Upgrade Guide | PUBLIC
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Upgrade Guide for SAP S/4HANA Cloud Private Edition

THE BEST RUN **SAP**

Content

Document History

Version	Date	Description
1.0	October 11, 2023	Version for SAP S/4HANA Cloud Private Edition 2023.
2.0	February 28, 2023	Version for SAP S/4HANA Cloud Private Edition 2023 FPS01.

1 Upgrade Guide for SAP S/4HANA Cloud Private Edition

This guide explains the upgrade process for the upgrade from all lower releases of SAP S/4HANA Cloud Private Edition to SAP S/4HANA Cloud Private Edition 2023 (any feature package or support package stack).

SAP S/4HANA is offered in alternative deployment options:

- SAP S/4HANA Cloud Private Edition
  Provides extensive functional scope and significant upgrade flexibility combined with a cloud experience.
- SAP S/4HANA
  An on-premise offering, which means that you install the software locally on your machines.

Much of the available information is valid for both deployment options. Therefore, any reference to SAP S/4HANA in this guide is also relevant and applicable for SAP S/4HANA Cloud Private Edition.

2 Getting Started

Read this guide carefully to get an overview of how to do the upgrade from a lower release of SAP S/4HANA Cloud Private Edition (any feature package or support package stack) to SAP S/4HANA Cloud Private Edition 2023.

This guide has to be used together with the following documents and tools:

- Simplification Item Catalog
- *Software Update Manager 2.0 <latest version>*
  Note that SAP ECS executes the technical part of this tool.
- *Maintenance Planner User Guide*
- SAP Readiness Check for SAP S/4HANA upgrades
- *Custom Code Migration Guide for SAP S/4HANA*

You find more information about these tools and guides (including where to find them), as well as additional important documents and SAP Notes relevant for the upgrade in the section Documentation and SAP Notes for the Upgrade [page 5].

The section Overview of the Upgrade Process [page 9] provides information about the different phases of the upgrade and the tools involved.

The sections Planning the Upgrade [page 14], Preparing the Upgrade [page 22], Follow-Up Activites [page 42], and the Appendix [page 48] provide details for those upgrade phases.

2.1 Documentation, Tools, and SAP Notes for the Upgrade

Required Documents, Tools, and SAP Notes

You require at least the following documents and SAP Notes.

Document	Available at	Comment
Simplification Item Catalog This tool enhances and replaces the *Simplification List for SAP S/4HANA* (PDF). The PDF is still available, but we recommend using the catalog.	https://help.sap.com/s4hana_op_2023 ▶ *Implement* ❭ *Conversions & Upgrade Assets* ❭	Lists the simplifications in comparison to the previous releases, SAP S/4HANA 1511, 1610, 1709, 1809, 1909, 2020, 2021, 2022 and 2023 (all feature package stacks), such as, simplified functions, merged database tables, and new data models.

Document	Available at	Comment
Software Update Manager 2.0 <latest SP>	http://help.sap.com/sltoolset 🖱 ▶ *Software Logistics Toolset (SL Toolset)* ❯ *System Maintenance* ❯ *System Maintenance Scenarios* ❯ *Software Update/Upgrade using SUM* ❯	Describes how to do the upgrade to SAP S/4HANA 2023 using the Software Update Manager tool. Altough SAP ECS performs the technical upgrade procedure, we recommend reading the *Software Upate Manager* guide for understanding potential decisions you need to make during the upgrade process. Potential decisions include fixing errors regarding inactive or locked objects, application related errors, releasing open transports, and so on.
Maintenance Planner User Guide	http://help.sap.com/maintenanceplanner 🖱	Describes how to use the Maintenance Planner for calculating and downloading the required stack.xml file and software packages.
SAP Readiness Check for SAP S/4HANA upgrades	https://sap.com/readinesscheck 🖱	This tool analyzes your SAP S/4HANA source system and highlights important aspects of the upgrade to your SAP S/4HANA target system, such as identification of relevant simplification items, high-level custom code analysis, add-on compatibility, and more. → Recommendation Although not mandatory, this tool is highly recommended. It is relevant for product release upgrades (for example from SAP S/4HANA 2022 to 2023), but not for updates from one FPS or SPS to the next (for example from SAP S/4HANA 2022 FPS02 to SPS03).
Custom Code Migration Guide for SAP S/4HANA	https://help.sap.com/ s4hana_op_2023 ▶ *Implement* ❯ *Conversion & Upgrade Assets* ❯	Provides instructions on how to adapt your custom code.
SAP S/4HANA 2023: Release Information Note	SAP Note 3307222 🖱	-
SAP S/4HANA 2023: Feature Package Stack 00: Additional Release Information	SAP Note 3351047 🖱	-

Document	Available at	Comment
SAP S/4HANA 2023: Restriction Note	SAP Note 3348949	-
SAP S/4HANA Add-on Note	SAP Note 2214409	-
SAP S/4HANA Cloud Private Edition Partner Products compatible with S/4HANA 2023	SAP Note 3279787	This note provides information about the Vendor Branded Reselling (VBR) partner products that are released for SAP S/4HANA Cloud Private Edition, running with S/4HANA 2023.
Notes relevant for the Simplification Item Check	SAP Notes 2399707 and 2502552	With these notes, the SI-Check is delivered.
SAP S/4HANA 2023 - application specific notes in system conversion / upgrade preparation phase	SAP Note 3340515	Information about errors that may occur during the preparation phase of the upgrade.
Additional information about the upgrade with the Software Upgrade Manager tool.	SAP Note for the latest version of SUM 2.0 at https://support.sap.com/sltoolset *System Maintenance* ⟩ *System Maintenance Scenarios* ⟩ *Software Update/Upgrade using SUM* ⟩	Information about errors that may occur during the SUM phase of the upgrade.
SAP S/4HANA 2023 - application specific notes in system conversion / upgrade follow-on phase	SAP Note 3340526	Information about errors that may occur during the follow-on phase of the upgrade.
SAP S/4HANA Foundation 2023: Release Information Note	SAP Note 3306766	-
SAP Fiori for SAP S/4HANA 2023: Release Information Note	SAP Note 3336823	-
Maintenance and Update Strategy for SAP Fiori	SAP Note 2217489	Check dependencies according to the SAP Fiori front-end server maintenance and update strategy.
ABAP Platform 2023 – General Information	SAP Note 3346290	-
Java components for SAP S/4HANA 2023 – Restrictions	SAP Note 3247591	-

Additional Information and SAP Notes

The following table lists important additional documents and SAP Notes.

Document	Available at	Comment
SAP S/4HANA: Always-Off Business Functions	SAP Note 2240359	-
SAP S/4HANA: Always-On Business Functions	SAP Note 2240360	-
Uninstalling ABAP Add-ons	SAP Note 2011192	-
SPAU Adjustment	SAP Note 2344014	-
Automated guided steps for enabling Note Assistant for TCI and Digitally Signed SAP Notes	SAP Note 2836302	-
SAP S/4HANA System Conversion / Upgrade: Measures to reduce technical downtime	SAP Note 2351294	-
Superfluous field "BUFFERED" causes exception in Consolidation and Mass Processing and potential S/4 upgrade error	SAP Note 2781530	-
SAP S/4HANA Service: Upgrade Information for WebClient UI Framework	SAP Note 2834255	-

Note Implementation Procedure

The following table provides information on how to implement Notes with SAP ECS.

Note type	Comment
Technical notes	SAP ECS can apply the SAP Notes for you as part of your standard subscription. In order to request the SAP Notes application, use the service request identifier *BASIC_1.5.04*.
	The two areas where the standard subscription service mostly applies are the components `BC-CST` and `BC-DB`. Any non-technical necessary post-installation tasks need to be performed by you, such as application-related settings, manual code creation in customer namespace or manual activities required in SAP namespace.
	If you use CHARM transport management or want to use the same transport across the landscape, implement the notes and inform SAP ECS via a service request. Note that the transport has to be imported into the next system in the landscape before the start of the upgrade in that system.
Application related notes	You need to implement these type of SAP Notes yourself but you can request SAP ECS to process them for you through SAP Cloud Application Services (CAS) at additional charge.
	To submit billable CAS requests, use the service request identifier *BASIC_1.5.03*.

For more information see SAP Product Policies - SAP S/4HANA, and ERP Cloud Services Documentation and search for *RISE with SAP S/4HANA Cloud Private Edition and SAP ERP, PCE Roles and Responsibilities*.

2.2   Overview of the Upgrade Process

The high-level overview of the upgrade process shown in the figure below (including the tools, the phases, and the activities involved in the upgrade process) is intended to help you to plan and perform the upgrade from lower SAP S/4HANA Cloud Private Edition releases to higher SAP S/4HANA Cloud Private Edition releases.

> → Recommendation
>
> We recommend that you do the activities in the sequence shown in the figure and explained in the sections below.
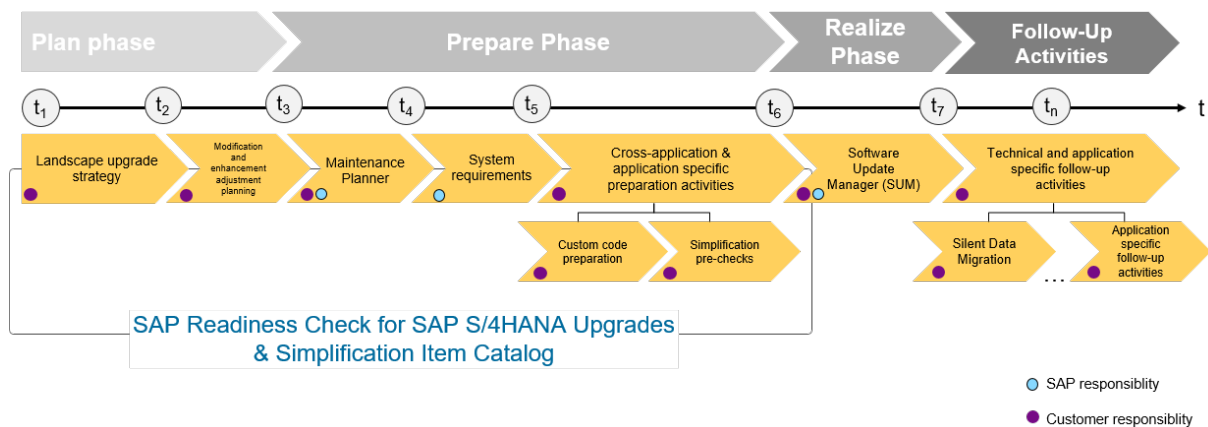
Upgrade to SAP S/4HANA Cloud Private Edition: Sequence

Plan Phase

When planning your upgrade to SAP S/4HANA Cloud Private Edition, make sure to do the following planning activities as required for your setup:

1. Plan your upgrade and updates according to your system landscape
   If you have an SAP system landscape consisting, for example, of a production system, a quality assurance system, and a development system, you must consider the entire system group regarding the sequence of updates.
2. Plan your SAP GUI upgrade
   In case you are using the SAP front-end software SAP GUI, the necessary steps to update to compatible version of the front-end software are part of your upgrade follow-up activities.
3. Plan your SAP Fiori upgrade
   This section explains the required steps addressing the technical upgrade of the SAP Fiori Front-end server, the SAP Fiori Upgrade Impact Analysis to identify successors to your currently used SAP Fiori apps in your target release version, and how to get recommendations about additional, new SAP Fiori apps supporting your updated business processes.
4. Manage your relevant simplification items
   This section provides important information on how to detect relevant simplification items and how to manage their potential impact on your updated business processes by performing the necessary adaptation actions.
5. Make required modification and enhancement adjustment planning
   All modified standard SAP objects and customer enhancements on underlying SAP development objects that were deleted or changed in an incompatible way, need to be adjusted. This section describes how to perform the required adjustments and the transfer of these adjusted objects from your development system to subsequent systems in your system landscape.

