



U Y U N I

# Upgrade Guide

Uyuni 2020.04

April 15, 2020

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# Introduction

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Uyuni has three main components, all of which will need regular updates. This guide covers updating your Uyuni Server, Proxy, and clients.

It is possible to automate the upgrades to some degree.

This guide is not intended to be read cover to cover. Instead, navigate to the component you want to upgrade, then identify the versions you are upgrading from and to.

---

# Server

Uyuni uses a **X.Y.Z** versioning schema.

- Z: If you are updating the server within the same minor version (Maintenance Update), see [server-update.pdf](#).
- Y: If you are upgrading the server within the same major version (SP Migration), see [ **Upgrade > Migrate-4x-4x >** ].
- X: If you are migrating the server from a major version to the next major version, see [migrate-3x-4x.pdf](#).

In addition to updating the operating of the server, you are also likely to need to update other underlying technologies, including the database. For more information about updating the database, see [db-migration.pdf](#).

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# Proxy

See [proxy-update.pdf](#) and [proxy-migration.pdf](#).

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# Client

See [client-migration.pdf](#).

# Uyuni Server Update

This update procedure covers simple package updates or a concerted micro update, which is also known as a maintenance update (MU). During a MU the user stops services, updates packages, runs the script to update the database, and restarts services.

Example: 4.1.1 → 4.1.2.

This means first you ensure that you have the latest version of all installed packages installed. Then you can upgrade the database schema.

## *Procedure: Updating Packages on the Uyuni Server*

By default, several update channels are configured and enabled for the Uyuni Server. New and updated packages will become available automatically.

1. On the Uyuni Server, at the command prompt, as root, stop the spacewalk services:

```
spacewalk-service stop
```

2. List available patches:

```
zypper list-patches
```

3. Apply all available patches:

```
zypper patch
```

4. Restart the spacewalk services:

```
spacewalk-service start
```



`spacewalk-schema-upgrade` is not needed anymore. It will be run during `spacewalk-service start` automatically.



Services affected by a package update are not automatically restarted after an update. You need to restart these services manually to avoid potential failures. Use `zypper ps` to check for applications that are using old code and require restarting.

Reboot the server if a patch update recommends rebooting.



## Migrating from Version 3.2 to Version 4.x

Migrating Uyuni from version 3.2 to 4.x must be done using two systems. The migration happens from the original source system to a new target system. In-place migration is not available.

While this means that you temporarily need two systems, it also means that the source system remains fully functional. This is useful to reduce downtime, and can act as a fallback if the migration is not successful.

Given the complexity of this process, if you experience any problems during the migration, you will need to start over from the beginning. The migration involves exporting the entire database from the source system and restoring it on the target system. Additionally, all of the channels and packages need to be copied to the target system. You should expect the entire process to take several hours.



Migrating to 4.x from an older version such as version 3.2 can be difficult. We strongly recommend that you contact SUSE Consulting to assist with this process.

## Prepare to Migrate

The source system must be running Uyuni 3.2 with all the latest updates applied. Before you start, ensure that the system is up to date and all updates have been installed successfully.



It is important that PostgreSQL 10 is already running on your Uyuni 3.2 system. For more information, see [db-migration.pdf](#).

During migration, the database on the source system needs to get exported. The database export is compressed, and temporarily stored on the target system. The compression is done using **gzip** using the default compression options. Maximum compression only yields about 10% of space savings. Before you begin, check the size of the database on the source system with:

```
du -sch /var/lib/pgsql/data
```

Ensure you have at least 30% of the total database size available in **/var/spacwalk/tmp** on the target system.

The **/var/spacwalk/tmp** directory will be created if it does not exist. If you want the export to be stored somewhere else, change the **\$TMPDIR** variable at the beginning of the migration script.

## Set Up the Target System

### *Procedure: Setting Up the Target System*

1. As the target system, install Uyuni Server 4.1 using the unified installer. Uyuni Server 4.1 is based on SUSE Linux Enterprise 15 SP2. For more information about installing Uyuni, see [ **Installation** >

**Install-server-unified > ].**

2. From the command prompt, run the YaST Uyuni setup tool:

```
yast2 susemanager_setup
```

3. On the setup screen, check **Migrate a SUSE Manager compatible server**.
4. In the **Hostname of source SUSE Manager Server** field, enter the source system hostname and domain.
5. Enter the database credentials of the source system.
6. Enter the IP address of the target system, or accept the default value if it is correct. If multiple IP addresses are available, ensure you specify the correct one.
7. Follow the prompts to complete the migration. YaST will terminate after the process is complete.



Be careful when you specify the database credentials. Ensure you use the same database parameters as the source system. Even if you intend to change it later on, the database credentials must match during migration.



During the migration process, the target system will fake its hostname to match the source system. Do not change the hostname during the process. Be careful when you log in to your systems during migration, as they will both show the same hostname.

To speed up the actual migration and thus reducing the server downtime, you can copy the system data in advance. For more information, see [Copy System Data to the Target System](#).

