



Upgrade Guide

SUSE Manager 4.0

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Service Pack Migration Introduction

You can upgrade the underlying operating system and also migrate SUSE Manager server from one patch level to the other (SP migration) or from one version to the next. This works for migrating SUSE Manager server 3.0 to version 3.1, or version 3.1 to version 4.0. For migrating version 3.0 to version 3.1, see the product documentation for SUSE Manager 3.1:

- <https://www.suse.com/documentation/suse-manager-3/>

Updating the SUSE Manager Server

This section provides information on performing regular updates and running a `spacewalk-schema-upgrade` on your PostgreSQL database.

Procedure: Updating SUSE Manager

1. As the root user, stop Spacewalk services:

```
spacewalk-service stop
```

2. Apply the latest patches:

```
zypper patch
```

3. You will be informed if a new database schema was included in the latest patch. Ensure the database service is running:

```
rcpostgresql start
```

4. Perform the upgrade:

```
spacewalk-schema-upgrade
```

5. Restart Spacewalk services:

```
spacewalk-service start
```



Restart of Services and Applications

Services affected by a package update are not automatically restarted after an update. You need to restart these services manually to avoid potential failures.

You may use `zypper ps` to check for any applications which may be using old code. Restart these applications.

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Migrating SUSE Manager from Version 3.1 to 3.2

The migration can either be done with the Online Migration tool (YaST) or with the Zypper command line tool.

Requirements

SUSE Manager 4.0 requires SLES 12 SP3 or later, with PostgreSQL version 9.6. Check the release notes for more information about these requirements. If you want to upgrade from an earlier version of SUSE Manager, check the relevant product documentation.



Reduce Installation Size

When performing the migration, YaST will install all recommended packages. Especially in the case of custom minimal installations, this may increase the installation size of the system significantly.

To change this default behavior and allow only required packages, adjust `/etc/zypp/zypp.conf` and set the following variable:

```
solver.onlyRequires = true
installRecommends=false # or commented
```

This changes the behavior of all package operations, such as the installation of patches or new packages.

Using YaST



Checking PostgreSQL Version

Before migrating to SLES 12 SP3 or later, check whether PostgreSQL is already updated to version 9.6. For more information, see [\[bp.postgresql.database.migration\]](https://www.postgresql.org/docs/9.6/migration.html).

To perform the migration with YaST, use the **Online Migration** tool:

Procedure: Migrating using YaST

1. If you are logged into a GNOME session running on the machine you are going to update, switch to a text console. Running the update from within a GNOME session is not recommended. This does not apply when being logged in from a remote machine (unless you are running a VNC session with GNOME).
2. Start in YaST **System > Online Migration** (`yast2 migration`). YaST will show possible migration targets with detailed summaries.

In case of trouble, resolve the following issues first:

- If the **Online Migration** is not available, install the `yast2-migration` package and its

dependencies. Restart YaST , otherwise the newly installed module will not be shown in the control center.

- If there are “old” online updates available for installation, the migration tool will warn and ask to install them now before starting the actual migration. It is recommended to install all updates before proceeding.

Using zypper



Checking PostgreSQL Version

Before migrating to SLES 12 SP3 or later, check whether PostgreSQL is already updated to version 9.6. For more information, see [\[bp.postgresql.database.migration\]](http://bp.postgresql.database.migration).

To perform the migration with Zypper on the command-line, use the **zypper migration** subcommand tool:

Procedure: Migrating using zypper migration

1. If you are logged into a GNOME session running on the machine you are going to update, switch to a text console. Running the update from within a GNOME session is not recommended. This does not apply when being logged in from a remote machine (unless you are running a VNC session with GNOME).
2. The **zypper migration** subcommand show possible migration targets and a summary.

In case of trouble, resolve the following issues first:

- If the **migration** subcommand is not available install the **zypper-migration-plugin** package and its dependencies.
 - If there are “old” online updates available for installation, the migration tool will warn and ask to install them now before starting the actual migration. It is recommended to install all updates before proceeding.
3. If more than one migration target is available for your system, select one from the list (specify the number).
 4. Read the notification and update the SUSE Manager database schema as described (**spacewalk-schema-upgrade**).
 5. Make sure SUSE Manager is up and running (**spacewalk-service start**).