For more details, see Planning the Upgrade [page 14].

Prepare Phase

Before you start the realization phase of the upgrade process, you have to do the following preparatory activities:

1. **Maintenance Planner**
   You have the choice of either running the Maintenance Planner yourself or requesting SAP ECS via a service request to run it for you. In case of SAP ECS running it for you, you will receive the planning results for approval before proceeding with the next steps. The Maintenance Planner tool checks your components, add-ons, and activated business functions to ensure compatibility with the SAP S/4HANA Cloud Private Edition release to which you are upgrading and also creates the stack file used during the upgrade process (for the Software Update Manager tool).
   For more information, see Maintenance Planner [page 23].

   > ⓘ Note
   >
   > This step is mandatory, because the Software Update Manager requires the stack file for the upgrade process.

2. **System requirements**
   Before starting the technical upgrade, you need to check certain requirements and prerequisites in your source system. This includes product availability matrix checks or checking the supported start releases. For more information, see System Requirements [page 24] and Supported Start Releases [page 22].

3. **Simplification Item-Check**
   This check identifies the steps you need to take to make sure that your system can technically be upgraded and that your business processes can start running directly after the upgrade process has been completed. The Simplification Item-Check (SI-Check) is called by the Software Update Manager. For more information, see Simplification Item-Check [page 25].

   > ⓘ Note
   >
   > This step is mandatory and will be triggered by the Software Update Manager. Ideally, you run the SI-Check report early in the upgrade process so that you can take note of the preparation information provided by the SI-Check results (see also SAP Note 2399707🐦). For more information on how to install, run and manage the results of the SI-Check read SAP note 2399707🐦 and the SAP Community blog: https://blogs.sap.com/2018/03/26/sap-s4hana-simplification-item-check-how-to-do-it-right./🐦.

   > ⓘ Note
   >
   > If dedicated simplification items require further mandatory preparation steps, the technical upgrade procedure stops to help ensure a consistent system upgrade. The Software Update Manager (SUM) does not continue unless the mandatory activities have been successfully accomplished.

   See also, SAP Readiness Check Versus SI-Check [page 48].

4. **Custom Code Migration**
   The custom code migration tool checks your custom code against the simplification items relevant for the upgrade. For more information, see Custom Code Analysis [page 27].

   > ⓘ Note
   >
   > Although not mandatory, this step is highly recommended. Ideally, you combine the upgrade project with housekeeping activities for your existing custom code base. In particular, you need a consolidated

> view of custom developments that are used productively and you should remove custom code that is no longer used.
>
> For more information, see the Custom Code Migration Guide for SAP S/4HANA at https://help.sap.com/s4hana_op_2023 ▶ *Implement* ❯ *Conversion & Upgrade Assets* ❯.

5. **Application-Specific Preparation Activities**
   You may need to perform manual, application-specific preparation activities. These activities are identified by the SI-Checks and custom code migration checks and documented by SAP Notes, which you receive through the check results.

> → Recommendation
>
> We highly recommend running the SAP Readiness Check for SAP S/4HANA upgrades in advance of your upgrade project to identify any issues you need to consider and activities you need to do in preparation for your project. For more information about how to use the SAP Readiness Check for SAP S/4HANA upgrades, see https://sap.com/readinesscheck↗.

> → Recommendation
>
> We recommend that you perform the steps in the prepare phase in the sequence listed above. It is, however, technically possible to do them independently or in parallel.

For more information about the preparatory steps, see Preparing the Upgrade [page 22].

Realize Phase

When you have completed the steps above and have implemented all the adaptations required to ensure your system and your custom code is suited to the SAP S/4HANA Cloud Private Edition release to which you are upgrading, you then request SAP ECS to run the **Software Update Manager (SUM)** by sending an upgrade related serive request to SAP ECS. SAP ECS might request your support for clarifications or other actions.

> ⓘ Note
>
> Although the technical upgrade process facilitated by the SUM tool is operated by SAP, there are several break-points in the procedure, where SAP is expecting your input/action, such as SPDD, Dev lock, SI-Checks and more.

For more information about the upgrade realization, see Realizing the Upgrade [page 40].

Follow-Up Activities

1. **Technical follow-up activities**
   SAP ECS takes care of the technical upgrade of the SAP Fiori Front-end Server (FES) as part of your service request to upgrade the system. SAP ECS will upgrade the system as required, independently of whether your SAP FES is embedded or standalone. For more details about SAP FES deployment options and recommendations, see https://blogs.sap.com/2020/04/01/sap-fiori-deployment-options-and-sap-

fiori-front-end-server-strategy-update-2020/ . However, there are more technical activities you need to perform. For more details, see Follow-Up Activites [page 42].

2. **Application-specific follow-on activities**
   You may need to perform manual application-specific activities. These activities are identified by the SI-Check and custom code migration checks and documented by SAP Notes, which you get through the checks.

For more details, see Follow-Up Activites [page 42].

3 Planning the Upgrade
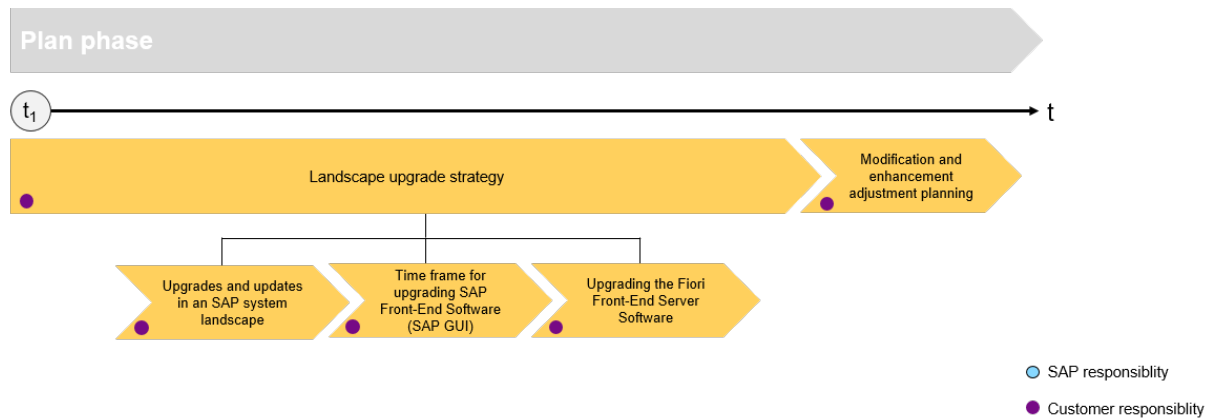
Upgrade to SAP S/4HANA Cloud Private Edition: Planning

When planning your upgrade, follow the necessary steps depicted in the previous graphic for getting ready to start your upgrade project.

3.1 Upgrades and Updates in an SAP System Landscape

If you have an SAP system landscape consisting, for example, of a production system, a quality assurance system, and a development system, you must consider the entire system group regarding the sequence of updates.

In addition, the update procedure influences your development activities, for example, dual maintenance might be temporarily necessary to ensure that your production system is supported with emergency corrections.

Sequence of Updates

Update or upgrade your systems in the same sequence in which you transport your custom objects. Update each system with the same software packages.If your system group consists for example of three SAP systems and includes a quality assurance system that has been set up between the development and production system, work in the following order:

1. Development system
2. Quality assurance sytsem
3. Production system

> ⚠ Caution
>
> We strongly recommend that you perform transports only between systems of the same level (regarding release, feature pack stack, or support package) and where the same business functions are activated. Transporting objects between systems with different versions of software may cause errors and inconsistencies.

If you have modified SAP objects that you want to retain, you must proceed in the correct sequence. The version management functions of the SAP system record all the changes you make only in the system in which you made the changes (the development system). Only this SAP system offers you optimal support when you adjust modifications.

If you configure the Transport Management System (TMS) accordingly, changes made in the development system after the update can be transported automatically to your other SAP systems. If you use this procedure, you no longer need to perform time-consuming adjustments in the production system.

> ⚠ Caution
>
> If you have modified SAP objects, make sure that you keep your development system. Do **not** copy your production system to your development system for test purposes.

Impact on Development

At a certain point in time during the update procedure, the development environment of the system that is updated, is locked. Changes to the system are not possible, and the repository objects are globally set to **not modifiable**. Consider this development freeze in your project plan and inform your developers about it.

> ⓘ Note
>
> You can check the system change status by calling transaction SE06 (*Set Up Transport Organizer*). Navigate to ▶ *System Change* ▶ *Option* ▶ *Global Setting* ▶.