## Migration

When your target system is ready, begin the migration with this command:

```
/usr/lib/susemanager/bin/mgr-setup -m
```

While the data migration is in progress, the Uyuni services are shut down. This is to ensure that no data is written to the database during the migration.

This command reads the data that was gathered during the setup procedure, sets up Uyuni on the new target system, and transfers all of the data from the source system.

Several operations need to be performed on the source system using SSH, so you will be prompted once for the root password of the source system. A temporary SSH key named **migration-key** is created and installed on the source system, so you need to give the root password only once. The temporary SSH key will be deleted after the migration is finished.

Depending on the size of the installation, the migration can take several hours. When the migration has finished successfully, a **migration complete** message is shown, and you are prompted to shut down the source system.

When you have received the **migration complete** message, you need to reconfigure the network of the target system to use the same IP address and host name as the original system. You will also need to restart the target system before it can be used.

## Troubleshooting

A complete migration can consume a lot of time. This is caused by the amount of data that must be copied. Here are some hints how you can compensate it.

### Copy System Data to the Target System

These numbers from a test installation illustrate the approximate time it takes to export and import a small 1.8 GB database:

```
14:53:37   Dumping remote database to /var/spacewalk/tmp/susemanager.dmp.gz on target system.
Please wait...
14:58:14   Database successfully dumped. Size is: 506M
14:58:29   Importing database dump. Please wait...
15:05:11   Database dump successfully imported.
```

In this example, exporting the database took around five minutes, and importing the export onto the target system took an additional seven minutes. For big installations this can take up to several hours.

You also need to account for the time it takes to copy all the package data to the target system. Depending on your network infrastructure and hardware, this can also take a significant amount of time.

You can copy the data at any time before the migration process. Copying the data before you migrate can significantly reduce the amount of downtime required when you perform the migration.

At any time before the migration, you can copy data with this command:

```
/usr/lib/susemanager/bin/mgr-setup -r
```

This command performs a copy using **rsync**, and does not require system downtime. When you perform the migration, some data will still need to be copied, but it will be significantly reduced if you have recently copied the data. This can make a significant difference to the amount of downtime required for a migration.

### Integrate Externally Stored Package Data

#### *Procedure: Migrating Data on an External Storage Device*

If you have package data on external storage you do not need to copy this data to the new system. For

example, if you have an NFS mount at `/var/spacewalk/packages`.

Follow this procedure after migration is finished, and before you start your target system for the first time.

1. Open the script at `/usr/lib/susemanager/bin/mgr-setup`.
2. Locate the `rsync` command on or around line 442, delete or comment it out, and save the file.
3. Ensure your external storage is mounted on the target system.
4. If `/srv/www/htdocs/pub` exists on your external storage, ensure it is mounted.
5. Start the upgraded target system for the first time, and ensure it can access your external storage device.



All files and directories that have not been copied by the migration tool will need to be manually copied to the new system.

## Upgrading from Version 4 to 4.x

You can upgrade Uyuni from version 4 to 4.x (when available) using either the YaST online migration tool or the Zypper command line tool. This procedure is also known as SP migration (service pack migration). This procedure does not replace the server with an updated copy. It is an in-place upgrade.

Example: 4.0.x → 4.1.0.

The upgrade from version 4 to 4.1 will also upgrade the base OS from SLES 15 SP1 to SLES 15 SP2, and the PostgreSQL database from version 10 to 12 with an additional step.



Upgrades should be run from a text console, rather than a graphical interface like GNOME. If you are logged into a GNOME session running on the machine you are going to migrate, you will need to switch to a text console. This does not apply if you are logged in from a remote machine (unless you are running a VNC session with GNOME).

## Upgrade Using YaST

To perform the upgrade with YaST, use the Online Migration tool.



If YaST does not have the Online Migration tool available, install the **yast2-migration** package and all the required packages. After installing, restart YaST to ensure the tool is available within YaST.

### *Procedure: Upgrading with YaST*

1. From the command prompt, as root, launch the YaST online migration tool:

```
yast2 migration
```

If there are older updates available, YaST will notify you and ask to install them first. You must install all package updates before performing the migration. For more information, see [server-update.pdf](#).

YaST will show the possible migration targets with detailed summaries.

2. Select the appropriate target, and follow the prompts to complete the migration.
3. Reboot the server.
4. When rebooted the spacewalk services are not running until you have migrated the PostgreSQL database to version 12.
5. Log in on the text console as root, and run the database migration script:

```
/usr/lib/susemanager/bin/pg-migrate-10-to-12.sh
```

6. Ensure the spacewalk services are running:

```
spacewalk-service start
```



`spacewalk-schema-upgrade` is not needed anymore. It will be run during `spacewalk-service start` automatically.

During the upgrade, YaST will install all recommended packages. This can significantly increase the installation size of the system. To only install required packages, open the `/etc/zypp/zypp.conf` configuration file and set these variables:

```
solver.onlyRequires = true
installRecommends = false
```

This changes the behavior of all future package operations.

## Upgrade Using Zypper

To perform the upgrade with Zypper, use the Zypper migration tool.

