



SAP NetWeaver '04  
Component Upgrade Guide

SAP<sup>®</sup> Web Application  
Server 6.40 SR1:  
IBM eServer iSeries

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## Typographic Conventions

| Type Style          | Description  |
|---------------------|--|
| <i>Example Text</i> | Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options.  |
|                     | Cross-references to other documentation  |
| <b>Example text</b> | Emphasized words or phrases in body text, graphic titles, and table titles   |
| EXAMPLE TEXT        | Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE. |
| Example text        | Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.                                   |
| <b>Example text</b> | Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.  |
| <Example text>      | Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.   |
| EXAMPLE TEXT        | Keys on the keyboard, for example, F2 or ENTER.  |

## Icons

| Icon   | Meaning        |
|--|----------------|
|  | Caution        |
|  | Example        |
|  | Note           |
|  | Recommendation |
|  | Syntax         |

Additional icons are used in SAP Library documentation to help you identify different types of information at a glance. For more information, see *Help on Help* → *General Information Classes and Information Classes for Business Information Warehouse* on the first page of any version of *SAP Library*.

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# Upgrade to SAP Web Application Server 6.40 SR1: IBM eServer iSeries

## Purpose

This documentation describes the upgrade to SAP Web Application Server 6.40 Support Release 1 from Source Release SAP Basis 4.6D and higher. It also contains additional useful information about the upgrade. The information in this documentation is intended for SAP system administrators with operating system, database, and SAP Web Application Server knowledge.

The [Upgrade – Step by Step \[page 16\]](#) section is a list of all actions that you must perform to upgrade your system successfully. The actions are placed in chronological order, so that you can work through them just like a checklist.

The following two parts of this documentation explain the upgrade procedure in detail:

- [Product-Specific Information for the SAP Web Application Server Upgrade \[page 28\]](#)
- [General Upgrade Information \[page 35\]](#)

The last part of this documentation, [Additional Information \[page 129\]](#), gives you information on troubleshooting, the administration tasks you need to perform before and after the upgrade, and the tools you use to upgrade the system.



Both the [structure of the documentation \[page 12\]](#) and the [upgrade procedure \[page 39\]](#) itself have changed significantly as of SAP Web Application Server 6.10.

## Integration

If you want to upgrade the component SAP Web Application Server 6.40 in the context of the upgrade of a mySAP Business Suite solution or one of its business scenarios, it is essential that you familiarize yourself with the contents of the corresponding Upgrade Master Guide before starting to upgrade.

The Upgrade Master Guide is the central document for the upgrade of mySAP Business Suite solutions and business scenarios. It lists the components and third-party applications required by each business scenario of a mySAP Business Suite solution, and refers to the required installation and upgrade guides. It also defines the upgrade sequence of the business scenarios of the corresponding mySAP Business Suite solution.



To find the latest version of this documentation and the Upgrade Master Guide, see SAP Service Marketplace at [service.sap.com/instguides](http://service.sap.com/instguides).

In addition to this documentation, you require other information, such as the Release Notes for the applications that you implement, the SAP Implementation Guide (IMG), the [SAP Notes \[page 25\]](#) that are specific to this upgrade, and any other documentation referred to in this documentation.

## Constraints

The following constraints apply:

- This documentation only applies if you are upgrading your SAP system on IBM eServer iSeries.



- You cannot upgrade from a non-Unicode to a Unicode system or vice versa. The Unicode migration is independent from the SAP system upgrade. For more information about Unicode, see SAP Service Marketplace at [service.sap.com/Unicode@SAP](http://service.sap.com/Unicode@SAP).

# 1 Introduction

This section of the documentation contains general information on:

- [Naming conventions \[page 11\]](#)

This section explains the terminology and abbreviations used in this documentation.

- [How to use this documentation \[page 12\]](#)

In SAP Web Application Server 6.10 the structure of the upgrade documentation has been changed from a process flow description with additional information to an information pool.

- [New features in the upgrade procedure \[page 14\]](#)

The upgrade procedure is continually being enhanced. This section contains the most important changes to the procedure, for both current and previous releases.

# 1.1 Naming Conventions for the SAP Web Application Server Upgrade

## SAP Basis and SAP Web Application Server

Release 6.10 renames the SAP Basis Component as the *SAP Web Application Server*. In this documentation, the term *SAP Basis* (or the short form *Basis*) is used when referring to Release 4.6D and lower, and the term *SAP Web Application Server* (or the short form *SAP Web AS*) is used when referring to Release 6.10 and higher.

## SAP Web Application Server System and SAP System

In this documentation, the term *SAP system* is the same as *SAP Web Application Server system*. *SAP* is also used as a synonym for *SAP Web Application Server* in terms such as *SAP start profile* or *SAP system language*.

## Release

Unless otherwise specified, the term *release* is used in the product-specific part of this documentation to refer to the release of the SAP Web Application Server system.

In the general part of this documentation, *release* is used to refer to the release of the Basis or SAP Web Application Server system.

## SAP System ID

In this documentation, the SAP system ID is abbreviated as *SID* or *sid*. If *<sid>* is used, your SAP system ID must be in lowercase letters, for example, "prd". If *<SID>* is used, you must write in uppercase letters, for example, "PRD".

## ID for the SAP Web Application Server Release

In this documentation, *<rel>* stands for the relevant SAP Web Application Server release, without a decimal point, such as *640*.

## Support Packages and Patches

As of Basis Release 4.6, SAP uses the term *Support Packages* instead of *SAP patches*. There are different types of Support Packages, such as Support Packages for technical component SAP\_BASIS or Add-on Support Packages.

## Archiving and Journaling

In this documentation, the term *archiving* is used as a synonym for *journaling database file changes*.

## IBM eServer iSeries and Short Forms

In this documentation, the short form *iSeries* is used for *IBM eServer iSeries*. In previous versions of this documentation, *IBM eServer iSeries* was referred to as *IBM AS/400*.

## IBM DB2 Universal Database for iSeries and Short Forms

In this documentation, the short form *DB2 UDB for iSeries* is used for the database *IBM DB2 Universal Database for iSeries*, and in certain cases, the SAP ID *DB4* is used as well. In previous versions of this documentation, *IBM DB2 Universal Database for iSeries* was referred to as *IBM DB2 Universal Database for AS/400* or *DB2/400*.

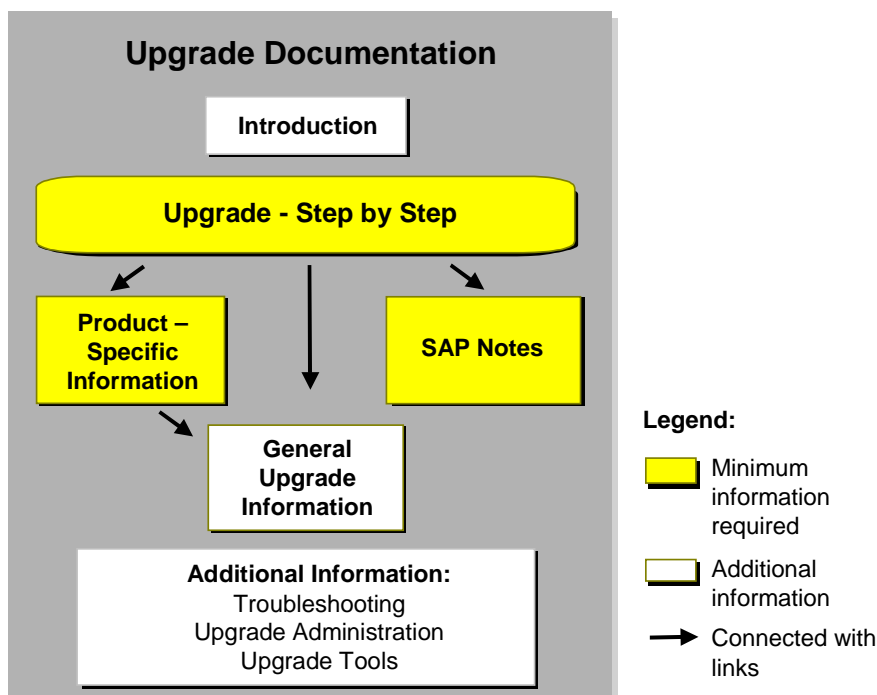
## 1.2 How to Use this Documentation

The documentation on upgrading the SAP system contains a large amount of information. Its aim is to give you both the information you need immediately at your fingertips, as well as providing additional background information when required. Treat the documentation as a pool of information.



If you have a lot of experience in upgrading the SAP system, you will probably only need the parts [Upgrade – Step by Step \[page 16\]](#), [Product-Specific Information \[page 28\]](#) and [SAP Notes for the Upgrade \[page 25\]](#).

### Structure of the Documentation



The documentation consists of the following parts:

- Introduction

The first sections of this documentation are as follows:

- [New Features in the SAP Web Application Server Upgrade \[page 14\]](#)
- [Naming Conventions for the SAP Web Application Server Upgrade \[page 11\]](#)

They contain information on new features in the upgrade for the last few releases, and on the naming conventions used in the documentation.

- [Upgrade – Step by Step \[page 16\]](#)

This section is the **core of the documentation**. It is a list of all actions that you must perform to upgrade your system successfully. The short descriptions of the individual actions contain the following:

- Important information, such as user entries
- Links to a detailed description of the action

- Links to any product-specific information about the action



The upgrade actions are listed chronologically. Use the [Upgrade – Step by Step \[page 16\]](#) section as a checklist for upgrading the system. This ensures that you do not miss important information.

Use the links to the general descriptions of the actions and to any additional product-specific information to help you perform the actions.

- [SAP Notes for the SAP Web Application Server Upgrade \[page 25\]](#)

This section contains a list of SAP Notes relevant for the upgrade.

- [Product-Specific Information for the SAP Web Application Server Upgrade \[page 28\]](#)

This part of the documentation contains additional information or restrictions on the descriptions in *General Upgrade Information*, which only affect this specific SAP product.

The headings of the sections are the same as the corresponding sections in the *General Upgrade Information*. Each product-specific text contains a link to the general description of the action.



The information in the product-specific part takes **priority** over the information in the general part of the documentation.

- [General Upgrade Information \[page 35\]](#)

This part of the documentation is a general description of the upgrade of an SAP system. It contains procedures and background information about the upgrade process flow and the individual actions. However, it does not contain all the information you need for the upgrade of your specific SAP product. For information on any extra details about the upgrade of your product, see the [Product-Specific Information \[page 28\]](#).

- [Additional Information \[page 129\]](#)

This part of the documentation contains three sections:

- [Troubleshooting \[page 130\]](#)
- [Upgrade Administration \[page 153\]](#)
- [Upgrade Tools \[page 162\]](#)

These sections contain information on troubleshooting, the administration tasks you need to perform for the upgrade, and the tools that you use to upgrade the system.

Use the links from section [Upgrade – Step by Step \[page 16\]](#) to the general descriptions of the actions and to any additional product-specific information to help you perform the actions.

## 1.3 New Features in the SAP Web Application Server Upgrade

### New Features in the Upgrade to SAP Web Application Server 6.40

- Support Release 1: Support Package levels included in the upgrade  
SAP Web Application Server 6.40 Support Release 1 is based on the following Support Package levels:
  - SAP ABA 640: 09
  - SAP BASIS 6.40: 09
  - PI\_BASIS 2004\_1\_640: 6
- Consistency check for function groups in the customer namespace  
Phase `JOB_RSTLIBG` checks the consistency between tables `TLIBG` and `TADIR` for function groups in the customer namespace. In case of inconsistencies, the `CHECKS.LOG` file contains an error message.
- Delivery on DVD  
As of SAP NetWeaver '04, the data and tools needed for the upgrade are delivered partly on CD and partly on DVD, which reduces the size of the package.

### New Features in the Upgrade to SAP Web Application Server 6.20

- Early creation of secondary indexes  
With strategy *downtime-minimized*, some of the secondary indexes will already be created during uptime. This applies to secondary indexes that are new in the target release and whose fields already exist in the source release. The background job that creates the indexes will not lock the tables concerned.
- Phase list for the upgrade in HTML format  
The [phase list \[page 160\]](#) is no longer part of the upgrade documentation. Instead, it is contained in the `htdoc` subdirectory of the upgrade directory in the form of HTML files. You can also create the phase list yourself by using the `'htmlph1'` option to call `R3up`.
- New procedure for dealing with add-ons  
In the `IS_SELECT` phase, you can include SAINT packages in the upgrade that you put in the transport directory before the upgrade.
- Calculating an add-on queue  
If you made a decision for all add-ons in the `IS_SELECT` phase, a new queue calculation is triggered. This calculation checks whether the import prerequisites can be met for the add-ons, and determines the sequence in which the corresponding requests are imported.
- New functions for including Support Packages  
To import Support Packages in the `BIND_PATCH` phase, the following Support Package levels are determined and taken into consideration for each component:

a. Minimum required Support Package level

Support Package level that the included add-ons of the target release require as an import prerequisite. The add-on queue calculation determines the minimum required Support Package level.

You are not allowed to select a Support Package level that is lower than the minimum level.

b. Equivalence Support Package level

You can define attributes for the Support Packages of the source release that determine which Support Package in a higher release corresponds to the one in the source release. This Support Package must be included so that no data is lost in the upgrade.

`PREPARE` determines this equivalence Support Package level in the `PATCHK_EQUI` phase.

The minimum and the equivalence Support Package levels for each component are displayed on the dialog box (wizard).

- Including a SPAM update

In the `BIND_PATCH` phase you can include a SPAM update for the **target release**.

- Conflict check

To check whether the add-on requests and CRTs are complete, `PREPARE` triggers a conflict check. You are then prompted to include the corresponding CRTs for the included add-ons, if necessary.

- Modifications

The procedure for copying modifications to the standard SAP system has changed. Modified objects that belong to the software components whose release does not change during the upgrade are copied automatically and therefore do not need to be adjusted again. Modified objects that belong to software components that are being upgraded are no longer copied automatically. Instead, all of these modifications are offered for adjustment, including modifications to objects that are deleted by the upgrade and that are not shipped by SAP in a more up-to-date version.

This new procedure may cause more objects to be offered in the modification adjustment than was previously the case. Customer objects are not affected by this change and are retained as usual.

## 2 Upgrade - Step by Step

### Purpose



If you have a lot of experience in upgrading the SAP system, you will probably only need the parts *Upgrade – Step by Step*, [Product-Specific Information \[page 28\]](#) and [SAP Notes for the Upgrade \[page 25\]](#). All other sections contain additional information on the upgrade, troubleshooting, and administration tasks.

This section is constructed as a checklist and contains all the actions you need to:

- [Find SAP Notes \[page 25\]](#)
- Plan the upgrade ([SAP Web Application Server-specific \[page 29\]](#) / [general \[page 36\]](#))
- Prepare the upgrade ([SAP Web Application Server-specific \[page 32\]](#) / [general \[page 66\]](#))
- Upgrade the SAP system ([SAP Web Application Server-specific \[page 34\]](#) / [general \[page 97\]](#))
- [Perform post upgrade activities \[page 113\]](#)

The actions are placed in chronological order, so that you can work through them just like a checklist. Use the links to the general descriptions of the actions and to any additional product-specific information to help you perform the actions.

The last part of this documentation, [Additional Information \[page 129\]](#), contains three sections with information on how to proceed with errors, perform administration tasks and use the upgrade tools:

- [Troubleshooting \[page 130\]](#)
- [Upgrade Administration \[page 153\]](#)
- [Upgrade Tools \[page 162\]](#)

### Process Flow

#### SAP Notes for the Upgrade

This upgrade documentation is enhanced and updated by SAP Notes in SAPNet – R/3 Frontend. These SAP Notes are an important source of information when you plan and prepare your upgrade, and also help you perform the actual upgrade.

| ✓ | Action   |
|---|--|
|   | You request the current <a href="#">SAP Notes for the upgrade [page 25]</a> . You require at least the following SAP Notes: <ul style="list-style-type: none"> <li>• General <b>Upgrade Note 775047</b></li> <li>• The SAP Web Application Server-specific <b>SAP Note 781092</b> (database-specific)</li> </ul> |

### Upgrade Planning

Before you start the actual upgrade, you must plan it carefully so that downtime is reduced to a minimum, and the upgrade runs as efficiently as possible.



The *Upgrade Planning* part of this documentation contains additional [SAP Web Application Server-specific \[page 29\]](#) and [general \[page 36\]](#) information.

| ✓ | Action  |
|---|---|
|   | You can upgrade the <a href="#">front-end software [page 38]</a> as soon as you receive the software package.   |
|   | You familiarize yourself with the features of the <a href="#">System Switch Upgrade [page 39]</a> and its effect on the way you upgrade the system.   |
|   | You decide on an <a href="#">upgrade strategy [page 41]</a> , taking into account your operating system and database upgrade.   |
|   | You define an <a href="#">archiving strategy [page 45]</a> for your database.   |
|   | Before you start the upgrade, you check the <a href="#">database-specific aspects [page 46]</a> and include them in your upgrade schedule, if necessary.  |
|   | You plan <a href="#">data management measures [page 47]</a> to reduce the amount of data, if necessary.   |
|   | You plan the <a href="#">incremental table conversion [page 47]</a> , if necessary.   |
|   | You plan the upgrade schedule ( <a href="#">SAP Web Application Server-specific [page 29]</a> / <a href="#">general [page 49]</a> ).  |
|   | Depending on your chosen upgrade strategy, you plan the runtime for the import of the substitution set ( <a href="#">SAP Web Application Server-specific [page 30]</a> / <a href="#">general [page 52]</a> ).   |
|   | You decide on the sequence of upgrades in your <a href="#">SAP system group [page 52]</a> .   |
|   | You plan the <a href="#">modification adjustment [page 53]</a> , if necessary.  |
|   | You check the <a href="#">structural requirements [page 55]</a> :<br>You call transaction RZ10 to check the values of the profile parameters <code>rdisp/mshost</code> and <code>rdisp/wp_no_vb</code> .  |
|   | You check the hardware requirements ( <a href="#">SAP Web Application Server-specific [page 30]</a> / <a href="#">general [page 56]</a> ): <ul style="list-style-type: none"> <li>• CPU, main storage and unprotected temporary storage – see SAP Service Marketplace at <a href="http://service.sap.com/sizing">service.sap.com/sizing</a></li> <li>• Space requirements in the database – see <b>SAP Note 775047</b></li> </ul>   |
|   | You check the <a href="#">software requirements [page 56]</a> : <ul style="list-style-type: none"> <li>• Source release of the SAP system (<a href="#">SAP Web Application Server-specific [page 30]</a> / <a href="#">general [page 57]</a>): <ul style="list-style-type: none"> <li>○ SAP Basis 4.6D</li> <li>○ SAP Web Application Server 6.10</li> <li>○ SAP Web Application Server 6.20</li> </ul> </li> <li>• Operating system (<a href="#">SAP Web Application Server-specific [page 31]</a> / <a href="#">general [page 57]</a>):<br/>At least OS/400 operating system Release V5R2M0</li> <li>• <a href="#">OS/400 Portable Application Solution Environment (PASE) [page 57]</a>:<br/>License program 5722SS1, option 33</li> </ul> |

|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>• <a href="#">Upgrade Assistant [page 58]</a>: <ul style="list-style-type: none"> <li>○ iSeries: AS/400 Developer Kit for Java (installed license program 5722JV1)</li> <li>○ Java Virtual Machine (at least Version 1.3.x (license program 5722JV1, option 5))</li> </ul> </li> <li>• <a href="#">Time zone environment variable [page 59]</a>:<br/>You must add the time zone environment variable <code>PASE_TZ</code> to your iSeries system to ensure the correct resolution of time zones.</li> <li>• <a href="#">Qshell [page 62]</a>: <ul style="list-style-type: none"> <li>○ Qshell Utilities (license program 5799XEH)</li> <li>○ Qshell Interpreter (license program 5722SS1, option 30)</li> </ul> </li> </ul> |
|  | You meet the requirements for installing the <a href="#">online documentation [page 62]</a> as described in the documentation <i>Installing the SAP Library</i> .  |
|  | You meet the requirements for the <a href="#">SAP Internet Transaction Server [page 63]</a> as described in the <i>SAP@Web Installation Guide</i> , if necessary.  |
|  | Optional: If you are using a J2EE Engine in production operation on your source release, you can plan a <a href="#">preliminary installation [page 31]</a> .   |
|  | You meet the requirements for <a href="#">importing additional languages [page 65]</a> , if necessary.   |

## Upgrade Preparations

You can prepare for the upgrade while the system is in production operation. The `PREPARE` program supports you here by making most of the necessary checks automatically. Start `PREPARE` as soon as possible before the upgrade so that you can initiate or perform the necessary preparations in time.

The *Upgrade Preparations* part of this documentation contains additional [SAP Web Application Server-specific \[page 32\]](#) and [general \[page 66\]](#) information.

### Preparations for PREPARE

| ✓ | Action  |
|---|---|
|   | You choose the <a href="#">host [page 67]</a> for <code>PREPARE</code> and the Upgrade Assistant.   |
|   | <p>You create an empty <a href="#">upgrade directory [page 67]</a> on the host with the central instance:</p> <ul style="list-style-type: none"> <li>• <code>DIR_PUT</code> has the value <code>&lt;upgrade directory&gt;</code> in the instance profile of the central instance.</li> <li>• With <code>SID&lt;OFR&gt;</code> as owner</li> <li>• If you have made a lot of your own developments, include approximately 20% extra space in the file system. Also do this if you want to include Support Packages and add-ons.</li> <li>• If you want to import languages other than English and German, provide an extra 120 MB of memory in the file system for each language.</li> </ul> |
|   | You import the <a href="#">latest SPAM update [page 69]</a> .   |

**Actions for Starting PREPARE**

| ✓ | Action   |
|---|--|
|   | <p>When you start PREPARE for the first time, you must start it from the DVD.</p> <ol style="list-style-type: none"> <li>1. You start <a href="#">PREPARE from the Upgrade Master DVD [page 69]</a> as user QSECOFR on the host with the central instance .</li> <li>2. You start the <a href="#">Upgrade Assistant server [page 71]</a>.</li> <li>3. You start the <a href="#">GUI of the Upgrade Assistant [page 71]</a>.</li> <li>4. You start the <a href="#">Upgrade Assistant [page 72]</a>.</li> </ol> <p>If you want to <a href="#">restart PREPARE [page 73]</a>, for example, if the results from its first run make you want to repeat some checks, you can execute it directly.</p> <p>You can <a href="#">reset PREPARE [page 73]</a> at any time.</p> <p>If you need extra software after starting PREPARE, <a href="#">you import it now [page 74]</a>.</p> |

PREPARE needs certain information from you so that it can run the modules. If possible, default values appear that you can confirm or change. For a complete list of all PREPARE modules and phases, see [Using the Phase List for the Upgrade \[page 160\]](#).

**User Actions During PREPARE**

| ✓ | Action   |
|---|--|
|   | You make the <a href="#">first entries [page 74]</a> for PREPARE.  |
|   | You make the entries for the <i>Parameter Input</i> module ( <a href="#">SAP Web Application Server-specific [page 32]</a> / <a href="#">general [page 76]</a> ). This includes entering DVD and CD mount directories.   |
|   | <p>You make the entries for the <a href="#">Initialization module [page 79]</a>.</p> <ul style="list-style-type: none"> <li>• You check the version of the SAP kernel, tp, and R3trans.</li> <li>• You check the SAP Notes for the add-ons, if necessary.</li> </ul> |
|   | You make the entries for the <a href="#">Import module [page 80]</a> .   |
|   | You make the entries for the <a href="#">Extension module [page 81]</a> , such as including Support Packages.  |
|   | You make the entries for the <a href="#">Installation module [page 89]</a> , such as the instance number and port numbers for the shadow system.   |
|   | You make the entries for the <a href="#">Preprocessing module [page 89]</a> .  |

**Checks Not Supported by PREPARE**

| ✓ | Action  |
|---|---|
|   | You evaluate the <a href="#">results of PREPARE [page 90]</a> in the log file CHECKS.LOG.   |
|   | <p>You make <a href="#">preparations at the operating system level [page 93]</a>:</p> <ul style="list-style-type: none"> <li>• You make a backup copy of the old SAP kernel.</li> </ul> |

|  |  |
|--|--|
|  | <p>You make <a href="#">preparations at the database level [page 94]</a>:</p> <ul style="list-style-type: none"> <li>You make sure that you can recover the database to the state it had before the upgrade.</li> <li>You check the disk space usage in your ASPs.</li> </ul>  |
|  | <p>You make preparations at the SAP system level:</p> <ul style="list-style-type: none"> <li>You make sure that the requirements for <a href="#">user DDIC [page 94]</a> have been met.</li> <li>You make sure that the <a href="#">requirements for the modification adjustment [page 95]</a> have been met.</li> <li>You call transaction RZ04 to set the <a href="#">operation mode [page 95]</a> for the upgrade.</li> <li>You import the new <a href="#">front-end software [page 38]</a>, if necessary.</li> </ul> |

## The Upgrade

The *The Upgrade* part of this documentation contains additional [SAP Web Application Server-specific \[page 34\]](#) and [general \[page 97\]](#) information.

For a complete list of all the upgrade phases, see the `htdoc` subdirectory of the upgrade directory. For details about the procedure, see [Using the Phase List for the Upgrade \[page 160\]](#).

| ✓ | Action  |
|---|---|
|   | You check the General Upgrade Note and your database-specific <a href="#">SAP Note [page 25]</a> for new information and changes.   |
|   | You choose the <a href="#">host for the upgrade [page 67]</a> .   |
|   | You mount the required <a href="#">DVD [page 32]</a> , if you have not already done so.   |
|   | You <a href="#">start R3up [page 98]</a> from the central instance as user <SID>OFR.<br>If errors occur, you can <a href="#">stop [page 99]</a> and <a href="#">restart [page 100]</a> the upgrade.   |
|   | <a href="#">Phase INITPUT [page 101]</a> :<br>You enter system-specific parameters.   |
|   | <a href="#">Phase PATCH_CHK [page 102]</a> :<br>You confirm any unconfirmed Support Packages.   |
|   | <a href="#">Phase KEY_CHK [page 102]</a> :<br>You enter the keyword from the current <b>Upgrade Note 775047</b> .   |
|   | <a href="#">Phase INITSUBST [page 103]</a> : <ul style="list-style-type: none"> <li>You choose your upgrade strategy. If you choose strategy <i>downtime-minimized</i>, you determine the runtime for the import of the substitution set (approximately 10 hours).</li> <li>If you choose strategy <i>resource-minimized</i>, you determine the number of parallel processes for importing the substitution set.</li> <li>You choose the time when you want database archiving to be switched off.</li> <li>You determine the number of parallel background processes.</li> </ul> |

|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>You enter the number of parallel <code>tp</code> processes in the <code>PARCONV_UPG</code> phase.</li> </ul>  |
|  | <p><a href="#">Phase CONFCHK_X [page 104]</a>:</p> <p>You update your operating system or database to the required version now at the latest, or you import any software you still need.</p>   |
|  | <p><a href="#">Phase VIEWCHK1 [page 104]</a>:</p> <p>You can begin to remove conflicts between customer tables and new views by deleting the customer tables in this phase.</p>  |
|  | <p><a href="#">Phase REPACHK1 [page 105]</a>:</p> <p>You release the locked objects and confirm repairs. You must do this in the <code>REPACHK2</code> phase at the latest.</p>  |
|  | <p><a href="#">Phase JOB_RSVBCHCK2 [page 105]</a>:</p> <p>You clean up outstanding updates. You must do this in the <code>JOB_RSVBCHCK_R</code> or <code>JOB_RSVBCHCK_D</code> phases at the latest.</p>   |
|  | <p><a href="#">Phase FREECHK_X [page 105]</a>:</p> <p>You make sure that you can recover the old kernel if this becomes necessary.</p>   |
|  | <p><a href="#">Phase LOCKEU_PRE [page 106]</a>:</p> <p>For <i>downtime-minimized</i>: You lock the ABAP Workbench. You must do this in the <code>REPACHK2</code> phase at the latest.</p>  |
|  | <p><a href="#">Phase EU_IMPORT1 [page 106]</a>:</p> <p>For <i>resource-minimized</i>: You isolate the central instance, stop the application servers and switch off the database feature permitting you to restore the data continuously, if necessary.</p>  |
|  | <p>All <code>EU_IMPORT</code> phases (<a href="#">SAP Web Application Server-specific [page 34]</a> / <a href="#">general [page 106]</a>):</p> <p>If the relevant DVD with the CD contents is not mounted on one of the specified mount directories, you are prompted enter a mount directory.</p> |
|  | <p><a href="#">Phase REPACHK2 [page 107]</a>:</p> <ul style="list-style-type: none"> <li>You release and confirm all open repairs in this phase at the latest.</li> <li>For <i>downtime-minimized</i>: You lock the ABAP Workbench in this phase at the latest.</li> </ul>                         |
|  | <p><a href="#">Phase CNV_CHK_XT [page 107]</a>:</p> <p>You process any uncompleted conversion requests and restart logs.</p>   |
|  | <p><a href="#">Phase ADJUSTCHK [page 108]</a>:</p> <p>Modifications: You confirm the request, if necessary.</p>  |
|  | <p>Phase <code>START_SHDI_FIRST</code>:</p> <p>As of this phase you can only log on with the <a href="#">new front-end software [page 38]</a>.</p>   |
|  | <p><a href="#">Phase ACT_&lt;rel&gt; [page 108]</a>:</p> <p>Modifications: You adjust modified SAP objects with the SAP standard versions.</p>   |

|  |   |
|--|---|
|  | <p><a href="#">Phase VIEWCHK2 [page 110]</a>:</p> <p>You remove conflicts between customer tables and new views by deleting the customer tables in this phase at the latest.</p>  |
|  | <p><a href="#">Phase MODPROF_TRANS [page 110]</a>:</p> <ul style="list-style-type: none"> <li>• For <i>downtime-minimized</i>: You isolate the central instance, stop the application servers and switch off the database feature permitting you to restore the data continuously, if necessary. Also make sure that you can recover the database to its current state.</li> <li>• You back up the upgrade directory.</li> <li>• You check the percentage of tables converted in transaction ICNV, if necessary.</li> </ul> |
|  | <p><a href="#">Phases JOB_RSVBCHCK_R and JOB_RSVBCHCK_D [page 111]</a>:</p> <p>You clean up outstanding updates in these phases at the latest.</p>  |
|  | <p><a href="#">Phase MODPROFP_UPG [page 111]</a>:</p> <p>In the phases MODPROFP_UPG, STARTR3_PUPG, and CHK_POSTUP, you perform the following actions:</p> <ul style="list-style-type: none"> <li>• You back up the database.</li> <li>• You determine P errors.</li> <li>• You switch off the database feature permitting you to restore the data continuously, if necessary.</li> <li>• You start the secondary application servers.</li> </ul>  |
|  | <p><a href="#">Phase CHK_POSTUP [page 112]</a>:</p> <p>You remove the P errors.</p>   |

## Post-Upgrade Activities

The [Post-Upgrade Activities \[page 113\]](#) part of this documentation contains information on how to proceed after R3up has finished.

R3up stops at the latest in the MODPROFP\_UPG phase and prompts you to start the post-upgrade activities. R3up then executes the last phases and completes the upgrade. At the same time you can perform the post-upgrade activities specified by R3up.

### Actions Before Restarting Production Operation

| ✓ | Action   |
|---|--|
|   | You back up the <a href="#">database [page 114]</a> .  |
|   | If there is no central software storage point: You distribute the <a href="#">SAP programs [page 114]</a> .                                |
|   | You call <a href="#">transaction RZ10 to check the profile parameters [page 116]</a> and reset them to their default values, if necessary. |
|   | You install the <a href="#">J2EE Engine [page 116]</a> , if necessary.   |
|   | You install the <a href="#">SAP Internet Graphics Service [page 118]</a> .   |

|  |  |
|--|--|
|  | You reimport <a href="#">additional programs [page 118]</a> such as RFC-SDK or CPIC-SDK from the DVD <i>SAP NetWeaver '04 – Presentation</i> , if necessary. |
|  | You call transaction SPAU to adjust modifications to <a href="#">Repository objects [page 119]</a> , if necessary.   |
|  | You perform <a href="#">application-specific post-upgrade-activities [page 119]</a> .  |

You can perform the following post-upgrade activities during [limited production operation \[page 113\]](#) of the system.

### Actions After Restarting Limited Production Operation

| ✓ | Action   |
|---|--|
|   | You reschedule <a href="#">background jobs [page 120]</a> whose release you reset when you isolated the central instance.  |
|   | You release <a href="#">held jobs [page 120]</a> .   |
|   | You call transaction SGEN to generate <a href="#">ABAP loads [page 121]</a> .  |
|   | You call transaction SGEN to generate the <a href="#">BSP applications [page 122]</a> , if necessary.  |
|   | You perform actions for the <a href="#">online documentation [page 122]</a> as described in the documentation <i>Installing the SAP Library</i> .  |
|   | You install the <a href="#">SAP Internet Transaction Server [page 63]</a> and the SAP@Web Studio as described in the documentation <i>SAP@Web Installation</i> , if necessary.   |
|   | You perform <a href="#">post-upgrade activities in the authorizations area [page 123]</a> : <ul style="list-style-type: none"> <li>You adjust the assignments between check flags and transactions.</li> <li>Upward compatibility for authorization checks: You adjust SAP_NEW.</li> <li>You handle problems with user buffers.</li> </ul> |

You can perform the following post-upgrade activities during normal production operation of the system.

### Actions After Restarting Production Operation

| ✓ | Action   |
|---|--|
|   | You import <a href="#">Support Packages [page 124]</a> , if necessary.<br>If you want to install additional languages, you import them <b>before</b> you import the Support Packages as described in the language transport documentation. |
|   | <a href="#">Transport Management System (TMS) [page 124]</a> : You distribute the configuration to all systems in the transport domain.  |
|   | <a href="#">Language transport [page 125]</a> : You copy glossary and terminology data from container tables to database tables.   |
|   | You convert old <a href="#">batch input logs [page 125]</a> to the new procedure in all clients, if necessary.   |
|   | You make a backup of the subdirectory that contains the <a href="#">shadow instance profiles [page 126]</a> , if necessary.  |

There are some post-upgrade activities that you do not need to perform directly after the upgrade. You can leave these activities until later.

### Evaluating the Upgrade Runtime

| ✓ | Action   |
|---|--|
|   | You send the evaluation of the <a href="#">runtime of the upgrade [page 126]</a> to SAP. |

### Actions Before the Next Upgrade

| ✓ | Action  |
|---|---|
|   | You delete the <a href="#">upgrade library and directory [page 128]</a> . |



## 3 SAP Notes for the SAP Web Application Server Upgrade

### Definition

To prepare and perform the upgrade of your SAP system, you require some additional information, not included in the documentation. This information is in a range of SAP Notes in SAPNet – R/3 Frontend. You must read the general **Upgrade Note 775047**. This SAP Note contains current cross-database information on preparing the upgrade. For database-specific information, see **SAP Note 781092**. When you actually upgrade the SAP system, you need information from some additional SAP Notes. These SAP Notes are named at the appropriate places in this documentation.

### SAP Notes for Preparing the Upgrade

You must request the general Upgrade Note and the SAP Note for your database from SAPNet – R/3 Frontend before you start your upgrade. Since these SAP Notes are updated regularly, make sure that you always use the newest version. The following list contains the SAP Notes you **need** to prepare for the upgrade:

| SAP Note Number | Description  | SAP Note Type                               |
|-----------------|--|---|
| 775047          | Additional Information: Upgrade to SAP Web AS 6.40 SR1                       | Specific to this upgrade                    |
| 781092          | Additional Information: Upgrade to SAP Web AS 6.40 SR1 (DB2 UDB for iSeries) | Database-specific, specific to this upgrade |

### Keyword for the Upgrade

When you start the upgrade, you are asked to enter a keyword, which you can get from the current general **Upgrade Note 775047**. You cannot start the upgrade until you have entered the keyword.