To avoid the development system being unavailable during the update, we recommend that you add a temporary copy of your development system to your system landscape. This temporary development system can supply your production system with emergency corrections or support a phased development go-live after you have updated the original development system. You then must make any corrections in both the original development system and the temporary development system. Make sure that your developers are notified about the dual maintenance. The following graphic illustrates this scenario.
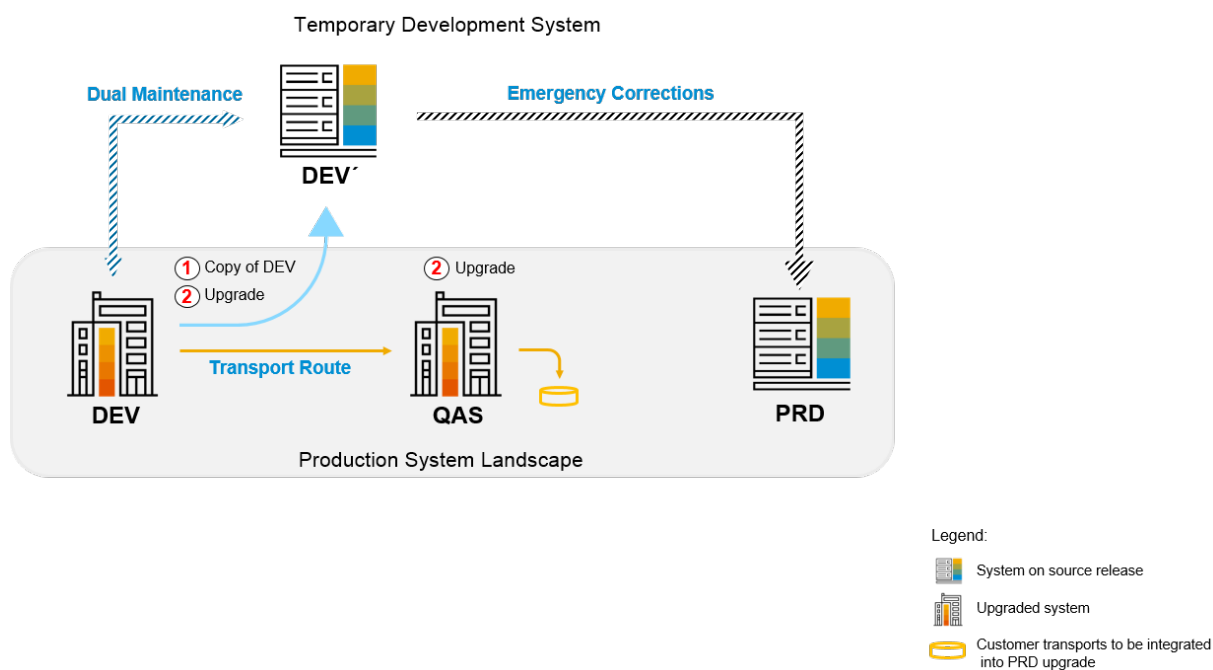
If you require the delivery of more changes in terms of configuration settings or application development aspects than emergency corrections to your production system, we recommend a second system landscape option to better support your upgrade project. In this case you can add a temporary development system and a quality assurance or test system to your system landscape. This will support a phased development approach as illustrated in the following graphic.
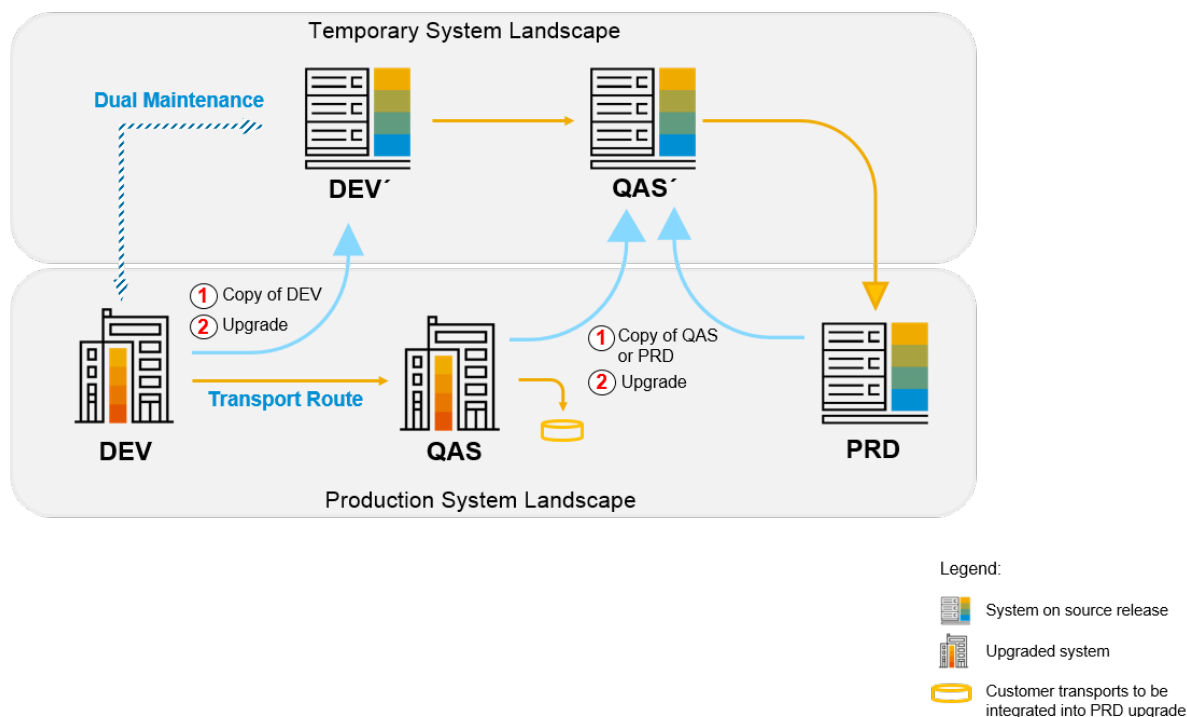
3.2 Upgrading SAP GUI

In case of using the SAP front-end software SAP GUI, take care of the following steps as part of your upgrade follow-up activities.

The new SAP system release cannot run until a compatible version of the front-end software (SAP GUI) has been installed. However, as the front-end software is compatible with several SAP system releases, you might not have to upgrade to a new front-end software release.

If you need or want to use a different front-end software, you can import it as soon as you receive the software package. If the front-end software you are using on the source release is not compatible with the target release, the latest possible time for upgrading the front-end software is in coordination with SAP ECS (who is performing the technical system upgrade) before the technical upgrade procedure approaches the system downtime phase.

> ⓘ Note
>
> You can already update your SAP GUI before you start with the upgrade of your SAP system.

> ⓘ **Note**
>
> You can use the SAP Front-End installation software NWSAPSetup to optimize the deployment of SAP GUI to thousands of clients. You can tailor installation packages to match your requirements, distribute patches, and set up automatic update processes for your clients.

Further Information

Additional information	Available at
Which front-end software to use	147519
Hardware and software requirements	26417
Using SAP GUI for HTML	178788
Installing the front-end software and using NWSAPSetup	SAP Front-End Installation Guide

3.3 Upgrading SAP Fiori

Technical upgrade of the SAP Fiori Front-end Server

The technical upgrade of the SAP Fiori Front-end Server (FES) is performed by SAP ECS as part of your service request to upgrade the system. As such, SAP ECS upgrades it as required, independent of whether your SAP FES is embedded or standalone. For more information about SAP FES deployment options and recommendations, see https://blogs.sap.com/2020/04/01/sap-fiori-deployment-options-and-sap-fiori-front-end-server-strategy-update-2020/.

Check dependencies according to the SAP Fiori front-end server maintenance and update strategy as per SAP Note 2217489.

SAP Fiori Upgrade Impact Analysis

In addition to the technical upgrade of SAP Fiori Front-end Server (FES) executed by SAP ECS, you also need to run the SAP Fiori Upgrade Impact Analysis, which is embedded into the SAP Fiori Apps Reference Library. There you can find out if your current SAP Fiori apps will be available, deprecated, obsolete, or if there are successor apps in your target release version.

For further details how to run the analysis and evaluate its results, see https://blogs.sap.com/2022/10/24/sap-fiori-for-sap-s-4hana-upgrade-impact-analysis/.

Recommended SAP Fiori Apps

You can use the SAP Readiness Check for SAP S/4HANA upgrades to recommend SAP Fiori apps based on your transaction usage history, see the section see the section *Recommended SAP Fiori Apps* at https://sap.com/readinesscheck🔗 ▌▶ *Feature Scope Description* ❯ *SAP Readiness Check* ❯ *Functions of SAP Readiness Check for SAP S/4HANA Upgrades* ▌.

3.4 Manage Relevant Simplification Items

A simplification item documents differences in application functionality (changed, replaced, removed) between start and target release of an SAP S/4HANA upgrade. It provides important information about the potential impact of a change and the required customer action.

Access detailed information on simplification items per SAP S/4HANA release via the simplification item catalog: https://me.sap.com/sic🔗 or https://help.sap.com/s4hana_op_2023. More important, the SAP Readiness Check tool for SAP S/4HANA, the ABAP custom code analysis, and the simplification item checks are based on the technical information of the simplification items.

Running an SAP Readiness Check early in your project is highlighy recommended to get a list of relevant simplification items so that you can identify the impact on your business processes and have sufficient time to take action on resolving any issues.

3.5 Modification and Enhancement Adjustment Planning

This section deals with modifications, which are changes to objects of the SAP standard.

There are two types of modifications:

- Changes to the translation of an object text
- Changes to the object itself

In addition, the *Enhancement Framework* allows enhancements, such as source code plug-ins, implementations of the new kernel-based BAdI, and class enhancements. We recommend using the *Enhancement Framework* to enhance or adapt SAP development objects.

Changes to the Translation of an Object Text

The changes are made in the translation environment (transaction SE63) or in the ABAP Workbench. An SSCR key is not required.

> ⚠ **Caution**
>
> Changes to translations of SAP objects are not retained when you update your system. They are overwritten by a new version or deleted. For more information about retaining these changes, see 485741🠒.

Modifications and Enhancements of SAP Objects

You might need an SSCR key to perform the modification adjustment. Get the key before you start the update. For more information, see https://support.sap.com/sscr🠒.

All modified standard SAP objects are displayed for adjustment in transactions SPDD or SPAU. Objects that SAP no longer delivers are deleted. If you want to keep these objects, you have to accept the modifications in transactions SPDD or SPAU.

All enhancements that you must adjust are shown in transaction SPAU_ENH. In contrast to modifications of source code units, you only must adjust enhancements if the underlying SAP development objects were deleted or changed in an incompatible way.

Make sure that you perform the adjustments in transaction SPAU_ENH after the adjustments in transactions SPDD or SPAU and not the other way around.

> ⚠ **Caution**
>
> Make sure that **before** the update there is at least one package in the customer namespace (Z*). You need this package if you have to create objects during the modification adjustment, for example, for an append structure for customer fields of an SAP table.
>
> You cannot create packages during the update.

The modification adjustment of ABAP Dictionary objects occurs during production operation. This is possible since the complete version management is available in the shadow system. The remaining Repository objects are still adjusted at the end of the update.

> ⚠ **Caution**
>
> Potential ABAP Dictionary objects and data loss because of passive deletion of objects.
>
> Be aware of the following issue: You want to perform a system upgrade or a conversion to a product based on SAP NetWeaver 7.50 or higher, and you have created new SAP objects (for example a structure or data element) as part of a manual correction instruction of an SAP Note, either manually or by executing a report attached to an SAP Note. However, the target support package of the upgrade does not include these corrections.
>
> The reason is that the Software Update Manager (SUM) does not rescue the objects during the SUM run because they are registered in the system as modified SAP objects. Therefore, they do not exist in the target release anymore, but are deleted passively. The objects will show up as deleted objects in SPDD or SPAU. If ABAP Dictionary objects are not manually re-created during SPDD, data loss can occur. For example, this can happen if a structure is used as a table append. You possibly encounter such a situation, for example, if you have implemented larger legal changes, such as Goods and Services Tax in India.
>
> As a solution, see 2513585🠒 for more information and for information about preventing the potential object loss, especially if you were requested to execute a report to create ABAP Dictionary objects. Contact SAP Support for assistance in identifying the objects to be saved.

If you haven't purchased a billable upgrade package, the workflow for the execution of tasks in `SPDD` and `SPAU` is as follows:

- SAP ECS sends the upgrade ticket back to you when the Software Update Manager (SUM) has reached the point that actions in transaction `SPDD` are required.
- Perform the required actions in transaction `SPDD`, send back the ticket to SAP ECS and include the transport number.
- SAP ECS proceeds executing the SUM.
- In case errors occur, SAP ECS might reach out to you again.
- After the upgrade, you have 14 days to review and perform remaining actions required in transaction `SPAU`.

> ⓘ Note
>
> You can perform the instructions yourself as described in the workflow. However, if you purchase a billable upgrade package (service request*Identifier -TO_NWABAP_1.5.08*), SAP ECS can support you performing the previously mentioned steps. In this case, the process is as follows: SAP ECS will trigger the execution of activities in `SPDD`. If any clarifications or relevant approvals are required, the SAP teams will reach out to you.