After finishing the migration procedure SUSE Manager 3.2 on SLES 12 SP3 or later is available to be used.

Migrating SUSE Manager from Version 3.2 to Version 4

The migration from SUSE Manager 3.2 to SUSE Manager 4 works in the same way as the migration from SUSE Manager 2.1 to SUSE Manager 3. The migration happens from the original machine to a new one. There is no in-place migration. While this has the drawback that you temporarily need two machines, it also has the advantage that the original machine will remain fully functional in case something goes wrong.



Migration Process

The whole process may be tricky, so it is strongly advised that the migration is done by an experienced consultant.

Given the complexity of the product, the migration is an "all or nothing" procedure, so if something goes wrong you will need to start over. Error handling is very limited. Nevertheless, it should work correctly if you follow these instructions carefully.



Time-Consuming Operation

The migration involves dumping the whole database on the source machine and restoring it on the target machine. All of the channels and packages then need to be copied to the new machine. You should expect the entire process to take several hours.

Prerequisites



Latest Updates

The source machine needs to run SUSE Manager 3.2 with all the latest updates applied. Before starting the migration process, make sure that the machine is up to date and all updates have been installed successfully.

During migration the database from the source machine needs to get dumped and this dump needs to be temporarily stored on the target system. The dump gets compressed with **gzip** using the default compression options (maximum compression only yields about 10% of space savings but costs a lot of runtime). Check the disk usage of the database; for example, a small test installation:

```
{prompt.root}du -sch /var/lib/pgsql/data
==>
1,8G    data
1,8G    total
```

Ensure that you have at least 30% of this value available in **/var/spacewalk/tmp**.

For larger installations the ratio might be better (space required for the database dump might be less than 30%).

1. Temporary Storage Space

The dump will be written to the directory `/var/spacewalk/tmp`. The directory will be created if it does not exist. If you want the dump to be stored somewhere else, change the definition of the variable `$TMPDIR` at the beginning of the script to suit your needs.

Setting Up the Target Machine

To prepare the target machine (with the example host name `suma40`) proceed as follows:

Procedure: Setup Target Machine

1. On the target machine, install “SUSE Manager” Server 4.0 with the Unified Installer (SUSE Linux Enterprise 15 SP1). For more information about installing SUSE Manager, see [\[install-server-unified\]](#).
2. Run `yast2 susemanagersetup` to set up SUSE Manager.
3. On the first SUSE Manager setup screen, ensure that **Migrate a SUSE Manager compatible server** is marked instead of **Set up SUSE Manager from scratch**.
4. On the second screen, enter the name of the source system as **Hostname of source SUSE Manager Server** as well as the domain name. Enter the database credentials of the source system.
5. On the next screen, you need to specify the IP address of the SUSE Manager 4 target system. Generally, this parameter should default to the correct value and you only should need to press **Enter**. Only in the case of multiple IP addresses you might need to specify the one that should be used during migration.



Faking the Host Name

During the migration process, the target system will fake its host name to be the same as the source system, this is necessary as the host name of a SUSE Manager installation is vital and should not be changed once set. Be careful when you log in to your systems during migration; they both will present you with the same host name.

6. Continue by following the normal installation steps.



Database Parameters

Specify the database parameters using the same database parameters as the source system. Even if you intend to change it later on, during migration you must use the the same database credentials as the original SUSE Manager database.

7. After all the data has been gathered, YaST will terminate.

Performing the Migration

The migration will not start automatically. You will need to trigger it manually, with this command:

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

This command reads the data that was gathered during the setup procedure, sets up SUSE Manager onto the new target machine, and transfers all of the data from the source machine. Several operations need to be performed on the source machine using SSH, so you will be prompted once for the root password of the source machine. A temporary SSH key named **migration-key** is created and installed on the source machine, so you need to give the root password only once. The temporary SSH key will be deleted after successful migration.

Depending on the size of the installation, the migration can take several hours. When the migration has finished successfully, you will be notified ("*Migration complete.*") and prompted to shut down the source machine. Re-configure the network of the target machine to use the same IP address and host name as the original machine and restart it. The target machine is now a fully functional replacement for your previous SUSE Manager 3.2 installation.