### Other SAP Notes

As well as the SAP Notes you need for preparing the upgrade, this documentation also refers you to other SAP Notes that contain **additional** information. The following lists contain these SAP Notes:

#### SAP Notes for All Databases

| SAP Note Number | Description  | SAP Note Type              |
|-----------------|--|----------------------------|
| 26417           | SAP GUI resources: Hardware and software                         | Front end / SAP GUI        |
| 86985           | SAP release for add-ons (IS)                                     | SAP add-ons                |
| 83458           | Downloading Support Packages from the SAP Service Marketplace    | SAP Support Packages       |
| 125971          | Service connection in Upgrade Assistant in SAPNet – R/3 Frontend | Remote Support for Upgrade |
| 133402          | Using the Upgrade Assistant with SAProuter                       | Upgrade Assistant          |

|        |   |  |
|--------|---|--|
| 62519  | Correction locks do not belong to system                                  | Workbench Organizer                              |
| 51046  | Copying the modification adjustment without a central transport directory | Change and Transport System                      |
| 96905  | Error message TG063 in the <code>JOB_RADDRCHK</code> phase                | ABAP Dictionary                                  |
| 97032  | Conversion of address tables, runtime                                     | Address management                               |
| 82167  | Conversion of address tables, runtime                                     | Address management                               |
| 24864  | No conversion of table BSEG   | ABAP Dictionary / phase <code>PARCONV_UPG</code> |
| 10187  | User buffer too small   | User administration                              |
| 197746 | Maintenance strategy Internet Transaction Server (ITS)                    | SAP@Web  |
| 399578 | Publishing IAC objects on the ITS after the upgrade                       | SAP@Web  |
| 86627  | Transaction types: Customizing for release upgrades                       | Customizing                                      |
| 676714 | Current SAP Note on the 6.40 language import                              | Language transport                               |
| 352941 | Language import and Support Packages                                      | Language transport                               |
| 322982 | Install language during upgrade   | Language transport                               |
| 485741 | Dealing with customer translations in the upgrade                         | Language transport                               |
| 663240 | Repairs for the upgrade to SAP Web AS 6.40                                | General upgrade                                  |
| 663258 | Corrections for <code>R3up</code> version 6.40                            | General upgrade                                  |
| 177680 | Correcting conversion problems in the <code>PARCONV_UPG</code> phase      | General upgrade                                  |
| 417670 | Additional information about resetting the upgrade                        | General upgrade                                  |
| 186066 | Increased free space requirements during the upgrade                      | General upgrade                                  |
| 175596 | Switch to a new batch input log   | General upgrade                                  |
| 122597 | Ignore errors in the <code>XPRAS_UPG</code> phase                         | General upgrade                                  |
| 430318 | Shadow instance on another operating system                               | General upgrade                                  |
| 94998  | Requesting a license key for a system                                     | General upgrade                                  |
| 29972  | Instance numbers in a distributed system                                  | General upgrade                                  |
| 48550  | CD problems in the <code>PREPARE</code> and <code>LANG_REQ</code> phases  | General upgrade                                  |
| 493387 | Potential effects of changes to table and structure extensions            | Activation                                       |
| 490788 | ICNV in the upgrade to SAP Web AS 6.20                                    | ICNV   |

|        |  |                                 |
|--------|--|---------------------------------|
| 367676 | Upgrade from 4.6 to 6.10 for customer programs                 | Adjusting customer developments |
| 452229 | Upgrade from 6.10 to 6.20 for customer programs                | Adjusting customer developments |
| 689951 | Upgrade from 6.20 to 6.40 for customer programs                | Adjusting customer developments |
| 318846 | Installation of a 4.6D kernel                                  | SAP kernel                      |
| 502999 | Installing SAP kernel 6.20 into a system using SAP Web AS 6.10 | SAP kernel                      |
| 664679 | Installing SAP kernel 6.40 into a system using SAP Web AS 6.20 | SAP kernel                      |
| 211077 | Exchanging the target release kernel during the upgrade        | SAP kernel                      |
| 19466  | Downloading SAP kernel patches                                 | SAP kernel                      |

#### iSeries-Specific SAP Notes

| SAP Note Number | Description                                       | SAP Note Type                    |
|-----------------|---|----------------------------------|
| 139326          | Memory Management in releases from 4.6A           | System administration            |
| 99792           | NLS   | National Language Support        |
| 410783          | Released operating systems for SAP Kernel 6.x     | Release planning                 |
| 66985           | SQL catalog points to wrong library               | iSeries installation             |
| 49701           | Information and recommendations: Kernel libraries | iSeries installation             |
| 53760           | Procedure for journal receivers during an upgrade | iSeries upgrade                  |
| 71258           | Problems in system cross-reference files          | External error                   |
| 161699          | Upgrade Assistant                                 | iSeries upgrade                  |
| 697353          | Setting the time zone environment variable        | iSeries installation and upgrade |

## 4 Product-Specific Information for the SAP Web Application Server Upgrade

This part of the documentation describes the **information and restrictions specific to an upgrade** of the SAP Web Application Server system.

Among other things, this includes SAP Web Application Server upgrade-specific directory sizes, database and operating system versions, as well as restrictions on and additions to the general upgrade procedure.



The information in the product-specific part takes **priority** over the information in the general part of the documentation.



This part of the documentation has a similar structure to the [General Upgrade Information \[page 35\]](#). The same section headings contain comments, additional information or restrictions on the upgrade. Each product-specific text contains a link to the description of the procedure in the general part of the documentation.

The following parts of the documentation contain additional information:

- [SAP Web Application Server: Upgrade Planning \[page 29\]](#)
- [SAP Web Application Server: Upgrade Preparations \[page 32\]](#)
- [SAP Web Application Server: The Upgrade \[page 34\]](#)

## 4.1 SAP Web Application Server: Upgrade Planning

This part of the documentation gives you SAP Web Application Server-specific information on planning the upgrade. The following sections include additional information, or restrictions placed on the general procedures:

- [Upgrade Schedule Planning \[page 29\]](#)
- [Runtime for the Import of the Substitution Set \[page 30\]](#)
- [Checking the Hardware Requirements \[page 30\]](#)
- [Checking the Source Release of the SAP System \[page 30\]](#)
- [Determining Whether an OS/400 Upgrade is Necessary \[page 31\]](#)
- [J2EE Engine Installation Planning \[page 31\]](#)



Start planning your upgrade **at least two to three weeks** before you want to begin with the upgrade.

**See also:**

[Upgrade Planning \(General Information\) \[page 36\]](#)

### 4.1.1 Upgrade Schedule Planning

When planning your upgrade schedule, you must consider the following:

- Upgrade preparations (see step 1 in the [general description \[page 49\]](#))  
Start your preparations for the upgrade **at the latest** one week before you upgrade your system.
- Starting the upgrade (see step 2 in the [general description \[page 49\]](#))  
If you decide to use upgrade strategy *resource-minimized*, start the upgrade on the last day of production operation with the old release. On the evening of this day, you can start the import of the substitution set.  
If you decide to use upgrade strategy *downtime-minimized*, start the upgrade in good time before the scheduled start of downtime. This ensures that all activities that can be performed during production operation are completed in time.



If you did not enter any mount directories during `PREPARE`, you are prompted at the beginning of the `EU_IMPORT` phases to change the CD. If you miss this prompt, your time schedule could be seriously disrupted.

The minimum runtime of the import in the `SHADOW_IMPORT_ALL` phase increases with every Support Package, add-on, and language that is included. Each language that you import increases the minimum duration of the import by about 30 minutes.

**See also:**

[Upgrade Schedule Planning \(General Information\) \[page 49\]](#)

## 4.1.2 Runtime for the Import of the Substitution Set

The import of the substitution set takes about 1.5 to 3 hours, depending on your hardware.

Upgrade strategy *downtime-minimized* prompts you to specify a total runtime for the import of the substitution set. Set the time required for the import so that it ends at least 5 hours before the planned shutdown of production operation. Depending on the start time of the upgrade, specify total runtimes of about 10 hours.

**See also:**

[Runtime for the Import of the Substitution Set \(General Information\) \[page 52\]](#)

## 4.1.3 Checking the Hardware Requirements

### CPU, Main Storage, Disk Space and Unprotected Temporary Storage

The sizing of the SAP Web Application Server is determined by the throughput requirements and is included in the standard sizing procedures for SAP solutions.

For information about the minimum hardware requirements, see SAP Service Marketplace at [service.sap.com/sizing](http://service.sap.com/sizing).

### Space Requirements in the Database

For information about space requirements in the database, see **SAP Note 775047**.

The `PREPARE` program also informs you of the amount of free space required in the database.

**See also:**

[Checking the Hardware Requirements \(General Information\) \[page 56\]](#)

## 4.1.4 Checking the Source Release of the SAP System

Before the upgrade, your SAP system must have one of the following source releases, which have been released for this upgrade:

- Release 4.6D of SAP Basis
- Release 6.10 of the SAP Web Application Server
- Release 6.20 of the SAP Web Application Server

**See also:**

[Checking the Source Release of the SAP System \(General Information\) \[page 57\]](#)

## 4.1.5 Determining Whether an OS/400 Upgrade Is Necessary

### Use

Production operation of the SAP source release is only possible with released operating system releases. For the upgrade to SAP Web Application Server 6.40 you need at least OS/400 operating system release V5R2M0.

If your current operating system version is not supported for your target SAP release, you have to upgrade OS/400 **before** upgrading the SAP system.

For information about the upgrade path you have to follow to move from your source release to your target SAP or OS/400 release, see **SAP Note 68440**.

### Procedure

1. Determine your present configuration. This consists of an operating system version and an SAP release.
2. To find out whether your current operating system version is supported for your target SAP release, refer to **SAP Note 410783**.

For detailed information, see SAP Service Marketplace at [service.sap.com/platforms](http://service.sap.com/platforms).

### Result

If you have to upgrade to a new operating system version before the upgrade, check the OS/400 system values again afterwards.

For information about adjusting the system values, see the installation documentation *SAP Web Application Server <Java or ABAP> 6.40: IBM eServer iSeries, section Checking and Adjusting iSeries System Values*.

### See also:

[Determining Whether an OS/400 Upgrade Is Necessary \(General Information\) \[page 57\]](#)

## 4.1.6 J2EE Engine Installation Planning

### Purpose

If you want to use the J2EE Engine, you normally install it after the upgrade of the SAP Web Application Server. However, if you are already using an J2EE Engine in production operation on the source release, and if you are planning to update it to a higher version after the upgrade, you can start the installation of the J2EE Engine during the downtime of the SAP Web Application Server.

### Process Flow

1. You wait until R3up has started the system downtime.  
The beginning of the downtime depends on your choice of the upgrade and archiving [strategy \[page 41\]](#).
2. You proceed as described in [Installing the J2EE Engine \[page 116\]](#).

## 4.2 SAP Web Application Server: Upgrade Preparations

This part of the documentation gives you SAP Web Application Server-specific information on preparing your upgrade. The following section includes additional information, or restrictions placed on the general procedure:

[Making Entries for the Parameter Input Module \[page 32\]](#)

**See also:**

[Upgrade Preparations \(General Information\) \[page 66\]](#)

### 4.2.1 Making Entries for the Parameter Input Module

When you make entries for the *Parameter Input* module, you will be prompted to enter mount directories for all the data carriers required during the upgrade. As of Release 6.40, some of the data formerly contained on CDs are now grouped on DVDs to reduce the amount of data carriers.

#### DVDs Required by PREPARE

| DVD Title  | Contents   |
|--|--|
| <ul style="list-style-type: none"> <li>SAP NetWeaver '04, Support Release 1, Upgrade Master / IBM DB2 UDB for iSeries</li> <li>SAP NetWeaver '04, Support Release 1, UNICODE Upgrade Master / IBM DB2 UDB for iSeries</li> </ul> | Upgrade tools                                    |
| <ul style="list-style-type: none"> <li>SAP NetWeaver '04, Support Release 1, SAP Kernel / IBM DB2 UDB for iSeries</li> <li>SAP NetWeaver '04, Support Release 1, SAP UNICODE Kernel / IBM DB2 UDB for iSeries</li> </ul>         | Programs and configuration files for the upgrade |
| SAP NetWeaver '04, Support Release 1, Upgrade Export   | Transport requests imported during the upgrade   |
| SAP NetWeaver '04, Support Release 1, Languages  | Standard languages English and German            |

#### DVD Required by R3up

| DVD Title  | Contents                                       |
|--|--|
| SAP NetWeaver '04, Support Release 1, Upgrade Export | Transport requests imported during the upgrade |



### Optional Data Carriers for the Upgrade

| CD / DVD Title  | Contents  |
|---|---|
| <i>SAP NetWeaver '04, Support Release 1, Languages</i>  | Languages <b>other than</b> English and German<br>For the exact contents, see the README file on the DVD. |
| <i>Installation &lt;Add-On&gt;</i>  | Add-ons   |
| <i>Upgrade &lt;Add-On&gt;</i>   | Add-ons   |
| <i>SAP NetWeaver '04<br/>SAP GUI for Windows 6.20 C6 / 6.40 C2,<br/>SAP GUI for Java 6.30, Presentation<br/>Server Components, Content Server</i> | SAP GUI   |

**See also:**

[Making Entries for the Parameter Input Module \(General Information\) \[page 76\]](#)

## 4.3 SAP Web Application Server: The Upgrade

This part of the documentation gives you SAP Web Application Server-specific information for your upgrade. The following section includes additional information, or restrictions placed on the general procedure:

[EU\\_IMPORT Phases \[page 34\]](#)

**See also:**

[The Upgrade \(General Information\) \[page 97\]](#)

### 4.3.1 EU\_IMPORT Phases

The following table contains a list of the import phases and how much of the total import duration they take up (percentage).

The differences in percentage of the total import duration depend on the hardware configuration.

#### Duration of the Individual Phases (Percentage)

| Phase      | Duration (Percentage) |
|------------|-----------------------|
| EU_IMPORT1 | 1 – 5                 |
| EU_IMPORT2 | 1 – 5                 |
| EU_IMPORT3 | 10 – 20               |
| EU_IMPORT4 | 10 – 20               |
| EU_IMPORT5 | 60 – 70               |

You can use these percentages together with your chosen total duration to estimate when you next need to enter the mount directory.

**See also:**

[EU\\_IMPORT Phases \(General Information\) \[page 106\]](#)

## 5 General Upgrade Information



This part of the documentation does not contain all the information you need to upgrade your specific SAP product. You must also read the *Product-Specific Information* part. This part contains additional product-specific upgrade information under the same headings.

The two parts are integrated in *Upgrade – Step by Step*. This checklist contains links to both the general descriptions of upgrade procedures, and to any additional product-specific information.

The following four parts of the documentation describe the accepted procedure for upgrading your SAP system:

- [Upgrade Planning \[page 36\]](#)
- [Upgrade Preparations \[page 66\]](#)
- [The Upgrade \[page 97\]](#)
- [Post-Upgrade Activities \[page 113\]](#)



In this documentation, the release names such as *Release 4.x* or *Release 6.x* refer to the Basis release or the SAP Web AS release of the SAP system. The releases in the product-specific part of this documentation refer to the product, if not stated otherwise.

## 5.1 Upgrade Planning

### General Information

This part of the documentation contains general information on planning your upgrade.



For any additional information, see the product-specific part of this documentation.

Before you begin the actual upgrade, you must first plan it carefully. This includes requesting all the SAP Notes you need. Careful planning is a prerequisite for a successful SAP system upgrade.

The following information helps you plan your upgrade so that downtime is reduced to a minimum, and the upgrade runs as efficiently as possible.



TeamSAP offers the free upgrade service *SAP GoingLive Functional Upgrade Check*. A team of experts checks the parameter settings of your system in one session before the upgrade, and gives you detailed recommendations on the configuration. After the upgrade, the parameters and the entire system status are checked again in a second session. For information on the service, see SAP Service Marketplace at [service.sap.com](http://service.sap.com) → Support → SAP Solution Management → Support Services → Safeguarding → SAP GoingLive Functional Upgrade Check. SAP Support is your contact for ordering this service.

When you plan your upgrade, note the following information in addition to the information in *Upgrade – Step by Step*:

- All the times specified in this documentation are based on hardware with medium performance levels.
- Do not perform any additional actions during the upgrade that could cause it to run less smoothly.
- Start planning your upgrade **in good time**.
- To make sure that all requirements are met, run the [PREPARE \[page 162\]](#) program as soon as possible. You can reset and repeat the program as often as you need before you start the actual upgrade. The successful execution of `PREPARE` is a prerequisite for starting the upgrade.
- If you are upgrading a modified system where changes have been made to the standard system, you must start by upgrading a development or quality assurance system that has the same SAP system release (including Support Package level), and contains the same modifications. The adjustments you perform manually for the new standard in this system can be automatically exported to the global transport directory and are integrated into the production system upgrade from there. This procedure eliminates the need for time-consuming adjustments to the production system.
- If it is technically possible, or unless otherwise specified, we recommend that you upgrade the operating and database system and your SAP system at different times.
- Before you start the upgrade, check the upgrade strategy of the add-on producer for the add-ons that exist for your source release. You must do this to make sure that the installed add-ons are compatible with your upgrade.

## Actions

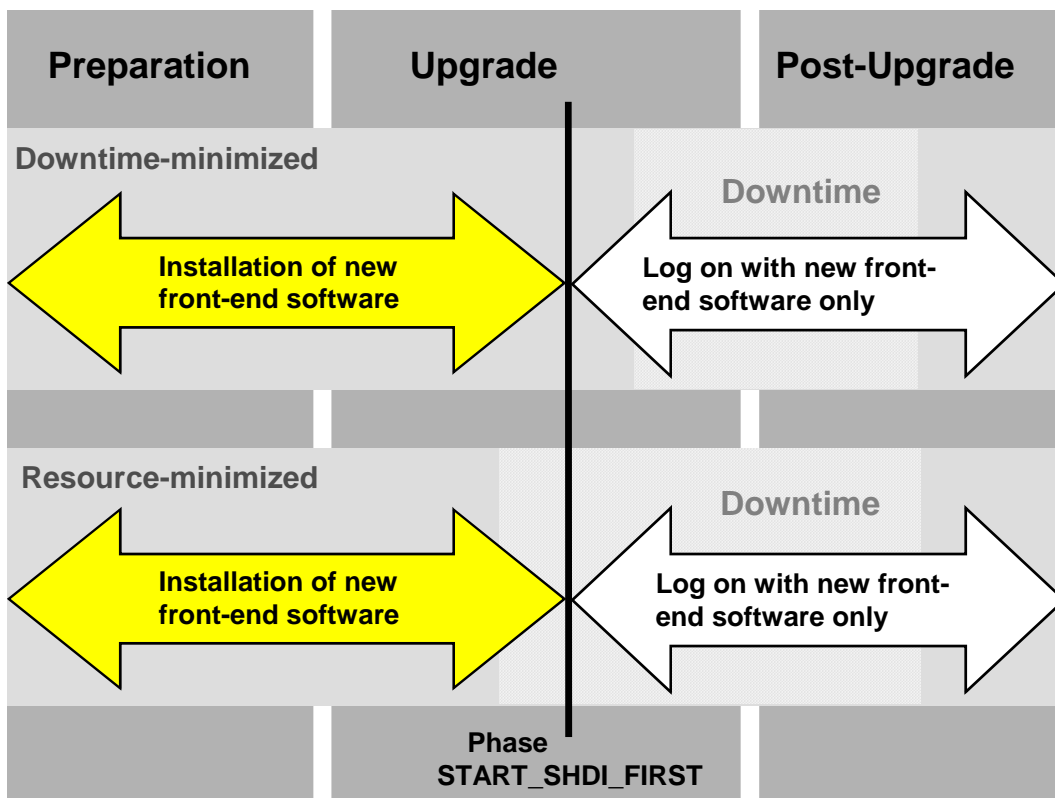
The following sections are important for planning the upgrade:

- [Time Frame for Upgrading the Front-End Software \[page 38\]](#)
- [System Switch Upgrade \[page 39\]](#)
- [Upgrade Strategy Planning \[page 41\]](#)
- [Database Backup \[page 45\]](#)
- [Database-Specific Aspects \[page 46\]](#)
- [Data Management Planning \[page 47\]](#)
- [Incremental Table Conversion \[page 47\]](#)
- [Upgrade Schedule Planning \[page 49\]](#)
- [Runtime for the Import of the Substitution Set \[page 52\]](#)
- [Upgrade in an SAP System Group \[page 52\]](#)
- [Modification Adjustment Planning \[page 53\]](#)
- [Checking the Structural Requirements \[page 55\]](#)
- [Checking the Hardware Requirements \[page 56\]](#)
- [Checking the Software Requirements \[page 56\]](#)
  - [Checking the Source Release of the SAP System \[page 57\]](#)
  - [Determining Whether an OS/400 Upgrade Is Necessary \[page 57\]](#)
  - [Installing the OS/400 Portable Application Solution Environment \[page 57\]](#)
  - [Meeting the Requirements for the Upgrade Assistant \[page 58\]](#)
  - [Setting the Time Zone Environment Variable \[page 59\]](#)
  - [Installing the Qshell \[page 62\]](#)
- [Accessing Documentation Before and During the Upgrade \[page 62\]](#)
- [Meeting the Requirements for the SAP Internet Solution \[page 63\]](#)
- [Importing Additional Languages \[page 65\]](#)

## 5.1.1 Time Frame for Upgrading the Front-End Software

The new SAP release cannot run until the new version of the front-end software (SAP GUI) has been installed. You can import the front-end software as soon as you receive the software package. The latest possible time for the upgrade is before you start the shadow system for the first time in the `START_SHDI_FIRST` phase. This graphic shows the time period during which you can upgrade the front-end software:

### Time Frame for Upgrading the Front-End Software



The front-end software is upgraded directly from a data carrier or from a file server. For more information, see the *SAP Front End Installation Guide*.

## 5.1.2 System Switch Upgrade

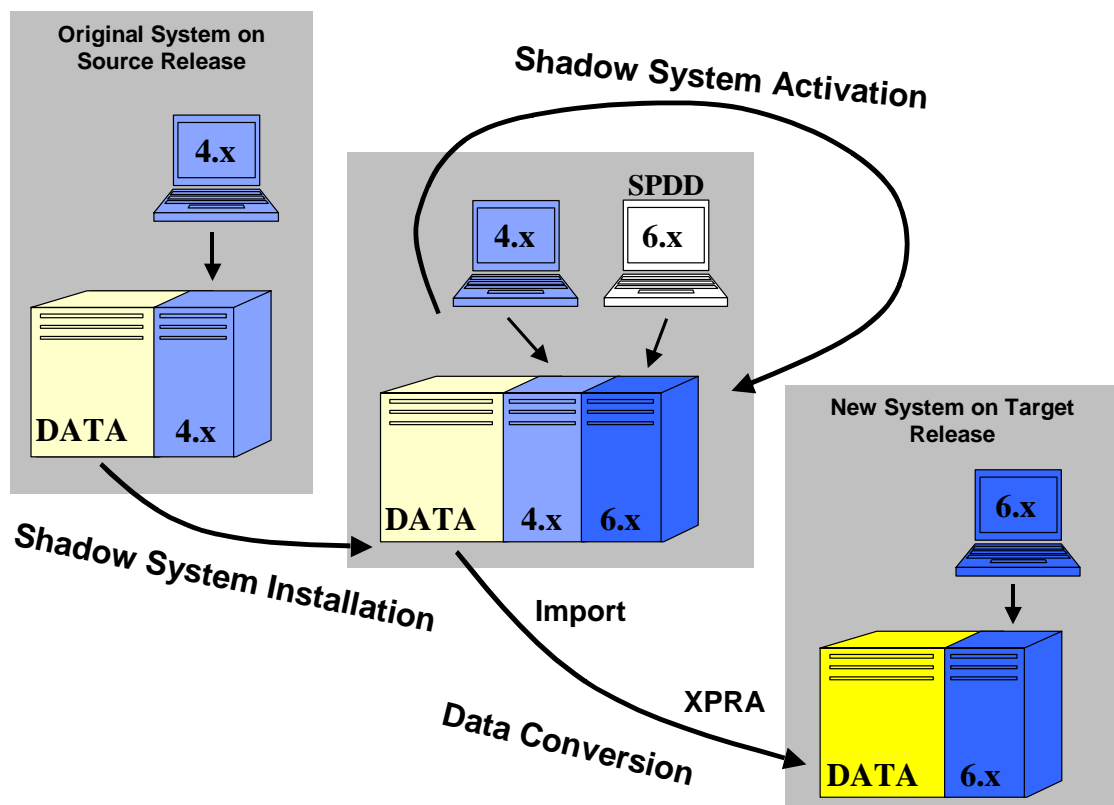
### Procedure

Systems are upgraded to SAP Web Application Server 6.10 and higher with the new *System Switch Upgrade* procedure. This procedure installs an instance of the target release, the shadow system, in parallel with the current source release system in the same database. This parallel system contains all the software of the target release and is used to integrate Support Packages that are included in the upgrade, add-ons, and customer modifications into the target release.

In the production database, the tables of the target release that contain both the descriptions of the ABAP Dictionary and the ABAP programs are imported as shadow tables under an alternative name. The shadow system enables you to access these tables. If you choose upgrade strategy *downtime-minimized*, you can perform upgrade actions before downtime starts, which previously had to be performed during downtime.

During the `EU_SWITCH` phase in downtime, the switch is made to the new system, and any remaining data is imported. Any parts of the source release system that are no longer needed are deleted.

### Process Flow of a System Switch Upgrade



## Characteristics of the Procedure

- Planning the Upgrade

No precise guidelines can be given for the duration of an upgrade. The duration of the individual actions depends to a great extent on the individual system, the number of modifications, and the number of included Support Packages and add-ons.

- Increased space and resource requirements

Operating two instances in parallel places increased demands on free space in the file system, in the database, and, according to the upgrade strategy, on the system resources. If necessary, some parameters in the production system might need to be adjusted to enable you to operate the production and the shadow systems in parallel.

- Extended free space check

The `PREPARE` program also checks the free space needed for tables created in the shadow system.

- Creating the shadow system

The `PREPARE` program has a new *Installation* module, which is used to prepare for the shadow instance. `PREPARE` first creates profiles, directories, programs and files needed by the shadow instance, as well as an extra database user. All tables of the SAP Web Application Server are needed as shadow tables to operate the shadow system. As well as all substitution tables already imported, and the newly created tables, the `R3up` program also creates all remaining SAP Web Application Server tables and fills them.

When all the required tables are in the shadow system, aliases, synonyms or views are created for them. Additional table contents are copied into the shadow system to enable adjustment, activation and distribution functions in the shadow system.

- Operating the shadow system

You can now use the shadow system to perform the modification adjustment of the ABAP Dictionary objects and activate and distribute the requests included in the upgrade. After you have operated the shadow system, you have a consistent inactive nametab with the descriptions of the table structures of the target release, including Support Packages and add-ons.

While it is running, the shadow system writes to a number of tables whose contents are required for the remainder of the upgrade, and for operating the system afterwards. These tables are renamed with their original names in the `EU_SWITCH` phase.

- Table conversion

All tables of the SAP Web Application Server whose contents need to be copied from the shadow system can be adjusted to the target release structure in the shadow system during production operation. Even the tables into which control data is imported already exist in the shadow system and only need to be renamed. The tables that need to be converted are those for which the original versions of the SAP Web Application Server will continue to be used. These tables can be converted during production operation by being copied to the shadow system, or converted externally.

External conversion no longer needs the ABAP conversion program of the source release, which means that the activation and conversion of the SAP Web Application Server only uses target release tools. This removes the restrictions of the previous procedure, such as no modifications to the SAP Web Application Server in Support Packages and add-ons.



As before, the application tables are converted during downtime in the `PARCONV_UPG` phase. They can be distributed during production operation. If you use the `ICNV`, the tables are converted during production operation.

- After operating the shadow system

Any tables that receive entries are created as copies with new formats in the shadow system. The upgrade then performs the shadow import. Modifications to the contents of the original tables are indicated by triggers. These tables must be copied and imported during downtime.

- During downtime

After `R3up` has converted the data and made all preparations, it completes the copy import action during downtime for all tables with triggers set. The `EU_SWITCH` phase completes the switch to the new system. All tables prepared in the shadow system are copied to the target release. The `KX_SWITCH` phase switches the kernel. The `PARCONV_UPG` phase converts the application table and the phase `TABIM_UPG` imports the remaining data. Finally, the `XPRAS_UPG` phase starts the XPRAs required by the system.

## 5.1.3 Upgrade Strategy Planning

### Purpose

If you are upgrading with the System Switch Upgrade procedure, SAP provides you with two upgrade strategies: *downtime-minimized* and *resource-minimized*. Choose the strategy that is best suited to your SAP system and to your requirements concerning system availability. Your decision depends on two factors:

- Maximum permitted downtime
- System resources

### Features of the Upgrade Strategies

#### Downtime-Minimized

- Parallel operation of production system and shadow system
- Higher demand on system resources
- Shorter downtime
- Import of the substitution set into the shadow tables during production operation
- Modification adjustment of the ABAP Dictionary objects during production operation
- Activation and distribution during production operation

#### Resource-Minimized

- Operation of production and shadow system only possible independently of each other
- Production operation stops before import of substitution set into shadow tables or, at the latest, before shadow instance is started for first time
- Increased downtime

- No ICNV

### Benefits of the System Switch Upgrade Procedure

If you choose the *downtime-minimized* strategy, the new System Switch Upgrade procedure offers you the following benefits:

- Modification adjustment during production operation  
The modification adjustment of the ABAP Dictionary objects is performed before downtime. This is possible since the complete version management is available in the shadow system.
- Activation and distribution during production operation  
You need to activate and distribute all ABAP Dictionary objects (including their dependent objects) that Support Packages modify in the delivered release, as well as objects that are modified or created by the customer. Where a large number of included Support Packages or add-ons are concerned, or where systems have been modified greatly, this procedure may take several hours.
- Specific use of the incremental table conversion function (transaction ICNV)  
You can also increase the number of candidates for transaction ICNV, since the amount and target structure of the tables is calculated at the customer site. Transaction ICNV can therefore be used for tables modified by customers, add-ons, and Support Packages. This is particularly noticeable in the shorter downtime for upgrades that include one or more add-ons.

Since these processes occur during production operation, downtime is reduced considerably, and some phases during downtime are much shorter. This mainly affects the phases `PARCONV_UPG` and `TABIM_UPG`. This means that in comparison to the Repository Switch Upgrade procedure downtime is reduced further by including the Support Packages and add-ons.

Other benefits of the System Switch Upgrade for both upgrade strategies include:

- Use of target release tools for the upgrade  
To upgrade from the source release structure to the target release structure, activation and distribution actions need to be specified and executed. This is now done by tools in the target release, which removes restrictions caused by using source release tools.
- Extended shadow import  
The shadow system is used to calculate the target release state of a table before downtime starts. Because the shadow tables are created in their final structure during production operation, the amount of tables into which data can be imported in advance can be increased. Until now, this was only possible for new tables and substituted tables.

## Comparison of Upgrade Strategies

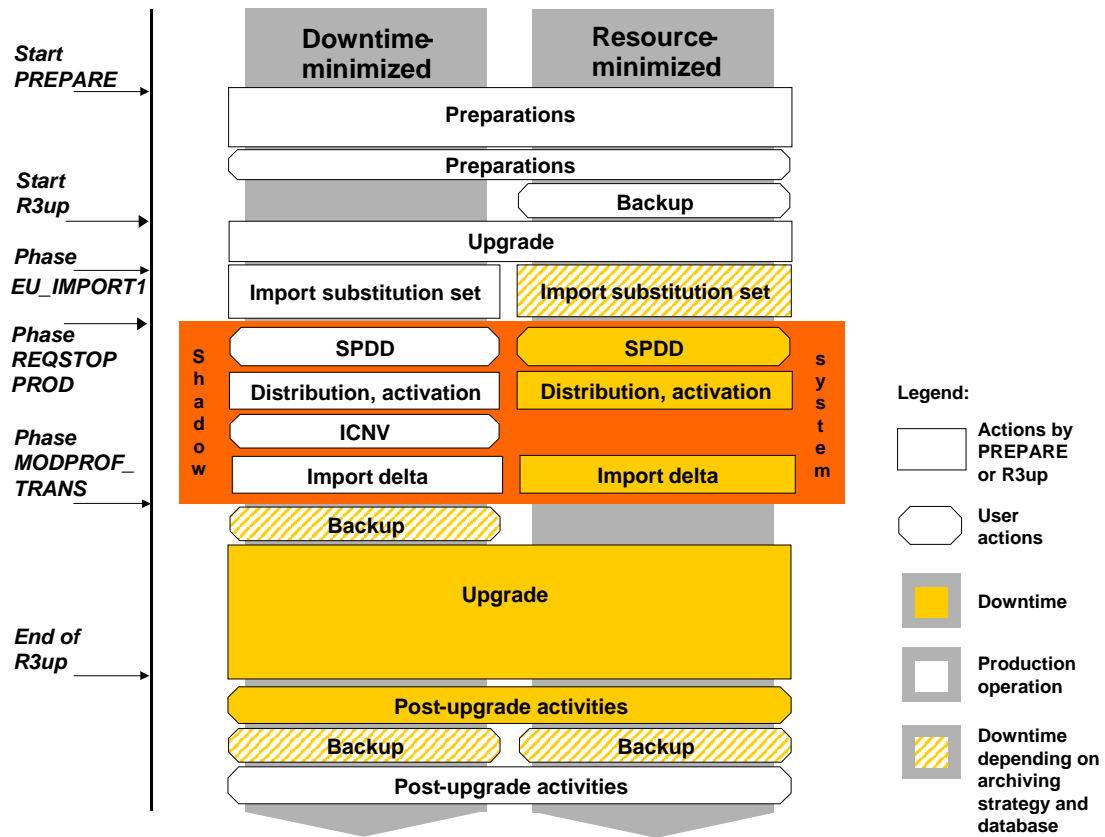
| Strategy                  | Advantages   | Disadvantages   |
|---------------------------|--|---|
| <i>Downtime-minimized</i> | <ul style="list-style-type: none"> <li>• Short downtime</li> <li>• Medium amount of space required to be able to recover the database</li> </ul>   | <ul style="list-style-type: none"> <li>• Increased demand on system resources due to parallel operation of production and shadow system</li> <li>• Offline backup required after upgrade if archiving deactivated at some stage</li> <li>• Disk capacity for a possible database recovery is monitored</li> </ul> |
| <i>Resource-minimized</i> | <ul style="list-style-type: none"> <li>• No additional system resources during upgrade</li> <li>• No additional space required to be able to recover the database</li> <li>• Disk capacity for a possible database recovery is <b>not</b> monitored</li> </ul> | <ul style="list-style-type: none"> <li>• Long downtime</li> <li>• Offline backup required after upgrade</li> </ul>  |

The upgrade strategy is one of the main factors in determining the runtime of the upgrade and how much downtime is involved.

The following graphic shows the course of the upgrade for the various strategies. It does not show the differences in the duration of the upgrade. The upgrade is divided into phases. `EU_IMPORT1`, `REQSTOPPROD`, and `MODPROF_TRANS` are important phases, since they mark the start of downtime (depending on the chosen upgrade and archiving strategy).

The course of the upgrade is identical in all strategies up to the `EU_IMPORT1` phase. For the *resource-minimized* strategy, downtime either begins in the `EU_IMPORT1` phase or the `REQSTOPPROD` phase. For the *downtime-minimized* strategy, downtime begins in the `MODPROF_TRANS` phase.

## Course of the Upgrade



## Upgrade Runtime

The following factors influence the total runtime of R3up:

- Hardware used
- Import runtime for the substitution set
- Languages installed
- Number of clients
- Extensive customer developments
- Modifications to standard SAP tables
- Add-on software
- Integration of Support Packages

The downtime depends on the upgrade strategy you choose and the hardware. The size of your database influences the runtime of the upgrade. Your source release can influence the runtime and downtime of the upgrade by up to approximately 25%.

## 5.1.4 Database Backup

### Database Archiving

The archiving strategy determines the time intervals in which database mechanisms save actions to the database, and how journal receivers are deleted (by the user or the system). This determines whether the database system can recover lost data.

Normally, the user manages the journal receivers. The actions performed include backing up and deleting journal receivers. This mode is referred to as *archiving on*.



In the following, *archiving is deactivated* means that the journal receivers are automatically deleted by the system. Journaling is not switched off during the upgrade.

When archiving is deactivated, the system manages the journal receivers. Receivers are deleted without being backed up. Recovery of the database is not possible. Therefore, you must run a full database backup before you switch to this mode.

The R3up program prompts you in the INITSUBST phase to select when you want to deactivate archiving.

The following options are available:

| Archiving Strategy   | Downtime-Minimized | Resource-Minimized |
|--|--------------------|--------------------|
| Archiving is activated during the entire upgrade.  | Possible           | Possible           |
| Archiving is deactivated in the EU_IMPORT1 phase.  | ---                | Recommended        |
| Archiving is deactivated before you start the shadow instance for the first time in the REQSTOPPROD phase. | Not recommended    | Recommended        |
| Archiving is deactivated in the MODPROF_TRANS phase.   | Recommended        | ---                |



The archiving strategies that are marked as *possible* are only useful in certain cases. Only the *recommended* archiving strategies are described here.

At the selected time, you are then prompted by R3up to deactivate archiving. After you have deactivated archiving, you can no longer use your system in production operation.

### Full Backup

If you deactivate archiving at some stage during the upgrade, you have to make a full backup of the database before you switch archiving back on.

The archiving strategy that you choose also determines when you need to make a full backup of the database.

- If you choose the *downtime-minimized* upgrade strategy, the full backup is made at the beginning of downtime, before the MODPROF\_TRANS phase.
- If you choose the *resource-minimized* upgrade strategy, the full backup is made before the substitution set is imported, either during production operation or during downtime.



At the same time, make a backup of the upgrade directory and its subdirectories.

After the upgrade you need to make another backup of the database.

For more information about performing a full backup, see the installation documentation *SAP Web Application Server <Java or ABAP> 6.40: IBM eServer iSeries*, section *Performing a Full Backup*.