Modification Adjustment in the First System (Development System)

> ⓘ Note
>
> Since all modifications to standard SAP objects are displayed during the update and you must adjust all the displayed objects, you must schedule enough time for the modification adjustment.
>
> This also applies to enhancements of the new Enhancement Framework that you must adjust. However, you only must adjust the enhancements if the underlying development objects were deleted or changed in an incompatible way.

You must test the modification and enhancement adjustment in a development system that has the same SAP system release and that has been modified in the same way as the production system. If the development system contains more modifications or enhancements, or has a different Support Package level, contact an experienced SAP consultant for help. The following explanation assumes that the levels of modification are identical.

1. The list of objects that has to be adjusted in your SAP system is determined by the Software Update Manager (SUM) at the end of the production period.
2. The ABAP Dictionary objects (tables, data elements, domains, and so on) are adjusted during production operation.

   > ⓘ Note
   >
   > Only adjust the objects. However, do not activate them using transaction `SE11` (ABAP Dictionary Maintenance).

3. Modified or enhanced repository objects (reports, screens, and so on) are adjusted towards the end of the update. At this stage, the import of SAP objects has already been completed. However, the old modified version is still available in the version database. As with ABAP Dictionary objects, all changes are released to a transport request that is flagged and then exported and registered by the Software Update Manager.

If you need to adjust enhancements, release these adjustments to the flagged transport request that already contains the adjusted modified objects. Adjust all modifications before you adjust the enhancements.

Modification Adjustment in Subsequent Systems

For the quality assurance and production system, we recommend that instead of adjusting modifications and enhancements manually, you automatically transfer the transport requests exported from the first system: one for the ABAP Dictionary objects adjusted using transaction `SPDD` and one for the Repository objects adjusted using transactions `SPAU` and `SPAU_ENH`.

> ⚠ **Caution**
>
> Make sure that the Support Package levels included in the update of the subsequent systems are similar to the Support Package levels included in the update of the first system.

The `ADJUSTPRP` phase in the *Configuration* roadmap step prepares the requests that you entered in phase `SUMASK_SPDD_SPAU` from the development system to be transferred. The phase checks whether all the modifications identified in the system are handled by transport requests. If this is the case, you do not need to perform a modification adjustment.

> ⚠ **Caution**
>
> The number of objects in the adjustment transport requests can exceed the number of modifications in the receiving system. In this case, the Software Update Manager imports changes that previously did not exist in the receiving system.

For a detailed description of the modification adjustment function, see the SAP Help Portal at https://help.sap.com/s4hana_op_2023 and see ▶ *Use* ❭ *Product Assistance* ❭ *English* ❭ *Enterprise Technology* ❭ *ABAP Platform* ❭ *Developing on the ABAP Platform* ❭ *Application Development on AS ABAP* ❭ *Customer-Specific ABAP Development* ❭ *Changing the SAP Standard (BC)* ❭ *Modifying the Standard* ❭ *The Modification Assistant* ❭ *Upgrade Procedures / Support Packages (link at the bottom of the Modification Assistant page)* ▶.

For a detailed description of how the modificaion assistance is integrated into the technical upgrade process, see the SUM Upgrade Guide at http://help.sap.com/sltoolset and see ▶ *Software Logistics Toolset (SL Toolset)* ❭ *System Maintenance* ❭ *System Maintenance Scenarios* ❭ *Software Update/Upgrade using SUM* ▶

4 Preparing the Upgrade
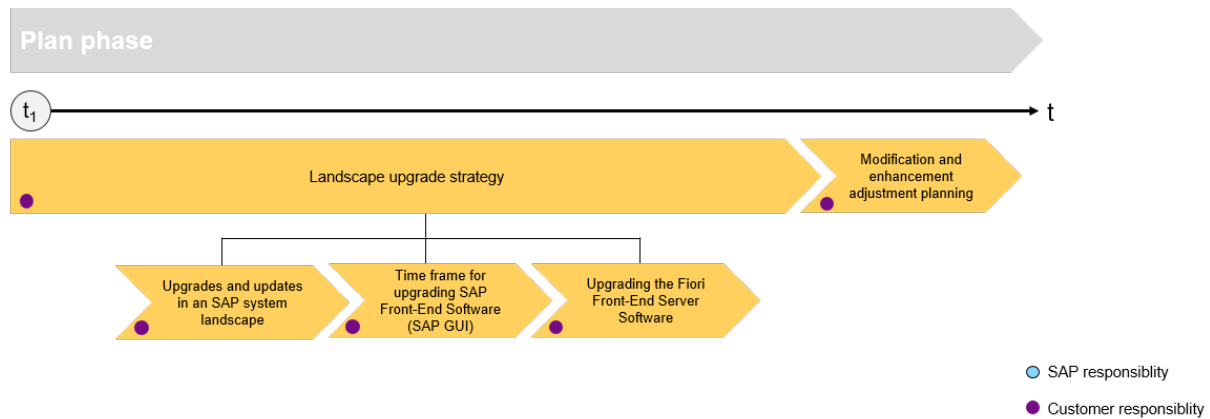
Upgrade to SAP S/4HANA Cloud Private Edition: Preparations

For the upgrade to SAP S/4HANA Cloud Private Edition you have to prepare an overall project plan and schedule the tasks. The preparation activities described in this section give you an idea of what is required.

4.1 Supported Start Releases

Make sure not to violate support package equivalences between source and target release. This ensures that all corrections already applied on the source system are also part of the target release support package stack.

If a higher support package has already been implemented on your source system, you need to plan to upgrade the target release to a higher support package. The Maintenance Planner blocks the planning if the support package level on your source system is too high. See Note 2457423 for more information. This means that you might have to wait until the equivalent support package of the target release will have been released before you can upgrade.

> → Tip
>
> Consider not updating your source system to a higher support package if you are already planning a major release upgrade and the equivalent support package has not been released yet for the target version.

Please check the *SAP S/4HANA 2023: Release Information Note* 3307222 for the required feature package stack equivalencies for the upgrade from SAP S/4HANA 1709, 1809, 1909, 2020, 2021, or 2022 (all feature package and support package stacks) to 2023 (all feature package and support package stacks).

4.2 Maintenance Planner

The Maintenance Planner generates the download files (add-ons, packages, DBDs, and the stack configuration file) that the Software Update Manager (SUM) uses to execute the upgrade. In particular, the Maintenance Planner checks if the following items are supported for the upgrade:

- Add-ons to your system
- Active business functions in your system
- Industry solutions

If there is no valid upgrade path for any of the items listed above (for example, an add-on is not released for the upgrade yet), the Maintenance Planner prevents the upgrade. After the check, the Maintenance Planner creates the stack configuration file (stack.xml).

Create a Maintenance Planner ID (MPID) and attach it to the upgrade service request for SAP ECS. If you need support from SAP ECS generating the Maintenance Planner ID, mention this in the service request. SAP ECS then generates the ID and sends it back to you with the service request for review. The upgrade is executed once you approve the Maintenance Planner ID.

For SAP S/4HANA Cloud Private Edition systems, SAP takes care of uploading relevant system landscape data to Maintenance Planner. If you are using the SAP Solution Manager, SAP Focused Run or SAP Cloud Application Lifecycle Management (SAP CALM) and you wish to upload system data from these systems to the Maintenance Planner, see http://help.sap.com/maintenanceplanner ▶ *Maintenance Planner* ❯ *Maintenance Planner - User Guide* ❯ *Before You Start* ❯ *Uploading Landscape Data Into SAP Support Portal* ❚.

For more information, see the Maintenance Planner User Guide at http://help.sap.com/maintenanceplanner .

Business Functions

Business functions can have the following status: `always_on`, `customer_switchable`, and `always_off`. This results in the following behavior during the upgrade:

- If a business function was switched on in the start release system, but defined as `always_off` in the SAP S/4HANA target release, then an upgrade is not possible with this release.
- If a business function was switched off in the start release system, but defined as `always_on` in the SAP S/4HANA target release, then the business function will be activated during the upgrade.
- If a business function is defined as `customer_switchable` in the SAP S/4HANA target release, it will keep the state defined in the target release during the upgrade.

For more information about always-off and always-on business functions in SAP S/4HANA, see SAP Notes 2240359 and 2240360 .

Add-Ons

For a description of supported add-on types and their related information, see SAP Note 2214409 .

For a list of partner products that are sold from the SAP price list (vendor-branded reselling products) in SAP S/4HANA Cloud Private Edition refer to the notes listed under section ▌ *Partner Add-Ons* ❯ *SAP S/4HANA Cloud Private Edition* ❳ in SAP Note 2214409 .

For a list of certified third-party ABAP add-ons for SAP S/4HANA and SAP S/4HANA Cloud Private Edition, see SAP Note 2861669 for information and related references. For any type of add-on, it is your responsibility to check with the respective software vendor, if and when released add-on versions are available for the selected SAP S/4HANA target version. If no released version is available, you can decide to uninstall the add-on. You can find more information about uninstalling add-ons in the section below. If you still require the add-on, you must wait until a released version is available. In this case, SAP ECS cannot process your upgrade service request.

Uninstall Add-Ons

Generally, the Software Update Manager (SUM) takes care of uninstalling add-ons. In some cases however, the SUM doesn't uninstall certain add-ons. Instead, SAP ECS sends an upgrade service request to you. Then you can request SAP ECS to perform the uninstallation via a separate service request with the identifier *BASIC 1.5.13A* from the serive catalog.

For third-party add-ons, it is your responsibility to take care of the uninstallation with your software vendor.

For information about uninstalling add-ons, see SAP Note 2011192 .

Industry Solutions

For information about supported industry solutions, see SAP Note 3348949 .

4.3   System Requirements

Before upgrading your SAP software you must make sure that the required infrastructure components such as SAP HANA database and operating system fullfill the minimum technical requirements. You find the respective information in the SAP Product Availability Matrix (PAM). For more information, see https:// apps.support.sap.com/sap/support/pam .

SAP ECS performs a system requirements check regarding the operating system and database as part of your upgrade service request.

If the check detects a need to update the operating system or the SAP HANA database version, you will be asked to submit the following service requests:

- Operating system upgrade: Upgrade SLES OS to Major Version (*Identifier - INFRA_1.6.12*)
- SAP HANA database upgrade: Update Database Software (*Identifier - DB_1.1.11, DB_1.1.12*)
- SAP S/4HANA version upgrade: Version upgrade of SAP Software: Execute technical upgrade tasks (*Identifier- BASIC_1.5.07*)

> ⓘ Note
>
> Patching of operating system and database requires a separate downtime.

4.4 Simplification Item-Check

The Simplification Item-Check (SI-Check) is called by the Software Update Manager (SUM) tool and it identifies the simplification items relevant for your system upgrade.

The SI-Check is delivered with SAP Notes 2399707 and 2502552. SAP Note 2399707 delivers the new check report; SAP Note 2502552 delivers the check classes via transport-based correction instructions (TCI) and prerequisite notes.

> ⓘ Note
>
> If you follow the process described in SAP Note 2502552 exactly, you do not need to read any of the SAP Notes required by SAP Note 2502552. They do not contain any manual tasks and are independent of business functionality. After you run the SI-Check, the result list will contain the SAP Notes you have to look at in detail.