### *Procedure: Upgrading with Zypper*

1. From the command prompt, as root, launch the Zypper migration tool:

```
zypper migration
```

Zypper will show the possible migration targets with detailed summaries.

2. Select the appropriate target, and follow the prompts to complete the migration.
3. Reboot the server.
4. When rebooted the spacewalk services are not running until you have migrated the PostgreSQL database to version 12.
5. Log in on the text console as root, and run the database migration script:

```
/usr/lib/susemanager/bin/pg-migrate-10-to-12.sh
```

6. Ensure the spacewalk services are running:



```
spacewalk-service start
```



`spacewalk-schema-upgrade` is not needed anymore. It will be run during `spacewalk-service start` automatically.

If the process fails, check these issues first:

- If Zypper does not have the migration tool available, install the `zypper-migration-plugin` package.
- If there are older updates available, Zypper will notify you and ask to install them first. You must install all updates before performing the upgrade.

## Troubleshooting

If the schema upgrade fails, the database version check and all the other spacewalk services do not start. Run `spacewalk-service start` for more information and hints how to proceed. You can run the version check directly:

```
systemctl status uyuni-check-database.service
```

or

```
journalctl -u uyuni-check-database.service
```

These print debug information if you do not use the `spacewalk-service` command.

Effective with SUMA 4.1 Beta 3 @mc almer mc almer added documentation docs-squad labels 10 days ago

## Update Uyuni Proxy

Uyuni Proxies are managed in the same way as clients. Maintenance updates (MU) can be installed on a Uyuni Proxy in the same way as other clients. MU updates require a restart of the proxy service.

### Prepare to Update

Before you perform any proxy update, schedule a maintenance window. The clients registered to Uyuni through the proxy will not be able to connect to Uyuni while the update is in progress. For more information about maintenance windows, see [ **Administration** > **Maintenance-window** > ].

### Update the Proxy

To update a proxy you first stop the proxy service, then update the software and finally restart the proxy service.

#### *Procedure: Updating the Uyuni Proxy*

1. On the Uyuni Server where the proxy is registered as a client, stop the proxy service:

```
spacewalk-proxy stop
```

2. Select the packages to be updated on the proxy, and then apply the selection.
3. On the Uyuni Server where the proxy is registered as a client, start the proxy service:

```
spacewalk-proxy start
```

If you need to update many proxies, you can create an action chain of this command sequence. You can use the action chain to perform updates on multiple proxies at the same time.

## Proxy Migration

Uyuni Proxy can be upgraded from version 3.2 to 4.0 if it was registered as a traditional client. The upgrade process is automated, but you will need to do some preparation steps before you can upgrade.

You will need to complete the Uyuni Server migration before you start.

The system must be running Uyuni 3.2 with all the latest updates applied. Before you start, ensure that the system is up to date and all updates have been installed successfully.



This process cannot be used to upgrade a Uyuni Proxy that was registered as a Salt client.

## Prepare to Migrate

Before you can update your proxy, you will need an autoinstallation distribution, and an autoinstallation profile. The distribution must be based on SUSE Linux Enterprise 15 SP1, because Uyuni 4 is part of the SUSE Linux Enterprise 15 SP1 product family.

### Procedure: Preparing Installation Media

1. On the Uyuni Server, create a local directory for the SLE 15 installation media.
2. Download an ISO image with the installation sources, and mount the ISO image on your server:

```
mkdir /mnt/sle15sp1
mount -o loop DVD1.iso /mnt/sle15sp1
```

### Procedure: Creating an Autoinstallation Distribution

1. In the Uyuni Web UI, navigate to **Systems > Autoinstallation > Distributions** and click **[Create Distribution]**.
2. In the **Create Autoinstallable Distribution** section, use these parameters:
  - In the **Distribution Label** section, type a unique name for the distribution. Use only letters, numbers, hyphens (-), periods (.), and underscores (\_), and ensure the name is longer than four characters.
  - In the **Tree Path** field, type an absolute path to the installation source. In this example, this would be **/mnt/sle15sp1**.
  - In the **Base Channel** field, select **SLE-Product-SUSE-Manager-Proxy-4.0-Pool for x86\_64**.
  - In the **Installer Generation** field, select **SUSE Linux Enterprise 15**.
  - In the **Kernel Options** field, type any options to be passed to the kernel when booting for the installation. The **install=** parameter and the **self\_update=0 pt.options=self\_update** parameter are added by default.

- In the **Post Kernel Options** section, type any options to be passed to the kernel when booting the installed system for the first time.

3. Click **[Create Autoinstallable Distribution]** to save.

### Edit Autoinstallable Distribution

[Delete Distribution](#)

[Edit](#) [Variables](#)

#### Edit Autoinstallable Distribution

The following details are needed to define an autoinstallable distribution. The tree path field should be a valid path to an installation tree located on this SUSE Manager server.

The Distribution Label field should contain only letters, numbers, hyphens, periods, and underscores. It must also be at least 4 characters long.

The Tree Path, Base Channel, and Installer Generation should always match. This generally means that the versions for each field should be from the same version of SUSE Linux Enterprise.