### 5.1.5 Database-Specific Aspects

At the beginning of downtime, (we [recommend \[page 45\]](#) that you start this in the `MODPROF_TRANS` phase for strategy *downtime-minimized* and in the `EU_IMPORT1` phase for strategy *resource-minimized*), you are prompted to stop all work in the SAP system and to confirm that journal receivers will be automatically deleted by the system.



You must be able to recover the database to the state it has at this point in time. Therefore, you must now make a full backup of your database so that, in case of a recovery, you need not apply all journal changes created so far, including those written during the previous import. You can choose between an online backup, which you must perform before you stop the central instance, and an offline backup, which you must perform before you confirm that journal receivers will be deleted by the system. Back up the upgrade directory as well.

`R3up` waits for your confirmation before it stops the central instance. Proceed as follows:

1. If you have opted for
  - an online backup:
    - i. Perform the online backup before you stop the central instance.
    - ii. Confirm that you want to stop the central instance.
  - an offline backup, perform it before the journal receivers will be deleted by the system.
2. Delete the journal receivers.

For more information, see [Handling Journal Receivers During an Upgrade \[page 156\]](#).
3. Confirm the `R3up` prompt about deleting the journal receivers.
4. Back up the upgrade directory now at the latest.
5. Confirm the `R3up` prompt about backing up the upgrade directory.

## 5.1.6 Data Management Planning

### Use

The upgrade runtime – and in particular the system downtime – is extended when dealing with large database tables. Table conversions during the upgrade and data adjustments at the end of the upgrade performed by, for example, XPRAs or other after-import methods, are the most time-consuming actions and can result in long upgrade runtimes. To avoid these problems, you should minimize the quantity of table entries that have to be converted prior to the upgrade. The best way to achieve this is to carry out Data Management measures, such as archiving or deleting data records from the tables.

Data Management is vital for maintaining a “healthy” live system, because it helps to keep system performance high and to make optimal use of existing hardware resources. One of the most effective Data Management methods is Data Archiving. It allows administrators to remove data that is no longer needed in everyday operations from the database and store it in archive files. These files can then be passed on to a storage system for long-term storage. After archiving, the data can still be accessed in read-only mode when the need arises, for example, during an audit.

For more information on Data Archiving, see SAP Service Marketplace at [service.sap.com/data-archiving](http://service.sap.com/data-archiving).

### Procedure

Before the upgrade, analyze the database to find out which database tables can be reduced in size, and how this can be achieved.

For more information, see the documentation *Archive-Quickwins for Upgrade*. It provides a list of database tables that tend to grow rapidly, but whose size can be reduced quite easily without an extensive and time-consuming approval process involving the business process owners. The tables are not analyzed from a stand-alone point of view but by taking into account the entire business context in which they are embedded. The document also describes how to analyze the content of each table and gives detailed recommendations about how to reduce the table size by archiving or deleting data.

To find the latest version of this documentation, see SAP Service Marketplace at [service.sap.com/dao](http://service.sap.com/dao) → *Media Library* → *Archive-Quickwins for Upgrade*.

## 5.1.7 Incremental Table Conversion

### Use



You can use incremental table conversion only if you use upgrade strategy *downtime-minimized*.

The structure of some of the tables in your database changes each time you upgrade your system to a new release. In some cases you need to convert these tables. This involves completely restructuring them and converting each individual data record. These conversions are usually made during the upgrade downtime (phase `PARCONV_UPG`).

The incremental conversion function enables many of these tables to be converted before the upgrade. The data is converted during production operation of the system.

This approach has the following benefits:

- Reduced downtime during the upgrade, especially for systems with one or more add-ons
- Simple return to the SAP standard for modified tables

### Prerequisites

The System Switch Upgrade only determines the candidates for transaction ICNV after the target structure of the tables has been defined. The candidates are determined in the ICNVREQ phase. R3up checks whether the system contains tables for which an incremental conversion is an advantage. These include tables that need to be converted, and that contain large volumes of data, and therefore would increase the downtime significantly during a conversion. The System Switch Upgrade also enables you to use transaction ICNV for tables that have been modified by Support Packages, add-ons, or customer developments.

If the above applies, R3up prompts you to start the incremental conversion.

Use of the incremental conversion function is optional. If you do not want to use incremental conversion, the tables are converted during downtime.

### Features

Incremental conversion is performed using transaction ICNV. This transaction offers the following functions:

- Displays the tables determined by R3up (candidates for transaction ICNV)
- Decides which candidates should be converted incrementally
- Starts the conversion
- Monitors the conversion
- Estimates the runtime of the conversion

For up-to-date information, see **SAP Note 490788**. For more information, call transaction ICNV and choose F1 or *Information*.

#### Note the following:

- Transaction ICNV makes modifications to the database tables that you want to convert during the *Initialization* step. You cannot reset these modifications by resetting the upgrade. In particular, you cannot directly upgrade these modifications.
- If you use incremental table conversion, do not start an SAP archiving program for these tables at the same time, since this can lead to performance bottlenecks. Therefore, archive as much data as possible before you start the conversion.
- After the incremental conversion starts, you cannot change any more ABAP Dictionary definitions for the relevant tables until the upgrade is complete. This means you cannot change, delete or add field definitions. Transaction SE11 is locked for these tables.
- Pay special attention to the resource usage of your database management system to detect bottlenecks early on. Incremental conversion requires double the space in the relevant database memory area (tablespace, dbspace, and so on) for each table affected during the conversion. The continuous transfer of data results in more transactions being performed. Therefore, also monitor the space available for the rollback information.
- Do not begin the upgrade downtime before at least 95% of the total data has been converted. R3up checks this at the beginning of downtime. If this percentage has not been reached, R3up displays an appropriate message.



This gives you the advantage of reducing critical downtime. To monitor the progress of the conversion, you can call transaction ICNV.

You can start downtime even if the 95% minimum has not been reached. However, the remaining data is transferred entirely during downtime. If this process is not finished before the `PARCONV_UPG` phase, the downtime increases depending on the remaining conversion set.

- Incremental conversion requires a sufficient number of background work processes. Ideally, there should be one process for each table that needs to be converted. If you cannot have one process for each table because there are too many of them, you can still convert them since transaction ICNV automatically distributes the tables to the available background processes. However, the incremental conversion then takes longer to complete, and the time for beginning downtime is pushed back.

## 5.1.8 Upgrade Schedule Planning

### Purpose

Create an exact schedule for your SAP system upgrade.

### Prerequisites

You have chosen one of the two upgrade strategies, *downtime-minimized* or *resource-minimized*.

### Process Flow

1. You decide when to begin preparing for the upgrade.

When you start the upgrade preparations does not depend only on the length of the preparations but also on the length of the upgrade itself. To determine the expected total length of the upgrade of your production system, perform a test upgrade of an SAP system with a similar set of data (a system copy of your production system is ideal).

2. You decide when to start the upgrade.

If you have special requirements regarding the availability of your SAP system, adjust the process and the length of the upgrade to fit the expected amount of downtime.

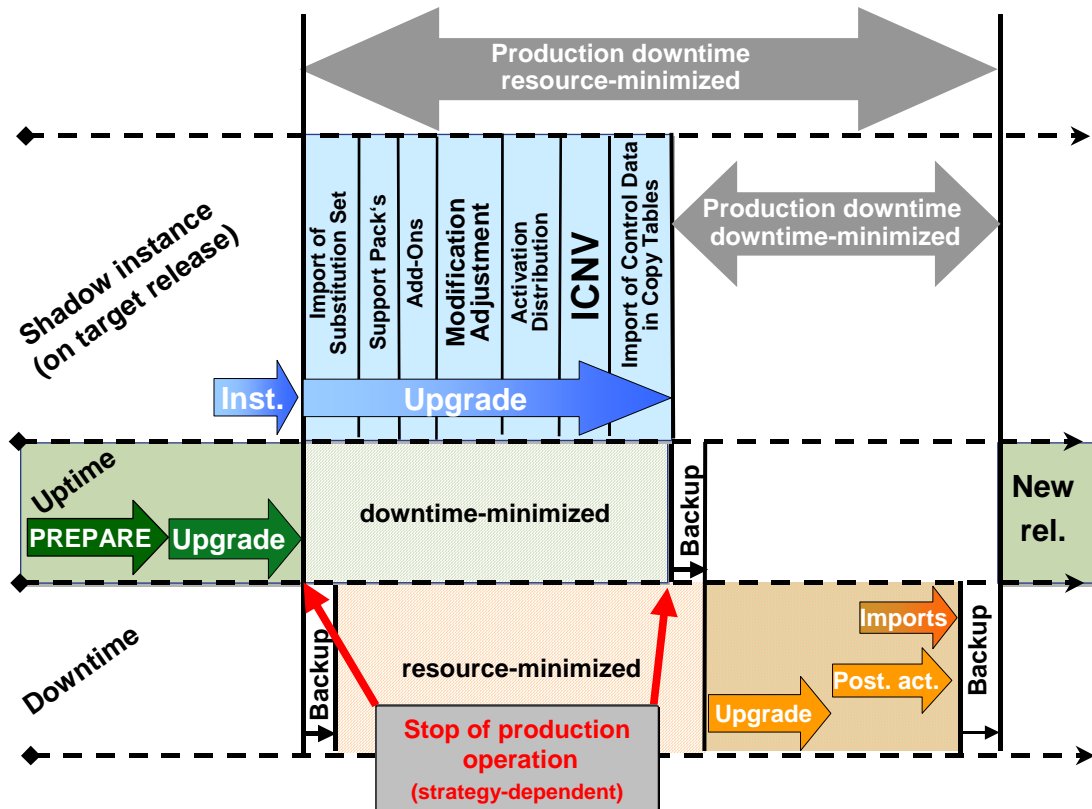
During the upgrade, various actions are performed by and in the shadow system. The runtime of these actions depends on various factors and is therefore specific to each SAP system:

- Creating the Shadow Repository (`EU_IMPORT` phases)
- Importing the additional software packages such as languages, Support Packages, add-ons (phase `SHD_IMP`)
- Adjusting modifications to the ABAP Dictionary objects (transaction `SPDD`)
- Mass activation and distribution
- Incremental conversion of tables (transaction `ICNV`)

The runtime of these phases depends on the upgrade strategy that you choose.

If you have chosen upgrade strategy *resource-minimized*, these phases take place during downtime. You can influence, among other things, how long they take by the number of import processes.

If you have chosen upgrade strategy *downtime-minimized*, you can continue to use your SAP system in production operation during these activities. You can reduce downtime if you make sure that all the activities that the shadow instance performs to deal with objects are finished before the scheduled start of downtime (phase `MODPROF_TRANS`). Therefore start the upgrade in good time. If you finish the activities before the scheduled start of downtime, you can stop the upgrade before the `MODPROF_TRANS` phase.



3. You determine the time for [importing the substitution set \[page 52\]](#).
4. You take the necessary measures to extend the time in which the upgrade can run unmonitored.
  - Specify all mount directories at the start of the upgrade.
 

`R3up` lets you specify up to 24 mount directories when you start upgrading. This significantly increases the amount of time `R3up` can run without user input.

For more information, see [Making Entries for the Parameter Input Module \[page 76\]](#).
  - Early locking of the ABAP Workbench
 

If you decided to use upgrade strategy *downtime-minimized*, the `LOCKEU_PRE` phase, which prompts you to enter the time from which the ABAP Workbench is locked, runs immediately before the `EU_IMPORT1` phase. If you are sure that

you can do without the ABAP Workbench from the `EU_IMPORT1` phase, confirm the lock in `LOCKEU_PRE`.

If you do not confirm the lock in `LOCKEU_PRE`, the system prompts you to do so in phase `REPACHK2`. Since the `REPACHK2` phase runs after the last request to enter a mount directory (`EU_IMPORT5` phase), you may not want to do this.

- Avoiding long upgrade downtimes

The Upgrade Assistant can inform you when the `R3up` control program is waiting for input. This could involve either normal user input or intervention to solve an error.

To receive this alert information, activate the [alert function \[page 153\]](#) and enter the appropriate parameters. You can trigger an external program to start if `R3up` has been waiting too long for input. This then triggers a communications service that informs the system administrator. You must supply this external program yourself.

For more information on the alert function, see the online help of the Upgrade Assistant in section *Set Alert window*. To access the online help, choose *Help* → *Introduction*.

Regardless of whether you use the Upgrade Assistant or not, the `R3up` control program always stops the upgrade when errors occur so that you can intervene. `R3up` tells you to intervene as follows:

- A message appears on the screen.
- An `upalert.log` file is created in subdirectory `tmp` of the upgrade directory.

If you fail to notice these errors, your upgrade schedule may be delayed significantly.

To avoid these delays, you can arrange to be notified automatically by telephone, for example, that the upgrade has stopped. You can use the alert file to do this. You must provide the appropriate software for using the alert file.

5. You decide when a full backup is performed after the upgrade.

The full database backup, which is a prerequisite for resuming production operation of your system, must be made after you have performed all necessary post-upgrade activities. This has the advantage that all database changes resulting from post-upgrade activities are included in the full backup.

6. You decide when production operation resumes.

If possible, resume production operation only after you have performed all required post-upgrade activities.

At the latest, system downtime begins in the `MODPROF_TRANS` phase. The earliest possible time for resuming production operation is the [MODPROFP\\_UPG phase \[page 111\]](#).

## 5.1.9 Runtime for the Import of the Substitution Set

The net total runtime of R3UP depends on the amount of time required to import the substitution set.

When you use the *resource-minimized* strategy, you can indirectly influence the length of the import runtime by the number of the processes that are used for this.

When you use the *downtime-minimized* strategy, you determine the runtime for the import yourself. The longer you make the runtime, the better the performance in your production system will be. This also reduces the number of journal receivers that need to be saved per hour.

To determine the expected total runtime of the relevant upgrade phases for your production system, perform a test upgrade of an SAP system with a similar set of data (a system copy of your production system is ideal).

If this is not possible, you can start the upgrade a few days before downtime is due to begin, and stop the upgrade process until the scheduled time.

## 5.1.10 Upgrade in an SAP System Group

### Purpose

If you have more than one SAP system, for example, a production system and a development system, you must consider the entire system group when you upgrade. Upgrade your systems in the same sequence in which you transport your modifications.

### Process Flow

- If you have a development system and a production system, upgrade the systems as follows:
  - a. Development system
  - b. Production system
- If your system group consists of three SAP systems and includes a quality assurance system that has been set up between the development and production system, upgrade your systems as follows:
  - a. Development system
  - b. Quality assurance system
  - c. Production system

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

Changes made in the development system after the upgrade 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.



If you have modified SAP objects, make sure that you keep your development system. Do **not** copy your production system to your development system to test the upgrade.

To test the upgrade with realistic production data, set up a quality assurance system between the development system and production system. This system can be a copy of the production system.

## 5.1.11 Modification Adjustment Planning

### Purpose



If you are sure that your SAP system corresponds exactly to the standard SAP system, you can skip this section

Modifications are changes to objects of the SAP standard. There are two types of modifications: ones that make changes to the translation of an object text, and ones that make changes to the object itself.

### 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.



Changes to translations of SAP objects are not retained when you perform an upgrade. They are overwritten by a new version or deleted. For more information about retaining these changes, see **SAP Note 485741**.

### Modifications to the Object

You may need an SSCR key to perform the modification adjustment. Get the key **before** you upgrade the system. For more information, see SAP Service Marketplace at [service.sap.com/sscr](http://service.sap.com/sscr).

All modified standard SAP objects are displayed for adjustment in transaction 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 transaction SPDD or SPAU.



Make sure that **before** the upgrade there is at least one package in the customer namespace (Z\*). You need this package if you have to create objects during modification adjustment, for example, for an append structure for customer fields of an SAP table.

You cannot create packages during the upgrade.

If you choose upgrade strategy *downtime-minimized*, 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 upgrade.

For more information about the modification adjustment, see SAP Service Marketplace at [service.sap.com/abapwb](http://service.sap.com/abapwb) → *Modification & Enhancement*.

## Process Flow

### Modification Adjustment in the First System (Development System)



Since all modifications to standard SAP objects are displayed during the upgrade, and you have to adjust all the displayed objects, you must schedule enough time for the modification adjustment.

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

1. The list of objects that must be adjusted in your SAP system is determined in the `ADJUSTCHK` phase. This phase is executed in the `PREPARE` module *Modification Support* and runs in the upgrade between the import of the substitution set and the end of the production period. The list is in the `UMODPROT.<SID>` log in the `log` subdirectory of the upgrade directory.
2. If you choose strategy *downtime-minimized*, the ABAP Dictionary objects (tables, data elements, domains, and so on) are adjusted during production operation. If you choose strategy *resource-minimized*, they are adjusted during downtime before the ABAP Dictionary is activated. The adjusted objects are collected in a repair that is released to a transport request. You cannot release this transport request; instead you must flag it for transport in transaction `SPDD`. Towards the end of the upgrade, `R3UP` exports the request to the transport directory `/usr/sap/trans` and registers it for transport in the `umodauto.lst` file.
3. Repository objects (reports, screens, and so on) are adjusted towards the end of the upgrade. 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 `R3UP`.

### Modification Adjustment in Subsequent Systems

For the quality assurance and production system, we recommend that instead of adjusting modifications manually, you automatically transfer both the transport requests exported from the first system as described in “Modification Adjustment in the First System (Development System)” above.



If you have not set up a central transport directory, you must perform some more steps before the transport requests can be transferred automatically. These steps are described in **SAP Note 51046**.

The `ADJUSTPRP` phase in the `PREPARE` module *Extension* prepares the requests from the development system to be transferred. If you confirm the transport requests, they are integrated into the upgrade. The phase also 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.



The number of objects in the adjustment transport requests might exceed the number of modifications in the receiving system. In this case, the upgrade will import changes that previously did not exist in the receiving system.

For a detailed description of the modification adjustment function, see the current online documentation under *Help* → *SAP NetWeaver Library* → *SAP NetWeaver* → *Application Platform (SAP Web Application Server)* → *ABAP Technology* → *ABAP Workbench* → *Changing the SAP Standard* → *Upgrade Procedure/Support Packages*.

## 5.1.12 Checking the Structural Requirements

### Use

You must meet the following structural requirements before you upgrade your system:

- The message server must run on the host with the central instance.  
During the upgrade, the upgrade control program `R3UP` uses Remote Function Call (RFC) to call function modules and temporarily schedules ABAP report programs for background processing. For this reason, the message server must still be running after the secondary instances are stopped. You can only guarantee this if the message server is located on the same host as the central instance.
- Update processes must run on the central instance when you make modifications to the standard SAP system.  
If you have made modifications to the standard SAP system, versions of the modified objects are created by the version management functions during the upgrade. The update program writes these versions. This means that an update process must be running on the central instance.

A standard installation meets the specified structural requirements.

If you are not sure whether you have a standard installation, you can use the following procedure to check the structural requirements.

### Procedure

1. Call transaction RZ10.  
Choose *Goto* → *Profile values* → *Of a server*.
2. Choose the server (host) where the central instance is running.  
The profile parameters for this server are displayed with their values.
3. Check the profile parameter `rdisp/mshost`.  
This parameter contains the host name where the message server is running. It must run on the same host as the central instance. This makes sure that the message server is active during downtime, because only the central instance runs during downtime, while the secondary instances are stopped.

4. If you have made changes to the standard SAP system, check the profile parameter `rdisp/wp_no_vb`.

This parameter displays the number of update processes for the central instance. The number must be greater than 0.

### 5.1.13 Checking the Hardware Requirements

#### Procedure

#### CPU, Main Storage, Disk Space and Unprotected Temporary Storage

Before the upgrade, check whether you have sufficient hardware resources, such as CPU, main storage, disk space, and unprotected temporary storage.

For more information about sizing, see SAP Service Marketplace at [service.sap.com/sizing](http://service.sap.com/sizing).

To plan technical upgrades (without functional extensions), see the information on how to perform a delta sizing for upgrades on SAP Service Marketplace at [service.sap.com/sizing](http://service.sap.com/sizing) → *Media Library* → *Presentations*.

#### Space Requirements in the Database

Make sure that enough temporary and permanent free space is available in your database.

### 5.1.14 Checking the Software Requirements

#### Use

You must meet certain software requirements before you upgrade the SAP system.

#### Procedure

1. Check the [source release of the SAP system \[page 57\]](#).
2. Check whether an [OS/400 upgrade \[page 57\]](#) is necessary.
3. Install the [OS/400 Portable Application Solution Environment \(PASE\) \[page 57\]](#).
4. If you want to use the Upgrade Assistant, meet the [requirements \[page 58\]](#).
5. Set the [time zone environment variable \[page 59\]](#).
6. Install the [Qshell \[page 62\]](#).



### 5.1.14.1 Checking the Source Release of the SAP System

#### Procedure

Before you upgrade your SAP system, it must have one of the source releases that have been released for this upgrade.

To determine the source release of your SAP system, log on to the system and choose *System* → *Status*.

The release appears in the *Component version* field.

### 5.1.14.2 Determining Whether an OS/400 Upgrade Is Necessary

#### Use

When you upgrade the SAP system, you may have to upgrade your operating system to a new version.

#### Procedure

For information on the operating systems released for the upgrade, see SAP Service Marketplace at [service.sap.com/platforms](http://service.sap.com/platforms).

For more information, see this section in the product-specific part of this documentation.

### 5.1.14.3 Installing the OS/400 Portable Application Solution Environment (PASE)

If you have not already done so, install option 33 of the OS/400 Portable Application Solution Environment (PASE, license program 5722SS1).

For more information on installing PASE, see [www.ibm.com/servers/enable/site/portable/iSeries/pase](http://www.ibm.com/servers/enable/site/portable/iSeries/pase).

## 5.1.14.4 Meeting the Requirements for the Upgrade Assistant

### iSeries

For iSeries, you need the installed license program 5722JV1 *AS/400 Developer Kit for Java*.

### Network

If you do not operate the GUI and server on the same host, you must be able to set up a TCP/IP connection between the GUI host and the server host.

### Java Virtual Machine

The Upgrade Assistant (Server and GUI) is implemented in Java. This means that it requires a Java Virtual Machine.

If you have any doubts about your operating system, find out about its Java porting from your Competence Center.

### Procedure for the Upgrade Assistant Server

You can run the Upgrade Assistant Server on version 1.3.x or higher of the Java Software Development Kit (SDK).

To install the J2EE Engine on the central instance, however, you require at least version 1.4.x of the SDK. For information on whether the scenario you are upgrading to is using the J2EE Engine, see the *Upgrade Master Guide*.

For information about which versions of the SDK are released for particular operating systems, see SAP Service Marketplace at [service.sap.com/platforms](http://service.sap.com/platforms) → *Product Availability Matrix*.

### Procedure for the Upgrade Assistant GUI

If the Upgrade Assistant GUI is not called on the central instance, you also require on each host at least Version 1.1.x of the Java Virtual Machine. You can provide this version in one of the following ways:

- **Internet browser with integrated Java Virtual Machine**

You can use an Internet browser to call the Upgrade Assistant GUI as a Java applet. To do this, the Internet browser must contain a Java Virtual Machine, or be able to call it as a plug-in. In addition, you have to make certain security settings to enable the browser to start Java applets.

At present, SAP supports the following browsers:

- Microsoft Internet Explorer as of Version 5
  - As of Microsoft Internet Explorer Version 6 or on Windows XP, you may have to install a Java Virtual Machine. The software package for the Windows 2000 operating system contains a Java Virtual Machine.
- Netscape Communicator as of Version 4.04 (Java AWT 1.1.4 or higher)

- **Java Runtime Environment (JRE)**

Includes porting for all relevant platforms. You can also use a Java Development Kit (JDK), which includes the JRE.

### 5.1.14.5 Setting the Time Zone Environment Variable

#### Use

You must add the time zone environment variable `PASE_TZ` to your iSeries system to ensure the correct resolution of time zones.

If the time zone variable has not been configured correctly, the following error message is displayed:

```
ABAP runtime errors      ZDATE_LARGE_TIME_DIFF
      Occurred on      2004/01/15 at 17:46:49
```

Large time difference between application server and database.

What happened?

The R/3 System synchronizes the times of the database and application server regularly.

As a result, a very large time difference was detected between these two systems.

...

#### Procedure

1. Log on to your iSeries as user `QSECOFR`.
2. Enter command `WRKENVVAR` and choose F4.  
The *Work with Environment Var (WRKENVVAR)* screen appears.
3. For the *Level* parameter, specify `*SYS` and choose ENTER.  
The *Work with Environment Vars (\*SYS)* screen appears.
4. Under *Opt*, enter 1, and under *Name*, add the `PASE_TZ` environment variable. Then choose ENTER.  
The *Add Environment Variable (ADDENVVAR)* screen appears.
5. In the *Initial value* field, enter the required time zone environment variable.



The following table contains some example values for the time zone environment variable:

| Region                                  | Value                       |
|---|-----------------------------|
| Western Europe (Walldorf)               | NFT-1DFT,M3.5.0/2,M10.5.0/2 |
| United Kingdom (London)                 | GMT0BST1,M3.5.0/1,M10.5.0/1 |
| East Coast North America (New York)     | EST5EDT4,M4.1.0/2,M10.5.0/2 |
| Central North America (Chicago)         | CST6CDT5,M4.1.0/2,M10.5.0/2 |
| North American Mountain Time (Denver)   | MST7MDT6,M4.1.0/2,M10.5.0/2 |
| West Coast North America (Los Angeles)  | PST8PDT7,M4.1.0/2,M10.5.0/2 |
| Japan (Tokyo) – no daylight saving time | JST-9JSTDT                  |

|                               |                               |
|-------------------------------|-------------------------------|
| East Coast Australia (Sydney) | EET-10EETDT-11,M10.5.0,M3.5.0 |
| Central Asia (Moscow)         | WST-4WDT-5,M3.5.0,M10.5.0     |

If the value of your time zone is not included in this table, enter the required value according to the format described in the following under "Format of the Time Zone Environment Variable".

### Format of the Time Zone Environment Variable

The values of the time zone environment variable have the following format:

```
<STD><offset_std><DST><offset_dst>,<start_date>/<start_time>,<end_date>/<end_time>
```

### Description of the Values of the Time Zone Environment Variable

| Value        | Description   |
|--------------|---|
| <STD>        | Three-character name for the time zone during standard time (not daylight saving time)                            |
| <offset_std> | Time offset relative to Universal Time Coordinated (UTC) for standard time (not daylight saving time)             |
| <DST>        | Three-character name for the time zone during daylight saving time  |
| <offset_dst> | Time offset relative to UTC during daylight saving time   |
| <start_date> | Leap Year or Julian representation of the date when daylight saving time starts for the region                    |
| <start_time> | Time at which daylight saving time starts on <start_date>   |
| <end_date>   | Leap Year or Julian representation of the date when the time is reset to standard time (not daylight saving time) |
| <end_time>   | Time on <end_date> at which the time is reset to standard time (not daylight saving time)                         |

The value for the offsets is based on Universal Time Coordinated (UTC), which has largely replaced Greenwich Mean Time (GMT) as the international time standard. Positive values lie west of the Prime Meridian, negative values east. Thus New York, for example, has a UTC offset of +6. Offsets may also be specified with minute and second precision (hh:mm:ss). Characters (comma and slash) separating fields are necessary. The values for <start\_time> and <end\_time> may not be negative.

### Leap Year Calendar Values and Julian Calendar Values

Depending on whether daylight saving time always starts and ends on the same calendar day in a country, there are two different ways to specify the <start\_date> and <end\_date> values:

- Leap Year Calendar Values
- Julian Calendar Values

### Leap Year Calendar Values

If daylight saving time does not always start on the same calendar date in a country, we recommend that you specify <start\_date> and <end\_date> using Leap Year calendar values. The format is as follows:

M<m> . <n> . <d>

#### Description of the Values

| Value | Description   |
|-------|---|
| <m>   | Calendar month (for example, January is 1)  |
| <n>   | The week of the month starting from week 1 defined as the first week beginning with Sunday. The last week is therefore always week 4. |
| <d>   | The day of the week starting from day 0 (Sunday)  |



For Eastern United States (New York), Leap Year notation is as follows:

EST5EDT6 , M4 . 1 . 0 / 2 , M10 . 5 . 0 / 2

This is the definition for Eastern Standard Time (+5 hours UTC) and Eastern Daylight Time (+6 hours UTC) that begins on Sunday of the first week of April at 02:00 a.m. and ends on Sunday of the fourth (and last) week of October at 02:00 a.m.

### Julian Calendar Values

If daylight saving time always starts on the same calendar date in a country, we recommend that you specify <start\_date> and <end\_date> using Julian calendar values. The format is as follows:

J<j>

#### Description of the Value

| Value | Description   |
|-------|---|
| <j>   | Julian value for the day of the year (February 2 would then be Julian 33) |



For Iraq, the daylight saving time always starts on April 1 and ends on October 1. The Julian notation is as follows:

MEST-3MEDT , J90 , J274

### Time Zone Offsets and Start and End Times that Do Not Fall on the Hour

In some regions, the time zone offset from UTC does not fall on the hour, but on some fraction of the hour. You can specify the value for the offset and the start or end times at a precision of minutes and seconds. Values for minutes and seconds must be preceded by a colon to separate minutes from hours and seconds from minutes.



If, for example, the East Coast of the United States decided to reduce daylight saving time by half an hour, and to begin and end daylight saving time at 30 seconds past 2:30 a.m. on the usual dates, the time zone environment variable would be as follows:

```
EST5EDT4:30,M4.1.0/2:30:30,M10.5.0/2:30:30
```

**See also:**

- For more information about definitions of international time zones that are recognized by your iSeries system, see your system documentation.
- **SAP Note 697353**

## 5.1.14.6 Installing the Qshell

### Use

You must install the Qshell on your iSeries.

This gives you a greater flexibility in dealing with stream files because you can use a large set of utilities that are common on UNIX systems, for example, `grep`, `tail`, or `ls`.

In addition, Qshell is compatible with `ksh` scripts in UNIX.

### Procedure

1. Install the Qshell Utilities (licence program 5799XEH).
2. Install option 30 of the Qshell Interpreter (licence program 5722SS1).

For more information about Qshell and installing the Qshell Utilities and the Qshell Interpreter, see [publib.boulder.ibm.com/html/as400/infocenterhtml](http://publib.boulder.ibm.com/html/as400/infocenterhtml).

## 5.1.15 Accessing Documentation Before and During the Upgrade

### Use

Before and during the upgrade you require documentation from the DVD *SAP Online Documentation* that contains the latest online documentation (for example, to modify adjustments). The documentation is not available online in your system until you have completed the upgrade and the installation procedure for the online documentation (SAP Library). However, you can make sure that you can read the DVD offline before the upgrade.

### Procedure

The instructions for installing the documentation are on the *SAP Documentation DVD* in file `Onldoc_e.pdf` or `Onldoc_e.htm`.

This upgrade documentation includes the paths to specific information in the appropriate sections. After the installation, you can use the same paths to find the documents online in the SAP system choosing *Help* → *SAP Library*. If you are upgrading from a 4.x Release, you can find most of the documentation online in the system before and during your upgrade to the new release.

## 5.1.16 Meeting the Requirements for the SAP Internet Solution

### Use

As of SAP NetWeaver 7.04, the SAP Internet Transaction Server (SAP ITS) is integrated into the SAP NetWeaver component SAP Web Application Server 6.40 as an Internet Communication Framework (ICF) service, which you can access, like other services, through the Internet Communication Manager (ICM). With the SAP ITS integrated in the SAP Web Application Server, the Web browser now communicates directly with the SAP system. Furthermore, all SAP ITS-related sources, such as service files, HTML templates, or MIME files, are now stored in the database of the system.

If you have developed your own SAP ITS-based Internet services, you can either use the integrated SAP ITS or you can continue using the standalone SAP ITS 6.20. ITS-based Internet services provided by SAP can run either on

- SAP Web AS 6.40 with integrated SAP ITS
- SAP Web AS 6.40 with integrated SAP ITS and SAP ITS 6.20
- SAP ITS 6.20

The SAP ITS integrated in the SAP Web AS supports the following functions:

- SAP GUI for HTML
- Internet Application Component (IAC) runtime or Web Transaction technology

The SAP ITS integrated in the SAP Web AS does not support the following functions:

- SAP ITS Flowlogic runtime
- WebRFC
- Web Reporting
- GUI XT

If you want to use these functions, you need a standalone SAP ITS 6.20.

Which ITS you can use may depend on the SAP Solution you have implemented. For more information about the SAP Solution you are using, see the *Upgrade Master Guide* of the specific SAP solution.



You can use the ABAP Workbench of the SAP system to develop your own Internet applications or modify the applications delivered with the standard SAP system. Any modification you make to Internet applications delivered in the standard SAP system are recorded by the Modification Assistant and can be adjusted with transaction SPAU during the upgrade.

## Prerequisites

**SAP ITS 6.20:** The prerequisites and the upgrade of customer-specific Internet application components are described in the documentation *SAP@Web Installation Guide*.

## Procedure

- If you want to use the integrated SAP ITS 6.40, proceed as follows:
  - a. Perform the upgrade of the SAP system.
  - b. Configure the integrated ITS.

For information on how to configure the integrated ITS, see the online documentation under *Application Platform (SAP Web Application Server) → ABAP Technology → UI Technology → ITS/SAP@Web Studio → SAP ITS in the SAP Web Application Server → Configuration*.
  - c. Migrate the applications.

For information on how to migrate SAP ITS-based Internet services, see the online documentation under *SAP NetWeaver → Application Platform (SAP Web Application Server) → ABAP Technology → UI Technology → Web UI Technology → ITS/SAP@Web Studio → SAP ITS in the SAP Web Application Server → Developing IACs with the SAP integrated ITS → Migration of existing ITS-Services*.
- If you want to continue using the services with the standalone SAP ITS 6.20, proceed as follows:
  - a. Upgrade the SAP system.
  - b. Read **SAP Note 197746** to see if newer versions of the SAP ITS and IACOR are available.
  - c. Make a backup copy of all Internet applications that you have developed or modified on the SAP ITS.

Make this backup copy even if you do not want to install a newer version of the SAP ITS.
  - d. If there are newer versions, install and configure the SAP ITS and IACOR as described in the *SAP@Web Installation Guide*.
  - e. Execute report W3\_PUBLISH\_SERVICES in the SAP system to publish the Internet applications from the SAP system to the SAP ITS.
    - i. Leave the fields *Transport Request* and *Package* empty and choose *Execute*.

A new dialog box appears.
    - ii. Choose *Workbench Settings*.

A new dialog box appears.
    - iii. Choose the option *On Selected Site* under *Publish*.
    - iv. Use the input help to select the site where you want to publish, and confirm.

If the selection menu is empty, the IACOR and its corresponding sites in the SAP system have not yet been configured correctly. For more information, see **SAP Note 399578**.



- v. Choose *Select All* and *Publish*.

The publishing process can take up to 15 minutes. If the publishing process was successful, an appropriate message appears.

- vi. If you have configured multiple sites where you want to publish, repeat steps b. to e.



Execute report W3\_PUBLISH\_SERVICES even if you have not installed a new version of the SAP ITS. For more detailed information, and any updates, see **SAP Note 399578**.

### 5.1.17 Importing Additional Languages

After the upgrade you have the option of importing new languages into the SAP system. SAP recommends that you only use this option if the system contains the Support Packages for the language DVD you are using. This is the case if you did not include any additional Support Packages in the upgrade, or did not import any additional Support Packages after the upgrade. For more information, see the *Language Transport* documentation, or **SAP Note 352941**.

The upgrade procedure itself only offers to update existing languages. You cannot install any new languages during the upgrade. However, you do have the option of classifying new languages in the SAP system before the upgrade with transaction SMLT, and importing them during the upgrade. For more information about this procedure, see **SAP Note 322982**.

If you intend to use additional languages in your system in the future, import them during the upgrade. In this way you can avoid any sequencing problems arising from Support Packages included in the upgrade, or Support Packages you need to import after the upgrade.



Importing new languages during an upgrade is a highly efficient process, and is preferable to importing a language into a production system after an upgrade.

## 5.2 Upgrade Preparations

### General Information

This part of the documentation contains general information on the preparations that you need to make before you upgrade your system.



For any additional information, see the product-specific part of this documentation.

You can prepare for the upgrade while the system is in production operation. Careful preparation of the upgrade is the best guarantee that it will run without errors. The [PREPARE \[page 162\]](#) program supports you here by making most of the necessary checks automatically. Start `PREPARE` as soon as possible before the upgrade so that you can perform the necessary preparations in time.