Implementing TCI and the SI-Check

1. To enable TCI implementation, follow the instructions provided in SAP Note 2187425 (see especially the PDF file attached to the SAP Note).

   > ⓘ Note
   >
   > If you do not enable your system to install TCI notes, SAP Note 2502552 will be implemented without the TCI part, which will cause missing check class errors. However, if your system is on SAP NetWeaver / ABAP Platform releases listed in the table, TCI is already enabled:
   >
   > TCI Enabled Releases
   >
   > | Release | Minimum Support Package |
   > | --- | --- |
   > | 750 | SP05 |
   > | 751 | SP02 |
   > | 752 | SP00 |
   > | 753 | SP00 |
   > | Or higher | - |

2. Follow the process description in SAP Note 2502552 to implement the SI-Checks.

Running the SI-Check

You run the SI-Check to identify the simplification items relevant for your upgrade project. We recommend to do this early in the project, to get an overview of the upgrade scope.

1. Start the report `/SDF/RC_START_CHECK` in transaction `SA38`.
2. In the section *Simplification Item Check Options*, choose the target SAP S/4HANA version.
3. Choose the mode in which you want to run the checks:
    *   In online mode: The results are displayed immediately after the check is finished.
    *   As a background job: We recommend this option if the check will need a long running time.
4. Run the checks to get an overview over all simplification items and then check the system consistency with *Check Consistency for All*.
5. Check the results.

The report returns a list of relevant and irrelevant simplification items. We recommend that you check every relevant simplification item for the impact it will have on your upgrade project.

Some simplification items have a consistency check. The consistency check identifies inconsistencies in the system that would be a problem during the SUM process. It also provides additional information on how to solve the problem. Some simplification items do not have a consistency check, but nevertheless are relevant. This means that from a technical perspective an upgrade of your system is possible without any action from you, but there will be an impact and you should investigate it.

Some of the error messages from the consistency check aim for you to read and understand the information provided by the consistency check error – for example, the information might be about data loss incurred during the upgrade process. These errors can only be processed by creating an exception for them which is logged in the system. The errors are highlighted in the report in the column *Exemption Possible*, so that you can see which errors need an exemption.

For more information about how to use the SI-Checks, see the user guide in SAP Note 2399707 .

SI-Check Messages and Their Meanings

The SI-Checks checks your system for data consistency (necessary for the upgrade of existing data) and effects on the data after the upgrade. The severity of the resulting messages indicates whether there are no inconsistencies, warnings you should look at, or inconsistencies you need to resolve. The results are provided as green, yellow, or red messages:

Message Overview

Message Color	Message Return Code	Descriptions
Green	0	These messages indicate that there are no technical or other inconsistencies. They also function as status messages and indicate that the upgrade can go ahead.

Message Color	Message Return Code	Descriptions
Yellow	4	These messages provide important information (or warnings) about various topics, such as changes to business functions, or adaptations that can be done either before or after the upgrade (but must be done to ensure business continuity). They indicate that there are no technical problems for the upgrade itself. However, some of these yellow messages provide information about possible data changes, changes in functionality, or required tasks after the upgrade. For instance, per default, no custom table appends are retained during the upgrade – the data from those fields is just lost. ⚠ **Caution** Please do not underestimate yellow messages. Read them carefully and do what is required to ensure system consistency after the upgrade, so that business continuity is not compromised.
Red	7	These messages show skippable errors that indicate important changes for the affected simplification items. The errors are no inconsistencies, but you need to confirm that you have read and understood them. Usually they point out imminent data loss, deprecation, or required activities after the upgrade. Once you have confirmed (that is, exempted) them, they will no longer act as blockers for the upgrade.
	8 or 12	These messages always indicate inconsistencies in the system. These inconsistencies need to be solved before the upgrade, as they would act as blockers in later SUM phases. Please read the messages for information about how you can solve the inconsistencies. ⓘ **Note** The Software Update Manager (SUM) runs the SI-Check at the beginning of the SUM process and again just before the downtime. At the beginning, the SUM process is stopped if a message with return code 12 is detected. Just before the downtime, the SUM process is stopped if a message with return code 8 or higher is found. So, for the SUM process to run successfully, you need to make sure that all the inconsistencies found by the SI-Check with message return codes at 8 or higher are solved.

4.5   Custom Code Analysis

The custom code migration checks are based on the simplification item concept. Before upgrading to SAP S/4HANA 2023 (or any of its feature package or support package stacks), you need to check your custom code against the SAP S/4HANA simplifications in an SAP S/4HANA 2023 system (on the correct feature package or support package stack) with the Custom Code Migration tool or the ABAP test cockpit (ATC). These tools provide you with a list of instances where your custom code does not comply with the scope and data structure of SAP S/4HANA 2023 (any feature package or support package stack).

> ⓘ Note
>
> Although it is not mandatory, we highly recommend that you perform these checks regularly so that your code remains in compliance with the SAP S/4HANA code.

For additional information about the Custom Code Migration tool, see:

- SAP Note 2241080 for information about how to download the simplification database.
- *Custom Code Migration Guide for SAP S/4HANA* at https://help.sap.com/s4hana_op_2023 *Implement Conversion & Upgrade Assets* .

4.5.1 Custom Code Analysis with Baseline

The following sections describe how to use the baseline functionality in the ABAP test cockpit and the Custom Code Migration app to filter legacy findings in the context of an SAP S/4HANA upgrade:

- Preparing the Custom Code Analysis [page 28]
- Using the ABAP Test Cockpit [page 30]
- Using the Custom Code Migration App [page 36]

4.5.1.1 Preparing the Custom Code Analysis

To prepare the custom code analysis, you need to perform the following tasks:

1. Configure users
2. Apply SAP Notes
3. Implement the Custom Code Migration app
4. Import the Simplification Database

Configuring the Users

In the SAP S/4HANA system you need the user SAP_SATC_ADMIN to use transaction ATC to perform custom code checks. The user provides the authorizations for setting up and using the ABAP test cockpit (ATC).

You also need the authorization object S_YCM for importing the Simplification Database into the system:

Overview of the Authorization Object

Name of the Authorization Object	Names of the Authorization Field	Values of the Authorization Field
S_YCM	SYCM_AREA	SBD
	ACTVT	UL

Applying SAP Notes

We recommend applying the SAP Notes listed in SAP Note 2436688 .

If you would like to request support from SAP ECS, refer to more details about note implementation procedures in Documentation, Tools, and SAP Notes for the Upgrade [page 5].

Implementing the Custom Code Migration App

Before you can implement the Custom Code Migration app, make sure that you have done the steps for *Implementing SAP Fiori Apps for Administrative, Configuration, and Extensibility Task*, see https://help.sap.com/s4hana_op_2023 ▶ *Use* ❯ *Product Assistance (English)* ❯ *SAP S/4HANA* ❯ *Enterprise Technology* ❯ *ABAP Platform* ❯ *Configuring the ABAP Platform* ▶.

You need to do settings in both the front-end and the back-end server:

1. **Front-end server:**
   1. a. Enabling the app for access in the SAP Fiori launchpad:
      1. In transaction `PFCG`, add the business catalog `SAP_BASIS_BC_CCM` (Custom Code Migration) to the user roles that need to use the Custom Code Migration app. The catalog can be added to either an existing user role or to a new one.
      2. Assign the user roles to all users that need to use the Custom Code Migration app.
   2. b. Activating OData services
      In transaction `/IWFND/MAINT_SERVICE`, add the following technical service names as services:

      List of Services

Component	External Technical Name
Custom code migration projects	`SYCM_APS_C_PROJECT_CDS`
Analysis of SAP S/4HANA custom code check findings	`SYCM_APS_C_ATC_FIND_ALP_CDS`
Custom code scoping	`SYCM_APS_SCOPING`
Download of SAP S/4HANA custom code check findings	`SYCM_APS_FILE_SRV`

      For more information about activating OData services, see: https://help.sap.com/s4hana_op_2023 ▶ *Use* ❯ *Product Assistance (English)* ❯ *Enterprise Technology* ❯ *SAP Fiori* ❯ *SAP Fiori Overview* ❯ *Implement SAP Fiori Apps* ❯ *UI-Specific Implementation Tasks* ▶ and http://help.sap.com/fiori_implementation ▶ *Implement* ❯ *SAP Fiori: App Implementation* ▶.

2. **Back-end server: assigning authorizations:**
   Assign the user role `SAP_BC_YCM_APS` to the users who need to work with the Custom Code Migration app. For users who only need to be able to display the results, add the authorization object `S_YCM_APS` to their roles and set the field `ACTVT` to the value *Display*.

Importing the Simplification Database

To check your custom code against the SAP S/4HANA simplifications, you need to download the Simplification Database zip file and import its contents.

SAP provides content for the Simplification Database of an SAP product in the SAP Support Portal. It can be downloaded as a zip file. The content of the zip file must then be imported into the system.

For information about the most recent content of the Simplification Database provided for SAP S/4HANA, see SAP Note 2241080 .

1. **Downloading the file:**
   1. Go to the SAP Software Download Center: https://support.sap.com/en/my-support/software-downloads.html .
   2. Choose ▶ *Types of Software* ❯ *Installations & Upgrades* ❯ *Access downloads* ❯ and search for `CCMSIDB`.
   3. Select the relevant zip file and choose *Download Basket*.
2. **Importing the content:**
   1. Log on to the SAP S/4HANA system.
   2. Run transaction `SYCM`.
   3. From the menu, choose ▶ *Simplification Database* ❯ *Import from ZIP File* ❯.
   4. Select the zip file with the downloaded Simplification Database from your drive and confirm with *Open*. This imports the Simplification Database content into the system.

4.5.1.2 Using the ABAP Test Cockpit

To check for ABAP test cockpit (ATC) findings, you need to configure a local ATC run series that checks the requested development objects. In addition, you can make use of the baseline functions to filter the findings for the current release (hence not specific to the upgrade itself). With the baseline functions, you can take over individual ATC results into the baseline and so, for example, exclude already known findings from the ATC result list.

To configure ATC run series, schedule them, and add them to the baseline you need to do the following tasks:

1. Configure a local ATC run series for the current release
2. Schedule the ATC run series for the current release
3. Add the ATC run series to the baseline
4. Configure a local ATC run series for the target release
5. Schedule the ATC run series for the target release
6. Analyse the findings

Configure a Local ATC Run Series for the Current Release

You need follow these steps:

1. Log on to your SAP S/4HANA system.
2. Run transaction ATC.
   The *ABAP Test Cockpit Overview* screen appears.
3. In the navigation pane, expand the nodes ▶ *ATC Administration* ❯ *Runs* ▌ and double-click the *Schedule Runs* entry.
   The screen now displays a list of existing run series.
4. Choose the *Create* button in the toolbar.
5. Enter a name for the new series and confirm.
6. Specify the following entries for the new run series:

Overview of Entries

Fields	Descriptions
Description	Enter a short description for the ATC run series you want to configure. ⓘ Note You can use the template provided by the *Description* field. When you execute the run series, the built-in variables are filled with data for the system, the day of the week, the calendar week, and the year. However, you can also add further texts to these variables, rearrange them, or replace the built-in variables with your own texts.