The Tree Path must be a local disk path on your SUSE Manager server containing the entire autoinstallable tree for a distribution including kernel, initrd, and repo information, but excluding any rpms. This directory should be readable by the apache and tomcat users. If you have media located on the SUSE Manager server at: `/var/distro-trees/sles-11-server/` you would specify that path as your Tree Path value.

Distribution Label*	<input type="text" value="proxy4"/>
Tree Path*	<input type="text" value="/var/distro-trees/sle15"/>
Base Channel*	<input type="text" value="SLE-Product-SUSE-Manager-Proxy-4.0-Pool for x86_64"/>
Installer Generation*	<input type="text" value="SUSE Linux Enterprise 15"/>
Kernel Options:	<input type="text" value="install=http://g228.suse.de/ks/dist/proxy4 self_update=0 pt.options=++self_update"/>
Post Kernel Options:	<input type="text"/>

[Update Autoinstallable Distribution](#)

When you have created an autoinstallable distribution, you can edit it by navigating to **Systems > Autoinstallation > Distributions** and selecting the distribution you want to edit.

Autoinstallation profiles contain all the installation and configuration data needed to install a system. They can also contain scripts to be executed after the installation is complete.

Use this example profile as a starting point for your own autoinstallation profile:

*Listing 1. Example: Autoinstallation Profile*

```
<?xml version="1.0"?>
<!DOCTYPE profile>
<profile xmlns="http://www.suse.com/1.0/yast2ns"
  xmlns:config="http://www.suse.com/1.0/configs">
  <add-on>
    <add_on_products config:type="list">
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-product-suse-manager-
proxy-4.0-updates-x86_64/proxy4</media_url>
        <name>sle-product-suse-manager-proxy-4.0-updates-x86_64</name>
        <product>SUSE Manager Proxy 4.0</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp1-pool-x86_64-proxy-4.0/proxy4</media_url>
        <name>sle-module-basesystem15-sp1-pool-x86_64-proxy-4.0</name>
        <product>SUSE Manager Proxy 4.0</product>
        <product_dir>/</product_dir>
      </listentry>
    </listentry>
  </add-on>
</profile>
```

```

    <ask_on_error config:type="boolean">true</ask_on_error>
    <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp1-updates-x86_64-proxy-4.0/proxy4</media_url>
    <name>sle-module-basesystem15-sp1-updates-x86_64-proxy-4.0</name>
    <product>SUSE Manager Proxy 4.0</product>
    <product_dir></product_dir>
  </listentry>
</listentry>
  <ask_on_error config:type="boolean">true</ask_on_error>
  <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp1-pool-x86_64-proxy-4.0/proxy4</media_url>
  <name>sle-module-server-applications15-sp1-pool-x86_64-proxy-4.0</name>
  <product>SUSE Manager Proxy 4.0</product>
  <product_dir></product_dir>
</listentry>
</listentry>
  <ask_on_error config:type="boolean">true</ask_on_error>
  <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp1-updates-x86_64-proxy-4.0/proxy4</media_url>
  <name>sle-module-server-applications15-sp1-updates-x86_64-proxy-4.0</name>
  <product>SUSE Manager Proxy 4.0</product>
  <product_dir></product_dir>
</listentry>
</listentry>
  <ask_on_error config:type="boolean">true</ask_on_error>
  <media_url>http://$redhat_management_server/ks/dist/child/sle-module-suse-manager-
proxy-4.0-pool-x86_64/proxy4</media_url>
  <name>sle-module-suse-manager-proxy-4.0-pool-x86_64</name>
  <product>SUSE Manager Proxy 4.0</product>
  <product_dir></product_dir>
</listentry>
</listentry>
  <ask_on_error config:type="boolean">true</ask_on_error>
  <media_url>http://$redhat_management_server/ks/dist/child/sle-module-suse-manager-
proxy-4.0-updates-x86_64/proxy4</media_url>
  <name>sle-module-suse-manager-proxy-4.0-updates-x86_64</name>
  <product>SUSE Manager Proxy 4.0</product>
  <product_dir></product_dir>
</listentry>
</add_on_products>
</add-on>
<general>
  $SNIPPET('spacewalk/sles_no_signature_checks')
  <mode><confirm config:type="boolean">>false</confirm></mode>
</general>
<upgrade>
  <only_installed_packages config:type="boolean">>false</only_installed_packages>
  <stop_on_solver_conflict config:type="boolean">true</stop_on_solver_conflict>
</upgrade>
<backup>
  <sysconfig config:type="boolean">true</sysconfig>
  <modified config:type="boolean">true</modified>
  <remove_old config:type="boolean">>false</remove_old>
</backup>
<networking>
  <keep_install_network config:type="boolean">true</keep_install_network>
  <start_immediately config:type="boolean">true</start_immediately>
</networking>
<software>
  <image/>
  <install_recommended config:type="boolean">true</install_recommended>
  <instsource/>
  <patterns config:type="list">
    <pattern>suma_proxy</pattern>
  </patterns>
  <products config:type="list">
    <listentry>SUSE-Manager-Proxy</listentry>
  </products>