### Actions

You perform the following general actions before you start `PREPARE`:

- [Determining the Host for the Upgrade Preparations \[page 67\]](#)
- [Creating the Upgrade Directory \[page 67\]](#)
- [Importing the Latest SPAM Update \[page 69\]](#)

The following actions describe how to start and use the Upgrade Assistant:

- [Starting PREPARE for the First Time \[page 69\]](#)
- [Starting the Upgrade Assistant Server \[page 71\]](#)
- [Starting the Upgrade Assistant GUI \[page 71\]](#)
- [Starting the Upgrade Assistant \[page 72\]](#)
- [Restarting PREPARE \[page 73\]](#)
- [Resetting PREPARE \[page 73\]](#)
- [Importing Software After Starting PREPARE \[page 74\]](#)

You perform the following actions during `PREPARE`:

- [Making the First Entries for PREPARE \[page 74\]](#)
- [Making Entries for the Parameter Input Module \[page 76\]](#)
- [Making Entries for the Initialization Module \[page 79\]](#)
- [Making Entries for the Import Module \[page 80\]](#)
- [Making Entries for the Extension Module \[page 81\]](#)
- [Making Entries for the Installation Module \[page 89\]](#)
- [Making Entries for the Preprocessing Module \[page 89\]](#)

You perform the following actions after you have executed `PREPARE`:

- [Evaluating the Results of PREPARE \[page 90\]](#)
- [Making Preparations at the Operating System Level \[page 93\]](#)
- [Making Preparations at the Database Level \[page 94\]](#)

- [Making Preparations at the SAP System Level \[page 94\]](#)
  - [Checking the User for the Upgrade \[page 94\]](#)
  - [Checking the Requirements for the Modification Adjustment \[page 95\]](#)
  - [Setting the Operation Mode for the Upgrade \[page 95\]](#)

## 5.2.1 Determining the Host for the Upgrade Preparations

### Use

You need to prepare for the upgrade on the host with the central instance. The central instance must be on the database host.

### Procedure

Decide which hosts you need for the upgrade preparation and the actual upgrade of the SAP system:

- **Host with the central instance**

You must execute the upgrade process and `PREPARE` on the host where the central instance is running. The Upgrade Assistant Server also runs on this host.
- **Other hosts**

The graphical user interfaces (GUIs) provided by the Upgrade Assistant can run on any hosts that meet the necessary requirements.
- **Database host**

You must perform the actions that affect the database on the database host. For a description of these actions, see [Making Preparations at the Database Level \[page 94\]](#).

## 5.2.2 Creating the Upgrade Directory

### Use

The SAP system is upgraded using the upgrade directory, which can be a softlink to another physical directory. It is divided into subdirectories that can also be softlinks. The standard path for the upgrade directory is `/usr/sap/put` on the host with the central instance, however, you can also give it a different name. For more information, see [Using a Different Upgrade Directory and Different Upgrade Libraries \[page 158\]](#). The `PREPARE` program needs the upgrade directory before the actual upgrade, since it copies data and programs into this directory.



Before you start the new upgrade the directory must exist, but be empty.

## Prerequisites

- The upgrade directory must be installed on the host with the central instance.



Make sure that the SAP profile parameter `DIR_PUT` in the instance profile of the central instance has the value `<upgrade directory>`.

- Make sure that there is enough disk space for the upgrade directory. This space is required for the upgrade and the logs.



You also require additional disk space in the upgrade directory for each language other than English or German. For more information, see *Upgrade – Step by Step*.

- You are logged on to your iSeries as user `<SID>OFR`.

## Procedure

If you did not delete the upgrade directory after the previous upgrade, delete it (steps 1-4) and then create a new one (step 5). If there is no upgrade directory from the previous upgrade, create the upgrade directory directly (step 5).

- Check whether the upgrade directory is a link. Enter:

```
WRKLNK OBJ(' <upgrade directory>') OBJTYPE(*ALL)
DETAIL(*EXTENDED)
```

- If the directory type is given as `SYMLNK -> DIR`, delete the link with the following command:

```
RMVLNK OBJLNK(' <upgrade directory>')
```



If you created softlinks to subdirectories, this deletes the links, but not the contents of the directories you linked to. To delete these directories as well, you must delete the directories one by one and redefine the links. Copy any manually created directories before you delete them if you want to keep them.

- If the upgrade directory is not a link, delete the upgrade directory and all its subdirectories:

```
RRM ' <upgrade directory>'
```

- To check that the link has been deleted, enter:

```
WRKLNK ' <upgrade directory>'
```

This will return the message *Object not found*.

- Recreate the upgrade directory:

```
MKDIR ' <upgrade directory>'
CHGPGP OBJ(' <upgrade directory>') NEWPGP(R3GROUP) DTAAUT(*RWX)
OBJAUT(*ALL)
```



The primary group of the directory and of all the subdirectories must be the SAP user profile `<SID>GROUP`.

## 5.2.3 Importing the Latest SPAM Update (Source Release 4.x and Higher)

### Use

As of Basis Source Release 4.0B, `PREPARE` calls functions of the SAP Support Package Manager (transaction SPAM) to include add-on updates and Support Packages in the upgrade. The current version of these functions must exist in your SAP system before the upgrade.

### Procedure

Import the latest SPAM update for your source release before you start `PREPARE`.

For more information about importing a SPAM update, see the online help in transaction SPAM, or the online documentation for the corresponding Basis source release:

- Basis Release 4.x  
Choose *SAP Library* → *Basis Components* → *Upgrade – General* → *Online Correction Support* → *Support Package Manager* → *Importing Support Packages with the Support Package Manager* → *Importing a SPAM/SAINT Update*.
- Basis Release 6.10 to 6.30  
Choose *SAP Library* → *mySAP Technology Components* → *SAP Web Application Server* → *Upgrade – General* → *Online Correction Support* → *Support Package Manager* → *Importing Support Packages with the Support Package Manager* → *Importing a SPAM/SAINT Update*.

## 5.2.4 Starting PREPARE for the First Time

### Use

You can execute `PREPARE` with the Upgrade Assistant or in scroll mode. We recommend that you use the Upgrade Assistant. To copy and unpack the Upgrade Assistant from the DVD directory, you must start `PREPARE` once directly from the DVD.

### Prerequisites

- You have met the [requirements for PREPARE \[page 66\]](#).
- The database and the SAP system have been started.

### Procedure

1. Mount the *Upgrade Master* DVD.
2. Log on to the host on which the central instance is running as user `QSECOFR`.
3. Enter the following commands:

```
LODRUN DEV(*OPT) DIR('/UM1/OS400/AS400/UPGRADE')  
SIGNOFF
```



If you want to use an upgrade directory other than the default directory `/usr/sap/put`, see [Using a Different Upgrade Directory and Different Upgrade Libraries \[page 158\]](#).

4. Log on as user `<SID>OFR` and enter the following commands:

```
ADDLIBLE R3UP
```

```
GO R3UP
```

5. To run `PREPARE`, choose option 1.

The *Prepare R/3 upgrade procedure* screen is displayed.

6. For *SAP System ID*, enter the name of your SAP system, for example, `C11`.

For the remaining fields you can normally accept the default values:

|                                  |                             |
|----------------------------------|-----------------------------|
| <i>Path to Master CD</i>         | <code>`/QOPT/*'</code>      |
| <i>Upgrade Directory</i>         | <code>`/usr/sap/put'</code> |
| <i>Upgrade Library (Pgms)</i>    | <code>R3UP</code>           |
| <i>Upgrade Library (SrvPgms)</i> | <code>R3UPSRV</code>        |

This creates a directory `<upgrade directory>/ua` into which the Upgrade Assistant is unpacked.

7. Decide how you want to continue.
- **EXIT** (default value): This ends the `PREPARE` program. You can [restart PREPARE \[page 73\]](#) using the Upgrade Assistant or the scroll mode.
  - **SERVER**: Use this option if you want to continue with the `PREPARE` program using the Upgrade Assistant. To start the Upgrade Assistant, proceed as follows:
    - i. Start the [Upgrade Assistant Server \[page 71\]](#).
    - ii. Start the [Upgrade Assistant GUI \[page 71\]](#).
    - iii. Start the [Upgrade Assistant \[page 72\]](#).
    - iv. In the Upgrade Assistant menu, choose *Administrator* → *Connect UA Server to R3up*.
  - **SCROLL**: You continue with the `PREPARE` program using the scroll mode.

## 5.2.5 Starting the Upgrade Assistant Server

### Prerequisites

You must have started the `PREPARE` program once from the DVD. This creates the `ua` subdirectory in the upgrade directory and unpacks the Upgrade Assistant in this directory.

### Procedure

To start the Upgrade Assistant Server, enter:

```
ADDLIBL R3UP
```

```
ADDENVVAR ENVVAR(PASE_LIBPATH) VALUE(`<upgrade directory/bin`)  
JAVA CLASS(UaServer) CLASSPATH(`<upgrade directory>/ua/ua.jar`)  
PROP((os400.file.io.mode TEXT)  
(os400.verify.checks.disable 3))
```

### See also:

For iSeries-specific information about the Upgrade Assistant, see **SAP Note 161699**.

## 5.2.6 Starting the Upgrade Assistant GUI

### Prerequisites

The [Upgrade Assistant Server \[page 71\]](#) is active.



The procedure depends on the host on which you are starting the Upgrade Assistant GUI. We recommend that you call the GUI from an Internet browser. If, for example, you have to use the SAProuter to pass a firewall, call the GUI by using the Java runtime environment. In this case, you can specify the required routing string.

### Procedure

#### Starting the GUI from the Internet Browser

- To start the GUI from a browser, enter the following Internet address:  
`http://<host name>:4239/ua/UaGui.html`  
Replace `<host name>` with the name of the host on which the Upgrade Assistant Server is running. You need to enter the full Internet name, for example:  
`as0029.wdf.sap-ag.de`
- To display the phase list, upgrade documentation, and additional information about the upgrade, enter the following URL:  
`http://<host name>:4239`  
From this page, you can also start the Upgrade Assistant GUI using the relevant link.

## Starting the GUI on Windows Hosts

1. So that the GUI can also be executed on other hosts, copy the `uagui.jar` file from the `<upgrade directory>/ua` directory on the iSeries to any `<UaGuiDir>` directory.
2. Start the GUI in a command prompt as follows:
  - When using the Java Software Development Kit (SDK)
 

```
java -cp <UaGuiDir>\uagui.jar UaGui
```
  - When using the Microsoft Virtual Machine
 

```
jview /cp <UaGuiDir>\uagui.jar UaGui
```

## 5.2.7 Starting the Upgrade Assistant

### Prerequisites

The Upgrade Assistant Server and the Upgrade Assistant GUI have already been started.

### Procedure

If you did not start the GUI from an Internet browser, a connect screen appears:

1. In the *Host name* field, enter the name of the host where the central instance is running.



Example of the format for the host name:

```
hw1156
hw1156.wdf.sap-ag.de
155.56.202.33
```

If you want to start the Upgrade Assistant GUI and the Upgrade Assistant Server on the same host, you can leave the *Host name* field empty.

2. Do not change the default value `4241` in the *Port number* field.
3. Choose *Connect*.  
A logon screen appears.
4. In the fields *User name* and *Phone number*, enter your personal information.
5. In the *Password* field, you must enter a password that specifies whether the GUI has the role of the administrator or the observer. The initial passwords for the two roles are as follows:

| Role          | Initial Password |
|---------------|------------------|
| Administrator | admin            |
| Observer      | observer         |

6. Choose *Login*.  
After you log on, the main menu window appears.



## 5.2.8 Restarting PREPARE

### Use

If you want to execute `PREPARE` again, you must restart it.

If you cannot use the Upgrade Assistant for some reason, or you do not want to, you can execute `PREPARE` in scroll mode. The commands for [starting PREPARE for the first time \[page 69\]](#) are the same for display mode *Server* (Upgrade Assistant GUI) and display mode *Scroll*, since `PREPARE` is started from the DVD. When you restart `PREPARE`, the commands for using the Upgrade Assistant and the scroll mode are different.

### Procedure

#### Using the Upgrade Assistant

1. Make sure that the Upgrade Assistant Server is active.
2. [Start an Upgrade Assistant GUI \[page 71\]](#).
3. Log on to the Upgrade Assistant GUI.
4. Choose *Administrator* → *Start PREPARE*.

The *Select the PREPARE modules* screen appears.

#### Using the Scroll Mode

1. Log on to the host on which the central instance is running as user `<SID>OFR`.
2. Enter the following commands:  

```
ADDLIBLE R3UP
R3UP UPGDIR(<upgrade directory>) PARMLIST('check')
```
3. When you are prompted for the display mode, enter `SCROLL` for the line-oriented mode.

## 5.2.9 Resetting PREPARE

### Use

If you have already executed `PREPARE` more than once, but do not want to upgrade the system, then you must reset `PREPARE`.



Between the phases `TOOLIMPD1` and `NPREPCRE0` in the *Import* module, you cannot reset `PREPARE`. In this case, you must execute the remaining phases up to at least phase `NPREPCRE0` before you reset `PREPARE`.

### Prerequisites

You are logged on as user `<SID>OFR`.

## Procedure

1. Enter the following commands:  

```
ADDLIBLE R3UP  
R3UP UPGDIR(<upgrade directory>) PARMLIST('reset prepare')
```
2. Delete the contents of the upgrade directory so that it has the same state it had the [first time PREPARE was started \[page 69\]](#).

## 5.2.10 Importing Software After Starting PREPARE

### Use

After you have started `PREPARE`, you may need to import software such as SAP Support Packages, languages, or add-ons (and add-on updates).

### Procedure

1. [Reset PREPARE \[page 73\]](#).
2. Import the required software.
3. Start `PREPARE` again [from the DVD \[page 69\]](#) and repeat the mandatory and optional modules.

## 5.2.11 Making the First Entries for PREPARE

### Use

`PREPARE` needs certain information from you so that it can run the `PREPARE` modules. Default values appear where possible. Confirm or change the default value. Certain data carriers are also required. For a list of the necessary values for the individual `PREPARE` modules, see below. For a complete list of the modules, see the `PREPARE` [phase list \[page 160\]](#).

### Procedure

1. If you ended the `PREPARE` program with `EXIT` after starting it for the first time, choose whether you want to run `PREPARE` in scroll mode or use the Upgrade Assistant.
2. Enter the SAP system ID (<SID>).
3. Start the import of the upgrade control data from the DVD.

If you ended the `PREPARE` program with `EXIT` after starting it for the first time, you are also prompted to enter the directory on which you have mounted the *Upgrade Master* DVD.



If you have not entered the path to the *Upgrade Master* DVD correctly, a dialog box appears where you can enter up to 24 DVDs. For more information, see “Mount directories for the data carriers” in [Making Entries for the Parameter Input Module \[page 76\]](#).

After the import has completed, the screen for selecting the `PREPARE` modules is displayed.

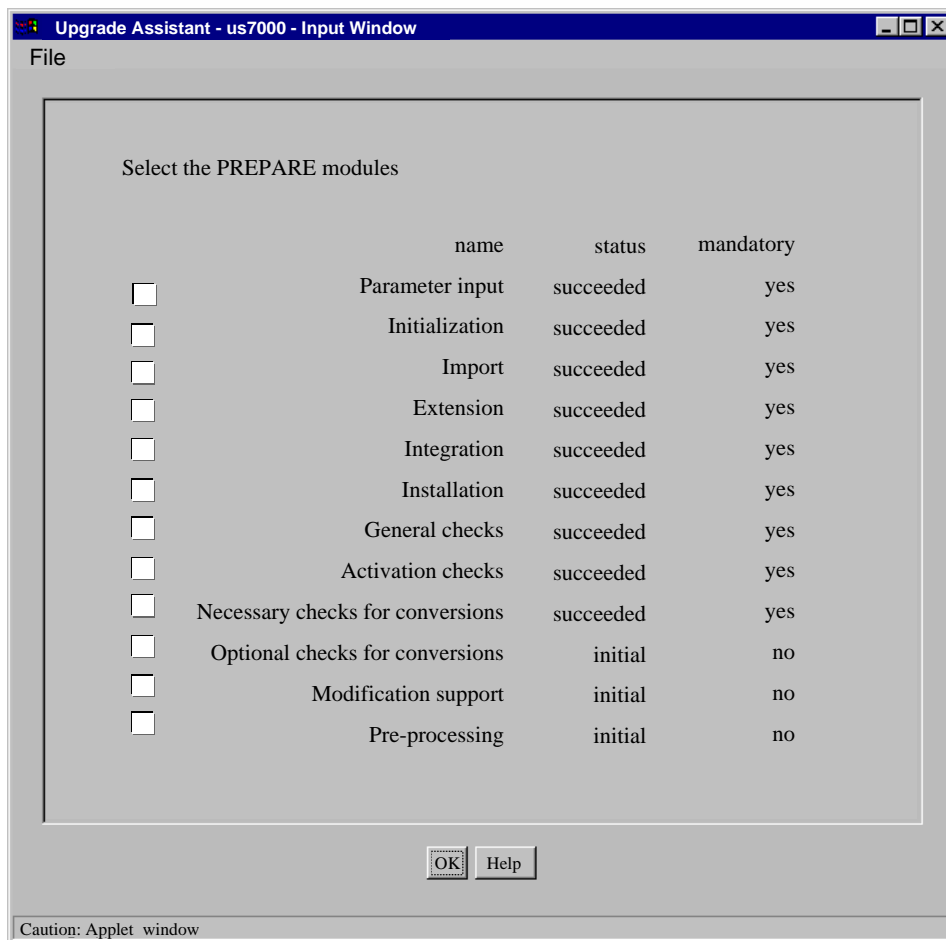


We recommend that you replace the `R3up` that has been delivered on the DVD with the latest `R3up` from SAP Service Marketplace now. For more information, see **SAP Note 663258**.

You can also copy the correction package `FIX_<product name>.SAR` to the upgrade directory now. For more information, see **SAP Note 663240**.

4. On the screen for selecting the `PREPARE` modules, select which modules you want `PREPARE` to run through.

Some modules are mandatory, some are optional. `PREPARE` must run through all mandatory modules before you start the actual upgrade. A successfully executed module has the status *succeeded*.



## 5.2.12 Making Entries for the Parameter Input Module

### Use

PREPARE needs certain information from you so that it can run the *Parameter Input* module. Default values appear where possible. Confirm or change the default value. For a list of the necessary entries for this PREPARE module, see below.

### Procedure

Enter the following information or confirm the existing entries when prompted to by PREPARE:

- Name to the new kernel library

The default name is R3<rel>OPT.

- Kernel version (OS/400 release)

If the kernel library you entered already exists and can be used for the upgrade, you are asked whether you want to import the new kernel from DVD or if you want to skip this step.

If you want to import the new kernel from DVD or if the library does not exist, enter the kernel version (OS/400 release) that you want to install.



The kernel version is the OS/400 release used to build the kernel. Therefore, it is not always identical to the OS/400 release on your iSeries. For information about available kernel versions, see **SAP Note 781092**.

- Name of the SAP system (<SID>)
- Host name of the central SAP server
- Number of the instance, for example, 00
- Path to the active SAP kernel
- Mount directories for the data carriers

If you have only **one DVD drive**, you do not have to enter any other mount directories. Whenever necessary, R3up prompts you to specify a mount directory or to change the data carrier. If you are working in scroll mode, choose ENTER to skip the prompts for extra mount directories.

If you have **more than one DVD drive** or if you are able to copy the contents of the DVDs and CDs to disk, enter all the mount directories used. You can enter up to 24 mount directories and change your entries each time you start PREPARE or R3up.

The prompt for the mount directories occurs during the EXTRACTKRN\_PRE phase, which runs during PREPARE and during the INPUT phase, which runs during the upgrade. You are only prompted for the mount directories, which means that it does not matter where the data carriers are mounted.



When you enter the mount directories, you can use a wildcard in the last part of the mount directory path, for example, `/mnt/*dvd*`. `R3up` fills the mount directory entry fields with all directories that the wildcard matches. Any duplicate entries found by the wildcard are removed automatically. Note the volume ID that is printed on the DVD and enter:  
`/QOPT/<volume ID>` (for example, `/QOPT/CD51030220`)  
 If you are using a directory on a remote iSeries system, enter:  
`/QFileSvr.400/<host name>/QOPT/<volume ID>`  
 If you are using a directory on a remote iSeries system, bear in mind that the users and passwords on this remote host must be identical to those on the local host. For example, if your work processes work with a user profile `SAP<nn>`, this user profile (with the same password) must also exist on the remote host.

If you entered mount directories for all data carriers required by the upgrade, and the program finds the right directory, you are not prompted to enter mount directories. If you do this, you can ignore all further instructions to enter mount directories in this documentation.

If you do not have enough DVD drives, you can copy the contents of each DVD and CD to separate directories on your hard disk (providing you have sufficient disk space). Specify the names of these directories when the program prompts you to enter the mount directories.

In addition to the *Upgrade Master DVD*, `PREPARE` and `R3up` require other data carriers. For a list of the data carriers, see this section in the **product-specific part** of this documentation.

The other data carriers in the upgrade package are not required by `PREPARE` or `R3up`. They are used by other programs related to the upgrade, for example, for importing a new version of the database system.

- Instance name of the database
- Host name of the database server
- Password of user `DDIC` in the system, client 000

This password is needed for the RFC connection to the SAP system. Check whether the password is correct by logging on to the SAP system. `R3up` asks you to verify the password by entering it a second time.

During the upgrade, you must unlock the user. After the upgrade, the user will **not** be locked again automatically.

Usually, it is not necessary to [change the password \[page 135\]](#) of user `DDIC` during the upgrade. If you do change the password, you have to change it in the original system, the shadow system, and the `R3up` parameter.

- Path and name of the profile of the central instance

The profile of the central instance is also in the general profile directory  
`/usr/sap/<SID>/SYS/profile.`

It meets the following naming conventions:

```
<SID>_DVEBMGS<instance number>_<host name>
```

You must check here whether your default value is correct. If in doubt, see the start profile for the correct name.

- Path of profile `DEFAULT.PFL`

Profile `DEFAULT.PFL` is in directory `/usr/sap/<SID>/SYS/profile`.

- Name of the SAP start profile

The SAP start profile is used in the SAP start procedure and is in the general profile directory `/usr/sap/<SID>/SYS/profile`.

It meets the following naming conventions:

`START_<instance name><instance number>_<host name>`



`START_DVEBMGS00_as0030`

Always check that the default value is correct. If it is not correct, change it.

- Host name of the background server

There is usually a background service available on the central instance. You can check this with transaction `SM51`.

However, in larger systems, the background service may be elsewhere to improve load distribution. In this case, enter the host name and the name of the relevant application server. Also make sure that the upgrade directory is mounted on the host with the background service, and that the background server can process background jobs of class C.

The server you select must be available for background operations round the clock. Check the active operation modes with transaction `SM63` to find out if it satisfies this requirement.

- Number of parallel processes during production operation

This is the number of background and activator processes that can run in the system during production operation. We recommend a value of 1. If you have enough main memory, you can use up to three processes.

- Number of parallel import processes

The number of parallel processes used by `R3trans` to import data into the database. We recommend three processes for hosts with 2 GB (and greater) main memory. Up to 12 parallel import processes are possible for multiprocessor hosts with sufficient main memory.

- Longest synchronization time of the buffers on all application servers

Usually, 60 seconds is entered for the `bufreftime` parameter in the instance profiles of the servers.



If you have installed multiple instances, you must specify the largest value of all the profiles. `R3up` must wait for this length of time at certain points during the upgrade so that all the instances are synchronized. If the time entered is too short, time intervals might occur in which users can make unchecked changes.

- Path to the EPS inbox

The default value appears. It must be identical with the value of profile parameter `DIR_EPS_ROOT`. Check the value and correct it, if necessary.

- Directory for the local system log

This is the local system log of the central instance.

The format of the system logs for the new release is not compatible with all previous versions. For this reason, the local system log of the central instance and the central system log are renamed in a kernel switch (`KX_SWITCH` phase).

The system logs are recreated the next time the SAP system is started with the new release.

- Directory for the central system log

See “Directory for the local system log” above.

## 5.2.13 Making Entries for the Initialization Module

### Procedure

#### Phase `TOOLVERSION_INI`

Before you can perform the upgrade, the tools in the SAP kernel directory `/usr/sap/<SID>/SYS/exe/run` of your Basis source release must have a [version \[page 154\]](#) and patch number released for the upgrade.

In the `TOOLVERSION_INI` phase of the *Initialization* module, `PREPARE` checks the SAP kernel patch number, the `tp` version, and the date `R3trans`. If necessary, it prompts you to switch the SAP kernel or tools to a version and patch number released for the upgrade.

The subsequent `PREPARE` modules require the version of the SAP kernel released for the upgrade, since older versions contain errors that cause problems in `PREPARE`.



Apart from the `disp+work` package, you also need the corresponding database library for the SAP kernel.



Do **not** replace programs in the `/preexe` and `/tools` subdirectories of the upgrade directory. You may only do this if you get approval from SAP Support.

### SAP Kernel

If your current SAP kernel does not fulfill the requirements of `PREPARE`, proceed as follows:

1. Before switching the SAP kernel, back up the existing kernel directory.



When you switch the SAP kernel, you overwrite all files and subdirectories in directory `/usr/sap/<SID>/SYS/exe/run`. For more information, see the `PREPARE` log `CHECKS.LOG`.

- Switch the SAP kernel as described in the following SAP Notes:

| Source Release | SAP Note |
|----------------|----------|
| 4.6x           | 318846   |
| 6.10           | 502999   |
| 6.20           | 664679   |



Before continuing the upgrade, make sure that the SAP kernel has at least the minimum required patch number.

- After you have switched the SAP kernel, repeat the *Initialization* module to change its status to *succeeded*.

### Tools R3trans and tp

The upgrade may require a certain version for tools `R3trans` and `tp`. For the required versions of these tools, see SAP Service Marketplace at [service.sap.com/swdc](http://service.sap.com/swdc) → *Download* → *Support Packages and Patches*.

You can also use the SAP kernel programs that are on the *SAP Kernel DVD*. For more information about the folders they are stored in, see the `CHECKS.LOG` file.

For more information on how to install these tools, see **SAP Note 19466**.

After you have replaced the tools, repeat the *Initialization* module to change its status to *succeeded*.

### Phase ADDON\_INFO

For most of the add-ons produced by SAP, there are special SAP Notes containing information on the upgrade strategy. In the `ADDON_INFO` phase, `R3up` writes the SAP Note numbers for your upgrade into the `CHECKS.LOG` file. `R3up` lists the general add-on Note as well as, if possible, specific add-on upgrade Notes to the add-ons installed.

Before the upgrade, check all SAP Notes listed in the `CHECKS.LOG` file. If there are add-ons installed in your SAP system for which there is no information in one of the listed SAP Notes, refer to the add-on producer for information.

## 5.2.14 Making Entries for the Import Module

### Procedure

#### Phase REQIMPORT

You are asked to confirm that you want the data and tools to be imported into the database. To import the data and tools, confirm the message that is output in this phase.

#### Phase TOOLFIX\_CHK

To ensure the stability and high performance of the upgrade tools, we provide upgrade correction packages for all upgrades. If you have not already done so, you are prompted to copy correction package `FIX_<product name>.SAR` to the upgrade directory in this phase.



For more information about the procedure and the availability of correction packages, see **SAP Note 663240**.

## 5.2.15 Making Entries for the Extension Module

### Procedure

#### Phase LANG\_SELECT

When you are prompted by `PREPARE`, mount the necessary directories of the language DVD. You need to do this even if only the standard languages English and German are installed in your system.

If you have installed languages other than the standard languages, you have the option of excluding some of these languages from the upgrade. The standard languages are always imported.

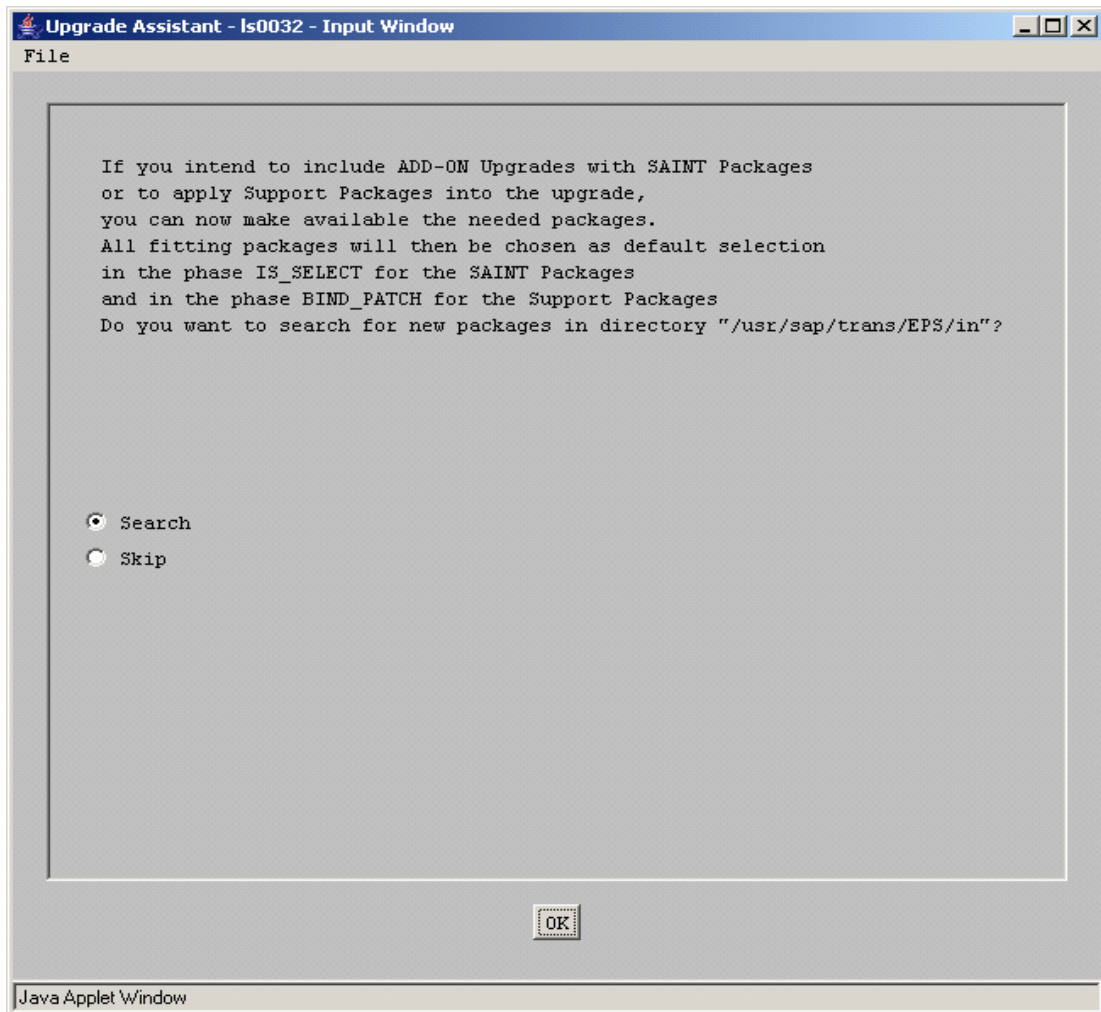


If you exclude a language, you cannot work in this language after the upgrade.

In principle, it is possible to install additional languages during the upgrade. For more information, see [Importing Additional Languages \[page 65\]](#).

#### Phase UPLOAD\_REQUEST

`PREPARE` prompts you to put all the packages such as add-on upgrade packages (SAINT packages) or Support Packages that are required for the upgrade in the specified directory.



If you want to include add-on upgrade packages (SAINT packages), Support Packages, or a SPAM update in the upgrade, proceed as follows:

1. Download the Support Packages and the SPAM update of the target release.  
You can download the Support Packages in one of the following ways:
  - From SAPNet – R/3 Frontend using transaction SPAM. If you choose this method, skip points 2 through 4 and proceed from point 5.
  - From the SAP Service Marketplace, following the instructions in **SAP Note 83458**
  - From a Support Package or add-on CD, following the instructions on each CD
2. Log on to your iSeries as user <SID>OFR.
3. Go to directory /usr/sap/trans.
4. Unpack the archive that contains the Support Packages with the following command:  
**SAPCAR -xvf /QOPT/<VOLID>/<PATH>/<ARCHIVE>.SAR -h'**

If you want to download the archives from a Support Package or add-on CD, you can find details about the archives and their paths in the README file on the CD.

5. Check whether the unpacked Support Packages are in the EPS inbox of your transport directory (/usr/sap/trans/EPS/in).

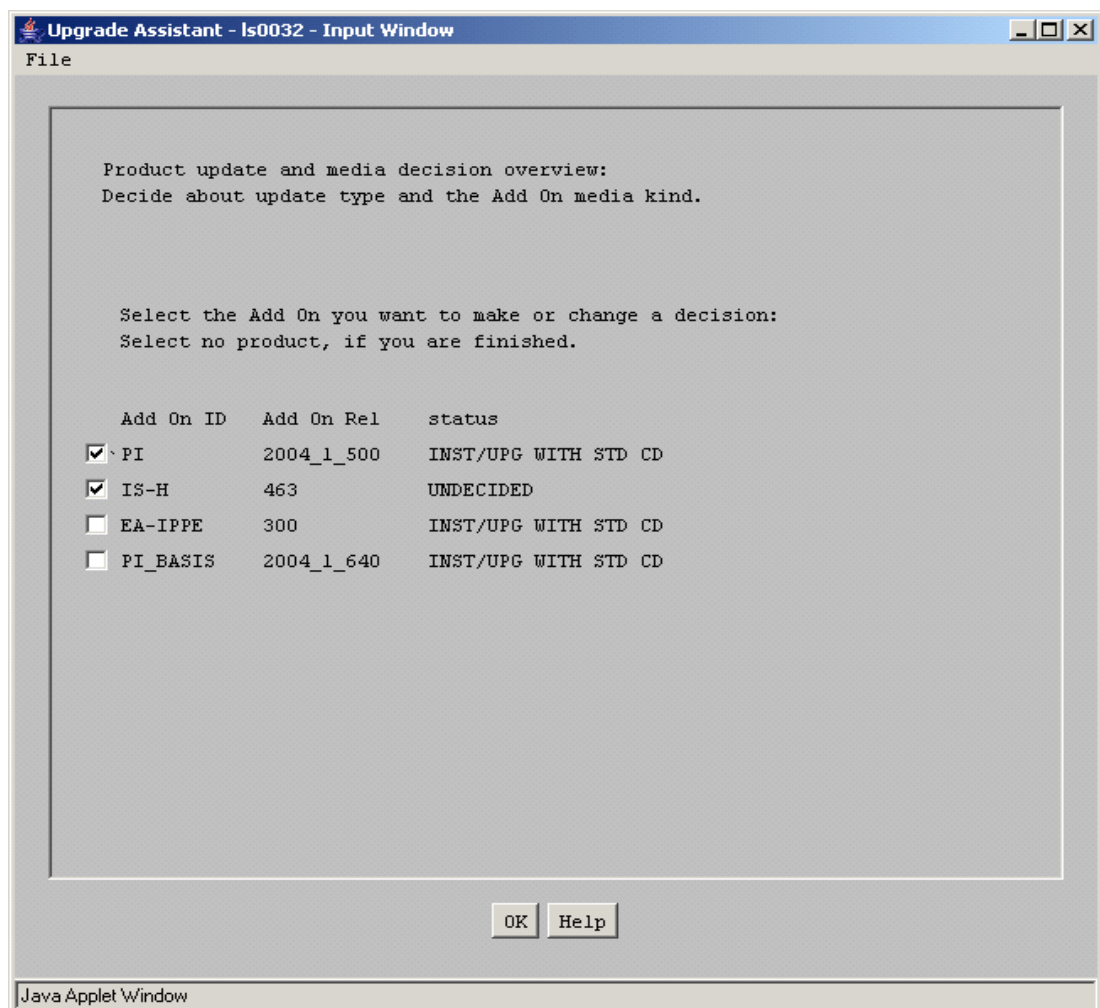


If you want to include Conflict Resolution Transports as well as Add-On Support Packages for add-on components, make sure that these packages are also in the EPS inbox.

When you select add-ons in the IS\_SELECT phase, or when you select Support Packages in the BIND\_PATCH phase, the corresponding packages appear as the default value.

## Phase IS\_SELECT

PREPARE determines all the add-ons that are contained in the SAP system and prompts you to decide how to proceed.