Fields	Descriptions

Check Variant	Enter one of the following check variants that matches your **current** SAP S/4HANA release:
	
	`S4HANA_READINESS_<year>_NO_FLE`
	
	Predefined settings:
	
	• Material number length = 18
	• Extended amount field length is disabled
	• Extended stock requirement field length is disabled
	• Extended season/theme/collection field length is disabled
	
	`S4HANA_READINESS_<year>`
	
	Predefined settings:
	
	• Material number length = 40
	• Extended amount field length is enabled
	• Extended stock requirement field length is enabled
	• Extended season/theme/collection field length is enabled
	
	ⓘ Note
	
	These product-specific global check variants check all the simplifications relevant for your current SAP S/4HANA release as well as those for previous releases.

Objects to Check	Specify the set of development objects you want to check. On the *Checkable Namespaces* tab, the option *By Query* lets you specify objects by name (such as by package name), by transport layer, or by component. The option *By Object Set* lets you specify an object set that you have defined in Code Inspector in the checked system. ⓘ Note You can use the value help to choose the packages or the object set in the remote system. On the *Modified Objects* tab, you can specify the modified source code objects you want to check.

7. Save the configuration.

Schedule the ATC Run Series for the Current Release

Proceed as follows to schedule a run series:

1. Select the required run series from the list and and click the *Schedule* button in the toolbar.
2. In the dialog that appears, adapt the settings for the *Life Span* of the series and for *Execution* to your needs. Otherwise, leave these settings unchanged.

   > ⓘ Note
   >
   > Note: The *Life Span* defines how long (in days) the ATC results are kept in the system. After this period, the ATC results are automatically deleted in the system.

3. Choose *Execute in Background* (F9) to schedule the run series.

Add the ATC Run Series to the Baseline

Proceed as follows:

1. Run transaction `ATC`.
   The *ABAP Test Cockpit Overview* screen appears.
2. In the navigation pane, expand the nodes ▐▶ *ATC Administration* ❯ *Runs* ❯ and double-click the *Manage Results* entry.
3. In the dialog, adapt the settings to display the last executed ATC run series. Usually, you can keep the default settings.
4. Choose the *Execute* button in the toolbar.
   The screen displays a list of executed run series.
5. Select the relevant row for the ATC run series scheduled for the current SAP S/4HANA release. In the menu, go to ▐▶ *Baseline* ❯ *Add to Baseline to ...* ❯ *Exempt Findings* ❯.
6. Confirm the popup informing you about the addition of the check result to the baseline (select *Yes*).
7. The flag in the column *Is in Baseline* shows that the run series has been added to the baseline.

Configure a Local ATC Run Series for the Target Release

Proceed as described in the section *Configure a Local ATC Run Series for the Current Release* (see above) and specify the following entries for the new run series:

Overview of Entries

Fields	Descriptions
Description	Enter a short description for the ATC run series you want to configure. ⓘ **Note** You can use the template provided by the *Description* field. When you execute the run series, the built-in variables are filled with data for the system, the day of the week, the calendar week, and the year. However, you can also add further texts to these variables, rearrange them, or replace the built-in variables with your own texts.
Consider Baseline	Flag this field. ⓘ **Note** When this setting is activated, all findings which are also stored in the baseline are - depending on the baseline option - suppressed, treated as exempted, or will be shown with reduced priority. Note:

Fields	Descriptions
Check Variant	Enter one of the following check variants that matches your **target** SAP S/4HANA release:

S4HANA_READINESS_2022_NO_FLE

Predefined settings:

- Material number length = 18
- Extended amount field length is disabled
- Extended stock requirement field length is disabled
- Extended season/theme/collection field length is disabled

S4HANA_READINESS_2022

Predefined settings:

- Material number length = 40
- Extended amount field length is enabled
- Extended stock requirement field length is enabled
- Extended season/theme/collection field length is enabled

> ⓘ Note
>
> These product-specific global check variants check all the simplifications relevant for SAP S/4HANA 2022, including those for previous releases.

Fields	Descriptions
Objects to Check	Specify the set of development objects you want to check.

On the *Checkable Namespaces* tab, the option *By Query* lets you specify objects by name (such as by package name), by transport layer, or by component. The option *By Object Set* lets you specify an object set that you have defined in Code Inspector in the checked system.

> ⓘ Note
>
> You can use the value help to choose the packages, or the object set in the remote system.

On the *Modified Objects* tab, you can specify the modified source code objects you want to check.

When you have entered your settings, save the configuration.

Schedule the ATC Run Series for the Target Release

Proceed as described in the section *Schedule the ATC Run Series for the Current Release* (see above) and select the relevant run series for the target release. Choose *Execute in Background* (F9) to schedule the run series.

Analyze the Findings

To analyze the results of the ATC run series, proceed as follows:

1. Run transaction ATC.
   The *ABAP Test Cockpit Overview* screen appears.
2. In the navigation pane, expand the nodes ▌ *ATC Administration* ❯ *Runs* ▌ and double-click the *Manage Results* entry.
3. In the dialog, adapt the settings to display the last executed ATC run series. Usually, you can keep the default settings.
4. 4. Choose the Execute button in the toolbar.
   The screen displays a list of executed run series.
5. Select the relevant runs series and choose the button *Display* in the toolbar.
   In the dialog, the list of findings is displayed.

> ⓘ Note
>
> In the toolbar, a filter button can be used to display either the unresolved findings (by default) and/or the exempted findings – that, for example, have been included in the baseline.

4.5.1.3   Using the Custom Code Migration App

The Custom Code Migration app (Fiori ID: F3191) enables you to scope and analyse custom code. In addition, the app supports you with identifying unused custom code based on your collected usage data. It provides a graphical representation of custom code analysis results. The results can be filtered by various categories, such as quick fix availability, scope and usage data

To use the Custom Code Migration app to analyse your custom code, you need to do the following tasks:

1. Create a custom code migration project for the current release
2. Add the ATC run series to the baseline
3. Create a custom code migration project for the target release
4. Analyze the findings

Create a Custom Code Migration Project for the Current Release

To create a project, proceed as follows:

1. Start the tile *Custom Code Migration* from the SAP Fiori launchpad.
2. Choose *Create* to create a new custom code migration project.
3. Enter a *Project Description* for your new project.
4. In the field *Target Release* specify your **current** SAP S/4HANA release.

> ⓘ Note
>
> Make sure that the *Material Number Length* is set to the relevant value and the checkboxes
> for *Extended Amount Length*, *Extended Stock/Requirement Segment* and *Extended Season/Theme/
> Collection* are enabled, if you use them.

5. To define the *Destination*, choose the communication scenario.
6. Confirm your input with *Save*.

Add the ATC Run Series to the Baseline

Proceed as explained in *Add the ATC Run Series to the Baseline* in section Using the ABAP Test Cockpit [page 30].

Create a Custom Code Migration Project for the Target Release

To create the project, proceed as explained in *Create a Custom Code Migration Project for the Current Release* (see above), except that in the field *Target Release* you specify your **target** SAP S/4HANA release (for example, SAP S/4HANA 2022).

Analyze the Findings

When you create a custom code migration project, the SAP S/4HANA custom code checks are performed automatically. The Custom Code Migration app then gives you an analytical representation of SAP S/4HANA custom code check findings.

To analyze the findings, proceed as follows:

1. After the first analysis has been finished, choose *Analysis* to get an overview of the results.
2. Choose *Analyze Findings* to get a detailed analysis.
3. In the *Custom Code Migration - Analysis - Findings* view, you can specify various filters, for example:
   - *Simplification Item Category* specifies whether findings are related to functionality which is not available any more or has been changed in an incompatible way.
   - *SAP Note Number* lets you analyze findings of a specific simplification Item (for example field length extension of material number).

- *Scope Information* lets you filter the findings to show only findings for objects that are in scope.
- *Quick Fix Availability* allows you to analyze which findings can be solved by a Quick Fix and which findings have to be solved manually.

4. Change the settings for the chart.
   To show the quick fix availability per SAP Note title, you must specify the following settings for the chart:
   - SAP Note title (as Category)
   - Findings (as Axis 1)
   - Quick Fix Availability (as Series)

4.6 Upgrade Information for Java Instances

> ⓘ Note
>
> The services provided by SAP ECS in the context of your SAP S/4HANA upgrade project are related to the SAP S/4HANA ABAP system stack only. If your SAP S/4HANA system is connected to a separate Java instance (either operated by SAP in the private cloud environment or under your own IT administration), you need to take care yourself about keeping the JAVA instance and the applications on top of it compatible to the target release of your SAP S/4HANA system upgrade.

In case you are operating the Java instance yourself, the following aspects are relevant for you:

- Validate the version interoperability between your Java instance and the target SAP S/4HANA release with SAP Note 2251604 and review the architecture diagram attached to the SAP Note.
- Check that your operating system is still supported for your target Java instance release. For more information, see the Product Availability Matrix at https://apps.support.sap.com/sap/support/pam . If your operating system is no longer supported, you must migrate to a supported operating system using the system copy procedure. For information see the system copy guide at https://support.sap.com/sltoolset .

In case the Java instance is operated by SAP you need to create a service request with identifier *BASIC_1.5.07* to initiate appropriate upgrade actions on the connected Java instances.

4.7 Upgrade Information for Operational Data Provisioning for SAP BW

When upgrading to SAP S/4HANA 2023, software component SAP BASIS is also updated to Version 7.58. With the upgrade of SAP BASIS 7.53, two technical job definitions automatically became active:

- `SAP_ODQ_CLEANUP`: Scheduling of program `ODQ_CLEANUP` for reorganization of delta queue
- `SAP_ODQ_DAEMON_STARTER`: Scheduling of program `ODQ_DAEMON` for support of real-time subscriptions

Before the upgrade, please check whether you have scheduled program `ODQ_CLEANUP` or `ODQ_DAEMON` with your own variants. In this case, you must decide whether you continue with the scheduling of your own variants after the upgrade, or instead, want to use the variants recommended by SAP in the technical job definitions. If your own variants correspond to the variants recommended by SAP, choose to use the technical job definitions.

For more information, see SAP Note 2677355 .