```

```

</software>
<scripts>
  <chroot-scripts config:type="list">
    <script>
      <filename>cleanup.sh</filename>
      <chrooted config:type="boolean">true</chrooted>
      <interpreter>shell</interpreter>
      <source>
        <![CDATA[
#!/bin/sh
    sysconf_addword /etc/sysconfig/apache2 APACHE_MODULES wsgi
    if [ -e /etc/rhn/rhn.conf.rpmsave ]; then
      cp /etc/rhn/rhn.conf.rpmsave /etc/rhn/rhn.conf
    fi
    zypper rr --all
  ]]>
      </source>
    </script>
  </chroot-scripts>
</scripts>
</profile>

```

## Migration

Before you begin, check that all the channels referenced in the autoinstallation profile are available and fully synchronized.

### Procedure: Migrating

1. On the Uyuni Server Web UI, navigate to **Systems > Autoinstallation > Profiles** and upload your autoinstallation profile.
2. In the **Kernel Options** field, enter **autoupgrade=1 Y2DEBUG=1**
3. OPTIONAL: The debug setting is not required but can help with investigating any future problems.
4. Check the **autoupgrade** option.
5. In the **System List**, select the proxy, navigate to the **Provisioning** tab, and select the autoinstallation profile you uploaded.
6. Click **[Schedule Autoinstallation and Finish]**. The system will download the required files, change the bootloader entries, reboot, and start the upgrade.

## Clean Up

When the Uyuni Proxy has finished upgrading process, it will still show the originally assigned channels.




If the server reports that there are updates available for the proxy, do not apply them before completing the clean up.

### Procedure: Cleaning Up

1. On the Uyuni Server Web UI, navigate to the **System List**, select the proxy, and navigate to the **Software > Software Channels** subtab.



2. Clear the old channels.
3. In the **Base Channel** field, select **SLE-Product-SUSE-Manager-Proxy-4.0-Pool** for **x86\_64**.
4. In the **Child Channels** field, select all the recommended channels.

 d14.suse.de [?](#) [Delete System](#) | [Add to SSM](#)

Details **Software** Configuration Provisioning Groups Audit Events

Patches Packages **Software Channels** SP Migration Software Crashes

When subscribing to a channel that contains a product, the product package will automatically be installed on traditionally registered systems or added to the package states on Salt managed systems. [?](#)

### Base Channel

You can change the base software channel your system is subscribed to. The system will be unsubscribed from all software channels, and subscribed to the new base software channel.

☒ include recommended

☐ (none, disable service)

SUSE Channels

☒ SLE-Product-SUSE-Manager-Proxy-4.0-Pool for x86\_64 [?](#)

### Child Channels

This system is subscribed to the checked channels beneath, if any. Disabled checkboxes indicate channels that can't be manually subscribed or unsubscribed from.

SLE-Product-SUSE-Manager-Proxy-4.0-Pool for x86\_64 [?](#)

- ☒ SLE-Module-Basesystem15-SP1-Pool for x86\_64 Proxy 4.0 [?](#)  
**recommended** [?](#)
- ☒ SLE-Module-Basesystem15-SP1-Updates for x86\_64 Proxy 4.0 [?](#)  
**recommended** [?](#)
- ☒ SLE-Module-ServerApplications15-SP1-Pool for x86\_64 Proxy 4.0 [?](#)  
**recommended** [?](#)
- ☒ SLE-Module-ServerApplications15-SP1-Updates for x86\_64 Proxy 4.0 [?](#)  
**recommended** [?](#)
- ☒ SLE-Module-SUSE-Manager-Proxy-4.0-Pool for x86\_64 [?](#)  
**recommended** [?](#)
- ☒ SLE-Module-SUSE-Manager-Proxy-4.0-Updates for x86\_64 [?](#)  
**recommended** [?](#)
- ☒ SLE-Product-SUSE-Manager-Proxy-4.0-Updates for x86\_64 [?](#)  
**mandatory** [?](#)

**Important:** All the 'mandatory' channels should be subscribed to have a consistent set of channels.

# Client Migration

Upgrading traditional clients from SLE 12 with the latest Service Pack to SLE 15 is automated, but you will need to do some preparation steps before you can upgrade.

Upgrading traditional clients from earlier SLE 15 Service Packs to later SLE 15 Service Packs is fully automated.

For supported SUSE Linux Enterprise 15 upgrade paths, see <https://documentation.suse.com/sles/15-SP1/html/SLES-all/cha-upgrade-paths.html>

## Upgrade Clients from SLE 12 to SLE 15

Your clients must have the latest available SLE 12 Service Pack, with all the latest updates applied. Before you start, ensure that the system is up to date and all updates have been installed successfully.

The upgrade is controlled by YaST and AutoYaST, it does not use Zypper.