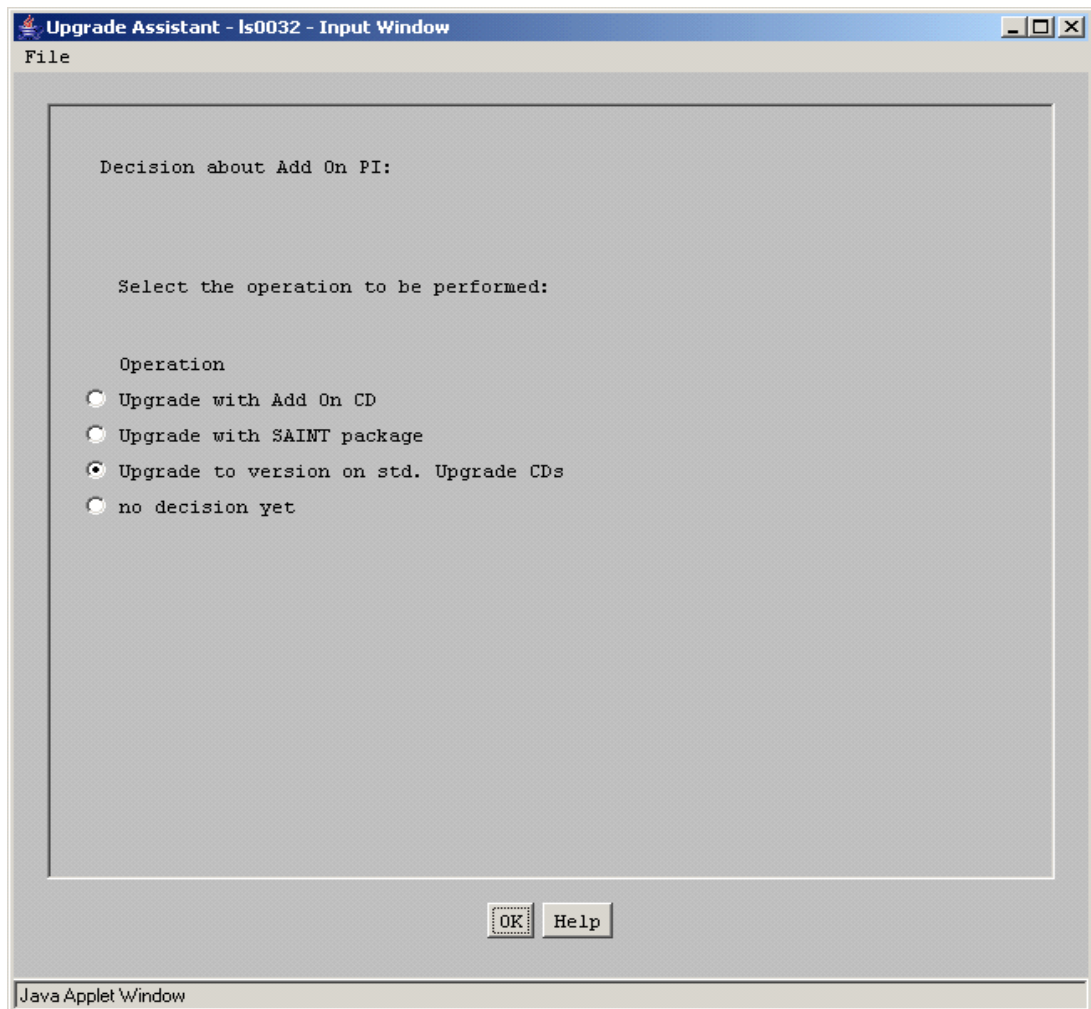


All add-ons that are included on the *Upgrade Export* DVD(s) and can be upgraded to a new release appear on the selection screen with default status *INST/UPG WITH STD CD*. For these add-ons, there is no need to make a new decision, unless you want to include a newer version of the add-on in the upgrade. For add-ons with status *UNDECIDED*, you have to decide how to proceed.

There are two different ways how to proceed, depending on the add-on status:

- Add on with status *INST/UPG WITH STD CD*:

The add-on is included on the upgrade DVDs. Depending on whether the software components required by the add-on must be kept the same or must be updated, the add-on can also remain unchanged or may have to be updated. If you decide to update the add-on during the upgrade, the following selection screen appears:

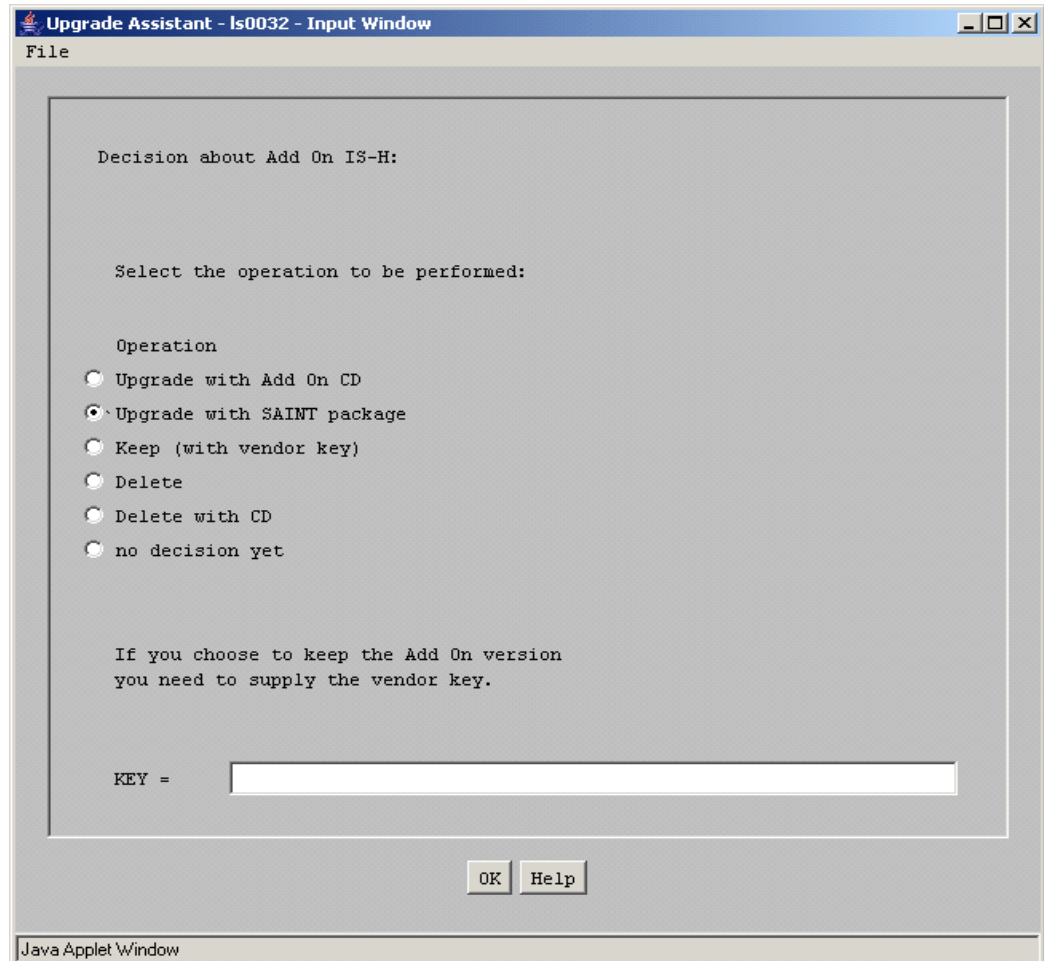


You have the following alternatives:

- Upgrade with an add-on-specific CD (*Upgrade with Add-On CD*)  
When you choose this alternative, you are asked to insert the corresponding CD. The data is copied to the upgrade directory.
- Upgrade with SAINT packages (*Upgrade with SAINT package*)  
The packages must be in transport directory `/usr/sap/trans/EPS/in`.
- Upgrade to the version on the standard *Upgrade Export DVD* (*Upgrade to version on std. Upgrade CD*)  
This alternative is valid only if there is an add-on on the Upgrade Export DVD(s). Once you have chosen this alternative, you do not need any additional CDs or packages for the add-on.

- Add-on with status *UNDECIDED*:

These are add-ons that were installed on the source system. They are optional. When you decide about the add-on, the following selection screen appears:



For this type of add-on, there are some additional options:

- Keep the present version of the add-on (*Keep (with vendor key)*).



Only choose this alternative if the vendor of your add-on has confirmed that you can do this without losing data. You must enter a password if you choose this alternative.

- Keep the present version of the add-on (*Keep your version*).

If none of the underlying software components experiences an update, or if the add-on already has a higher version than the one in the export, then this add-on is automatically kept, provided you do not include an update.



No password is required to do this.

- Delete the add-on (*Delete*).



Only choose this alternative if the vendor of your add-on has confirmed that you can do this without any problems, and if the present version of the add-on can also operate in the new context. You may require a password.

R3up prompts you to perform manual follow-up activities.

- Delete the add-on with CD (*Delete with CD*).



If a delete CD is available for the add-on, use it since, among other things, it deletes database objects that exist for this add-on.

To complete phase IS\_SELECT successfully, none of the add-ons may have status UNDECIDED.

### Phase PATCH\_CHK3

This phase tests whether all Support Packages have been confirmed.

Unconfirmed Support Packages are displayed on the screen and in the PATCHOUT.LOG file in the log subdirectory of the upgrade directory. Confirm these Support Packages with transaction SPAM.

If the source release contains Support Packages that are more recent than those in the delivered target release, a warning appears that informs you which Support Packages these are. All software components appear whose Support Package level is more up-to-date than the status of the software components on the *Upgrade Export* DVD(s).



Always include all available Support Packages for the target release, and all released Basis Support Packages. This means that your system is completely up-to-date after the upgrade.

If you use an add-on component, you can find information about including the corresponding Add-On Packages or Conflict Resolution Transports in the SAP Note for the add-on supplement CD.

If R3up displays a warning that your Support Package level of the source release is too up-to-date and you want to include the corresponding Support Packages of the target release, you must do this in the next phase BIND\_PATCH. You can include the Support Packages for multiple software components in this phase.

### Phase BIND\_PATCH

You can include the Support Packages for the target releases in this phase.

If the release of a component does not change during the upgrade, the Support Packages previously installed for this component are automatically kept and do not have to be included again. Even another adjustment of the modifications contained within using transaction SPDD or SPAU is not required. You can also include additional Support Packages for this component.

To include Support Packages, proceed as follows:

1. If you want to include Support Packages for your various software components, answer **Yes** to the prompt about including Support Packages in the BIND\_PATCH phase.

If you did not download the Support Packages for the target release during the UPLOAD\_REQUEST phase, do this now. Proceed as described in steps 1 to 5 in the description of phase UPLOAD\_REQUEST above.

- In column *Support Package Level select*, enter the Support Package level you want for your various software components.



When the `BIND_PATCH` phase is started for the first time, `PREPARE` tries to find a default Support Package queue. It first searches for a package inclusion file of a previous upgrade. If it can find one in the `save` subdirectory of the upgrade directory, `PREPARE` checks whether this package inclusion file contains a selection valid for the current upgrade. If the selection is valid, you can use it as default.

If there is no package inclusion file from a previous upgrade, `PREPARE` calls the SPAM Patch Queue Calculator. It tries to generate a Support Package queue of all Support Packages that you have uploaded. If it can generate a valid queue, you can use it as default.

| Component | Support Package Level |        |         |                                 |
|-----------|-----------------------|--------|---------|---------------------------------|
|           | min                   | equi   | current | select                          |
| SAP_BASIS | <none>                | <none> | 0020    | <input type="text" value="20"/> |
| SAP_ABA   | <none>                | <none> | 0020    | <input type="text" value="20"/> |
| SAP_APPL  | <none>                | <none> | 0008    | <input type="text" value="8"/>  |
| SAP_HR    | <none>                | <none> | 0013    | <input type="text" value="13"/> |
| EA-IPPE   | <none>                | <none> | 0007    | <input type="text" value="7"/>  |
| PI_BASIS  | <none>                | <none> | 0006    | <input type="text"/>            |

Navigation buttons: << < > >> OK Help

Java Applet Window

Column *Support Package Level min* contains the minimum Support Package level required for a component to meet the import prerequisites of the add-ons in phase `IS_SELECT`.

Column *Support Package Level equi* contains the equivalence Support Package level. This is the Support Package level of the target release, which corresponds to the Support Package level of the source release. To avoid data loss, the Support Package level of the target release must not be lower than the equivalence Support Package level.



You no longer need to reset `PREPARE` to reduce the number of Support Packages that you want to include. All you need to do is overwrite the default Support Package level.

If you want to cancel the selection for a software component completely, delete the relevant entry if you are using the Upgrade Assistant, or enter `NONE` if you are using scroll mode.

Column *Support Package Level current* contains the highest Support Package level that is currently included. To find out the current state of the SAP system, `PREPARE` checks the following Support Package level information:

- a. Support Package level that has already been installed in the source system. This only applies when the release of the SAP component does not change during the upgrade (component upgrade procedure).
  - b. Support Package level that is delivered with the upgrade DVDs (for example, a Support Release level)
  - c. Support Package level that has already been selected and confirmed by the customer
3. Apart from including Support Packages, you can also include the latest SPAM update for the target release. This prevents any error messages resulting from the fact that your SPAM update in the source release is newer than the SPAM version on the upgrade DVD. It can also save you from having to import the latest SPAM update immediately after the upgrade. `PREPARE` automatically looks in the EPS inbox for a current SPAM update and gives you the option of including it in the upgrade.
  4. In addition, you can also include a single change request. In certain situations, you can use a single change request to avoid losing data. The modification adjustment function ignores this request.



Using the single change request function is risky. Only use this function if the owner of the request can guarantee that it is compatible with the upgrade.



Apart from the single change request and the requests for the modification adjustment, there is no other way of importing a request into the system before activation, or during the adjustment of the ABAP Dictionary objects.

5. When you confirm the confirmation prompt, you integrate all Support Packages up to the specified level into the upgrade for this component.

It may take a few minutes to unpack the Support Package data.

You can include any necessary Conflict Resolution Transports (CRTs) in the upgrade. Any Support Packages that you cannot include in the upgrade must be imported into the system after the upgrade.

## Phase `ADJUSTPRP`

If you want to execute `PREPARE` in a target system and you made preparations for an automatic modification adjustment in the first system, you are prompted to choose a request.



## 5.2.16 Making Entries for the Installation Module

### Use

All tables of the SAP Web Application Server are needed as shadow tables to operate the shadow system. The *Installation* module prepares the shadow instance. `PREPARE` creates the profiles, directories, programs and files needed by the shadow instance, as well as an extra database user.

### Procedure

#### Phase INITSHD

When prompted by `PREPARE`, enter an instance number not yet used in your system landscape for the shadow system or confirm the default value.

For more information on choosing the instance number for the shadow instance, see **SAP Note 29972**.

#### Phase SHDINST\_CPY

If you have made a backup of the `save` directory from a previous upgrade, you can now use the [profiles for the shadow instance \[page 126\]](#) that have been stored in this directory.



Only use the profiles if both upgrades have the same environment and use the same upgrade strategy.

If you want to use the shadow instance profiles, make sure that the `save` directory has been copied to the upgrade directory and confirm the prompt with **Yes**.

## 5.2.17 Making Entries for the Preprocessing Module

### Phase SAVE\_VAR\_CHK

After the upgrade, many of your variants can no longer be used because the relevant selection screens have changed. To save the variants, the SAP system offers two reports:

- RASUVAR1 saves your variants on the source system.
- RASUVAR2 restores the variants in the target system.

During phase `SAVE_VAR_CHK` you can decide whether you want the upgrade tool to run report RASUVAR1. The report is started in phase `JOB_RASUVAR1`. If you have decided to run report RASUVAR1, phase `JOB_RASUVAR2` automatically starts report RASUVAR2 towards the end of the upgrade.

For more information about the reports, see **SAP Note 712297**.

## 5.2.18 Evaluating the Results of PREPARE

### Use

[PREPARE \[page 162\]](#) writes its results to the `CHECKS.LOG` file. This file is located in the `log` subdirectory of the upgrade directory. Each time you run `PREPARE`, it generates a header entry containing the text `Starting new execution of PREPARE modules <module name> at <timestamp>`. This is followed by the `PREPARE` results.

The entries in the `CHECKS.LOG` file can be error messages, information or prompts for user action.

### Procedure

Most of the entries are self-explanatory. You can find information and troubleshooting procedures for entries that are not self-explanatory below:

- The buffers of your SAP system instance are not automatically validated.
  - a. Make sure that parameter `rdisp/bufrefmode` has one of the following values in the `DEFAULT.PFL` profile of directory `/usr/sap/<SID>/SYS/profile`:

| Value                        | Meaning   |
|------------------------------|---|
| <code>sendon,exeauto</code>  | Your SAP system (<SID>) has multiple instances. |
| <code>sendoff,exeauto</code> | Your SAP system (<SID>) has only one instance.  |

- b. Also make sure that parameter `rdisp/bufrefmode` is **not** set in the instance profile.

The profile of the central instance is named according to the following convention:

```
<SID>_DVEBMGS<instance number>_<host name>
```

If you have distributed application servers that do not share access to the profile of the central instance via `/QFileSvr.400`, follow the procedure described above for each server.

- Insufficient freespace in the database as follows:
 

The new release needs more space in the database. The existing space in your database is not sufficient to import the data for the new release. For information on the extensions that you need to make, see the table that follows the message in `CHECKS.LOG`. Also add the space you need for any extra data that is created before you actually upgrade your system.
- In Release <rel> you applied the following unconfirmed patches to your system.
 

There are unconfirmed Support Packages in your SAP system (such as Support Packages for the technical components `SAP_BASIS` or `SAP_BW`). To confirm these Support Packages before the upgrade, call transaction `SPAM`.
- There are dependencies between Basis Support Packages included in phase `BIND_PATCH` and the patch level of the target release kernel in directory `/usr/sap/put/exe`.

The `disp+work` needs at least patch level <number> or higher.

Please proceed as described in note 211077.

A Support Package included in the upgrade requires a different patch number for the SAP kernel. Proceed as described in **SAP Note 211077**.

- Change the permission of these executables:

If you get the error message:

```
ERROR> No write permission for file <executable>
```

the cause may be that the symbolic link points to an object that does not exist. In this case, delete the link:

```
DEL ` /usr/sap/<SID>/SYS/exe/run/<executable> `
```

- The following function groups (FUGR) are inconsistent. The TADIR entry (and the frame program) have no corresponding entry in the master table TLIBG.

Your SAP system contains customer function groups that have not been entered in table TLIBG. To enter the function groups in table TLIBG, call transaction SE80. If you do not fix the problem, the customer function groups will be lost during the upgrade. In case of questions or problems, open a customer message on component BC-DWB-TOO-FUB.

- no write permission on <file name>:

The specified file in the directory of user <SID>OFR cannot be overwritten because the authorizations have not been set correctly or the owner of the file is not <SID>OFR. Correct this by changing the authorizations or the owner.

- Release these open transport requests and repairs:



If you ignore open repairs, you could lose modifications.

Your SAP system contains locked SAP objects in open repairs or requests. The numbers of these repairs or requests are listed.

Before you start the upgrade, you must release and confirm all the open repairs and requests listed by `PREPARE`, since the objects contained in them are locked. For more information, see [Releasing and Confirming Open Repairs and Requests \[page 159\]](#).



If open repairs that do not belong to this system appear, then this system was created by a database copy. You cannot release these repairs in the normal way.

For more information on releasing these repairs, see **SAP Note 62519**.

To release and confirm these open repairs, you must log on to the system with the name of their owner. The list in `CHECKS.LOG` contains these names.

- Restart logs of DB conversions found.  
Outstanding DB conversions found.

Your SAP system contains outstanding conversions and restart logs of terminated conversions. Clean these up as described in [Cleaning Up Terminated Conversions in the DB Conversion Phases \[page 138\]](#).

- Unresolved request found in TRBAT.

.....

TRBAT entry indicates that a batch job is running.

.....

TRBAT entry indicates that a batch job has finished.

.....

Corrupted TRBAT entry found

.....

The transport control program `tp` uses the table TRBAT to communicate with the SAP system. Entries found in this table by `R3up` may be the remains of a terminated or running import or export.

When you prepare the upgrade, locate any entries left over from imports or exports that terminated and clean them up. Do not delete entries made by running imports or exports during production operation.

First try to process the TRBAT entries from `/usr/sap/trans/bin` with the following command:

```
tp 'getprots <SID>'
```

This does not affect any imports or exports that are still running. `tp` informs you about possible processing problems in file `SLOG<YY><WW>.<SID>`. You can monitor this file using the following command:

```
dspf '/usr/sap/trans/log/SLOG<YY><WW>.<SID>' and function key F17
```

where `<YY>` is the year (two digits) and `<WW>` is the calendar week (two digits).

To delete any entries in TRBAT that cannot be processed and that are no longer needed, call transaction SM31.

For more information about the transport control program `tp`, see the online documentation for the SAP Basis or SAP Web AS of the source release:

- **Release 4.x**

*Help → SAP Library → BC – Basis Components → Change and Transport System → BC – Transport Tools → Transport Control Program tp*

- **Release 6.x**

*Help → SAP Library → mySAP Technology Components → SAP Web Application Server → Change and Transport System → Transport Tools → Transport Control Program tp*

- The following indexes `<number>` were read:

Indexes whose names are identical up to the 14th character were found in a table belonging to the substitution set. The 14th character is an 'X' in one of the two names and is empty in the other. This is an inconsistency and would result in an error during the import of the substitution set.

The index with the 'X' as the 14th character can only have occurred in a previous upgrade or have been created outside the SAP system. For more information, contact your SAP consultant.

- The following database tables have names that are identical to names of Basis views. The views will be created in this upgrade. Therefore ...

Delivered views may have names identical to the names of customer tables in the SAP namespace. You must delete these tables. If you need the table data later, you must make a backup before deleting the tables.

- Update records still exist - Please process

Make sure that you have cleaned up all outstanding updates and outbound queue RFC calls by the `JOB_RSVBCHCK_R` or `JOB_RSVBCHCK_D` phase (during downtime) at the latest.

If you are still in the preparation phase (`PREPARE`) and therefore in production operation, you must only delete the **terminated** updates.



We recommend that you clean up as many updates and RFC calls as possible. Otherwise, you will have to clean them up during downtime.

To find terminated or outstanding updates, proceed as follows:

- a. Call transaction SM13.
- b. Delete the default values for the client, user and time.
- c. Select all the update requests.

To find outstanding outbound queue RFC calls, proceed as follows:

- a. Call transaction SMQ1.
- b. Delete the default values for the client.
- c. Make sure that the list of outbound queue RFC calls is empty.

Otherwise you might lose data in other systems (for example, in SAP BW).

Repeat these checks when production operation ends. For more information, see [Isolating the Central Instance \[page 155\]](#).



If you have installed the PI plug-in, `R3up` will display more information.

## 5.2.19 Making Preparations at the Operating System Level

### Procedure

#### Backing Up the SAP Kernel

During the upgrade, the SAP kernel programs are replaced under `/usr/sap/<SID>/SYS/exe/run`. Make sure that you can recover the old kernel if this becomes necessary. Make a backup copy of the related libraries to guarantee this.

## 5.2.20 Making Preparations at the Database Level

### Procedure

#### Backing Up the Database

Make sure that you can reset the database to the state it had before the upgrade by using an existing database backup. For more information on timing and performing database backups, see [Upgrade Strategy Planning \[page 41\]](#), [Database Backup \[page 45\]](#), and [Database-Specific Aspects \[page 46\]](#).



At the same time, make a backup of the upgrade directory and its subdirectories.

#### Checking the Disk Space Usage

To check the disk space usage in your auxiliary storage pools (ASPs), run the `WRKDSKSTS` command. For best performance, make sure that less than 80% disk space is used.

## 5.2.21 Making Preparations at the SAP System Level

### Procedure

In addition to the preparations at the operating system level and the database level, you also need to make preparations at the SAP system level:

- [Checking the User for the Upgrade \[page 94\]](#)
- [Checking the Requirements for the Modification Adjustment \[page 95\]](#)
- [Setting the Operation Mode for the Upgrade \[page 95\]](#)

### 5.2.21.1 Checking the User for the Upgrade

#### Procedure

Make sure that you can log on to the system in client 000 as user `DDIC`. The initial password for `DDIC` is `19920706` in a newly installed system.

To be able to perform all necessary actions for the upgrade, user `DDIC` needs the authorization `SAP_ALL`.

## 5.2.21.2 Checking the Requirements for the Modification Adjustment

### Procedure

If you modified SAP objects in your SAP system, make sure that you meet the requirements for the [modification adjustment \[page 53\]](#).



In particular, make sure that changes to the Repository are allowed in the client in which you want to perform the modification adjustment. To check this, call transaction SCC4.

For more information on the requirements for the modification adjustment, see the online documentation for the target release under *SAP NetWeaver Library* → *SAP NetWeaver* → *Application Platform (SAP Web Application Server)* → *ABAP Technology* → *ABAP Workbench* → *Changing the SAP Standard* → *The Modification Assistant*.



If you do not make sure that you have met the requirements for the modification adjustment, we cannot guarantee complete support during the adjustment. You also risk losing the data for ABAP Dictionary objects.

## 5.2.21.3 Setting the Operation Mode for the Upgrade

### Use

Various background jobs are started during the upgrade. When you schedule jobs, a check is made to see whether the SAP instance on which you want them to run is defined in an operation mode. The operation mode specifies which services are offered by the work processes (dialog, update, background processing, enqueue, spool, and so on).

### Prerequisites

No operation modes must exist that contain servers other than those belonging to the current system.

### Procedure

1. Before you start the upgrade, call transaction RZ04 to check the definition of your operation modes. Also check the DUMMY operation mode. The DUMMY operation mode may have `<host name>_<SID>` entered as the server name. Change this entry to `<host name>_<SID>_<instance number>`.
2. Delete the invalid operation modes. If operation modes contain names of servers other than those belonging to the system, problems may arise in the background interface in some phases. The jobs may be released, but not set as *active* (in theory, this affects all jobs scheduled to start on a specific server and triggered by an event).
3. If the SAP instance on which you want to upgrade the system is not entered in an operation mode, create the operation mode for the upgrade as follows:
  - a. Call transaction RZ04.

- b. Choose *Operation mode* → *Create*.  
Enter a name for the operation mode, for example, **Upgrade**. Enter a short description and then save the operation mode.
- c. Make sure that the instance required for the upgrade has been started up.
- d. Position the cursor on the new operation mode and choose *Operation mode* → *Maintain instances* → *Instances/OP modes*.
- e. Choose *Settings* → *Based on act. status* → *New Instances* → *Create*.  
This displays all instances and their current configuration.
- f. Choose *Save*.
- g. Call transaction SM63 to enter the operation mode you have defined as an active operation mode for 24 hours (select *Normal operation (24 hours)*).



## 5.3 The Upgrade

### General Information

This part of the documentation provides general information on upgrading your system.



For any additional information, see the product-specific part of this documentation.

When you upgrade your system, note the following:

- Before you begin the upgrade, you must have completed all required planning and preparation actions.
- [R3up \[page 164\]](#) controls the entire upgrade of the SAP system, from checking the requirements and importing the required programs through stopping production operation until production operation is resumed. The upgrade procedure is divided up into a number of different phases with the successful completion of a phase being a precondition for the success of all subsequent phases. This section describes all the required user input and actions, as well as critical points during the upgrade. For a complete [list of all phases \[page 160\]](#), see the `htdocs` subdirectory of the upgrade directory.
- R3up must run on the application server of the central instance.
- You can use the Upgrade Monitor, the upgrade logs and the alert function to monitor the upgrade.
  - The [Upgrade Monitor \[page 167\]](#) lets you monitor the upgrade, and helps you recognize processes that have exceeded their runtime.
  - R3up logs all actions in the [upgrade logs \[page 131\]](#), which you can use as your starting point for troubleshooting.
  - You can use the [alert function \[page 153\]](#) to gather information if the upgrade has stopped.
- Many phases of the upgrade require no user input. In the following, you can find a description of all phases that do require user input.
- User actions are also required when problems occur. If an error occurs, correct it and repeat the phase in which the error occurred. Once the phase has been repeated successfully, you can continue the upgrade. For more information about troubleshooting, see the [Troubleshooting \[page 130\]](#) part of this documentation.
- During the upgrade, you are prompted to enter a mount directory for a specific data carrier at the appropriate times. To avoid having to manually enter the mount directory during the upgrade, you can specify several mount directories in the `INITPUT` phase. This documentation assumes that you only have one DVD drive. If you have multiple DVD drives, you can ignore instructions to enter mount directories.

### Actions

The following sections are important for performing the upgrade:

- [Starting the Upgrade \[page 98\]](#)
- [Stopping the Upgrade \[page 99\]](#)
- [Restarting the Upgrade \[page 100\]](#)
- [Phase INITPUT \[page 101\]](#)

- [Phase PATCH\\_CHK \[page 102\]](#)
- [Phase KEY\\_CHK \[page 102\]](#)
- [Phase INITSUBST \[page 103\]](#)
- [Phase CONFCHK\\_X \[page 104\]](#)
- [Phase VIEWCHK1 \[page 104\]](#)
- [Phase REPACHK1 \[page 105\]](#)
- [Phase JOB\\_RSVBCHCK2 \[page 105\]](#)
- [Phase FREECHK\\_X \[page 105\]](#)
- [Phase LOCKEU\\_PRE \[page 106\]](#)
- [EU\\_IMPORT Phases \[page 106\]](#)
- [Phase REPACHK2 \[page 107\]](#)
- [Phase CNV\\_CHK\\_XT \[page 107\]](#)
- [Phase ADJUSTCHK \[page 108\]](#)
- [Phase ACT <Rel> \[page 108\]](#)
- [Phase VIEWCHK2 \[page 110\]](#)
- [Phase MODPROF\\_TRANS \[page 110\]](#)
- [Phases JOB\\_RSVBCHCK\\_R and JOB\\_RSVBCHCK\\_D \[page 111\]](#)
- [Continuation of the Upgrade After the MODPROFP\\_UPG Phase \[page 111\]](#)
- [Phase CHK\\_POSTUP \[page 112\]](#)

## 5.3.1 Starting the Upgrade

### Prerequisites

- You are logged on to the central instance as user <SID>OFR.
- You have completed the mandatory PREPARE modules.
- You have not deleted any files in the upgrade directory. Deleting these files could cause unpredictable inconsistencies.
- You have made the preparations that are not supported by PREPARE.



It is important that you note which subsystem R3up is started in. The subsystem should run in the \*BASE pool or in a suitable pool with sufficient main storage at its disposal as all jobs started by R3up will also run in this subsystem.

The runtime of your upgrade might be increased, for example, if R3up is started in subsystem QINTER and this subsystem on your server machine has too little main storage at its disposal. For more information about setting pool sizes and subsystem dependencies, see the IBM documentation *OS/400 Work Management* (SC41-4306).

- You have decided on whether to use the Upgrade Assistant or scroll mode. We recommend that you use the Upgrade Assistant.

## Procedure

### Using the Upgrade Assistant

1. Check that the Upgrade Assistant Server is active on the host on which the central instance is running
2. Start the [Upgrade Assistant GUI \[page 71\]](#) and log on as administrator.
3. In the main menu, choose *Administrator* → *Start R3up*.

R3up displays the initial screen of the upgrade. It displays the R3up version, the target release, and the SAP system ID. This screen appears in each future restart.

4. If the entries are correct, confirm this screen with *Continue*.

### Using the Scroll Mode

1. Log on to the host on which the central instance is running as user <SID>OFR.
2. To run R3up, enter the following commands:  

```
ADDLIBLE R3UP
GO R3UP
```
3. Choose option 2.
4. For *Upgrade Directory*, enter the path of your upgrade directory, for example, `‘/usr/sap/put’`.
5. When you are prompted for the display mode, enter `SCROLL` for the line-oriented mode.

## 5.3.2 Stopping the Upgrade

### Use

You can stop R3up at the beginning of a specific phase or at the end of a phase that is currently running. For example, you need to do this if an SAP Note tells you to correct a program before you execute it.

### Procedure

#### Stopping the Upgrade at the End of the Current Phase

To stop the upgrade at the end of the current phase, you have the following options:

- In the main menu of the Upgrade Assistant, choose *Administrator* → *Stop R3up after current phase*.

- Enter the following command in a second window at the operating system level:  
`R3UP UPGDIR(<upgrade directory>) PARMLIST(stop)`

### Stopping the Upgrade at the Start of a Phase

Enter the following command in a separate window at operating system level:

```
R3UP UPGDIR(<upgrade directory>) PARMLIST('stop <phase name>')
```



```
R3UP UPGDIR(<upgrade directory>) PARMLIST('stop
XPRAS_UPG')
```

## 5.3.3 Restarting the Upgrade

### Use

You usually only have to restart the upgrade when errors have occurred or an upgrade phase has terminated.

If a phase terminates, `R3up` stops and suggests that you repeat the phase by choosing *repeat*.

If you have exited `R3up` by choosing *exit*, other start modes are offered:

- *repeat*

If nothing else is specified in this documentation, **always** use start mode *repeat* to restart `R3up`. This is the only way to make sure that all upgrade phases have been completed correctly.



The *repeat* start mode restarts the upgrade at the exact point where it was interrupted. `R3up` runs through the phase and checks where it has to be restarted. This means that the *repeat* start mode does not necessarily restart from the beginning of the phase.

- *init*

When you choose the *init* start mode, the phase in which the upgrade was interrupted is repeated from the beginning.

- *reset*

The *reset* start mode is used to restart the upgrade from the beginning. This is only possible up to the `SUBSTNT_INS` phase. After this you can restart the upgrade only by resetting the database.

This mode resets the upgrade to the `INITPUT` phase. If the system is already in downtime, it must be restarted once manually if *reset* is chosen.

Alternatively, you can also correct the entries with `R3UP UPGDIR(<upgrade directory>) PARMLIST('set stdpar')` or `R3UP UPGDIR(<upgrade directory>) PARMLIST('reset DDICpwd')`. For more information, see [Correcting Entries Made in the INITPUT and INITSUBST Phases \[page 135\]](#).



Other start modes can cause errors. SAP must confirm their use for your specific situation.

## Prerequisites

- If you need to restart due to an error or termination during the upgrade, the cause of the error must be clear and you must correct the error first.  
For more information on finding and correcting errors, see [Troubleshooting \[page 130\]](#). If you are not sure how to proceed, contact SAP Support.
- A password is generally necessary if you want to ignore an error, or jump to a phase other than the one currently being executed. Only enter this password when your troubleshooting has clearly identified the source of the error and you have checked with SAP. Support cannot be guaranteed if you do not consult SAP. In only a very few cases is it a good idea to ignore an error with a password. A large number of cases are known where ignoring an error resulted in serious inconsistencies, at worst making a recovery of the database necessary. Only in exceptional cases, such as in phases `ACT_<rel>` and `XPRAS_UPG`, can you ignore errors with `repair severe errors`. For more information on finding and correcting errors, see [Troubleshooting \[page 130\]](#) and under *Help* in `R3up`.

## Procedure

### If you do not exit `R3up` after it has terminated:

1. If a phase terminates, choose start mode *repeat*.  
`R3up` continues the phase from the point where it terminated. This checks whether the error repeats itself. If the error is not repeated, the upgrade continues after the phase has been completed. If the error occurs again, you must correct it.
2. If an error occurred, choose *exit* to leave `R3up` and correct the error.

### If you exited `R3up` with *exit*:

1. [Start the upgrade \[page 98\]](#).
2. If possible, choose start mode *repeat*.  
`R3up` repeats the terminated phase and continues the upgrade.

## 5.3.4 Phase INITPUT

### Use

In the [Parameter Input \[page 76\]](#) `PREPARE` module you are prompted to enter values for certain system-specific parameters needed by the upgrade, for example, names, paths and passwords. You can modify the entries you made in `PREPARE` in the `INITPUT` phase.

### Activities

At the start of this phase `R3up` asks you whether you want to change any parameters.

- If you confirm this, you are prompted for all the parameters. If the default values are correct, confirm them.

- If you skip this phase and realize in the following phases that you made an incorrect entry, correct it as described in [Correcting Entries Made in the INITPUT and INITSUBST Phases \[page 135\]](#).

### 5.3.5 Phase PATCH\_CHK

#### Use

This phase checks that the following prerequisites are met:

- All Support Packages have to be confirmed for the source release. Unconfirmed Support Packages are displayed on the screen and in the `PATCHOUT.LOG` file in the `log` subdirectory of the upgrade directory.
- The source release does not contain Support Packages that are more recent than those in the delivered target release.

PREPARE phase `PATCH_CHK3` has already made these checks. For more information, see the description of the `PATCH_CHK3` phase in [Making Entries for the Extension Module \[page 81\]](#).

#### Activities

1. If you still have to confirm Support Packages for the source release, call transaction SPAM and confirm the Support Packages that are proposed there.
2. If a warning appears that the Support Package level of your source release is too high, proceed as follows:
  - If you have already included Support Packages in the `BIND_PATCH` phase of `PREPARE`, you can ignore this warning.
  - If you have not included any Support Packages in the `BIND_PATCH` phase of `PREPARE`, you will lose data if you continue with the upgrade. In this case, you must [reset the upgrade \[page 145\]](#), repeat `PREPARE`, and include the necessary Support Packages.

### 5.3.6 Phase KEY\_CHK

#### Use

This phase prompts you for the keyword specified in the current SAP Upgrade Note.

#### Activities

If you have not already done so, request the latest SAP Notes now. SAP Notes are continually being updated. For a list of the SAP Notes you need for the upgrade, see the introductory part of this documentation under *SAP Notes for the Upgrade*.

If you use SAP add-on components in your system (such as IS components), you are also prompted for other keywords. SAP systems that have other software components (add-ons) installed must wait until the upgrade has been released by the relevant add-on software vendor.

## 5.3.7 Phase INITSUBST

### Use

You must specify the following in this phase:

- Upgrade strategy
- Import time for the substitution set
- Number of parallel processes available to import the substitution set
- Archiving strategy
- Number of parallel background processes
- Number of parallel `tp` processes during the `PARCONV_UPG` phase

### Activities

- Upgrade strategy

Choose between the strategies *downtime-minimized* and *resource-minimized* described in [Upgrade Strategy Planning \[page 41\]](#).

- If you decide to use *downtime-minimized*, the system now prompts you to enter your runtime for the total import of the substitution set.

