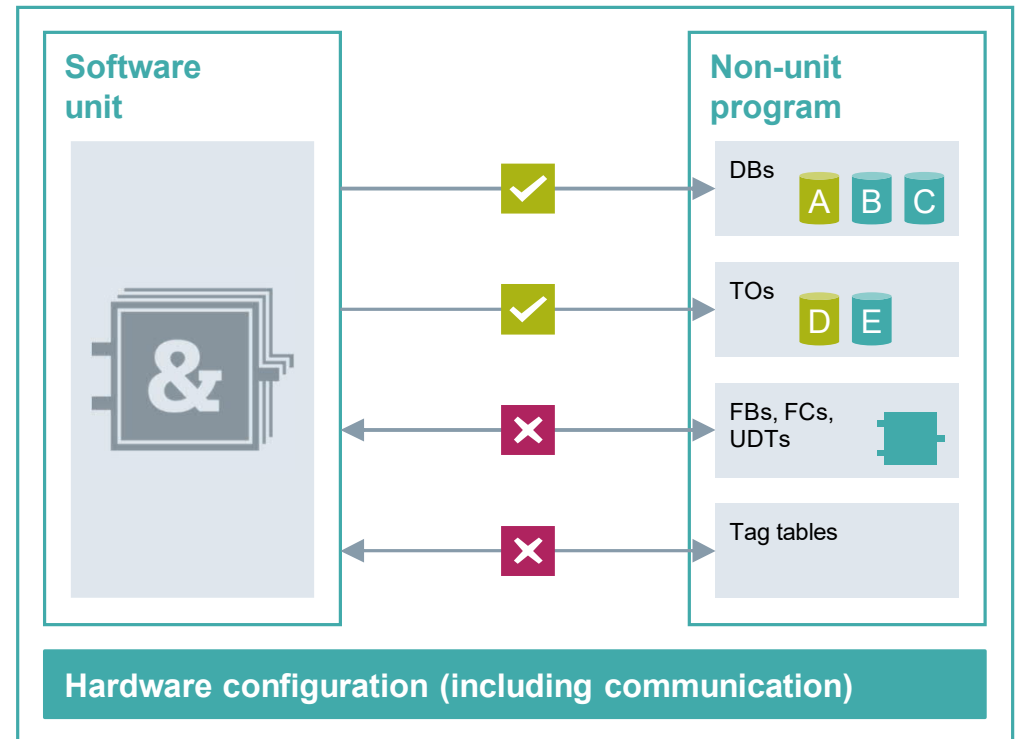


Engineering and commissioning in a team

Software units - Interaction with non-unit program

Function

- Access to optimized DBs of the non-unit program defined via relations. No user data types can be used in these DBs.
- Access to TOs of the non-unit program defined by relations
- No block calls between software units and the non-unit program
- No access to PLC tags of the non-unit program



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Working in a team Summary



1

Effective collaboration with TIA Portal Multiuser

2

Faster commissioning with logical units (software units)

3

Project Server allows Multiuser Engineering and Exclusive engineering for Central User Access & Management



TIA Portal – www.siemens.com/tia-portal –
You can find additional information here:

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Working in a team with multiuser engineering

Additional information

[Product Web page](#)

Automation Task Video Multiuser Engineering

<https://www.youtube.com/watch?v=n4oTZ2Gzg6U&list=PLC76AD9A5EF6E8212&index=14>

Multiuser Engineering application example

<https://support.industry.siemens.com/cs/de/en/view/109740141>