4.8 Data Transition Validation

The data transition validation is a tool that allows you to compare business data before and after a system conversion from SAP ERP to SAP S/4HANA, or before and after an SAP S/4HANA upgrade. The tool supports validation of upgrade or conversion scenarios with predelivered content for business validation. The tool uses business reports or transactions as instruments of comparison. It is available as part of the standard license.
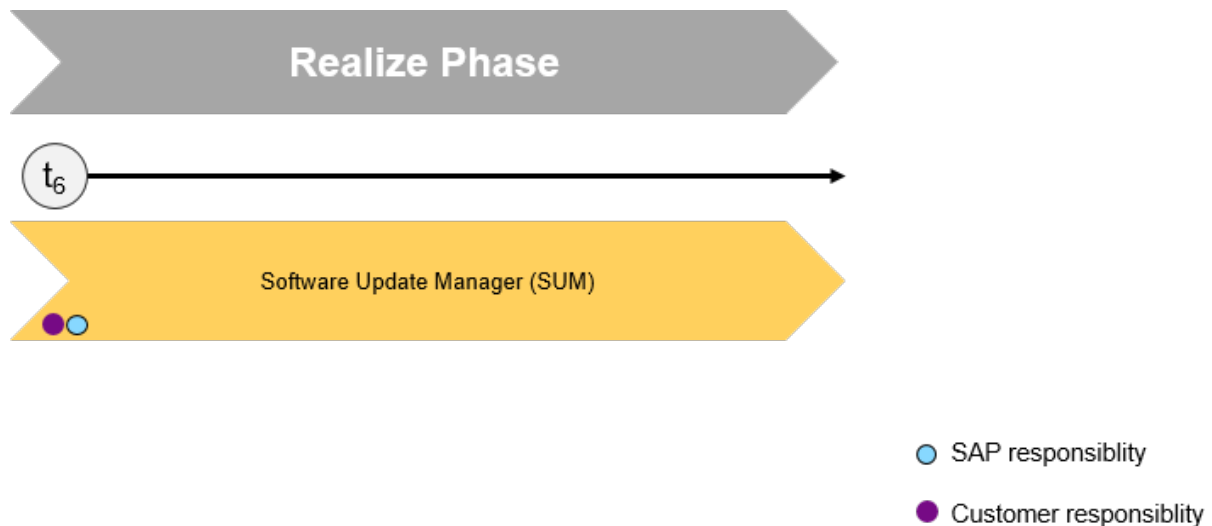
To use DTV for the business validation after an upgrade, proceed as follows:

1. In the preparation phase of the uprgade, define the reports to be used for validation together with your requesting lines of business and your internal or external auditors.
2. Create a project and maintain required test specifications in the DTV tool.
3. During the ramp-down of the system prior to the SAP S/4HANA system upgrade, trigger data extraction from the source release.
4. Once the SAP S/4HANA system upgrade is finished, proceed with the tasks in the target release to validate business correctness.

For more information about the DTV tool, see:

- Product documentation at https://help.sap.com/s4hana_op_2023 ▶ *Use* ❭ *Product Assistance* ❭ *English* ❭ *Enterprise Technology* ❭ *ABAP Platform* ❭ *Administrating the ABAP Platform* ❭ *Administration Concepts and Tools* ❭ *Solution Life Cycle Management* ❭ *Software Logistics* ❭ *Data Transition Validation* ❭
- SAP Note 3117879

5 Realizing the Upgrade

Realize Phase

t_6

Software Update Manager (SUM)

○ SAP responsiblity
● Customer responsiblity

Upgrade to SAP S/4HANA Cloud Private Edition: Realizing

When you have completed the previous steps and have implemented all the adaptations required to ensure your system and your custom code is suited to the SAP S/4HANA Cloud Private Edition release to which you are upgrading, you then request SAP ECS to run the technical upgrade process facilitated by the SUM tool. SAP ECS triggers the SUM 24 hours before the execution start time specified in the service request. With this timing SAP ECS can complete the uptime activities controlled by the SUM tool so that the upgrade downtime can start at the time specified in the service request.

> ⓘ Note
>
> If you need SAP ECS to trigger the uptime earlier, note this in the service request.

SAP ECS clarifies any application-related break points such as SPDD, Dev lock, SI-Checks, and so on with you and informs you as soon as the uptime is complete. Once you have completed necessary ramp-down activities, you hand over to SAP ECS. Ramp-down activities include stopping application-related background jobs, locking business users, clearing stuck transaction queues and update errors, such as verifying that the system is idle and ready for downtime activities.

Based on the schedule indicated in the service request, SAP ECS then triggers the SUM downtime. If there are delays in the execution, SAP ECS sends back the service request to provide you with the new downtime schedule to proceed with the execution. You can select the upgrade service template under https://me.sap.com/servicerequest .

Application data is usually migrated during release upgrades or updates while the system is down. SAP provides the Silent Data Migration Infrastructure (SDMI) to allow the migration of application data after the upgrade during business operations. For more information, see Silent Data Migration [page 42].

For all information about using the SUM, see the guide *Software Update Manager 2.0 <latest version>* available at https://support.sap.com/sltoolset 〉 *Software Logistics Toolset* 〉 *System Maintenance* 〉 *System Maintenance Scenarios* 〉 *Software Update/Upgrade using SUM* 〉.

5.1 Follow-On Activities for Policy Management (FS-PM)

With Policy Management (FS-PM), you can map the whole life cycle of an insurance contract, starting from the creation of an application, through policy issuance and ongoing contract maintenance, right up to the termination of the contract.

SAP Notes for the Upgrade of Policy Management

SAP Note Number	Title
3373830 ⤤	Release Information Note (RIN) for Policy Management and Claims Management in SAP S/4HANA 2023

6 Follow-Up Activites
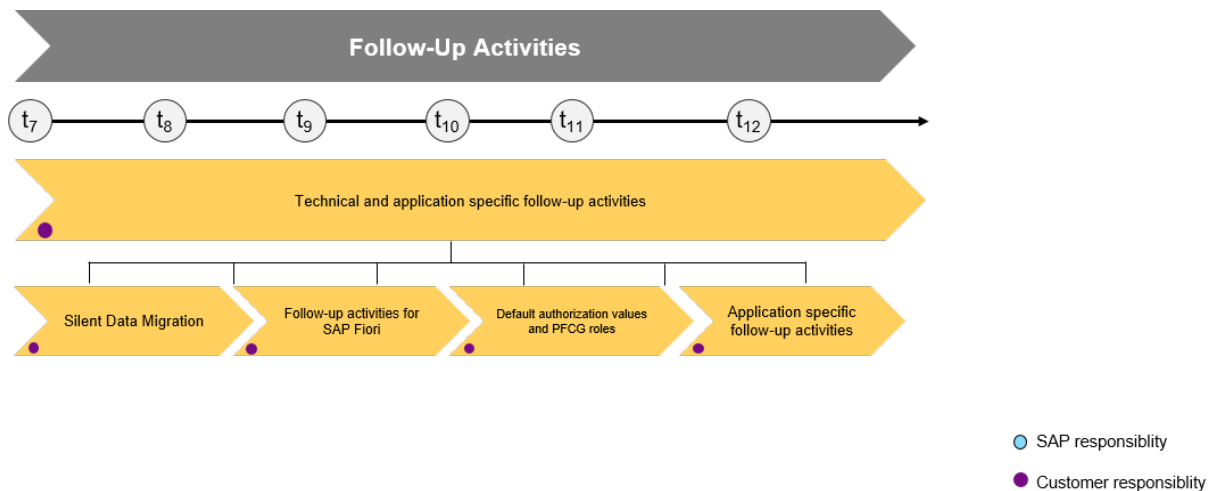
Upgrade to SAP S/4HANA Cloud Private Edition: Follow-up activities

After SAP ECS has performed the technical upgrade, make sure to follow-up on the activities displayed in the graphic. For a short overview of the complete process, see Overview of the Upgrade Process [page 9].

6.1 Silent Data Migration

Migration of application data usually happens during release upgrades or updates during downtime. In contrast, the Silent Data Migration Infrastructure (SDMI) allows zero-downtime upgrades and runs after the upgrade (or conversion) during business operations.

An SDMI supports uptime capability for at least one release. Therefore zero-downtime upgrades are possible if every release is taken into account. If an upgrade jumps over a certain release (for example, if the upgrade goes from SAP S/4HANA 1809 straight to SAP S/4HANA 2020), the SDMIs from the release that was jumped over (in this example, SAP S/4HANA 1909) are done during business downtime (if they do not support uptime capability for the target release).

As of SAP S/4HANA 2020 (as start release) SDMIs also support **three** releases in uptime making it possible to do jump-upgrades with zero downtime option (ZDO) over up to **two** releases (towards the **third** release), for example from SAP S/4HANA 2020 to SAP S/4HANA 2023.

By default the SDMIs are run during uptime. The SDMI job from the job repository starts and calls the SDMIs in each client individually once the system comes out of the maintenance mode. To see all relevant SDMIs, call transaction `SDM_MON`.

The users can be maintained in transaction `SDM_USER` prior to the upgrade, so that the users can comply to your corporate standard. However, they can also be created as technical users during the upgrade process by the Software Update Manager (SUM). In this case this will be accomplished by the SAP ECS operations team.

During the post-processing phase, the SUM checks if the technical user exists. If not, a message will be created in the update log. If the users are not created, the SDMIs cannot be started and the data will not be migrated.

> ⓘ Note
>
> It is also possible to create the technical users after the SUM run. For more information, see https:// help.sap.com/s4hana_op_2023 ▷ *Use* ❯ *Product Assistance* ❯ *English* ❯ *Enterprise Technology* ❯ *ABAP Platform* ❯ *Adminstrating the ABAP Platform* ❯ *Administration Concepts and Tools* ❯ *Solution Life Cycle Management* ❯ *Silent Data Migration Infrastructure* ▷.

The SUM offers the option to force the SDMI processing during downtime. In that case, the SDMIs are finished by the time the system resumes business operations.

> ⚠ Caution
>
> On the one hand, this option has the one benefit that the business data is no longer changed by SDMI processes after the upgrade procedure is completed. On the other hand, this option also includes disadvantages that you should be aware of:
>
> - The overall system business downtime is significantly extended due to the time it takes to execute the data migration because the SUM runs the SDMI jobs synchronously and waits until they are completed.
> - Depending on the available resources, the size of the migration tables and the configuration of the dialog work processes and the parallelization framework, the downtime can even reach a duration that is no longer tolerable.

> ⓘ Note
>
> If you want to have SDMI data migrations already executed during the upgrade procedure in the postprocessing roadmap step, you need to mention this in the upgrade service request itself. No separate ticket is required.

> ⓘ Note
>
> Please take care that all SDMIs have been processed successfully in all clients. Otherwise this will leave the upgrade unfinished and bears the risk, that some new application functionality may not be available on the target release. Furthermore, all SDMIs need to be done before the next upgrade can happen.

For more information, see:

- SAP Note 2850918 *Authorizations required for Silent Data Migration (SDMI) in SAP S/4HANA Release*
- SAP Note 2664638 *Create and assign SDMI User in a client*
- SAP Note 2907976 *Silent Data Migration (SDMI) - FAQ*
- SAP Note 2916801 *Silent Data Migration (SDMI) Configuration Options*
- SAP Note 3382097 *SDMI Classes in the Silent Data Migration Framework in SAP S/4HANA 2023 (Details, Corrections, Special Handling)*
- https://blogs.sap.com/2019/10/03/s4hana-silent-data-migration-infrastructure-quick-guide/

6.2 Cleaning Up Obsolete Data After the Upgrade

The Obsolete Data Handling tool allows you to delete obsolete data that may remain after the upgrade.

Obsolete data originates from SAP S/4HANA data model simplifications in many application areas where the related application data is migrated to new data structures. These areas include Material Management, Financials, Sales and Distribution, Environment and Health Science and others. The source data is not deleted automatically during the conversion because this would increase the business downtime and the obsolete data store may sometimes be required during or after the upgrade. Therefore, after you have successfully tested and validated the upgrade results, you can clean up the obsolete data with the Obsolete Data Handling tool.