For information on which factors you must consider when you choose a runtime, see [Runtime for the Import of the Substitution Set \[page 52\]](#).

- If you decide to use *resource-minimized*, you are asked for the number of parallel processes for importing the substitution set.

The number of parallel `R3load` processes should not be higher than the number of processors on your iSeries.

- Archiving strategy

Choose a time when you want database archiving to be switched off. The [archiving strategy \[page 45\]](#) is not linked to the chosen upgrade strategy. However, if you choose upgrade strategy *downtime-minimized*, we recommend the `MODPROF_TRANS` phase; if you choose upgrade strategy *resource-minimized*, we recommend the `EU_IMPORT1` phase or before the first start of the shadow instance in the `REQSTOPPROD` phase.

- Number of parallel background processes

During downtime, the SAP system is started with a modified number of background processes so that operations can be processed in parallel. To enable this, the profile of the central instance is modified temporarily. For hosts with up to two processors, choose two background processes, and for those with a higher value choose four background processes. (The default value is three background processes.)

- Number of parallel `tp` processes in the `PARCONV_UPG` phase

You are asked whether you want to use multiple parallel `tp` processes in the `PARCONV_UPG` phase. This function reduces the runtime during the `PARCONV_UPG` phase.

For hosts with up to two processors, choose two processes. For hosts with more processors, select the number of processors divided by 2.

If you realize in the following phases that you made an incorrect entry, correct it as described in [Correcting Entries Made in the INITPUT and INITSUBST Phases \[page 135\]](#).

### 5.3.8 Phase CONFCHK\_X

#### Use

This target release is released for certain operating system versions only. This phase checks that the operating system version installed on your computer satisfy the requirements for the upgrade.

#### Activities

If the version check determines that the operating system must be upgraded to a new version, or that you need to import additional software, you can interrupt `R3up` at this point.



Do not make any changes in the upgrade directory.

### 5.3.9 Phase VIEWCHK1

#### Use

This phase displays conflicts between customer tables in the SAP namespace and views that are newly delivered. It also writes this information to the `VIEWCHK1.LOG` file.

#### Activities

You can ignore the messages at this point. You must, however, rename or delete the tables in the `VIEWCHK2` phase at the latest. First save any data that you need in these tables.



### 5.3.10 Phase REPACHK1

#### Use

This phase displays all repairs and requests containing objects locked by SAP, and writes them to the REPACHK1.LOG file.

#### Activities

You can ignore the messages at this point. These objects must be released and the repairs confirmed at the latest by the REPACHK2 phase.

### 5.3.11 Phase JOB\_RSVBCHCK2

#### Use

If there are any outstanding or incomplete updates, the upgrade stops in this phase with a message.

#### Activities

If errors occur in this phase and you are still in production operation, you can skip these errors with *ignore* without entering a password. However, we recommend that you check for outstanding updates and clean them up. For more information, see [Evaluating the Results of PREPARE \[page 90\]](#). The PREPARE message is:

```
Update records still exist - Please process
```

### 5.3.12 Phase FREECHK\_X

#### Use

This phase checks whether there is enough free space in the log subdirectory of the upgrade directory during the upgrade. You must have enough free space in the log directory so that the upgrade can run without errors.

During downtime, the SAP kernel is switched in the kernel directory `/usr/sap/<SID>/SYS/exe/run`. This phase also compares the free disk space in the kernel directory with the space requirements of the new SAP kernel.

#### Activities

At this point, make sure that you are able to restore the old kernel, if this becomes necessary.



All files and subdirectories in directory `/usr/sap/<SID>/SYS/exe/run` are overwritten during the upgrade when the kernel is switched. For more information, see the PREPARE log CHECKS.LOG.

### 5.3.13 Phase LOCKEU\_PRE

#### Use

If you have chosen upgrade strategy *downtime-minimized*, R3up asks you in this phase if you want the ABAP Workbench to be locked on all SAP instances now or in phase REPACHK2.

This lock is needed to prevent development objects (for example, ABAP reports, table definitions, and so on) from being changed during the upgrade, since these modifications would be lost.

#### Activities

If you have chosen strategy *downtime-minimized*, you can continue to use your SAP system in production operation, even if you confirm that the ABAP Workbench can be locked.

If you confirm the lock now:

- R3up does not stop in the REPACHK2 phase to allow you to confirm the lock on the ABAP Workbench. This increases the time in which R3up does not need user input after the last request for a mount directory (EU\_IMPORT5 phase).
- You may not perform any more transports into or out of the SAP system.
- R3up waits until the time entered in the INITPUT phase as the maximum synchronization time for all the instances has expired (see *Phase INITPUT*).

### 5.3.14 EU\_IMPORT Phases

#### Import Runtime

The total runtime of the import is distributed unevenly over the various import phases. If you have extended the [runtime for the import of the substitution set \[page 52\]](#), this also extends the duration of the individual phases.

If an error causes the import to terminate in one of the phases, you have the option of speeding up the import when you restart it.

#### Activities

##### Phase EU\_IMPORT1

At the start of this phase, the upgrade control program R3up stops and waits for user input.

If you have chosen the *resource-minimized* upgrade strategy, you are prompted at the beginning of this phase to do the following:

- Isolate the [central instance \[page 155\]](#).
- If necessary, verify that you can recover the database to its current state at this point.
- Disable the capability of the database to continually recover data. Refer to [Handling Journal Receivers During an Upgrade \[page 156\]](#).

Then confirm that you want to continue with the upgrade.

## 5.3.15 Phase REPACHK2

### Use

This phase displays all the repairs and corrections that are not released and writes them to the REPACHK2.LOG file.

### Activities

- Before you continue with the upgrade, you must release and confirm all the open repairs; otherwise the objects in them are locked. For a description of this procedure, see [Releasing and Confirming Open Repairs and Requests \[page 159\]](#).



If you ignore open repairs, you could lose modifications.

Once you have released and confirmed all the open repairs, you must repeat the REPACHK2 phase. Any modifications made to SAP objects in your repairs might be overwritten during the upgrade.

For information on how modifications are copied to the new SAP standard during the upgrade, see the documentation DVD for the target release, under *SAP NetWeaver Library* → *SAP NetWeaver* → *Application Platform (SAP Web Application Server)* → *ABAP Technology* → *ABAP Workbench* → *Changing the SAP Standard* → *Upgrade Procedure/R/3 Support Packages*.

- **Upgrade strategy *downtime-minimized*:** If you did not confirm the ABAP Workbench lock in the LOCKEU\_PRE phase, do this now.



After you have confirmed the ABAP Workbench lock, no more transports can be made into or out of the SAP system.

R3up waits until the time entered in the INITPUT phase as the maximum synchronization time for all instances has expired (see [Phase INITPUT \[page 101\]](#)).

This phase displays all the repairs that are still in open transport requests. They are also written to the REPACHK2.LOG file. Release these transport requests so that you can continue; otherwise the objects contained in the repairs will be locked.

## 5.3.16 Phase CNV\_CHK\_XT

### Use

This phase checks whether the following still exist:

- Unprocessed conversion requests
- Restart logs

### Activities

If you find errors, proceed as described in [Cleaning Up Terminated Conversions in the DB Conversion Phases \[page 138\]](#).

## 5.3.17 Phase ADJUSTCHK

### Use

If you chose to copy a request in the `ADJUSTPRP` phase, the modifications it contains are now compared with the modifications in the system. The result of this comparison appears.

### Activities

You are prompted to confirm that the request was copied. If this request contains all the modifications found in the system, `R3up` does not stop before the activation of the ABAP Dictionary objects. However, you can still specify that you want `R3up` to stop in this phase.

## 5.3.18 Phase ACT\_<Rel>

### Use

Depending on the results of the `ADJUSTCHK` phase, you may be asked at the beginning of this phase to adjust your modifications to ABAP Dictionary objects so that they correspond to the new SAP standard version of the objects.



The objects are adjusted on the shadow instance.

### Activities



Do not attempt to import adjustment transport requests into the system manually in this phase. This leads to the loss of data in customer fields. Any requests for automatic adjustment from previous upgrades can be included in this upgrade in the `PREPARE` phase `ADJUSTPRP` only.

You must make adjustments in the `ACT_<rel>` phase if you have made structural changes to tables. Otherwise, data will be lost.

1. In `R3up`, confirm that you want to perform a modification adjustment.
2. Add an entry for the shadow instance to the SAP Logon.

Take the values from the original system for the server and system ID; for the instance number, take the value you specified in `PREPARE` for the shadow instance. The default value in `PREPARE` is the instance number of the original system plus one.

Since the original system is still running if you use the *downtime-minimized* strategy, you can also log on to the shadow instance in transaction `SM59` with the RFC connection `SAP_UPGRADE_SHADOW_SYSTEM`.

3. Log on to the shadow instance with the user `DDIC` and the `DDIC` password of the original system.

Only the users `DDIC` and `SAP*` exist in the shadow instance.

4. Call transaction SE06 to set the system change option. Set:  
the global setting to *Modifiable*.  
the change option for the software components to *Modifiable* or *Restricted modifiable*.  
the SAP namespace to *modifiable*.
5. Call transaction SU01 to create one or more users to perform the modification adjustment. To do this, copy the DDIC user.



In some cases, the error message `Error occurred in address management` appears. You can ignore this error message.



If you directly create new users, this may cause terminations.

The new users exist only on the shadow instance and are not copied to the original system.

6. Log on to the shadow instance with one of the new users.



Modification adjustment of ABAP Dictionary objects must be performed in client 000.

7. Use transaction SPDD to determine the ABAP Dictionary objects that need to be adjusted.

For more information about transaction SPDD, see the online documentation for the target release under *Help* → *SAP NetWeaver Library* → *SAP NetWeaver* → *Application Platform (SAP Web Application Server)* → *ABAP Technology* → *ABAP Workbench* → *Changing the SAP Standard* → *Upgrade Procedure / Support Packages* → *Adjusting ABAP Dictionary Objects*.

For an FAQ on SPDD and more information about the Modification Assistant, see SAP Service Marketplace at [service.sap.com/spau](http://service.sap.com/spau).

If errors appear when you activate your **own developments** after executing this phase, you can correct these here, since `R3up` stops when errors occur. However, you also have the option of choosing *ignore* to temporarily ignore these errors. You do not need a password to do this. If you chose *ignore* here, you must activate these objects after the upgrade.



Only choose *ignore* if you are sure that this does not affect SAP objects.

If you are prompted for a password anyway, this means that the activation has been terminated and you must not continue with the next phase. You first have to remove the cause of the termination.



While you are upgrading on the shadow system, adjust only objects of the ABAP Dictionary.  
You can make changes to the SAP Repository (changing and creating programs or packages, for example), but we do not recommend this since it may make the system inconsistent.

## 5.3.19 Phase VIEWCHK2

### Use

This phase displays conflicts between customer tables in the SAP name range and views delivered for the first time. It also writes the information to the VIEWCHK2.LOG file.

### Activities

You must delete these customer tables now, at the latest. You can use R3UP to do this if the tables are transparent. You must delete pooled or cluster tables manually in the SAP system. First save any data that you need in these tables.

## 5.3.20 Phase MODPROF\_TRANS

### Use

The R3UP program stops the SAP system in this phase and modifies the instance profile for the duration of the upgrade. R3UP prompts you to perform several activities, depending on your database and the upgrade strategy you have chosen.

### Activities

- If you chose upgrade strategy *downtime-minimized*, make sure that the following prerequisites are met:
  - All production work in the SAP system is stopped and no users are logged on to the SAP system.
  - The [central instance is isolated \[page 155\]](#).
  - All secondary application servers are shut down.
  - The capability of the database to continually restore data is disabled. See also [Handling Journal Receivers During an Upgrade \[page 156\]](#).
- If you called transaction ICNV during the upgrade, R3UP checks whether you have already converted the recommended percentage of the selected data (see [Incremental Table Conversion \[page 47\]](#)). R3UP informs you if you have not. If you ignore the information from R3UP, the rest of the data is converted in the conventional manner during downtime. For details on the status of the incremental conversion, call transaction ICNV.



So that you can recover your SAP system after errors, perform the following actions:

- Strategy *downtime-minimized*: Make sure that you can recover the database to its current state.
- **Both** upgrade strategies: Back up the upgrade directory now, so that you can reset the upgrade to this state at a later point.  
The only way to save the upgrade directory in its entirety with SAV is to end the upgrade at this point with F3 (= *Exit*). This is because log file log/R3UP.STD is being used.

## Result

Once you have performed all activities, R3up automatically shuts down the central instance and modifies the instance profile in directory `/usr/sap/<SID>/SYS/profile` for the duration of the upgrade. All changes to the profile are written to the `ALPXPOOL.LOG` file.



If you want to use transaction RZ10 to adjust the instance profile during the upgrade, start by reimporting the current version of the profile into your SAP system.

If you do not do this, the changes made by the upgrade are reset, which can cause the upgrade to stop running.

## 5.3.21 Phases JOB\_RSVBCHCK\_R and JOB\_RSVBCHCK\_D

### Use

If some updates have not been performed yet, the upgrade stops in phase `JOB_RSVBCHCK_R` (if you use strategy *resource-minimized*), or in phase `JOB_RSVBCHCK_D` (if you use strategy *downtime-minimized*).

### Activities

In this phase you must clean up all outstanding updates. Proceed as follows:

1. Make sure that the release for all background jobs was canceled, except for `RDDIMPDP`. For more information, see [Isolating the Central Instance \[page 155\]](#).
2. Clean up the outstanding updates as described in [Evaluating the Results of PREPARE \[page 90\]](#).

The `PREPARE` message is:

```
Update records still exist - Please process
```

3. Repeat this phase.

## 5.3.22 Continuation of the Upgrade After the MODPROFP\_UPG Phase

### Purpose

Up to the `MODPROFP_UPG` phase, R3up does not expect any further user input unless an error occurs. In this and the following phases, R3up makes preparations for restarting production operation and prompts you to take some actions. You can restart production operation after these actions have been completed.

## Process Flow

R3up performs the following actions in the MODPROFP\_UPG phase and the STARTR3\_PUPG, REQGENLD, and CHK\_POSTUP phases. R3up

- Displays the P errors (see [Phase CHK\\_POSTUP \[page 112\]](#)).
- Stops the system for the last time and recovers the state of the system profiles before the upgrade.
- Prompts you to set the database so that it can be recovered.
- Prompts you to make a full backup of your database.
- Prompts you to start the secondary application servers.
- Prompts you to start transaction SGEN to [generate ABAP loads \[page 121\]](#).

You can then resume production operation or begin the post-upgrade activities.

### 5.3.23 Phase CHK\_POSTUP

#### Use

You can solve some of the problems that occur during an upgrade after you complete the upgrade. This type of problem is indicated by a *P* in the second column of the .ELG logs.

R3up displays a complete list of these P messages in this phase in the LONGPOST.LOG file. You must usually remove the cause of these problems before you start using your SAP applications again.



Some of the secondary indexes may not have been created because they were not unique. Use the ABAP Dictionary tools (transaction SE14) to create these indexes in the database.

#### Activities

To remove an error, proceed as described in the long text of the message.

Any messages that you do not handle immediately need to be handled at the next possible opportunity.



## 5.4 Post-Upgrade Activities

### General Information

This part of the documentation contains general information on the post-upgrade activities you need to perform after you have upgraded your SAP system.



For any additional information, see the product-specific part of this documentation.

When you perform post-upgrade activities, note the following information (in addition to the information in *Upgrade – Step by Step*):

- Perform the actions in section *Upgrade – Step by Step* in the specified order.
- Before you start the post-upgrade activities, you must have run the upgrade up to and including the MODPROFP\_UPG phase.
- R3up stops in the MODPROFP\_UPG phase and prompts you to start several post-upgrade activities. R3up then executes the last phases and completes the upgrade. At the same time, you can already perform the specified post-upgrade activities.

The post-upgrade activities are divided into three blocks:

- Actions needed before resuming production operation  
These actions ensure that all the processes that are relevant to system operation are available again. You can start these actions while R3up is finishing the upgrade.
- Actions during limited production operation  
During this time, your SAP system is already consistent and all the processes that are relevant to system operation are available. However, this system state does not yet contain measures for optimizing performance, or actions for resuming standard operation (resuming background processing, or adjusting authorizations, for example). Check the actions that are listed in this block and perform them before you restart production operation, if necessary.
- Actions during production operation  
You can also perform these actions when the system is back to production operation.

### Actions

You must perform the following actions before you resume production operation of your system:

- [Backing Up the Database \[page 114\]](#)
- [Performing Post-Upgrade Activities for the SAP Kernel \[page 114\]](#)
- [Checking the Profile Parameters with Transaction RZ10 \[page 116\]](#)
- [Installing the J2EE Engine \[page 116\]](#)
- [Installing the SAP Internet Graphics Service \[page 118\]](#)
- [Reimporting Additional Programs \[page 118\]](#)
- [Adjusting Repository Objects \[page 119\]](#)
- [Performing Post-Upgrade Activities for the Applications \[page 119\]](#)

You can perform the following actions during limited production operation of your system:

- [Rescheduling Background Jobs \[page 120\]](#)
- [Releasing Held Jobs \[page 120\]](#)
- [Generating ABAP Loads \[page 121\]](#)
- [Generating BSP Applications \[page 122\]](#)
- [Performing Actions for the SAP Online Documentation \[page 122\]](#)
- [Performing Post-Upgrade Activities in the Authorizations Area \[page 123\]](#)

You can perform the following actions during production operation of your system:

- [Importing Support Packages After the Upgrade \[page 124\]](#)
- [Transport Management System: Distributing the Configuration \[page 124\]](#)
- [Performing Post-Upgrade Activities for the Language Transport \[page 125\]](#)
- [Saving Files for Follow-Up Upgrades \[page 126\]](#)
- [Evaluating the Upgrade Runtime \[page 126\]](#)
- [Deleting the Upgrade Library and Directory \[page 128\]](#)

### 5.4.1 Backing Up the Database

#### Prerequisites

You have not yet resumed production operation of the system.

#### Procedure

Perform a full backup of your database.

For more information about performing a full backup, see the installation documentation *SAP Web Application Server <Java or ABAP> 6.40: IBM eServer iSeries*, section *Performing a Full Backup*.

### 5.4.2 Performing Post-Upgrade Activities for the SAP Kernel

#### Procedure

##### Installing the SAP Kernel

For production operation, you must replace the kernel that was installed during the upgrade with the current kernel from SAP Service Marketplace.

To do so, apply the current patch for `disp+work (DW)`.

For more information about how to install the current kernel, see **SAP Notes 19466** and **49365**.

## Distributing SAP Programs

If your SAP system has multiple application servers, you must distribute the kernel libraries to all servers. You can copy the kernel from the central instance.



In this procedure, the example kernel library is called R3<rel>OPT.

1. Save the kernel library of the central instance:  

```
SAVLIB LIB(R3<rel>OPT) DEV(TAP01)
```
2. Log on to the application servers as QSECOFR.
3. Load the new kernel library on the server, add it to the library list on the first position and make sure that the authorizations are correct:  

```
RSTLIB SAVLIB(R3<rel>OPT) DEV(TAP01)
ADDLIBLE LIB(R3<rel>OPT)
FIXR3OWNS R3<rel>OPT
```
4. Log on to the application servers as <SID>OFR.
5. Add the new kernel library to the library list and remove the links to the old kernel library:  

```
ADDLIBLE LIB(R3<rel>OPT)
RMVR3KRN SID(<SID>)
```
6. Apply the new SAP kernel with the following command:  

```
APYR3KRN SID(<SID>) KRNLIB(R3<rel>OPT) DLTSQLPKG(*NO)
CHGENV(*YES)
```
7. After ensuring that the old kernel libraries are no longer being used by any SAP systems, you can delete these libraries. Do not delete them if they are still in use.
  - a. Log off with **SIGNOFF** and log on again as <SID>OFR.  
The library list now contains the new kernel library.
  - b. Now delete the old libraries:  

```
DLTLIB LIB(<old optimized kernel library>)
```
8. Delete the R3<sub>up</sub> library:  

```
DLTLIB LIB(R3UP)
```

## 5.4.3 Checking the Profile Parameters with Transaction RZ10

### Use

After the upgrade, use transaction RZ10 to check the settings in your system profiles. This transaction checks the profiles of all servers.

### Procedure

1. Make sure that all active servers (SAP instances) are started.
2. Make sure that you have the authorization S\_RZL\_ADM in the SAP system.
3. Call transaction RZ10.
4. Choose *Utilities* → *Import profiles* → *Of active servers*.
5. Choose *Utilities* → *Check all profiles* → *Of active servers*.  
If parameters are set incorrectly, a warning appears.
6. Check the parameters whose values differ from the default.

You can use transaction RZ10 to display the parameters with their current settings and their default value.

- a. On the initial screen of the transaction, choose *Goto* → *Profile values* → *Of a server*.
- b. Double-click a server to display its settings.



Whenever possible, return the parameter values to the default values.

For more information about changing the profile parameters, choose *SAP NetWeaver Library* → *SAP NetWeaver* → *Solution Life Cycle Management* → *System Management* → *Configuration* → *Profiles* in the online documentation for the target release.

## 5.4.4 Installing the J2EE Engine

### Use

The J2EE Engine is an integral part of the SAP Web Application Server 6.40. The use of the J2EE Engine largely depends on the business scenario you are upgrading to. In the following, we will describe several different installation and migration options. For information on which option to choose, see the *Upgrade Master Guide* for your business scenario.

When upgrading to this release, there are three different cases, depending on your system landscape on the source release:

- New central SAP system installation
- J2EE Engine 6.20 exists
- J2EE Engine 6.30 exists

## Prerequisites

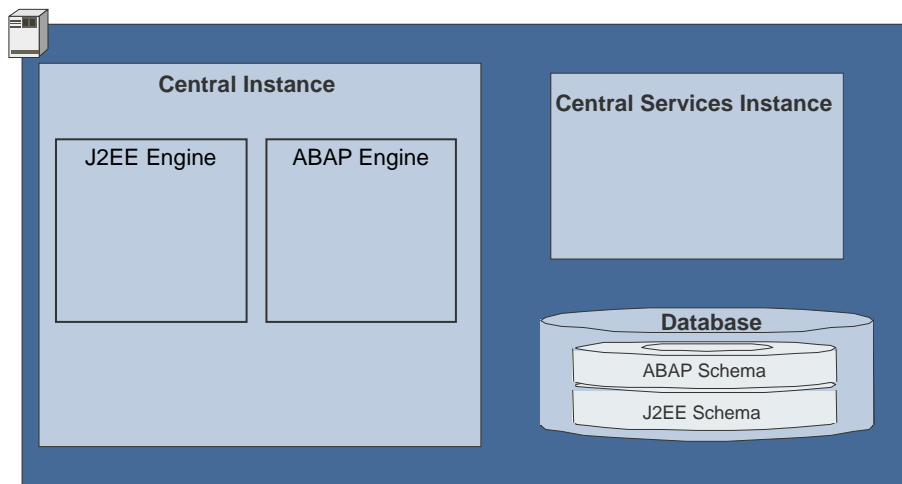
You have upgraded the central instance successfully.

If your SAP system is a non-Unicode system, make sure that the database you are using for the J2EE Engine supports Unicode. For more information, see the Product Availability Matrix (PAM) on SAP Service Marketplace at [service.sap.com/PAM](http://service.sap.com/PAM).

## Procedure

### New Central SAP System Installation

There is no installation of an J2EE Engine on the source release and the business scenario you are implementing requires an J2EE Engine 6.40. In this case, you can install the J2EE Engine on the central instance. With this installation, all mandatory SAP components are installed on the same host, including the central services instance.



Install the J2EE Engine as described in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on IBM eServer iSeries*.

### J2EE Engine 6.20 Exists

There is an installation of an J2EE Engine 6.20 on the source release and the business scenario you are implementing requires an J2EE Engine 6.40. In this case, install the J2EE Engine as described in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on IBM eServer iSeries*.

This will replace the existing J2EE Engine 6.20 with the J2EE Engine 6.40.

### J2EE Engine 6.30 Exists

To upgrade to J2EE Engine 6.40, apply the relevant J2EE Engine Support Packages.

## 5.4.5 Installing the SAP Internet Graphics Service

### Use

The SAP Internet Graphics Service (SAP IGS) is a server-based engine for generating content (graphical or non-graphical) based on data from an SAP system or an external system. The SAP IGS is needed in several applications to render graphics for them.

### Procedure



Make sure that you install the SAP IGS on every application server of your system.

To install the SAP IGS, proceed as described in the documentation *SAP Internet Graphics Service – Installation after Upgrade* on SAP Service Marketplace at [service.sap.com/instguidesNW04](http://service.sap.com/instguidesNW04) → *Upgrade* → *SAP Web AS*.



The installation of the J2EE Engine 6.40 includes the installation of an SAP IGS. If you have installed the J2EE Engine 6.40, you only have to perform the post-installation steps as described in section “Configuration of ABAP System” of the documentation *SAP Internet Graphics Service – Installation after Upgrade*.

## 5.4.6 Reimporting Additional Programs

### Use

During the upgrade, the contents of directory `/usr/sap/<SID>/SYS/exe/run` are completely deleted before the new SAP kernel is imported. If you installed additional programs in this directory, such as the RFC library, the CPIC library, or ArchiveLink, you must install them again from the *Presentation DVD*.

### Procedure

Use the SAP tool `L0DR3SDK`.

## 5.4.7 Adjusting Repository Objects

### Use

If you have made modifications to programs, screens or interfaces (GUIs), you must adjust them with transaction SPAU.

Until now, customer exits were used to enhance the standard SAP system without modifying it. To exploit the advantages of the new Business Add-In technology, and to unify enhancement techniques, some of the customer exit definitions you use might have been migrated to Business Add-Ins by SAP. You can migrate the customer exits you have implemented to Business Add-In implementations at the touch of a button. The implementations that need migrating are displayed by the modification adjustment functions.

### Procedure

For more information on the modification adjustment, see the online documentation for the target release under *SAP NetWeaver Library* → *SAP NetWeaver* → *Application Platform (SAP Web Application Server)* → *ABAP Technology* → *ABAP Workbench* → *Changing the SAP Standard* → *Upgrade Procedure / Support Packages* → *Adjustment of Repository Objects*.

For an FAQ on SPAU and more information about Business Add-Ins, see SAP Service Marketplace at [service.sap.com/spau](http://service.sap.com/spau).



After you have completed the upgrade you have a maximum of 14 days to execute transaction SPAU without the key being checked (SAP Software Change Registration) for the objects that you modified.

## 5.4.8 Performing Post-Upgrade Activities for the Applications

### Use

Some applications require you to perform some application-specific post-upgrade activities, without which the applications cannot run. If you need to display Release Notes in your SAP system, proceed as follows:

- In the IMG structure, choose *Additional Information* → *Release Notes*.
- If you want to display the Release Notes independently from the IMG, choose *Help* → *Release Notes*.

When you choose this option for the first time, you are prompted to generate the Release Notes before you can display them.

### Procedure

#### Application-Specific Activities

These application-specific activities are described in the Release Notes for the particular application, and in the product-specific part of this documentation.

## Source Release SAP Basis 4.6D and lower: Converting Codepages

In SAP Basis Release 6.10, the codepage administration has changed considerably. If you have created customer-specific codepages starting with "9", and you want to continue using them after the upgrade, convert the codepages with report RSCP0126.

For more information, see **SAP Notes 485455, 413396, and 511732**.

## Adjusting Customer Developments

The programs and applications that you have written, which run without errors on the source release, may contain syntax or runtime errors after the upgrade. These may be caused by additional developments of the ABAP Workbench, changes to the ABAP syntax, or stronger syntax checks when you upgrade from one release of SAP Basis or SAP Web AS to the next one.

For information about recommendations for adjustments and instructions, see the following SAP Notes:

| SAP Note | SAP Basis/SAP Web AS Release |
|----------|------------------------------|
| 367676   | 4.6 to 6.10                  |
| 452229   | 6.10 to 6.20                 |

## 5.4.9 Rescheduling Background Jobs

### Use

Use this procedure to release all background jobs that were locked when you isolated the central instance.

### Procedure

1. Log on in client 000 as user DDIC.
2. Execute report BTCTRNS2.

Errors may occur if a background report was changed by the upgrade, since the report variants will no longer be correct. If this is the case, you must reschedule the job.

## 5.4.10 Releasing Held Jobs

### Use

During the upgrade, various background jobs are submitted to delete libraries that are not longer needed after the upgrade. Libraries that are deleted include old kernel libraries. After the upgrade, you have to release these jobs.



## Procedure

1. Enter the following command:  
`WRKUSRJOB <SID>OFR *JOBQ`
2. Choose option 6 (= *Release*).

## 5.4.11 Generating ABAP Loads

### Use

After an upgrade, the ABAP loads for the SAP system programs do not yet exist. When you call a program, a load is automatically generated, if it does not already exist. This may, however, reduce production system performance. To avoid this, you can use transaction SGEN to generate the missing loads.

Transaction SGEN offers the following functions:

- Selection of predefined generation tasks. Choose *Regenerate after an SAP System upgrade*.
- Selection of software components to restrict the amount of objects being generated (SAP\_ABA, SAP\_BASIS and so on)
- Selection of the application servers for parallel generation
- Generation in the background
- Job Monitor for checking the progress of the generation in the background

### Procedure



If you are planning to install a new SAP kernel after the upgrade, do not start the load generation until after the installation. Kernel parameters introduced with the new kernel might invalidate the loads.

If possible, generate the loads directly after the upgrade. Load generation requires a large amount of system resources.

For a detailed description of the features, see the online documentation in transaction SGEN by choosing *Information on the SAP Load Generator*, or in the Job Monitor by choosing *Job Monitor*.

For more information on the free space requirements in the load tables, see **SAP Note 186066**.

## 5.4.12 Generating BSP Applications

### Use

After an upgrade, the Business Server Page applications (BSP applications) do not yet exist. If you plan to implement BSP applications in your SAP system, you can generate them with transaction SGEN.

Transaction SGEN offers the following functions:

- Selection of predefined generation tasks. Choose *Generation of BSP Applications*.
- Selection of software components to restrict the amount of objects being generated (SAP\_ABA, SAP\_BASIS and so on)
- Selection of the application servers for parallel generation
- Generation in the background
- Job Monitor for checking the progress of the generation in the background

### Procedure

Start to generate the BSP applications as soon as possible after the upgrade. The generation requires a large amount of system resources.

For a detailed description of the features, see the online documentation in transaction SGEN by choosing *Information on the SAP Load Generator*, or in the Job Monitor by choosing *Job Monitor*.

## 5.4.13 Performing Actions for the SAP Online Documentation

You must perform the following actions before you can display the online documentation (SAP Library) in your SAP system:

- Install the files for the online documentation.
- For help type PlainHtmlHttp: Set up the Web server.
- Maintain the settings variants for the Online Help in the IMG.
- Install a Web browser/viewer.

For the exact procedure, see the documentation *Installing the SAP Library*.

## 5.4.14 Performing Post-Upgrade Activities in the Authorizations Area

### Procedure

#### Adjusting the Assignments Between Check Flags and Transactions

You can use transaction SU24 to do the following:

- Deactivate checks within a transaction.
- Define proposals for the profile generator for activated checks.

Both the check flags and the default values are based on SAP default values. To change these, call transaction SU24.

To copy the latest SAP default values while retaining your own modifications, call transaction SU25 (steps 2 and 3):

- This transaction displays the differences between your own check flags or authorization default values and the new SAP default values for all the changes by SAP.
- It also defines all the roles which will have to be generated later on with the profile generator, so that authorizations can be generated for all the current checks.

For more information, see the online documentation for transaction SU25.

#### Upward Compatibility for Authorization Checks

Some functions are protected in more detail by new authorization objects in the new release. The authorizations for these new objects are in the single profiles S\_NEW\_<rel><number>, where <rel> is the release for which the new authorization check was delivered. The composite profile SAP\_NEW contains all single profiles S\_NEW\_<rel><number>.



The SAP\_NEW composite profile contains all the individual S\_NEW\_<rel><number> profiles. This means that the composite role also contains the overall authorization for the S\_TCODE check.

Every user should have the profile SAP\_NEW in his or her master record. This guarantees that after an upgrade users can still perform the same functions that they were able to perform previously without an authorization check. Before this, delete all the individual profiles from SAP\_NEW that refer to releases that are lower than the source release for the upgrade.

After the upgrade the user administrator must go through the profile SAP\_NEW and decide for each authorization object, into which customer profile the authorizations need to be copied. This defines which users can continue to perform the corresponding functions.

Empty and activate the SAP\_NEW profile after completing these actions. To do this, remove the single profile S\_NEW\_<rel><number> from the composite profile SAP\_NEW. Keep the single profiles S\_NEW\_<rel><number>, so that you can find out later which authorization appeared in which release.



The SAP\_NEW profile does not contain the authorizations for functions delivered in the upgrade. It only contains the authorizations for new checks in functions that have already been delivered.

## Handling Problems with User Buffers

If the user master records were already very large before the upgrade, the predefined buffer size might not be large enough for the newly delivered profiles. If you encounter authorization problems after the upgrade where authorizations are missing for users although they are included in the master record, see **SAP Note 10187**.

## 5.4.15 Importing Support Packages After the Upgrade

### Use

To avoid problems with your SAP software, we recommend importing new Support Packages into your system as soon as they become available. This also applies after the upgrade, in order to avoid potential problems in your system before they occur.

If you have not included all the necessary Support Packages during the upgrade, you can also import them after the upgrade.

### Procedure

Import the newest Support Packages. Always start with the newest SPAM update.



If you want to install additional languages in your SAP system, perform the language import **before** you import the Support Packages. The Support Packages always contain the current language version for text-relevant objects.

For information on importing a language, see the online documentation under *Help* → *SAP NetWeaver Library* → *SAP NetWeaver* → *Solution Life Cycle Management* → *Change and Transport System* → *Language Transport*.

## 5.4.16 Transport Management System: Distributing the Configuration

### Use

After an upgrade, you must distribute the information about the new release to all systems in the transport domain.

### Procedure

If your Transport Management System has already been set up, proceed as follows:

1. Log on to the system that is configured as the domain controller.
2. Call transaction STMS and choose *Overview* → *Systems*.
3. Select the system that has been upgraded and choose *SAP System* → *Update configuration*.

4. Choose *Extras* → *Distribute TMS configuration*.

## 5.4.17 Performing Post-Upgrade Activities for the Language Transport

### Use

To reduce downtime during the upgrade, some data from the *Languages* DVD was only imported into container tables, and not yet imported into the actual database tables of the system. This data includes glossary and terminology data. If you want to use a glossary or terminology in your system, use the following procedure to copy the data from the container tables to the database tables.

### Prerequisites

- You have imported a language during the upgrade.
- You are using a glossary or terminology in your system.

### Procedure

Call transaction SMLT.

The transaction automatically recognizes that post-upgrade activities are necessary, and schedules a background job for this purpose.

## 5.4.18 Converting Batch Input Logs

### Use

As of Release 4.6C, the system only supports the new batch input log procedure. All old batch input logs must be converted with program RSBDCCLCH in all clients, otherwise the system cannot read them. The old log files are deleted after they have been converted successfully.

### Prerequisites

You have not yet converted your logs from a Basis release lower than 4.6C.

### Procedure

For the procedure and additional information, see **SAP Note 175596**.

## 5.4.19 Saving Files for Follow-Up Upgrades

### Use

In phase `SAVEPRO`, several upgrade files are saved in the `save` subdirectory of the upgrade directory. If you perform a follow-up upgrade with the same environment and the same upgrade strategy, you can reuse these files.

### Prerequisites

You are planning a follow-up upgrade with the same environment and the same upgrade strategy.

### Procedure

1. After the upgrade, make a backup of the `save` subdirectory of the current upgrade directory.
2. When you start with the new upgrade, copy the `save` subdirectory to the new upgrade directory.



You can copy the subdirectory as soon as you have created the new upgrade directory.

The following files are saved in the directory and can be used in a follow-up upgrade:

- Shadow system profile  
In `PREPARE` phase `SHDINST_CPY`, you can reuse the shadow system profiles.
- Results from phase `BIND_PATCH` (file `patbind.lst`)  
If suitable, you can use the Support Package selection as default selection.

## 5.4.20 Evaluating the Upgrade Runtime

### Use

Our aim is to provide you with a fast and efficient upgrade procedure. In phase `EXIT`, `R3up` extracts statistical data and evaluates the upgrade, for example, calculates the runtimes of the individual phases. Evaluating this information helps us to improve both the current upgrade procedure and new upgrades. We would also appreciate feedback on your experience with the SAP upgrade. Therefore, we have designed the *SAP System Upgrade Evaluation*. It contains the following:

- *Upgrade Evaluation Form*

This form consists of a simple questionnaire on your experiences with the upgrade and an upgrade log file generated by `R3up`.



Your feedback from the *Upgrade Evaluation Form* is mainly used to identify areas in need of improvement. If you have specific questions on the upgrade and need an answer soon, open a customer message in SAPNet – R/3 Frontend.

- *Upgrade Information*

Using the corresponding link in the text, you can open the file `upana.htm`. It is designed to help you evaluate your upgrade and to better plan follow-up upgrades. It contains detailed information on the system, the overall upgrade and the individual phases. You can add your own comments to this file.