### Prepare to Migrate

Before you can migrate your client from SLE 12 to SLE 15, you need to make these preparations:

1. Prepare installation media
2. Create an auto-installation distribution
3. Create an activation key
4. Upload an AutoYaST profile

#### *Procedure: Preparing Installation Media*

1. On the Uyuni Server, create a local directory for the SLE 15 installation media.
2. Download an ISO image with the installation sources, and mount the ISO image on your server:

```
mkdir /mnt/sle15
mount -o loop DVD1.iso /mnt/sle15
```

#### *Procedure: Creating an Autoinstallation Distribution*

1. In the Uyuni Web UI, navigate to **Systems > Autoinstallation > Distributions** and click [**Create Distribution**].
2. In the **Create Autoinstallable Distribution** section, use these parameters:
  - In the **Distribution Label** section, type a unique name for the distribution. Use only letters, numbers, hyphens (-), periods (.), and underscores (\_), and ensure the name is longer than four characters.
  - In the **Tree Path** field, type an absolute path to the installation source. For example,

/mnt/sle15.

- In the **Base Channel** field, select **SLE-Product-SLES15-Pool for x86\_64**.
- In the **Installer Generation** field, select **SUSE Linux Enterprise 15**.
- In the **Kernel Options** field, type any options to be passed to the kernel when booting for the installation. The **install=** parameter and the **self\_update=0** **pt.options=self\_update** parameter are added by default.
- In the **Post Kernel Options** section, type any options to be passed to the kernel when booting the installed system for the first time.

3. Click **[Create Autoinstallable Distribution]** to save.

#### *Procedure: Creating an Activation Key*

In order to switch from the old SLE 12 SP4 base channel to the new SLE 15 channel, you need an activation key.

1. In the Uyuni Server Web UI, navigate to **Systems > Activation Keys** and click **Create Key**.
2. Enter a description for your key.
3. Enter a key or leave it blank to generate an automatic key.
4. OPTIONAL: If you want to limit the usage, enter your value in the **Usage** text field.
5. Select the **SLE-Product-SLES15-Pool for x86\_64** base channel.
6. OPTIONAL: Select any **Add-On System Types**. For more information, see <https://documentation.suse.com/sles/15-SP1/html/SLES-all/art-modules.html>.
7. Click **[Create Activation Key]**.
8. Click the **Child Channels** tab and select the required channels.
9. Click **[Update Key]**.

#### *Procedure: Uploading an AutoYaST Profile*

Create an AutoYaST profile. For more information about AutoYaST, see [ **Client-configuration > Client-automating-installation >** ].

1. In the Uyuni Server Web UI, navigate to **Systems > Autoinstallation** and click **Upload Kickstart/Autoyast File**.
2. Paste the XML content in the text area or select the file to upload and click **[Create]**.
3. Navigate to the **Details** tab.
4. In the **Kernel Options** field, select **autoupgrade=1** and click **[Update]**.
5. Navigate to the **Variable** tab.
6. In the **registration\_key=** field, enter the activation key, and click **[Update Variables]**.

## Migration

Before you begin the migration, make sure that the migration target channels are completely mirrored. For the upgrade to SUSE Linux Enterprise 15, at least the **SLE-Product-SLES15-Pool** base channel with the **SLE-Manager-Tools15-Pool** child channel for your architecture is required. The matching update channels such as **SLE-Manager-Tools15-Updates** and **SLE-Product-SLES15-Updates** are recommended.

You can monitor the mirroring progress in **/var/log/rhn/reposync/sles15-pool-x86\_64.log**.

### Procedure: Migrating

1. In the Uyuni Server Web UI, navigate to **Systems** and select the client to be upgraded.
2. Navigate to **System Details > Provisioning > Autoinstallation > Schedule**, and select the AutoYaST profile you uploaded.
3. Click **[Schedule Autoinstallation and Finish]**.

Next time the client synchronizes with the Uyuni Server, it will receive a re-installation job. The re-installation job fetches the new kernel and initrd packages. It will also write a new **/boot/grub/menu.lst**, containing pointers to the new kernel and initrd packages.

When the client next boots, it will use grub to boot the new kernel with its initrd. PXE booting is not used during this process.

Approximately three minutes after the job was fetched, the client will go down for reboot.

## SP Mass Migration

If you want to migrate a large number of clients to the next SP version, you can use Uyuni API calls.

### Procedure: SP Mass Migration

1. You need to know to which migration target you want to migrate. List available migration targets:

```
spacecmd api -- system.listMigrationTargets -A 1000010001
```

Create a list of system IDs you want to migrate.

2. For each system ID, call **listMigrationTarget** and check that it is an available target.
  - If the system ID is an available target, call **system.scheduleSPMigration**.
  - If it is not an available target, skip the system.

Adapt this template for your environment:

```
target = '[....]'  
basechannel = 'channel-label'  
system_ids = [1, 2, 3]  
  
session = auth.login(user, pass)  
for system in system_ids  
    if system.listMigrationTargets(session, system).ident == target  
        system.scheduleSPMigration(session, system, target, basechannel, [], False, <now>)  
    else  
        print "Cannot migrate to requested target -- skipping system"  
    endif  
endfor
```

## Database Migration

This section covers upgrading the PostgreSQL database from version 9 to version 10. If you are already using PostgreSQL 10, you do not need to perform this migration.