> ⓘ Note
>
> With SAP S/4HANA 2023 a new obsolete data handling tool is delivered.
>
> The old tool (report/transaction code `ODH_Data_processing`) can only be used with SAP S/4HANA 2023 to view the logs of already finished cleaning runs. It will not be available at all for future SAP S/4HANA releases. For the old tool, see SAP Note 2661837 .
>
> **All new obsolete data cleaning activity must be done with the new, class-based tool** (transaction code `SODH`). For information on how to enable and use this tool in the productive SAP S/4HANA 2023 system, see SAP Note 3335020 .

6.3 Follow-Up Activities for SAP Fiori

Please perform the following tasks on your **front-end server** after the technical upgrade with the Software Update Manager (SUM) to SAP S/4HANA 2023 to ensure that your SAP Fiori Launchpad and SAP Fiori Applications are able to run properly:

Those activities are not part of your standard SAP S/4HANA Cloud Private Edition subscription, but could be covered by SAP ECS as part of an additional chargeable Cloud Application Services package.

1. Check the latest correction notes from the *SAP Fiori for SAP S/4HANA 2023 Release Information Note* 3336823 .
2. **Update the SAPUI5 application index** by running the report `/UI5/APP_INDEX_CALCULATE`.
   For more information about how to run this report, see the product assistance at: https://help.sap.com/s4hana_op_2023 ▶ *Use* ▶ *Product Assistance* ▶ *English* ▶ *Enterprise Technology* ▶ *ABAP Platform* ▶ *UI Technologies* ▶ *SAPUI5: UI Development Toolkit for HTML5* ▶ *Developing Apps* ▶ *The SAPUI5 ABAP Repository and the ABAP Back-End Infrastructure* ▶ *SAPUI5 Application Index* .
3. **Replicate app descriptors:**
   If you use Web Dynpro or SAP GUI for HTML Apps on your SAP Fiori Launchpad, it may be necessary to update their app descriptors or to load new app descriptors from the backend catalogs into the technical frontend catalogs.
   1. Check that your system is configured as described in *Replicate App Descriptors* at https://help.sap.com/s4hana_op_2023 ▶ *Use* ▶ *Product Assistance* ▶ *English* ▶ *Enterprise Technology* ▶ *SAP*

Fiori ⟩ *SAP Fiori Overview* ⟩ *Implement SAP Fiori Apps* ⟩ *UI-Specific Implementation Tasks* ⟩ *Basic Information* ⟩ .

2. Run the report `/UI2/GET_APP_DESCR_REMOTE_ALL` on your front-end server to start the replication.

> ⓘ Note
>
> This replication step is also required in an embedded deployment scenario.

4. **Invalidate caches:**

   1. Run transaction `/UI2/INVAL_CACHES` or report `/UI2/INVALIDATE_GLOBAL_CACHES` to invalidate all UI2 caches.
   2. If you are using the SAPUI5 cache busting mechanism for your SAP Fiori Launchpad, run the report `/UI2/INVALIDATE_CLIENT_CACHES` to invalidate the client caches.

      For more information, see the product assistance at: https://help.sap.com/s4hana_op_2023 ⟩ *Use* ⟩ *Product Assistance* ⟩ *English* ⟩ *Enterprise Technology* ⟩ *ABAP Platform* ⟩ *UI Technologies* ⟩ *SAP Fiori Launchpad* ⟩ *Administration Guide* ⟩ *Operations* ⟩ *Performance* ⟩ *Client-Side Cache* ⟩ *Cache Buster for SAP Fiori Launchpad and SAP Fiori Apps* ⟩ *Invalidating Client Caches* ⟩ .
   3. Run the report `/UI2/DELETE_CACHE_AFTER_IMP`. It clears the UI2 cache on the front-end server.

> ⓘ Note
>
> The above steps are also required when updating to a new service pack (SP) or feature package stack (FPS).

Please do the following task on your **back-end server**:

If you use SAP GUI for HTML Apps on your SAP Fiori Launchpad, check if the ICF node `/sap/public/bc/its` and all its sub-nodes are activated (use transaction `SICF`).

SAP Fiori Launchpad Settings for Improved Performance

As of SAP S/4HANA 1809 additional configuration settings are available for the SAP Fiori Launchpad that improve the system performance when launching SAP GUI for HTML and Web-Dynpro apps.

> → Recommendation
>
> When you upgrade from a lower SAP S/4HANA release or if these settings were not yet implemented in SAP S/4HANA 1809, 1909, 2020, 2021 or 2022 we recommend that you enable these performance improvements by activating the features described below on your front-end server after the upgrade to SAP S/4HANA 2023 (any feature package or support package stack).

1. **In-place navigation for classic UIs (SAP GUI for HTML and Web-Dynpro Apps)**

   > ⓘ Note
   >
   > We recommend activating the in-place navigation centrally on your front-end server (on client level). If this is not desired for some users or roles, you can override the central setting by defining a target mapping parameter for ex-place and assigning it (using a catalog) to a specific role. In addition, it

is also possible define exceptions for ex-place navigation on app level (in the target mapping) in the launchpad content.

For more information, see https://help.sap.com/s4hana_op_2023 ▌ *Use* ❯ *Product Assistance* ❯ *English* ❯ *Enterprise Technology* ❯ *ABAP Platform* ❯ *UI Technologies* ❯ *SAP Fiori Launchpad* ❯ *Administration Guide* ❯ *Managing Launchpad Settings* ❯ *Configuring In-Place Navigation for Classic UIs* ▌.

2. **Improved performance when launching SAP GUI for HTML apps**

   For more information, see https://help.sap.com/s4hana_op_2023 ▌ *Use* ❯ *Product Assistance* ❯ *English* ❯ *Enterprise Technology* ❯ *ABAP Platform* ❯ *UI Technologies* ❯ *SAP Fiori Launchpad* ❯ *Administration Guide* ❯ *Operations* ❯ *Performance* ❯ *Improving Navigation Performance for SAP GUI Applications* ▌.

> ⓘ Note
>
> In mixed backend scenarios, where backend products with lower SAP S/4HANA releases are also connected to your front-end server, the features are not supported.

For more information on how to configure the SAP Fiori Launchpad, see https://help.sap.com/s4hana_op_2023 ▌ *Use* ❯ *Product Assistance* ❯ *English* ❯ *Enterprise Technology* ❯ *ABAP Platform* ❯ *UI Technologies* ❯ *SAP Fiori Launchpad* ▌.

6.4 Default Authorization Values and PFCG Roles

Checking Default Authorization Values After the Upgrade

After the upgrade, you have to perform some follow-up activities regarding the authorization concept.

The default authorization values are the data basis for the provision of authorizations required for applications in the Profile Generator (transaction `PFCG`).

Default authorization values for standard SAP applications are delivered via upgrade, support package deployment, or SAP Note. This SAP-provided data is displayed and maintained in transaction `SU22`.

Customer default authorization values are maintained in transaction `SU24`. Only these customer default authorization values are applied when PFCG is used.

After the upgrade the SAP default values may have been changed. You therefore must use transaction `SU25` to carry out a comparison of the default values (steps 2a and 2b) and transfer the default values maintained by SAP.

For more information about this process, see SAP Notes 1539556 and 440231 .

Updating PFCG Roles

After checking and updating the default authorization values you must do some follow-up activities for the PFCG roles. You need to consider how changed default authorization values as well as new or changed content in SAP Fiori Catalogs affect your PFCG roles. You adjust your PFCG roles using the transaction SU25 actions *Update of Application Groups in Role Menu* and *Roles to Be Checked*.

6.5 Follow-Up Activities for Advanced Variant Configuration

- Tasks required after the upgrade from SAP S/4HANA releases lower than 1709:
  In this case, you have to all the steps described in the section *Follow-Up Activities for Advanced Variant Configuration* in the *Installation Guide for SAP S/4HANA* at https://help.sap.com/ s4hana_op_2023 ▶ *Implement* ❭ *Guides* ❭.
- Tasks required after the upgrade from SAP S/4HANA releases equal to or higher than 1709:
  In this case, you have to do the steps described in SAP Note 2987015 .

6.6 Follow-Up Activities for PP/DS

Handling of material plants that are *Flagged for Deletion* in PP/DS has been changed as of SAP S/4HANA 2022. If you are upgrading from SAP S/4HANA 2021 or lower to SAP S/4HANA 2022 or higher, you must run the report PPDS_DEACTIVATE_ADVN_PLN_PROD manually to update the *Advanced Planning Status* for material plants that are *Flagged for Deletion*. However, if you are upgrading from SAP S/4HANA 2022 to SAP S/4HANA 2023, you do not need to run the report PPDS_DEACTIVATE_ADVN_PLN_PROD manually because the data in the SAP S/4HANA 2022 system is already correct.

> ⓘ Note
>
> For more information, see SAP Note 3150247 .

7 Appendix

7.1 SAP Readiness Check Versus SI-Check

SAP Readiness Check Versus SI-Check

The tools SAP Readiness Check SAP S/4HANA upgrades and Simplification Item-Check (SI-Check) are used to support the upgrade process, see also Overview of the Upgrade Process [page 9]. The following table explains the differences between the two tools.

Tool Comparison

	SAP Readiness Check	Simplification Item-Check /SDF/RC_START_CHECK
Type	Customer self-service provided by SAP Digital Business Services (included as standard support)	Standalone report
SAP Solution Manager	Not required	Not required
SAP Cloud ALM	Not required	Not required
User Interface	Cloud-based web interface	SAP GUI
Included Checks	• Simplification item relevance • Custom code • Recommended SAP Fiori apps • Add-on compatibility • SAP Custom Development projects • Check of system consistency before conversion or upgrade • Integration analysis	• Simplification item relevance • Check of system consistency before conversion or upgrade
Called by Software Update Manager (SUM)	No	Yes

	SAP Readiness Check	Simplification Item-Check /SDF/RC_START_CHECK
Mandatory	No	Yes
Use Cases	• Conversion to SAP S/4HANA • Upgrade to a higher SAP S/4HANA release or feature pack stack	• Conversion to SAP S/4HANA • Upgrade to a higher SAP S/4HANA release or feature pack stack

While both the SAP Readiness Check and the Simplification Item-Check can display information on simplification item relevance and consistency, they serve different purposes and are both required:

- SAP Readiness Check for SAP S/4HANA upgrades is mainly a planning tool which you run early in an upgrade project to get an overview about the required activities – including tasks related to simplification items. It is also useful for tracking these activities during the project, for example, using the burndown chart that shows simplification item consistency errors.

- The Simplification Item-Check is used on operational level during the cleanup of the simplification item consistency errors, up to the downtime, before which the SUM tool does the final executions of the SI-Check. So, the SI-Check offers a more detailed control over running the checks. This includes the option to re-run checks for individual simplification items instead of running all checks like SAP Readiness Check for SAP S/4HANA upgrades does. This option can significantly reduce the check runtime when you just want to re-check if a specific error which you have just fixed is really gone.
  In addition, the SI-Check offers the option to exempt certain types of errors (for details, see the blog post linked below).

For more information, see:

- SAP Note 3059197 (about the SAP Readiness Check).
- In this guide Simplification Item-Check [page 25]
- Blog post https://blogs.sap.com/2018/03/26/sap-s4hana-simplification-item-check-how-to-do-it-right./

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