If you are using the Upgrade Assistant, the *SAP System Upgrade Evaluation* is displayed automatically in a browser window.

### Prerequisites

- A browser has been installed on the machine from which you are monitoring the upgrade.
- The machine has an e-mail connection.
- The upgrade has finished.

### Procedure

To send the *Upgrade Evaluation Form* to SAP, proceed as follows:

1. Wait until phase `EXIT` has finished.
  - If the Upgrade Assistant is running, a browser window appears displaying the *SAP System Upgrade Evaluation*.
  - If the Upgrade Assistant is not running, you are prompted to open the following address:  
`http://<host name>:4239/htdoc/eval/index.htm`
  - If you are using scroll mode, open file `index.htm` in the following folder:  
`<upgrade directory>/htdoc/eval`
2. Answer the questions under *Upgrade Evaluation Form*.



Answering the questions is optional.

3. Choose *Send to SAP*.

This submits the *Upgrade Evaluation Form* to SAP.



After the upgrade has finished, you can return to the *SAP System Upgrade Evaluation* either by directly opening file `index.htm` in subdirectory `/htdoc/eval` of the upgrade directory or by entering the following path:  
`http://<host name>:4239 → Upgrade Evaluation`

## 5.4.21 Deleting the Upgrade Library and Directory

### Prerequisites

You have completed the upgrade and all post-upgrade activities.

### Procedure



It is important that you make a backup copy of the upgrade directory before deleting it. You do not need to make a backup copy of the upgrade library.

To remove upgrade objects that are no longer needed, enter the following commands:

```
DLTLIB LIB(R3UP)  
DLTLIB LIB(R3UPSRV)  
RRM '<upgrade directory>'
```



## 6 Additional Information

This part of the documentation contains general information on the following topics:

- [Troubleshooting \[page 130\]](#)
- [Upgrade Administration \[page 153\]](#)
- [Upgrade Tools \[page 162\]](#)

## 6.1 Troubleshooting

This part of the documentation contains additional information on how to proceed when you want to correct known problems that have occurred during the upgrade.

- Logs
  - [Upgrade Logs \[page 131\]](#)
  - [Evaluating the ELG Log Files \[page 133\]](#)
- Correcting Errors After Phases
  - [Correcting Errors in the RFCCHK Phase \[page 134\]](#)
  - [Correcting Entries Made in the INITPUT and INITSUBST Phases \[page 135\]](#)
  - [Correcting Errors in the DBCHK Phase \[page 136\]](#)
  - [Correcting Errors in the BATCHCHK Phase \[page 137\]](#)
  - [Correcting Errors in the INTCHK and INTCHK\\_SW Phases \[page 137\]](#)
  - [Correcting Errors in the JOB Phases \[page 138\]](#)
  - [Cleaning Up Terminated Conversions in the DB Conversion Phases \[page 138\]](#)
  - [Correcting Errors in the TRBATCHK\\_XT Phase \[page 141\]](#)
  - [Correcting Errors in the ACT Phase \[page 141\]](#)
  - [Correcting Conversion Errors in the PARCONV Phase \[page 142\]](#)
  - [Correcting Errors in the XPRAS Phase \[page 143\]](#)
- General Problems
  - [Preparing the Restart of the Upgrade After a System Failure \[page 145\]](#)
  - [Resetting the Upgrade \[page 145\]](#)
  - [Restarting the Upgrade in Scroll Mode \[page 148\]](#)
  - [Correcting Problems when Processing ABAP Steps \[page 149\]](#)
  - [Correcting Problems when Starting the SAP System \[page 150\]](#)
  - [Correcting Problems when Copying SAP Programs \[page 150\]](#)
  - [Providing SAP Support with Information \[page 151\]](#)

As well as the problems listed here, also read the SAPNet – R/3 Frontend Notes. Request the SAP Notes that are relevant to this upgrade.

## 6.1.1 Upgrade Logs

### Use

R3up logs all actions in log files. You can use these log files to monitor your upgrade. If you encounter any errors, you can analyze them to help you find a solution.

### Features

R3up records all actions in the R3up.log log file in the log subdirectory of the upgrade directory.

The tp steps are also listed in the SLOG<rel> file in the log subdirectory of the upgrade directory. Additional detailed logs are usually written for these tp steps.

A simple method of monitoring the progress of all tp-driven phases is to use DSPF to monitor the SLOG log. To do this, open another emulation window and enter the following command:

**DSPF** '`<upgrade directory>/log/SLOG<rel>`' and choose F17.

Each tp-driven phase is divided up into a number of different steps whose start and end times are noted in the SLOG log. The start and end of a phase are indicated by the lines START put and STOP put. The section in the SLOG log relating to the ACT\_<rel> phase looks like this:

```
START put          Q1A          20010307200903      Q1AOFR      AS0102
START tpsetstopm  Q1A          20010307200903      Q1AOFR      AS0102
STOP tpsetstopm   Q1A          20010307200903      Q1AOFR      AS0102
START tplock_eu   Q1A (        20010307200903      Q1AOFR      AS0102
STOP tplock_eu    Q1A (        20010307200904      Q1AOFR      AS0102
START tpsapstart  Q1A 3        20010307200904      Q1AOFR      AS0102
STOP tpsapstart   Q1A 3        20010307200935      Q1AOFR      AS0102
START DD ACTIVAT Q1A A        20010307200936      Q1AOFR      AS0102
START tp_getprot  Q1A          20010307200936      Q1AOFR      AS0102
STOP tp_getprot   Q1A          20010307202559      Q1AOFR      AS0102
STOP DD ACTIVAT  Q1A A        20010307202559      Q1AOFR      AS0102
START locksysX    Q1A {        20010307202559      Q1AOFR      AS0102
STOP locksysX     Q1A {        20010307202559      Q1AOFR      AS0102
START tpsapstart  Q1A 3        20010307202600      Q1AOFR      AS0102
STOP tpsapstart   Q1A 3        20010307202631      Q1AOFR      AS0102
START locksys     Q1A |        20010307202631      Q1AOFR      AS0102
STOP locksys      Q1A |        20010307202631      Q1AOFR      AS0102
START tpdequeue   Q1A          20010307202631      Q1AOFR      AS0102
STOP tpdequeue    Q1A          20010307202632      Q1AOFR      AS0102
STOP put          Q1A 0000 20010307202632      Q1AOFR      AS0102
```

Additional detailed logs are also written for most steps. These are in the tmp subdirectory of the upgrade directory, where you can also monitor them with DSPF. After the various steps of the phase have been completed, tp moves the individual logs to the log subdirectory of the upgrade directory.

The table below lists the most important steps together with their log names, and specifies which programs execute the steps:

| Step                               | Log Name  | Program Executing the Step |
|------------------------------------|---|----------------------------|
| SHADOW_IMPORT                      | SAPK??????.<SID>  | R3trans                    |
| DD IMPORT (H)                      | SAPH??????.<SID>  | R3trans                    |
| DD ACTIVATION (A)                  | SAPA??????.<SID>  | ABAP (RDDMASGL)            |
| DISTRIBUTION OF DD OBJECTS (S)     | DS<DATE>.<SID>  | ABAP (RDDDIS0L)            |
| TBATG CONVERSION OF DD OBJECTS (N) | N<DATE>.<SID>   | ABAP (RDDGEN0L)            |
| tpmvntabs                          | P<DATE>.<SID><br>PA<DATE>.<SID><br>PD<DATE>.<SID><br>PL<DATE>.<SID> | tp                         |
| MAIN IMPORT (I)                    | SAPI??????.<SID>  | R3trans                    |
| tpmvkernel (c)                     | KERNELMOVE.LOG<br>C<DATE>.<SID>                                     | tp                         |
| TBATG CONVERSION OF MC OBJECTS (N) | N<DATE>.<SID>   | ABAP (RDDGEN0L)            |
| IMPORT OF SELFDEFINED OBJECTS (D)  | SAPD??????.<SID>  | ABAP (RDDDIC1L)            |
| VERSION UPDATE (V)                 | SAPV??????.<SID>  | ABAP (RDDVERSL)            |
| EXECUTION OF REPORTS AFTER PUT (R) | SAPR??????.<SID>  | ABAP (RDDEXECL)            |

Once the logs are located in the `log` subdirectory of the upgrade directory, you can also display them in the SAP system. You can do this by executing program RDDPROTT with transaction SE38. RDDPROTT displays all the logs for a specific transport request. In the *Transport Request* field, enter the name of the transport request (for example, `SAPK<rel>D01`) and then choose *Execute*.

A brief overview of all the logs existing for this transport request appears. Double-click a line to display a log for this step. The logs are broken down into several levels. Level 1 only displays the return code for the step. Check at least level 2 to display any error messages. Double-click an error to see its long text.

After completing each `tp`-driven phase, `R3up` creates a summary of all individual logs in this phase. The names of the summaries usually comprise the phase name (without underscores) and the extension `.ELG` (for example, `DDIC<rel>.ELG`). The summary contains the names of the individual logs, any errors that occurred and the return codes. If no errors have occurred, you need to check these summaries only.

## 6.1.2 Evaluating the ELG Log Files

### Use

The <PHASE>.ELG log files are summary log files that contain a list of all the errors that occurred during a specific phase of the upgrade. From these files, you can call up detailed log files that contain more information. When errors are detected during a phase, R3up displays an appropriate message and prompts you to repeat that phase. First check the <PHASE>.ELG log to find out why the step terminated:

- No errors have occurred if a return code lower than 8 appears in the log at the end of a step, and no error messages appear for that step.
- Errors have occurred if the return code is 8 and error messages appear before it, or if the return code is greater than 8.

### Procedure

1. Analyze the errors, using the detailed log file if necessary. The name of this log is listed in the header of each phase step.

If a return code is greater than or equal to 12, then tp or a program called by tp has terminated.

2. Determine when the program terminated from the last two lines of the SLOG log. If tp or R3trans have terminated, analyze the last log that was written. For a chronological list of the files in both log directories, enter the following commands:

```
WRKLNKSAP '<upgrade directory>/log'
```

```
WRKLNKSAP '<upgrade directory>/tmp'
```

3. If a background step in the SAP system terminates, you must analyze the job log in the SAP system to determine the cause of the error.
  - a. Log on as user DDIC and call transaction SM37. Enter a job name as the name of the report that usually processes the terminated step (RDDMASGL for DD ACTIVATION, for example).

Make sure that the date in the SM37 input screen is correct and that an asterisk (\*) appears in the *or after event* field. The job overview normally displays one canceled job and one background job that completed normally.
  - b. Double-click the canceled job to display the job log.
  - c. Double-click the error line to display the long text for the error.



If you use a user ID other than DDIC to log on to the SAP system and correct the error, the SAP system may prevent you from logging on.

In this case, proceed as follows:

1. Enter the following commands to unlock the SAP system (here <transport\_profile> is the transport profile of the transport domain to which the system is connected):

```
cd '<upgrade directory>/bin'  
tp 'unlocksys <SID> pf=<transport profile>'  
tp 'unlock_eu <SID> pf=<transport profile>'
```
2. Log on to the SAP system and correct the error.

```
3. Enter the following commands to lock the SAP system again:  
cd '<upgrade directory>/bin'  
tp 'locksyst <SID> pf=<transport profile>'  
tp 'lock_eu <SID> pf=<transport profile>'
```

- Once you have found and corrected the error, repeat the phase by selecting *repeat* in R3up. The repeated phase is usually completed quickly, since the transport control program `tp` automatically starts from the point at which it terminated.

## Result

In some cases, you can choose *ignore* in R3up to continue with the upgrade and avoid repeating the failed phase. Generally, you must always remove the cause of the error. When you choose *ignore*, R3up prompts you to enter a password if the errors are serious. In this case, you must get approval to ignore the error from SAP Support.



A return code of 8 indicates that some individual objects have not been processed or not been processed completely.

Remove all errors to avoid the risk of follow-on errors. If you are not sure how to proceed, contact SAP Support.

## 6.1.3 Correcting Errors in the RFCCHK Phase

### Use

This phase tests the RFC connection to your SAP system.

### Prerequisites

An error message appears. This can be caused by the following:

- Your SAP system has not been started.
- Your SAP system cannot be reached with the gateway and password you have specified.

### Procedure

- Check whether your system is started and that you have specified the correct gateway.
- If you need to correct the gateway information, proceed as described in [Correcting Entries Made in the INITPUT and INITSUBST Phases \[page 135\]](#).

## 6.1.4 Correcting Entries Made in the INITPUT and INITSUBST Phases

### Use

If in later phases you find that entries you made in the `INITPUT` and `INITSUBST` phases were incorrect, you can correct them.

Frequently, the password of user `DDIC` is changed during the upgrade. For this reason background jobs could not be started in the `JOB_<name>` phases or the `RUN_<name>` phases. So that you do not have to reconfirm all the entries you made in the `INITPUT` phase, you have the option of only changing the password of user `DDIC`.

### Procedure

#### If you are using the Upgrade Assistant

1. In the main menu of the Upgrade Assistant, choose *Administrator* → *Start R3up with option*.
2. If you need to correct entries made in phase `INITPUT`, enter the following command:

```
set stdpar
```

Usually, it is not necessary to change the password of user `DDIC` during the upgrade. After the installation of the shadow system, the password of user `DDIC` in client 000 is the same as on the original system. If you change the password on the original instance afterwards, you also have to change the password on the shadow instance and in the `R3up` parameter.

To change the password of user `DDIC`, enter the following command:

```
set DDICpwd          (original system)
```

```
set shdDDICpwd      (shadow system)
```

3. If you need to correct entries made in phase `INITSUBST`, enter the following command:  

```
set rswpar
```
4. Choose *exit* to exit `R3up` and then [restart the upgrade \[page 100\]](#), otherwise the changes will not take effect. To do this, use start mode *init*.

#### If you are using scroll mode

1. If you need to correct entries made in phase `INITPUT`, enter the following command:

```
R3UP UPGDIR(<upgrade directory>) PARMLIST('set stdpar')
```

Usually, it is not necessary to change the password of user `DDIC` during the upgrade. After the installation of the shadow system, the password of user `DDIC` in client 000 is the same as on the original system. If you change the password on the original instance afterwards, you also have to change the password on the shadow instance and in the `R3up` parameter.

To change the password of user `DDIC`, enter the following command, depending on the system.

- Original system:  

```
R3UP UPGDIR(<upgrade directory>) PARMLIST('set DDICpwd')
```

- Shadow system:  
`R3UP UPGDIR(<upgrade directory>) PARMLIST('set shdDDICpwd')`
- 2. If you need to correct entries made in phase `INITSUBST`, enter the following command:  
`R3UP UPGDIR(<upgrade directory>) PARMLIST('set rswpar')`
- 3. Restart `R3up`, otherwise the changes will not take effect. To start the current phase, use start mode `init`.

## 6.1.5 Correcting Errors in the DBCHK Phase

### Use

This phase determines the database version and the release of the SAP system. To do this, `R3up` runs the transport control program `tp`, which logs on to the database and reads the necessary information from there. Any problems in this phase are usually due to a failed database connection.

### Prerequisites

The system has displayed the error message `No information received from the database`.

### Procedure

1. Check the `SLOG<rel>` file in the `log` subdirectory of the upgrade directory. Any problems with `tp` are usually due to a non-initialized Workbench Organizer.
2. To initialize the Change and Transport System, call transaction `STMS` from the Transport Management System (TMS).

For more information, see the TMS online documentation. To display the documentation, choose *Information* in transaction `STMS` or the following:

- **Release 4.6x**  
*Help → SAP Library → Basis Components → Change and Transport System → Transport Management System*
- **Release 6.x**  
*Help → SAP Library → mySAP Technology Components → SAP Web Application Server → Change and Transport System → Transport Management System*



## 6.1.6 Correcting Errors in the BATCHCHK Phase

### Use

This phase tests whether the background server can access the upgrade directory. To do this, the background job RDDIT008 is started on the specified background server. This job writes a test log in the `tmp` subdirectory of the upgrade directory.

### Procedure

1. If errors occur, call transaction SM37 to check whether the background job has run.
  - If the job cannot be started, this is generally due to a problem with the name of the background server.
    - i. Check whether the host specified in phase `INITPUT` is included in the list displayed for the current background service.

To do this, perform a test call of function module `TH_SERVER_LIST` in transaction SE37. To display the list, double-click the table parameter `LIST` after executing the function module.
    - ii. Depending on the problem, you either have to change the network configuration or change the entries made in the `INITPUT` phase.

To change the entries, proceed as described in [Correcting Entries Made in the INITPUT and INITSUBST Phases \[page 135\]](#).
  - If the job terminates, call transaction SM21 to check the system log of the SAP system.
  - If the job is successful, however `R3UP` cannot find the log, make sure of the following:
    - i. The file system of the upgrade directory must be mounted on the background server.
    - ii. The value of the SAP profile parameter `DIR_PUT` must match the current upgrade directory.
2. To repeat the phase, choose *repeat*.

## 6.1.7 Correcting Errors in the INTCHK and INTCHK\_SW Phases

### Use

These phases check whether the inactive nametab is empty. If not, an error occurs.

### Procedure

1. Analyze the `DDXTTCHK.LOG` file to find the affected objects.
2. Call transaction SE11 to activate these objects.

The inactive nametab is then empty.

3. Call `R3up` again with *repeat*.

## 6.1.8 Correcting Errors in the JOB Phases

### Use

A `JOB` phase starts a background job in the SAP system and waits for it to be completed. If problems occur during execution of the background job, you receive an error message.



The naming convention for the `JOB` phases is `JOB_<name>` or `RUN_<name>`, where `<name>` is the name of the job or report.

### Procedure

1. Log on to the SAP system as user `DDIC`.
2. Call transaction `SM37` and restrict the start time and start date of the background job as much as possible.
  - If no background job was started, this is generally due to a syntax error in the calling program. If there is no SAP Note explaining this error, contact SAP Support.
  - If the background job was started, there are two possible situations:
    - The job was terminated.  
Check if the error can be reproduced by selecting *repeat* in `R3up`. If the error occurs again, contact SAP Support. In this case, proceed as described in [Providing SAP Support with Information \[page 151\]](#).
    - The job was completed normally, but with error messages.  
In certain situations, you can ignore these error messages. In this case `R3up` does not require a password if you choose *ignore*. If you are not sure how to proceed, contact SAP Support.

## 6.1.9 Cleaning Up Terminated Conversions in the DB Conversion Phases

### Use

These conversion errors are indicated by the following `PREPARE` and `R3up` error messages:

- Restart logs of DB conversions found
- Outstanding DB conversions found

These errors can occur in the phases `CNV_CHK_GEN`, `CNV_CHK_IMP` and `CNV_CHK_XT`.



If both messages appear, process the message `Restart logs of DB conversions found first`.

## Procedure for Restart Logs of DB Conversions Found

To clean up terminated conversions indicated by the message `Restart logs of DB conversions found`, proceed as follows:

1. Call the database utility transaction (transaction SE14) to find the terminated conversions.
2. Choose *DB Requests → Terminated*.  
A list of the terminated conversions appears.
3. Double-click a table name to see its details.
4. Check the meaning and status of the table.
  - a. Find out whether the table is still needed. Sometimes the tables are test tables that are no longer needed.
  - b. Ask the last person who changed the table, or the table owner, to find out its status.
    - If the table is no longer needed, choose *Cancel adjustment* in the detailed display (*Unlock table* as of Release 4.5A). This prevents the conversion being continued automatically. The table itself does **not** return to a consistent state. Any data that is still in the temporary table is lost during the next conversion.
    - In some cases, however, the table was already corrected without the reset log being deleted. The function *Cancel adjustment (Unlock table* as of Release 4.5A) is harmless in this case.
  - c. You can determine the state of the table with *Check → Database object* and *Check → Runtime object*.
  - d. Also check if the table contains the data you expect. You can do this with transaction SE16, for example. If the data does not exist, it could still be in the temporary table. Contact your SAP consultant or SAP Support for help in saving this data.
5. Determine the cause of the error.

If you find out that the table is still needed, choose *Object log*. Look for error messages that explain why the conversions were terminated. You could encounter the following problems here:

- You cannot find a log because it was deleted at some time in the past. Continue with step 6 (continue the conversion to the end).
  - The log does not contain an error message, but ends abruptly. This indicates that the conversion was stopped by an external event. Call transaction SM21 to read the system log and find out the approximate time the conversion was terminated, and to look for the cause of the error.
  - If the log clearly gives a reason for the error, you must correct it.
6. Continue the conversion to the end.

In the detailed display, choose *Continue adjustment*. Since you do not know how long this will take, choose processing type *Background*.

The situation can be as follows:

- The conversion finished successfully. You can see this because the error message disappears, the *Check* function does not display any further problems, and there is a success message in the object log.
- The conversion terminates again. A log now exists. Repeat the analysis from step 5 (*Determine the cause of the error*).

If, after several attempts, you still cannot complete the conversion, contact an SAP consultant or SAP Support.

## Procedure for Outstanding DB conversions found

To clean up terminated conversions indicated by the message `Outstanding DB conversions found`, proceed as follows, proceed as follows:



Process this message after you have processed the message `Restart logs of DB conversions found`.

1. Determine the objects that are affected.
  - a. Start the database utility transaction (transaction SE14) and choose *DB Requests* → *Mass Processing*.
  - b. Choose *All requests*.

You now see the worklist of the conversion program. This worklist was generated by developments or modifications in your SAP system, but has not yet been processed.
  - c. Choose *DB requests* → *Created with import*.

This displays the worklist that was not processed correctly during the last upgrade.
2. Check the meaning and status of the requests.

In contrast to the procedure for the message `Restart logs of DB conversions found`, this procedure can also include requests for indexes, views and matchcode objects. The requests that are found are not always terminated. They might not even have been started.

- a. Ask the last person who changed the object if the request should still be processed.
- b. If the user does not want it to be processed, select the request and choose *Delete selected*.

This removes the objects from the worklist of the conversion program.

Do not remove requests from the last upgrade.

3. Process the outstanding requests.

You can select the requests from the list of mass processing requests and schedule a job for execution with the function *Schedule selections*.

  - a. Go to the detailed display of the object by double-clicking it in the list of requests created by the import.
  - b. Schedule the request, or continue it. Since you do not know how long this will take, choose processing type *Background*.

## 6.1.10 Correcting Errors in the TRBATCHK\_XT Phase

### Use

The `tp` program uses table TRBAT to communicate with the SAP system. If this table contains entries, they could be the remains of an import or export that either terminated or is still running. `PREPARE` already made this check.

### Procedure

Clean up table TRBAT. For more information, see [Evaluating the Results of PREPARE \[page 90\]](#) under the following `PREPARE` messages:

```
Unresolved request found in TRBAT.  
...  
TRBAT entry indicates that a batch job is running.  
...  
TRBAT entry indicates that a batch job has finished.  
...  
Corrupted TRBAT entry found.  
...
```

## 6.1.11 Correcting Errors in the ACT Phase

### Use

Depending on the results of the `ADJUSTCHK` phase, you may be asked in the `ACT_<rel>` phase to adjust your modifications to SAP objects so that they correspond to the latest SAP standard version of the objects. If your SAP system has been modified, error messages with return code 8 might occur during the `ACT_<rel>` phase.

### Prerequisites

Before you can correct ABAP Dictionary objects that cannot be activated, you may need to unlock the shadow instance of the SAP system. Proceed as follows:

1. Log on to the iSeries as user `<SID>OFR`.
2. Enter the following commands:

```
cd `<upgrade directory>/bin`  
R3UP UPGDIR(<upgrade directory>) PARMLIST(`unlockshd <SID>`)
```

### Procedure

1. Log on to the shadow instance as a user other than `DDIC`.  
If you have not yet created users on the shadow instance, do so now as described in [Phase ACT\\_<Rel> \[page 108\]](#).
2. Make the required corrections.



To make the corrections, use only the maintenance transaction of the ABAP Dictionary (SE11). Do not try to repair the objects with the *Database Utility* transaction (SE14). This can cause serious inconsistencies.

3. If you had to unlock the SAP system, as described under “Prerequisites”, lock it again with the following commands:

```
cd '<upgrade directory>/bin'  
R3UP UPGDIR(<upgrade directory>) PARMLIST('<lockshd <SID>')
```

## Result

Once you have corrected all the errors, you can proceed with the upgrade where it terminated in the ACT\_<rel> phases by selecting *repeat* in R3up.

If you choose *ignore severe errors*, all error messages with return code 8 are ignored.

## 6.1.12 Correcting Conversion Errors in the PARCONV Phase

### Use

This procedure enables you to correct problems that occur in the PARCONV\_UPG phase. The errors can roughly be divided into two classes:

- Technical problems on the database

You can recognize these in the system log (transaction SM21), where they are marked with SQL-ERROR followed by an abbreviation with an error number. The problem is often called by a lack of space.

- Logical errors in the object definition

These could also appear in the form of SQL errors. Some of them, however, are already detected by the system before a command can be given to the database.

This type of error frequently occurs if you decide to revert to the SAP standard when you use the modification adjustment functions in transaction SPDD (ACT\_<rel> phase).



A field was added to an SAP table. This field was also used in an index or view. In the ACT\_<rel> phase, however, you decided to return to the standard definition of the table (using transaction SPDD) and this additional field was removed. The index or view definition is now incorrect since the relevant table field is missing. If the index definition is not corrected, and the ACT\_<rel> phase was completed with *ignore*, there will be errors when the objects are created.

## Procedure

1. Analyze the log `PARCONV.ELG`.
2. Remove the cause of the error.
  - Technical problems on the database  
Read the documentation in the database system about how to correct the error. If necessary, extend the database.
  - Logical errors in the object definition  
Correct the objects. To do this, you can use transaction SE11. In the above example, you could, for instance, remove the deleted field from the index or view definition or re-insert the deleted field into the table. Also check whether the objects that are not contained in the standard system and that are now incorrect can be deleted completely.
3. Repeat the `PARCONV_UPG` phase.

For more information on alternative procedures, see **SAP Note 177680**.

## 6.1.13 Correcting Errors in the XPRAS Phase

### Use

If errors occur in the `XPRAS_UPG` phase during the execution of XPRAS reports, `R3up` stops and refers to the `XPRAS_UPG.ELG` log, which contains error messages with the following header:

```

~~~~~
XPRAS ERRORS and RETURN CODE in <file name>
~~~~~

```

If this header is followed by lines other than the return code, then errors have occurred while the reports were being executed. In addition to the actual error lines, a separate line indicates the names of the reports that generated the preceding error messages.

You can display a detailed help text for each of these error messages in the SAP system. These texts usually contain all the information you need to correct the error.

### Procedure

#### Finding Help Texts for Error Messages

1. Search the `XPRAS_UPG.ELG` log to find the file name specified in the header.



The file name that appears in the header of `XPRASUPG.ELG` is important for finding the help text. The file name always has the following format:

`SAPR<ID>.<SID>`

`<ID>` can be any string of six characters.

The name of the relevant transport request can be derived from the two names. Replace the `R` with a `K` and delete the period and all characters that follow it. You now have `SAPK<ID>` as the name of the transport request.

2. Log on to the SAP system.

3. Call transaction SE09.
4. Choose *Request/task* → *Display individually* and enter the name of the transport request `SAPK<ID>`.
5. To display the individual transport logs, choose *Goto* → *Transport logs*.
6. To navigate to the log display for this step, double-click the line *Exec after put*.  
You can expand the log to view it in more detail. The error messages will generally be visible as of the second level.  
To display a help text, position the cursor on the error message and choose *Long text*.

## Correcting Errors

1. Follow the instructions in the help text precisely. The help text helps you correct the error.
2. When you have corrected all the errors, repeat the upgrade phase with `R3up`.
3. If you need more information or if the report still results in errors when you repeat the `XPRAS_UPG` phase, read the documentation of the report in question. To access this information, log on to the SAP system. Call transaction SE38 and display the documentation for the report that is named in the error log. This documentation is always available in English and German.
4. If you choose *ignore*, `R3up` gives you two options for continuing the upgrade:
  - *repair severe errors*
  - *ignore all errors*

Choose *repair severe errors*. `R3up` repeats the phase and ignores all error messages with the return code 8. The errors must be removed **after** the upgrade.

You require a password for *ignore all errors*. `R3up` then continues with the next phase, without executing the following XPRAs. Before you can choose *ignore*, you must have approval from SAP Support.

## Correcting Errors After the Upgrade

If possible, correct errors immediately. However, you can correct some errors that occur during the execution of XPRAs reports after you have completed the upgrade. This option makes sense, for example, when special measures in the SAP application areas are necessary to correct the errors, and the corresponding specialists are not available right now. To do this, you must suppress the execution of the corresponding report before you repeat the upgrade phase. After the upgrade, correct the error and run the report manually using transaction SE38.

For technical instructions on skipping an XPRAs, see **SAP Note 122597**.



Only skip an XPRAs report program if you are sure you can execute it later (for example, if an SAP Note tells you that this is allowed).  
If you cannot execute an XPRAs later and still want to skip it, contact SAP.



## 6.1.14 Preparing the Restart of the Upgrade After a System Failure

### Use

If the system fails (due to power failure, for example) `R3up`, `tp`, and `R3trans` can no longer perform certain cleanup actions. Before you restart the upgrade after a system failure, you must make sure that you meet the requirements for restarting the system successfully.

### Procedure

1. Start the SAP system.
2. Log on to the SAP system as user `DDIC` and call transaction `SM31` to delete all the entries from table `TRBAT`.
3. Call transaction `SM37` to delete all the released background jobs related to the processing of a phase with the exception of `RDDIMPDP`.
4. To change the status of all the current or active background jobs to *canceled*, run report `RSBTCRPR`, and then call transaction `SM37` to delete these jobs.
5. Call transaction `SM50` to cancel any background jobs that have already been restarted.
6. Move all the logs contained in the `tmp` subdirectory of the upgrade directory to the `log` subdirectory.



Enter the following commands to copy a log to a new location. These commands make sure that if there are identical names, the logs from the `tmp` subdirectory of the upgrade directory are added to the logs in the `log` subdirectory and no logs are overwritten.

```
CD '<upgrade directory>/log'  
WRKLNK '<upgrade directory>/tmp/*'  
Choose option 2 (= Move).
```

7. [Restart the upgrade \[page 100\]](#).

## 6.1.15 Resetting the Upgrade

### Use

You need to take different measures to reset the upgrade (because of hardware problems, for example), depending on what stage the upgrade has reached. In addition to resetting the database, you might also have to reset the SAP kernel and the SAP profiles.

You need to distinguish between the following cases:

- The `MODPROF_TRANS` phase **has not yet been completed**, which means that the important database conversions have not yet started.
- The `MODPROF_TRANS` phase **has been completed**, which means that the database conversions have started.



Information for the database conversion is stored in the upgrade directory. This means that losing the upgrade directory has the same consequences as losing the database. It is important that the database state and the state of the upgrade directory are always consistent.

The actions you need to take are listed in the following depending on the selected upgrade strategy and the progress of the upgrade. Some of the actions are flagged with comments from <sup>1)</sup> to <sup>n)</sup>. To perform these actions, see the end of this section under “Detailed Description of the Individual Actions”. For information on the progress of the upgrade, see log file `R3up.log`.



For additional information on resetting an upgrade, see **SAP Note 417670**. If you have any questions, contact SAP Support.

## Procedure

### Before Reaching the MODPROF\_TRANS Phase

Regardless of the upgrade strategy you choose, no irreversible database changes are made up to this phase.

Proceed as follows:

1. **Only if the database fails:** Import the database backup.
  - Strategy *resource-minimized*:  
Use the backup you made before the `EU_IMPORT1` phase.
  - Strategy *downtime-minimized*:  
The system was in production operation up to the database failure, so make a point-in-time recovery up to the last database state.
2. Perform these follow-up actions:
  - a. Stop `R3up`.
  - b. If necessary, stop the shadow instance <sup>5)</sup>.
  - c. Strategy *resource-minimized*:  
Start the central instance.
  - d. Execute report `RSUPGRES`.  
This report deletes all shadow tables, which enables you to restart the upgrade. For more information, see **SAP Note 417670**.
  - e. If necessary, save the upgrade directory to another directory for troubleshooting.
  - f. Delete the upgrade directory <sup>3)</sup>.
3. Restart the upgrade with `PREPARE`.

## After Reaching the MODPROF\_TRANS Phase

### Upgrade Strategy Downtime-Minimized

1. Reset the database.

Use the backup you made before the MODPROF\_TRANS phase.



You also need to do this if you lose the upgrade directory.

2. Reset the upgrade directory <sup>4)</sup>.
3. Reset the SAP profiles <sup>1)</sup>.
4. If the KX\_SWITCH phase has already been completed, reset the SAP kernel <sup>2)</sup>.
5. Restart the upgrade in the MODPROF\_TRANS phase.

### Upgrade Strategy Resource-Minimized

1. Reset the database.

Use the backup you made before the EU\_IMPORT1 phase.



You also need to do this if you lose the upgrade directory.

2. If any of the following R3up phases have already been completed, perform the relevant action:

| Phase      | Action                               |
|------------|--------------------------------------|
| EU_IMPORT1 | Reset the SAP profiles <sup>1)</sup> |
| KX_SWITCH  | Reset the SAP kernel <sup>2)</sup>   |

3. Perform the follow-up actions as described above in step 2 under "Procedure Before Reaching the MODPROF\_TRANS Phase".
4. Restart the upgrade with PREPARE.

## Detailed Description of the Individual Actions

### Reset the SAP profiles <sup>1)</sup>

After the MODPROF\_TRANS phase (for upgrade strategy *resource-minimized* after the EU\_IMPORT1 or REQSTOPPROD phase), the instance profile and the default profile of the SAP system are changed by R3up. If this phase has been completed, you must retrieve these two files from the `sapnames` subdirectory of the upgrade directory. The instance profile is saved in `PROFX.BCK`, the default profile in `DEFPROF.BCK`.

### Reset the SAP kernel <sup>2)</sup>

The new kernel is active after the KX\_SWITCH phase. You must reimport the old kernel when you make the recovery. Since the old kernel library is still physically present on your iSeries, you have to reset the links:

```
APYR3KRN SID(<SID>)
KRNLIB(<old optimized kernel library>)
DLTSQLPKG(*YES)
```

### Delete the upgrade directory <sup>3)</sup>

We recommend that you archive all the subdirectories before you delete the contents of the upgrade directory.



You can exclude the `data` directory if you have space problems.

### Reset the upgrade directory <sup>4)</sup>

You must recover the whole upgrade directory with all its subdirectories. You must have backed up the upgrade directory when you [isolated the central instance \[page 155\]](#) if you want to do this.

### Stop the shadow instance <sup>5)</sup>

Enter the following commands as user `<SID>OFR`:

```
ADDLIBLE R3UP
```

```
R3UP UPGDIR(<upgrade directory>) PARMLIST('stopshd')
```

## 6.1.16 Restarting the Upgrade in Scroll Mode

### Prerequisites

You are upgrading the system in scroll mode from a PC and the terminal connection has broken.

### Procedure

1. Check whether `R3up` is running in the background on the host. If it is, enter command `ENDJOB` to stop `R3up`.
2. Check whether a `tp` process still exists with command `WRKUSRJOB <SID>OFR *ACTIVE`. If so, note the process number.

If `tp` was active when `R3up` terminated, it keeps running independently of the upgrade.

3. [Restart the upgrade \[page 100\]](#).

`R3up` logs any processes it has started, both in the SAP system and at the operating system level. When you restart `R3up`, a check is made to see if any of the processes you noted are still running. If so, `R3up` must wait until these processes have ended. `R3up` does not need to wait if the processes found are of a different type.



You must prevent `R3up` from starting two processes of the same type.

## 6.1.17 Correcting Problems when Processing ABAP Steps

### Use

Some of the ABAP steps are performed in the SAP system. These are:

- ABAP Dictionary activation (A)
- Distribution of ABAP Dictionary objects (S)
- Table conversion (N)
- Matchcode activation (M)
- Import of application objects (D)
- Update of version management (V)
- Execution of XPRAs (R)

The TRBAT table forms the interface between the transport control program `tp` and the SAP system. To trigger an ABAP step, `tp` writes control information to this table.

The `JOB_RDDNEWPP` phase schedules the event-driven background job.

### Procedure

1. Check that the SAP system was started correctly. Log on in client 000 as user `DDIC`.
2. Call transaction `SM37` and check whether the background job `RDDIMPDP` has been scheduled.

In the *or after event* field, enter an asterisk (\*), so that event-driven jobs are also displayed.

3. Check when `RDDIMPDP` last ran and whether it ran without errors.
4. Check whether the control information in table `TRBAT` has been entered correctly.

The table must have one `HEADER` entry and should contain one entry for each transport request. While the ABAP Dictionary objects are being distributed (S) and the tables converted (N), table `TRBAT` may contain only one `HEADER` entry, since these steps are not carried out by transport request.

5. Call transactions `SM37` and `SM50` to check whether `RDDIMPDP` has already started the background job that processes the ABAP step.