If you want to upgrade to the latest Uyuni version, you must be using PostgreSQL version 10 or 12. If you are using an older version, such as version 9.6, you must migrate PostgreSQL to version 10 before you begin the Uyuni migration.



If you run PostgreSQL 9.4 on Uyuni 3.2, see the product documentation at <https://documentation.suse.com/external-tree/en-us/suma/3.2/susemanager-best-practices/html/book.suma.best.practices/bp.sp.migration.html#sp.migration.postgresql>. You cannot migrate directly from PostgreSQL 9.4 to version 10.

## Prepare to Upgrade

Before you begin the upgrade, prepare your existing Uyuni Server and create a database backup.

PostgreSQL stores data at `/var/lib/pgsql/data/`.

*Procedure: Preparing to Upgrade*

1. Check the active PostgreSQL version:

```
psql --version
```

If you are using PostgreSQL 9.6, you can upgrade to PostgreSQL 10.

If you are already using PostgreSQL 10, you do not need to perform this migration.

2. Check the active smdba version:

```
rpm -q smdba
```

PostgreSQL 10 requires **smdba** version 1.6.2 or later.

3. Perform a database backup. For more information on backing up, see [ **Administration > Backup-restore >**  ].

## Upgrade PostgreSQL



Always create a database backup before performing a migration. For more information about a database backup, see [db-migration.pdf](#).



PostgreSQL upgrades can be performed in two ways: a regular upgrade, or a fast upgrade:

A regular upgrade will create a complete copy of the database, so you will need double the existing database size of space available. Regular upgrades can take a considerable amount of time, depending on the size of the database and the speed of the storage system.

A fast upgrade only takes a few minutes, and uses almost no additional disk space. However, if a fast upgrade fails, you must restore the database from the backup. A fast upgrade reduces the risk of running out of disk space. A regular upgrade will copy the database files instead of creating hard links between the files.

PostgreSQL stores data at `/var/lib/pgsql/data/`.

#### *Procedure: Performing a Regular Upgrade*

1. Perform a database backup. For more information on backing up, see [ **Administration > Backup-restore >**  ].
2. Start the upgrade:

```
/usr/lib/susemanager/bin/pg-migrate-96-to-10.sh
```

3. When the upgrade has successfully completed, you can safely delete the old database directory and reclaim lost disk space. The old directory is renamed to `/var/lib/pgsql/data-pg96`.

The `pg-migrate-96-to-10.sh` script performs these operations:

- Stop spacewalk services
- Shut down the running database
- Check if PostgreSQL 10 is installed and install it if necessary
- Switch from PostgreSQL 9.6 to PostgreSQL 10 as the new default
- Initiate the database migration
- Create a PostgreSQL configuration file tuned for use by Uyuni
- Start the database and spacewalk services



If the upgrade fails, the migration script will attempt to restore the database to its original state.

#### *Procedure: Performing a Fast PostgreSQL Upgrade*

1. Perform a database backup. Without a verified database backup, you must not initiate a fast upgrade. For more information on backing up, see [ **Administration > Backup-restore >**  ].
2. Start the upgrade:

```
/usr/lib/susemanager/bin/pg-migrate-96-to-10.sh fast
```

3. When the upgrade has successfully completed, you can safely delete the old database directory and reclaim lost disk space. The old directory is renamed to `/var/lib/pgsql/data-pg96`.

## Database Migration

This section covers upgrading the PostgreSQL database from version 9 to version 10. If you are already using PostgreSQL 10, you do not need to perform this migration.

If you want to upgrade to the latest Uyuni version, you must be using PostgreSQL version 10 or 12. If you are using an older version, such as version 9.6, you must migrate PostgreSQL to version 10 before you begin the Uyuni migration.



If you run PostgreSQL 9.4 on Uyuni 3.2, see the product documentation at <https://documentation.suse.com/external-tree/en-us/suma/3.2/susemanager-best-practices/html/book.suma.best.practices/bp.sp.migration.html#sp.migration.postgresql>. You cannot migrate directly from PostgreSQL 9.4 to version 10.

## Prepare to Upgrade

Before you begin the upgrade, prepare your existing Uyuni Server and create a database backup.

PostgreSQL stores data at `/var/lib/pgsql/data/`.

*Procedure: Preparing to Upgrade*

1. Check the active PostgreSQL version:

```
psql --version
```

If you are using PostgreSQL 9.6, you can upgrade to PostgreSQL 10.

If you are already using PostgreSQL 10, you do not need to perform this migration.

2. Check the active smdba version:

```
rpm -q smdba
```

PostgreSQL 10 requires `smdba` version 1.6.2 or later.

3. Perform a database backup. For more information on backing up, see [ **Administration > Backup-restore >**  ].

## Upgrade PostgreSQL



Always create a database backup before performing a migration. For more information about a database backup, see [db-migration.pdf](#).