For more information on the transport control program `tp`, and the communication between `tp` and the SAP system, see the online documentation for Basis or SAP Web AS of the source release under:

- **Release 4.x**

*Help* → *SAP Library* → *Basis Components* → *Change and Transport System* → *BC – Transport Tools* → *Transport Control Program tp*

- **Release 6.x**

*Help* → *SAP Library* → *mySAP Technology Components* → *SAP Web Application Server* → *Change and Transport System* → *Transport Tools* → *Transport Control Program tp*

## 6.1.18 Correcting Problems when Starting the SAP System

### Use

`tp`, the transport control program, automatically restarts the SAP system several times during the individual phases. If the startup attempt fails and the next step requires processing within the SAP system (such as a table conversion), then `tp` waits for this step to end without result.

### Procedure

1. Check the SLOG log (`SLOG<rel>`) to see whether the SAP system is supposed to be stopped or started at this point. Starting at the end of the log, search upwards for the latest entry marked `tpsapstop` or `tpsapstart`.
2. If the SAP system is supposed to be started, according to the SLOG log, but you cannot log on as user `DDIC`, enter the following command to stop any SAP processes that are running:

```
stopsap <SID> <instance>
```

3. Check whether all the processes of the SAP system have really been stopped. To do this, enter the following command:

```
WRKACTJOB SBS(R3_<instance>)
```

The output should show no jobs.

4. Enter the following command to try to start the SAP system:

```
startsap <SID> <instance>
```

If you cannot start the SAP system manually, then this is usually due to changes in the SAP profile in the `MODPROF_TRANS`, `MODPROF_BAS` and `MODPROFP_UPG` phases, or due to a switch of the SAP programs in the `KX_SWITCH` phase. In both cases, increased demands on host resources may have caused the problems. In this case, try to run the SAP system with fewer dialog processes.

For more information about startup problems, see **SAP Note 46390**.

## 6.1.19 Correcting Problems when Copying SAP Programs

### Use

In the `KX_SWITCH` phase, the SAP programs in directory `/usr/sap/<SID>/SYS/exe/run` are switched. Do not start the SAP system during this period; otherwise, `R3up` cannot overwrite the old files.

### Procedure

1. Analyze the logs of the copy process. They are located in the `log` subdirectory of the upgrade directory and are called `C<DATE>.<SID>` and `kernelmove.log`.

- Repeat the phase or enter the following commands:

```
RMVLIBLE LIB(<old kernel library>)
```

```
ADDLIBLE LIB(<new kernel library>)
```

```
APYR3KRN SID(<sid>) KRNLIB(<new kernel library>) DLTSQPKG(*YES)
```

## 6.1.20 Providing SAP Support with Information

### Use

If none of the measures described in [Troubleshooting \[page 130\]](#) solves your problem, contact SAP Support. To enable us to help you as quickly and efficiently as possible, follow the procedure given here.

### Procedure

If you encounter problems that are specific to the upgrade, create an error message in the SAPNet – R/3 Frontend and assign it to component BC-UPG. Answer the following questions and put these answers in your customer message:

- For which SAP component do you want to perform the upgrade?
- Which release are you upgrading from? Which release are you upgrading to?
- Which operating system version are you using?
- What was the original release of your SAP system?
- In which R3up phase does the error occur?

This information is listed at the end of the of the R3up.log file located in the upgrade directory.

- Did you have problems with the SAP system before upgrading?



If an online connection is set up to a defective SAP system, we can find the cause of the error more easily, and can therefore correct it more quickly.

If you are certain that the problem is not an upgrade-specific one but a product-specific one, assign your error message to the appropriate product-specific component. The following table gives you information on the different components to which you can assign your message in SAPNet – R/3 Frontend.

| SAP Product                        | Component in SAPNet – R/3 Frontend |
|------------------------------------|------------------------------------|
| Index Management Server            | BC-SRV-TRX                         |
| OLTP-R/3-System                    | BC-UPG                             |
| R/3 Standalone Gateway             | BC-UPG                             |
| SAP Add-On                         | BC-UPG-ADDON                       |
| SAP Supply Chain Management        | APO-BAS                            |
| SAP Business Connector             | BC-MID-BUS                         |
| SAP Business Information Warehouse | BW-SYS                             |

|  |                |
|--|----------------|
| SAP Business-to-Business Procurement                       | BBP-SAD        |
| SAP Customer Relationship Management                       |                |
| - Communication Station and Mobile Development Workstation | CRM-MW         |
| - CRM Server   | BC-MID-INT-SRV |
| - Internet Pricing and Configurator (IPC)                  | CRM-MT-IU-SPE  |
| - Mobile Client Component                                  | CRM-WBT-IU     |
| - R/3  | BC-UPG         |
| SAP TREX Search Engine (SAP DrFuzzy Search Engine)         | BC-SRV-TRX     |
| SAP Frontend   | BC-INS         |
| SAP Internet Transaction Server                            | BC-FES-ITS     |
| SAP Knowledge Management                                   | KM-KW          |
| SAP Enterprise Core Component                              | BC-UPG         |
| SAP Strategic Enterprise Management                        | BC-UPG-ADDON   |
| SAP Web Application Server ABAP                            | BC-UPG         |
| SMART Installation   | BC-UPG         |



## 6.2 Upgrade Administration

This part of the documentation contains additional information on the various administrative tasks that you need to perform before and during the SAP system upgrade:

- [Alert Function \[page 153\]](#)
- [Determining Versions \[page 154\]](#)
- [Isolating the Central Instance \[page 155\]](#)
- [Handling Journal Receivers During an Upgrade \[page 156\]](#)
- [Deleting Archived Upgrade Logs \[page 157\]](#)
- [Using a Different Upgrade Directory and Different Upgrade Libraries \[page 158\]](#)
- [Releasing and Confirming Open Repairs and Requests \[page 159\]](#)
- [Using the Phase List for the Upgrade \[page 160\]](#)

### 6.2.1 Alert Function

#### Use

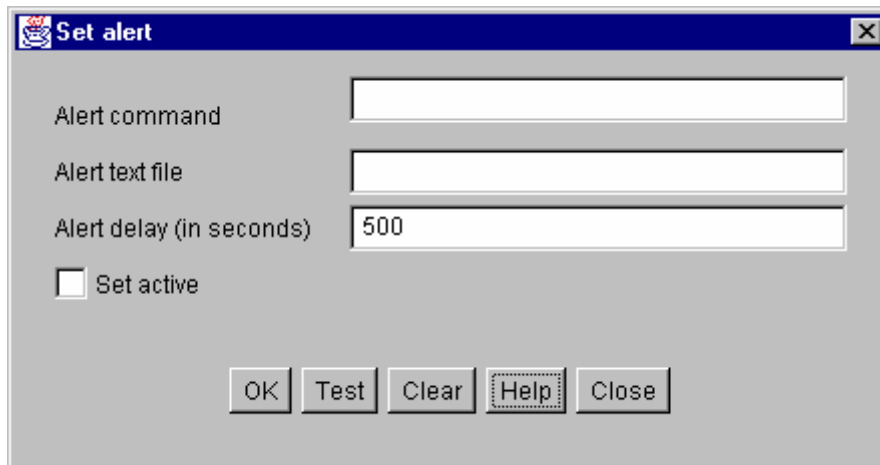
Use the alert function to inform yourself if the upgrade waits for a long time, or if the upgrade terminates (for example, due to an error).

#### Features

- Alert file  
If the upgrade stops, an appropriate message appears. An alert file `upalert.log` is also created in the subdirectory `tmp` of the upgrade directory, to indicate that you need to take action. You can use this to notify the system administrator, for example by telephone, and minimize downtime. For starting a communication service, however, you must provide the external software. The alert file is deleted when the upgrade is continued.
- Alert Function of the Upgrade Assistant  
When you use the Upgrade Assistant for your upgrade, you can use an alert function, instead of analyzing the alert file. You can then be informed if the control program `R3up` waits longer than a predefined period of time for input. As with the alert file, you must also provide the external software for starting a communication service.

#### Activities

To activate the alert functions of the Upgrade Assistant, go to the main menu of the Upgrade Assistant and choose *Administrator* → *Set Alert*. You see the following screen:



You can get more information online in the Upgrade Assistant. Choose *Help* → *Introduction* and look for the section 'Set Alert' window.

## 6.2.2 Determining Versions

### Procedure

#### Determining the Operating System Version

1. At the iSeries command line, enter the following command:  
`DSPSFWRSC`
2. Choose F11.

#### Determining the SAP System Release

To find out what SAP source release you have, choose *System* → *Status* in your SAP system.

The release appears in the *SAP Release* field.

#### Determining the SAP Kernel Version

To determine the version of the kernel you are using and its patch number, proceed as follows:

1. In the SAP system, choose *Tools* → *Administration* → *Monitor* → *System Monitoring* → *Servers*.
2. Select a server and choose *Release info*.

#### Determining the Date of R3trans

Call `R3trans` without options.

The program displays the date and the version number.

## Determining the Version of tp

Call `tp` with the following command:

```
tp '-v'
```

The last line displays the highest patch number.

## 6.2.3 Isolating the Central Instance

### Use

You need to isolate the central instance so that only the upgrade program can work with the system during downtime. This means that you can use the central instance exclusively for the upgrade. `R3up` asks you to isolate the central instance when downtime begins.

During downtime, all users must have logged off the system. You can use transaction SM02 to inform the users logged on to the system.

### Procedure

1. Stop `saposcol` as user `<SID>OFR`:  

```
CALL PGM(saposcol) PARM('-k')
```
2. Stop the database monitor:  

```
ENDDBMON JOB(*ALL)
```
3. Make sure that no job is scheduled that affects the SAP system, such as starting and stopping the SAP system, saving the database or similar actions. This could impair the full control of `R3up` over the SAP system.
4. No background job other than `RDDIMPDP` may be active during the upgrade.  
These jobs are automatically descheduled by `R3up`.
5. Make sure that no change of operation mode is defined on the central instance during the upgrade. If this is the case in normal operation, call transaction SM63 to either choose a single operation mode for all time spans or delete all the assignments.
6. Clean up all outstanding updates as described in [Evaluating the Results of PREPARE \[page 90\]](#) when the message `Update records still exist - Please process` appears.
7. Shut down all application servers if necessary (secondary SAP instances).
8. Make sure that you can recover the database to its current state.
9. If you have chosen strategy *downtime-minimized*, back up your upgrade directory and library `R3up` now.  
  
If a hardware problem occurs during downtime, you may need to reset the upgrade to the state it had when the SAP system was isolated. So that `R3up` has the correct control information, the upgrade directory must have the same state as at the beginning of the `MODPROF_TRANS` phase.
10. If the central instance and the database server are on the same host, you can lock the database against remote access. Contact the database administrator.



Make sure that no transport requests are imported into the system during downtime. Otherwise you may lose data. For example, by manually importing requests for the automatic adjustment, you may lose all your modifications to the standard SAP system.

## 6.2.4 Handling Journal Receivers During an Upgrade

### Use

We assume that you make regular backups of the database library. Between these backups, you save the journal receivers so that the data can be restored at any time. After saving the journal receivers, they are deleted to release disk space.

Many database operations run during the upgrade and, consequently, many journal receivers are generated within a short space of time. To avoid having to continually save and delete journal receivers during the upgrade, they are deleted automatically in certain upgrade phases.

To automate the deletion, the `QSQJRN` journal is changed so that the *Delete receivers.....* option is set to `*YES`.

To reset this, the `QSQJRN` journal is changed again so that the *Delete receivers.....* option is set to `*NO`.

### Procedure

#### Activating Automatic Deletion of Journal Receivers

When you are requested to do so by `R3up`, save and delete the journal receivers that currently exist. This is a requirement for automatic deletion of the journal receivers by `R3up`.

1. Save all the receivers with status *ONLINE*. To do so, use, for example, the command:  
`SAVOBJ OBJ(QSQJRN0010 QSQJRN0011) LIB(R3<SID>JRN) DEV(TAP01)`
2. To automate deletion of the journal receivers, enter:  
`CHGJRN JRN(QSQJRN) DLTRCV(*YES)`
3. To check whether the journal receivers exist, enter:  
`WRKJRNA JRN(R3<SID>DATA/QSQJRN)`
4. Choose `F15` (= *Work with receiver directory*).

The following screen appears:

```

Work with Receiver Directory
Journal . . . . . : QSQJRN      Library . . . . . : R30JEDATA
Total size of receivers . . . . . : 5398528

Type options, press Enter.
  4=Delete  8=Display attributes

Opt Receiver  Library  Number  Date      Status      Save
-  QSQJRN0006 R30JEJRN  00001  03/19/97  ONLINE      00/00/00
-  QSQJRN0007 R30JEJRN  00002  03/19/97  ATTACHED    00/00/00

F3=Exit  F5=Refresh  F11=Display size  F12=Cancel
Bottom
  
```

5. To delete the saved journal receivers, use option 4 (= *Delete*) on the *Work with Receiver Directory* screen.

### Resetting Automatic Deletion of Journal Receivers

1. To reset automatic deletion of journal receivers, enter:  
`CHGJRN JRN(QSQJRN) DLTRCV(*NO)`
2. To check whether automatic deletion was successfully reset, enter:  
`WRKJRNA JRN(R3<SID>DATA/QSQJRN)`

## 6.2.5 Deleting Archived Upgrade Logs

### Use

You can create more space by deleting archived logs from earlier upgrades that you no longer need.

### Procedure

To do this, delete the subdirectories `<target release>` along with their contents:

```
/usr/sap/trans/upgrade/<SID>/<target release>
```



If you no longer need the logs of the upgrades to 3.0F and 3.0H, you can delete the subdirectories **30F** and **30H**:

```
/usr/sap/trans/upgrade/P11/30F
/usr/sap/trans/upgrade/P11/31H
/usr/sap/trans/upgrade/P11/40B
.....
/usr/sap/trans/upgrade/T11/30F
/usr/sap/trans/upgrade/T11/31H
/usr/sap/trans/upgrade/P11/40B
.....
```

## 6.2.6 Using a Different Upgrade Directory and Different Upgrade Libraries

### Use

You can use an upgrade directory other than `/usr/sap/put/`. This is useful if you have several SAP systems on a single host and you want to upgrade them all to a new release.



If you want to use another upgrade directory, make sure that no `/usr/sap/put/` directory exists on this host.

### Procedure

1. In the instance profile of the SAP system, set parameter `DIR_PUT` to the upgrade directory that you want to use:

```
DIR_PUT = <upgrade directory>
```

The name of the directory must include the whole directory path. The name cannot be longer than 30 characters in total.



The parameter does not become effective until you restart the SAP system. Alternatively, as it is a dynamic parameter, you can use transaction RZ11 to set it without restarting the SAP system.

When `R3up` starts, it checks whether the value in the instance profile matches the specified upgrade directory.

2. If you want to run several upgrades in parallel, each upgrade must use its own `R3up` and `R3up3x` libraries. After you have run the command `LODRUN DEV(*OPT) DIR(' /UM1/OS400/AS400/UPGRADE')` and before you start `PREPARE`, make a copy of these two libraries with different names `<r3uplib>` and `<r3up3xlib>` for each upgrade.

3. Call `PREPARE` or `R3up` with the following parameters:

- For `PREPARE`, enter:

```
PREPARE SID(SID) PUTDIR(' <upgrade directory>')
R3UPLIB(<r3uplib>) R3UPSRVLIB(<r3upsrvlib>)
```

- For `R3up`, enter:

```
R3UP UPGDIR(<upgrade directory>)
```

You must specify parameter `PUTDIR` or `upgdir` each time you call `PREPARE` or `R3up`; otherwise default value `/usr/sap/put` is used.

## 6.2.7 Releasing and Confirming Open Repairs and Requests

### Use

Before you start the upgrade, you must release and confirm all the open repairs and requests that conflict with the SAP delivery. `PREPARE` determines a list of these repairs and requests. If you ignore open repairs, you could lose modifications.

### Procedure

1. Log on to the SAP system as the owner of the open repair. You can find the user names of the owners in `CHECKS.LOG`.



If you cannot log on with a specific user ID, you can change the owner of the repair in transaction `SE09` as follows:

- a. In the list of open repairs, position the cursor on the repair.
- b. Choose *Change owner*.

To be able to change an owner in transaction `SE09`, you need project authorization for the Workbench Organizer (`S_CTS_PROJEC`).

2. Call transaction `SE09`.
3. Choose *Request/task* → *Find requests...*
4. For *Request type*, only select *Repair*.
5. For *Request status*, select everything **except** *Released*.
6. Choose *Execute*.  
A list of all open repairs for the selected user appears.
7. Position the cursor on the request that you want to release.
8. Choose *Release*.
9. Release the request to which the repair is assigned.

## 6.2.8 Using the Phase List for the Upgrade

### Use

The phase list for the upgrade contains phases for `PREPARE` and for the upgrade itself.

The phase list consists of two HTML files:

- The `phaselist.htm` file contains a table with all the phases.

The phases that are listed in the tables run in the specified sequence. The `R3up` tool does not stop at the end of one of these sections. It stops only for user actions, if there are errors, or if you manually stop the upgrade at a particular phase. The table contains the following columns:

- **Phase**

Table fields of phases that run while the shadow system is in operation are indicated by a gray background.

- **PREPARE / R3up Actions**

Gives a brief explanation of the tool actions. Constraints are printed in bold.

- **Duration**

Indicates the percentage of the total runtime of `R3up` required for this phase. The runtime depends on the following criteria:

- Amount of customer data
- Number of SAP components implemented
- Quantity and type of modifications and customer developments involved
- Number of clients
- Number of included packages

The duration of some of the phases depends on the gap between the source and target release of the SAP system. The smaller the gap, all the shorter the duration of the phase.

- **Log Files**

Lists the log files that are generated by `R3up` for each phase.

- **User Actions**

If there is no entry in this column, `R3up` does not require an operator at this point. Otherwise `R3up` prompts you to make the entries described.

Some phases have comments next to them in the various columns. These are as follows:

| Comment | Meaning  |
|---------|--|
| (var)   | The runtime of the phase depends on your data. The percentage duration of these phases can be very different in your upgrade.    |
| (log)   | Not all logs can be included in the <i>Log Files</i> column. For more information, see <a href="#">Upgrade Logs [page 131]</a> . |



- The `phase_toc.htm` file contains a list of all the phases with links to the corresponding short description in the `phaselist.htm` file.

### Procedure

The files for the phase list are in the `htdocs` subdirectory of the upgrade directory. The phase list files contained in the upgrade package are dummy files. After you have started the first `PREPARE` module, `PREPARE` updates these files so that they match your upgrade.

You can also create the phase lists yourself by using the '`htmlph1`' option to call `R3up`. The files are then saved in the current directory, or – if you are calling `R3up` from the Upgrade Assistant – in the `tmp` directory.

## 6.3 Upgrade Tools

The following tools are provided for the upgrade of the SAP system:

- [PREPARE \[page 162\]](#)
- [R3up \[page 164\]](#)
- [Upgrade Assistant \[page 165\]](#)
- [Upgrade Monitor \[page 167\]](#)

### 6.3.1 PREPARE

#### Use

Use the `PREPARE` program to prepare your SAP system for the upgrade. The `PREPARE` program:

- Can be executed while the system is running.
- Checks whether or not the requirements for the upgrade are met and gives you extra information when you are executing the optional modules.
- Imports a number of tools into your database.
- Copies data and programs required for the upgrade into the upgrade directory.

`PREPARE` performs the majority of the required checks automatically. Afterwards, you must also check the operating system, database and SAP system manually.

#### Integration

When you start the upgrade, `R3up` assumes that the mandatory `PREPARE` modules have been completed successfully. `R3up` then repeats a number of the checks (not all of them), since production operation of the SAP system could have created a new situation.

#### Prerequisites

You must meet a number of prerequisites before you run the `PREPARE` program, including the following:

- Determine a host for the upgrade preparations
- Create an upgrade directory
- Make sure that there is enough free space in the database
- Import the latest SPAM update

For more information about the prerequisites for `PREPARE`, see the sections about upgrade preparations in the product-specific and in the general part of this documentation.

#### Features

`PREPARE` executes all its actions in phases. These phases are combined into `PREPARE` modules. For a complete list of the modules and the phases which execute in these modules, see [Using the Phase List for the Upgrade \[page 160\]](#).

The PREPARE modules have the following features:

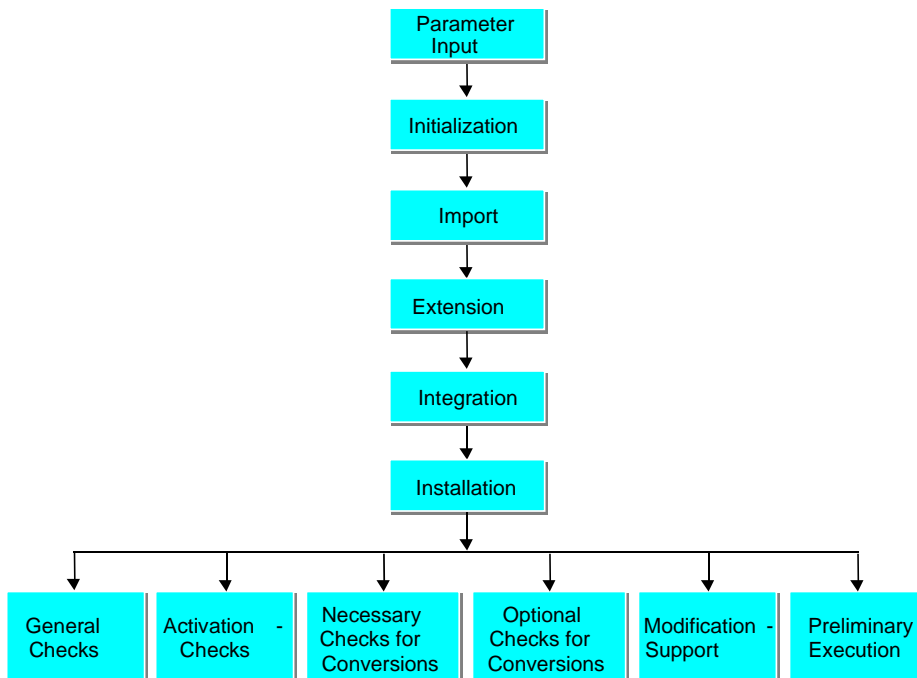
- They can be mandatory or optional.
- They may be dependent on a predecessor module that must be executed first.



You must import the analysis tools before you can execute them.

- You must execute the PREPARE modules **up to and including** the *Installation* module once only. If you want to execute these modules once more, you must first reset PREPARE.
- You can execute all modules **after** the *Installation* module as often as you want.
- You can execute PREPARE modules individually.

The following graphic is an overview of all the PREPARE modules and the order in which you need to execute them.



For more information about the contents and features of the PREPARE modules, see the online help for PREPARE. To call up the online help, choose *Help* when selecting a module.

## Activities

- Start PREPARE as soon as possible before the upgrade so that you can perform the necessary preparations in time.
- After you start PREPARE, you may need to import software such as SAP Support Packages, languages, or add-ons (and add-on updates). For more information, see [Importing Software After Starting PREPARE \[page 74\]](#).

## Result

PREPARE writes the results for the executed modules to the CHECKS.LOG file. This file is in the log subdirectory of the upgrade directory.

View this file and perform any measures required by the information it contains. You can execute certain `PREPARE` modules repeatedly to make sure that all requirements are met. If the `CHECKS.LOG` file already exists, it is overwritten each time a module is executed again. Its contents are saved in the `CHECKS.SAV` file.

## 6.3.2 R3up

### Use

`R3up` controls the entire upgrade of the SAP system, from checking the requirements and importing the necessary programs, to restarting production operation of the system. `R3up` controls the upgrade sequentially in phases, where one phase must end successfully before the next one can begin. For a complete list of all phases, see [Using the Phase List for the Upgrade \[page 160\]](#).

When started, `R3up` repeats all the important checks made by `PREPARE`. During the checks, you can still use the SAP system in production operation. When downtime begins and how long it lasts depends on the [upgrade strategy \[page 41\]](#) you choose. The upgrade strategies are also differentiated by the disk space requirements, and when production operation of the system stops.

In the individual phases, `R3up` starts various tools, checks the results and creates a series of logs. These logs are stored in the `log` subdirectory of the upgrade directory. This subdirectory also contains the main log file `R3up.log`.

The [Upgrade Monitor \[page 167\]](#) lets you follow the progress of the upgrade, and helps you recognize processes that have exceeded their runtime.

### Prerequisites

The mandatory `PREPARE` modules have run successfully.

### Activities

- You start `R3up`.
- You can [stop R3up \[page 99\]](#) at the beginning of a specific phase or at the beginning of the next phase.

For example, you need to do this if an SAP Note tells you to correct a program before you execute it.

- You can continue the upgrade by [restarting R3up \[page 100\]](#).

You usually only have to restart the upgrade when errors have occurred or an upgrade phase has terminated. In this case, `R3up` stops and offers you several modes for restarting the upgrade. If you choose the default value `repeat`, `R3up` makes the necessary checks and then starts at the point in the phase where the program terminated.

## 6.3.3 Upgrade Assistant

### Use

The Upgrade Assistant is the front end for the upgrade process. It provides one or more graphic user interfaces (GUIs) for controlling and monitoring the upgrade. The Upgrade Assistant simplifies the upgrade procedure.

### Integration

The Upgrade Assistant is a distributed program consisting of a server component and several GUI components. Only one person can control the upgrade from the GUI components.

- **Server component**

The server controls communications between the upgrade control program `R3up` and the GUIs of the Upgrade Assistant. It must be started on the host on which you want the upgrade process to run.

- **GUI components**

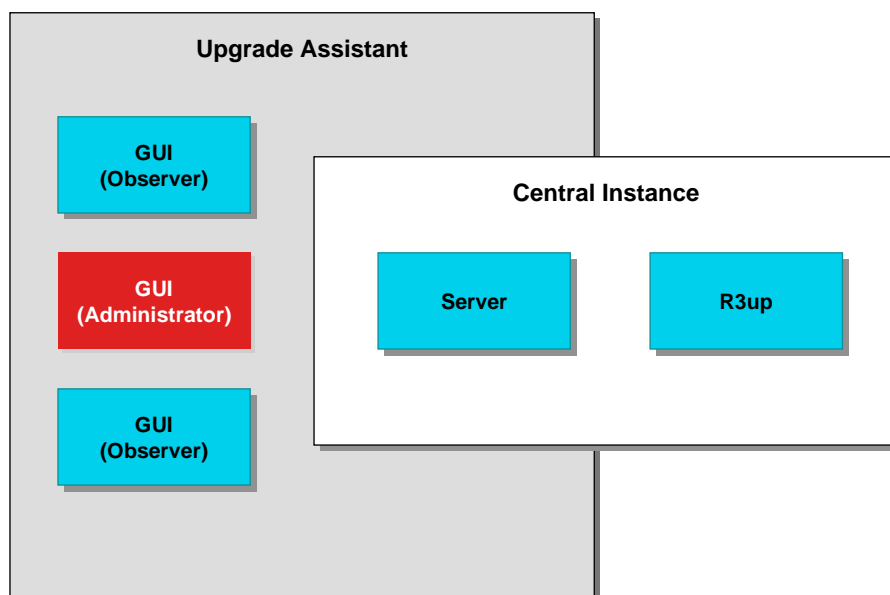
The GUI components can be executed on any other hosts.



If you use the Upgrade Assistant on another host, make sure that you use a secure connection to the upgrade host, for example, a Virtual Private Network connection.

You can log on to the server as the observer or the administrator. The observer role only authorizes you to monitor an upgrade. An administrator is authorized to take actions affecting the progress of the upgrade, for example, an administrator can start or stop the upgrade and can enter any necessary commands. Only one GUI can assume the role of administrator. However, the GUI with this role can change in the course of the upgrade.

The graphic below illustrates the architecture of the Upgrade Assistant and the interaction between the Upgrade Assistant and the `R3up` upgrade control program.



## Features

- You can control and monitor the progress of the upgrade from a number of different places.
- The front end and the upgrade process are divided into separate components so that the entire upgrade does not terminate if a connection fails.  
This provides optimal support for a remote upgrade.
- You have an alert mechanism that lets you start an external program.
- You can view all files and their contents in the upgrade directory.
- Provided you have access to the Internet, you can access the SAP Notes database in the SAP Service Marketplace from a GUI.
- The Upgrade Assistant Server and the Upgrade Assistant GUI can be connected using one or more SAProuters, but only if you used the Java Runtime Environment to start the Upgrade Assistant GUI. For more information, see **SAP Note 133402**.

The Upgrade Assistant is implemented in Java. A scroll mode is provided for the upgrade for platforms that do not support Java. We recommend that you use the Upgrade Assistant, since scroll mode does not provide the above features.

### 6.3.3.1 Using the Upgrade Assistant

#### Use

The Upgrade Assistant offers you a number of functions. You can change the passwords for the roles, change roles, use and monitor `PREPARE`, or look for SAP Notes.

#### Procedure

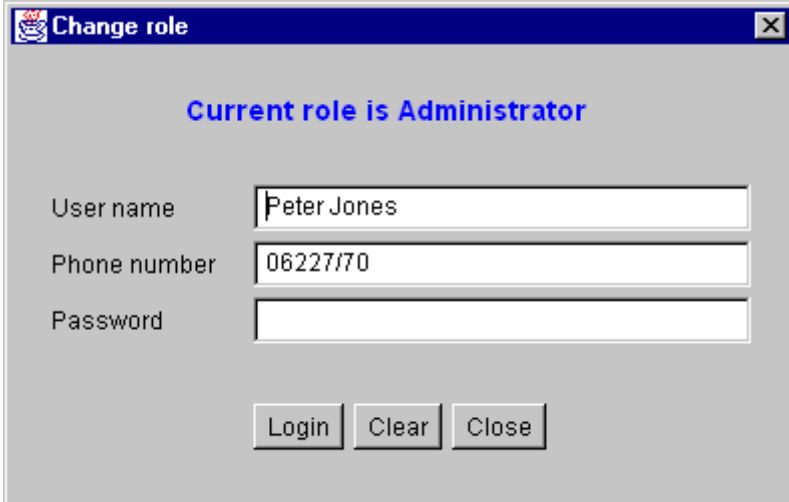
##### Changing Passwords

You can change the passwords for the two roles from the administrator GUI only. To do this, choose *Administrator* → *Change passwords* in the main menu.

##### Changing the Role

To change the role dynamically, choose *File* → *Change role*.

The following dialog box appears:



The screenshot shows a 'Change role' dialog box. The title bar reads 'Change role'. The main area has a blue header 'Current role is Administrator'. Below this are three input fields: 'User name' with the text 'Peter Jones', 'Phone number' with the text '06227170', and 'Password' which is empty. At the bottom are three buttons: 'Login', 'Clear', and 'Close'.

If, for example, you are in the role of the observer and enter the password for the administrator, you change to the administrator role. If an administrator already exists, the administrator role is removed from this user.

If you only want to change the *User name* or the *Phone number*, enter the password of the role you are in. In this case only the data you enter is updated.

### File Service

You can use the File Service to view all files and their contents in the upgrade directory. This is, for example, helpful for a quick scan of the log files. To access the service, choose *Services* → *Online Services* → *File Service*.

### Searching for Notes from the GUI

If you have an Internet connection, you can access SAP Notes in the SAP Service Marketplace from the GUI. In the main menu, choose *Services* → *Online Services* → *SAP Notes*.

### More Information on the Upgrade Assistant

To display a description of the Upgrade Assistant with all its functions, choose *Help* → *Introduction* in the main menu.

## 6.3.4 Upgrade Monitor

### Use

The Upgrade Monitor lets you monitor the upgrade, and helps you recognize any processes that have stopped.

### Features

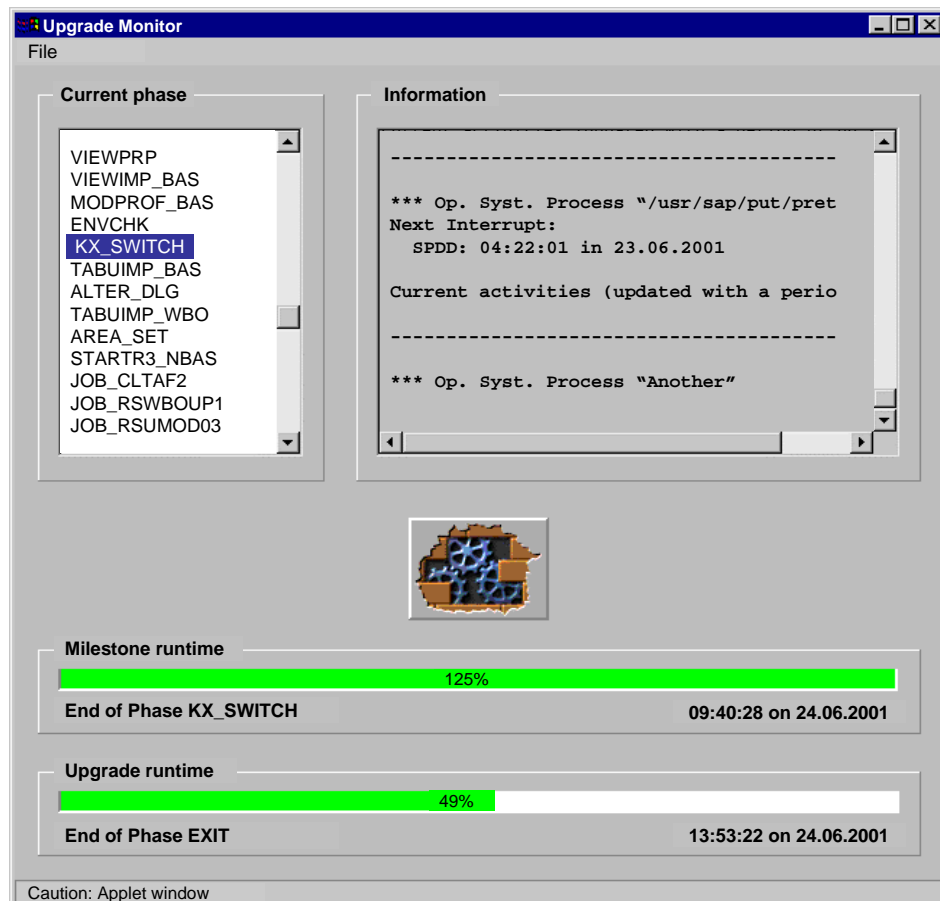
The monitor estimates the time when the upgrade will be completed, as well as other important stages (milestones).

These estimates are based on SAP reference times and the runtimes of upgrade phases that have already been completed. The output of the monitor is updated every 60 seconds. The

more advanced the upgrade is, the more precise the estimates are. If possible, the runtime estimate also includes any runtime that is lengthened for systematic reasons, however this is subject to restrictions. Systematic fluctuations can also occur if the upgrade phases run more quickly than expected. This means that the end of the upgrade cannot be estimated precisely.

The way the data appears on the screen depends on whether you are upgrading the system with the Upgrade Assistant or in scroll mode.

## Graphic Display in the Upgrade Assistant



The total runtime of the upgrade and the runtime of the next milestone appear as bar graphs. As long as the runtime has not been exceeded, the bar appears in green. If the runtime has been exceeded, the bars appear first in yellow and then in red.

An animated graphic displays the activity of the upgrade processes. If the graphic is not moving, one of the upgrade processes has stopped. This may be the Upgrade Monitor, the Upgrade Assistant or the R3up program.

The upgrade processes that are running appear under `Current activities`. The Monitor does not recognize any subprocesses of these processes, and therefore cannot display them. Note that the process bar is updated only every 60 seconds.

## Numerical Display in Scroll Mode

No graphics are displayed in scroll mode, so the progress of the upgrade and the estimated runtime until the next milestone are shown in numerals.

The upgrade processes that are running appear under `Current activities`.



### 6.3.4.1 Starting the Upgrade Monitor

#### Procedure

#### Upgrade Assistant

Start the Upgrade Monitor in the initial screen of the Upgrade Assistant by choosing *Services* → *Upgrade Monitor*.

#### Scroll Mode

1. Open another window at the operating system level.
2. Enter the following commands in the new window:

```
cd '<upgrade directory>/bin'
```

```
R3UP UPGDIR(<upgrade directory>) PARMLIST('>=SCROLL Monitor')
```

### 6.3.4.2 Understanding the Upgrade Monitor Display

#### Use

Either of the following situations in the Upgrade Monitor display indicates that you may have to intervene:

- One of the bars showing the progress of the upgrade is red.
- The graphic that shows the activity of the upgrade processes stops moving. This means that upgrade processes are hanging.

#### Procedure

#### Red Progress Bar

1. Check the database and CPU activity.
2. If you can still detect activity, then either the runtime has been exceeded significantly, or the upgrade is in an endless loop.

If this is the case, do not terminate the upgrade; instead, try and find out why the runtime is so long. If you are not sure how to proceed, contact SAP Support.

#### Hanging Upgrade Processes

1. First, restart the Upgrade Assistant GUI only.
2. If step one is not successful, restart the server of the Upgrade Assistant.
3. If the previous steps are not successful, restart `R3up`.

When `R3up` is restarted, the Monitor displays any processes that are still running. The restarted `R3up` must wait for these processes before the upgrade can continue with any other activities.