PostgreSQL upgrades can be performed in two ways: a regular upgrade, or a fast upgrade:

A regular upgrade will create a complete copy of the database, so you will need double the existing database size of space available. Regular upgrades can take a considerable amount of time, depending on the size of the database and the speed of the storage system.

A fast upgrade only takes a few minutes, and uses almost no additional disk space. However, if a fast upgrade fails, you must restore the database from the backup. A fast upgrade reduces the risk of running out of disk space. A regular upgrade will copy the database files instead of creating hard links between the files.

PostgreSQL stores data at `/var/lib/pgsql/data/`.

#### *Procedure: Performing a Regular Upgrade*

1. Perform a database backup. For more information on backing up, see [ **Administration > Backup-restore >**  ].
2. Start the upgrade:

```
/usr/lib/susemanager/bin/pg-migrate-96-to-10.sh
```

3. When the upgrade has successfully completed, you can safely delete the old database directory and reclaim lost disk space. The old directory is renamed to `/var/lib/pgsql/data-pg96`.

The `pg-migrate-96-to-10.sh` script performs these operations:

- Stop spacewalk services
- Shut down the running database
- Check if PostgreSQL 10 is installed and install it if necessary
- Switch from PostgreSQL 9.6 to PostgreSQL 10 as the new default
- Initiate the database migration
- Create a PostgreSQL configuration file tuned for use by Uyuni
- Start the database and spacewalk services



If the upgrade fails, the migration script will attempt to restore the database to its original state.

#### *Procedure: Performing a Fast PostgreSQL Upgrade*

1. Perform a database backup. Without a verified database backup, you must not initiate a fast upgrade. For more information on backing up, see [ **Administration > Backup-restore >**  ].
2. Start the upgrade:

```
/usr/lib/susemanager/bin/pg-migrate-96-to-10.sh fast
```

3. When the upgrade has successfully completed, you can safely delete the old database directory and reclaim lost disk space. The old directory is renamed to `/var/lib/pgsql/data-pg96`.

## Troubleshooting

This section contains some common problems you might encounter with Uyuni upgrades, and solutions to resolving them.

### Web UI Fails to Load

Sometimes, the Web UI will not load after migration. This is usually caused by browser caching, if the new system has the same hostname and IP address as the old system. This duplication can confuse some browsers.

This issue is resolved by clearing the cache and reloading the page. In most browsers, you can do this quickly by pressing *Ctrl+F5*.

### Not Enough Disk Space

Check the available disk space before you begin migration. We recommend locating `/var/spacwalk` and `/var/lib/pgsql` on separate XFS file systems.

When you are setting up a separate file system, edit `/etc/fstab` and remove the `/var/lib/pgsql` subvolume. Reboot the server to pick up the changes.

### Retrying to Set up the Target System

If you need to retry setting up the target system, follow these steps:

1. Delete `/root/.MANAGER_SETUP_COMPLETE`.
2. Stop PostgreSQL and remove `/var/lib/pgsql/data`.
3. Set the target system hostname to match the source system hostname.
4. Check the `/etc/hosts` file, and correct it if necessary.
5. Check `/etc/setup_env.sh` on the target system, and ensure the database name is set:

```
MANAGER_DB_NAME='susemanager'
```

6. Reboot the target system.
7. Run `mgr-setup` again.

# Sample Autoinstallation Script

This section contains an example autoinstallation script. Use this script as the basis for an upgrade from SLE 12 SP4 to SLE 15.

*Listing 2. Example: Autoinstallation Script*

```
<?xml version="1.0"?>
<!DOCTYPE profile>
<profile xmlns="http://www.suse.com/1.0/yast2ns"
  xmlns:config="http://www.suse.com/1.0/configs">
  <general>
    $SNIPPET('spacewalk/sles_no_signature_checks')
    <mode>
      <confirm config:type="boolean">false</confirm>
    </mode>
  </general>
  <add-on>
    <add_on_products config:type="list">
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle15-updates-
x86_64/autumn2018</media_url>
        <name>SLE15 Updates</name>
        <product>SLE15</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-manager-tools15-pool-
x86_64/summer2017</media_url>
        <name>SLE15 Manager Tools Pool</name>
        <product>SLE15</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-manager-tools15-
updates-x86_64/autumn2018</media_url>
        <name>SLE15 Manager Tools Updates</name>
        <product>SLE15</product>
        <product_dir>/</product_dir>
      </listentry>
    </add_on_products>
  </add-on>
  <upgrade>
    <only_installed_packages config:type="boolean">false</only_installed_packages>
    <stop_on_solver_conflict config:type="boolean">true</stop_on_solver_conflict>
  </upgrade>
  <backup>
    <sysconfig config:type="boolean">true</sysconfig>
    <modified config:type="boolean">true</modified>
    <remove_old config:type="boolean">false</remove_old>
  </backup>
  <networking>
    <keep_install_network config:type="boolean">true</keep_install_network>
    <start_immediately config:type="boolean">true</start_immediately>
  </networking>
  <scripts>
    <init-scripts config:type="list">
      $SNIPPET('spacewalk/sles_register_script')
    </init-scripts>
  </scripts>
</profile>
```