These numbers from a test installation illustrate the approximate time it takes to dump and import the database:

```
14:53:37 Dumping remote database to /var/pacewalk/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 a test installation with a 1,8GB database, we recorded these times:

- Dumping the database took around five minutes
- Importing the dump onto the target system took an additional seven minutes

For big installations this can take up to several hours. You should also account for the time it takes to copy all the package data to the new machine. Depending on your network infrastructure and hardware, this can also take a significant amount of time.

A complete migration can consume a lot of time. This is caused by the amount of data that must be copied. Total migration time can be greatly decreased by eliminating the need to copy data prior to performing the migration (for example, channels, packages, auto-install images, and any additional data). You can gather all data via YaST by running:

```
mgr-setup -r
```

The **mgr-setup -r** command copies the data from the old server to the new one. This command can be run at any time and your current server will remain fully functional. When the migration has been

initiated only data changed since running `mgr-setup -r` will need to be transferred. This significantly reduces downtime.

On large installations, transferring the database (which involves dumping the database onto the source machine and then importing the dump onto the target system) will still take some time. During the database transfer no write operations should occur. To avoid this, the migration script shuts down any SUSE Manager database services running on the source machine.

Packages on External Storage

If you have package data on external storage (for example, if you have an NFS mount at `/var/pacewalk/packages`), you do not need to copy this data to the new machine. After migration has completed, edit the script located in `/usr/lib/susemanager/bin/mgr-setup` and remove the respective `rsync` command (it will be around line 442).



Mounting External Storage

Make sure your external storage is mounted on the new machine before starting the system for the first time. Also make sure `/srv/www/htdocs/pub` is mounted if it exists on an external storage device.

All other required files and directories that have not been copied by the migration tool, should be manually copied to the new server.

Troubleshooting

This section describes some common problems found after migration. === Web UI Fails to Load

It is possible that the Web UI may break during migration. This behavior is not a bug, but a browser caching issue. The new machine has the same host name and IP address as the old machine. This duplication can confuse some Web browsers. If you experience this issue reload the page. For example, in Firefox pressing the key combination `Ctrl+F5` should resume normal functionality.

Not Enough Disk Space

In case of trouble check available disk space. It is recommended to have `/var/pacewalk` and `/var/lib/pgsql` on separate (XFS) file systems. Make sure to remove the subvolume entry in `/etc/fstab` for the subvolume of `/var/lib/pgsql` when using a separate file system and reboot the server first before continuing.

Corrupted Database Dump

Check the output of the following command (replace `<SUMA_3.2_MACHINE>` with the actual host name of your 3.2 source machine):

```
ssh root@<SUMA_3.2_MACHINE> "su -s /bin/bash - postgres -c exit"
```

This command must not produce any output. Output can lead to a corrupted transfer of the archive with the database dump. Re-visit your bash environment on the 3.2 source machine (for example, the `.bashrc` file) and make sure no extra text is printed on the shell start.

Retrying to Set Up the New Server

To retry setting up the new server, perform the following steps on the new server machine:

1. remove `/root/.MANAGER_SETUP_COMPLETE`
2. stop postgresql and remove `/var/lib/pgsql/data`
3. set the hostname correctly (it now has the host name from the old SUSE Manager server)
4. correct the `/etc/hosts` file
5. on the new server check `/etc/setup_env.sh` and see if the correct database name is set:

```
MANAGER_DB_NAME='susemanager'
```

6. reboot the server before running `mgr-setup` again.

Client Migration

Upgrading from SLE 12 with the latest service pack (SP) to SLE 15 can be automated, but requires some preparation steps.

To upgrade the SP version on SLE 12 (for example, upgrading from SLE 12 or any SLE 12 SPx to SLE 12 SP4) can be fully automated and requires no additional preparation.

Upgrading SLE 12 SPx to Version 15

SLE 12 SPx clients can be auto-upgraded to SLE 15 with YaST auto-installation. This also applies for other supported products based on SLE 12. For generally supported SUSE Linux Enterprise upgrade paths, see https://www.suse.com/documentation/sles-15/book_sle_upgrade/data/sec_upgrade-paths_supported.html (SLE Upgrade Guide, Chapter “Supported Upgrade Paths to SLE 15”).

It is important that you migrate the client to the latest available SP first. Upgrade to SLE 12 SP4 after December 2018.



Auto-Upgrading Salt Minions Currently Not Supported

This procedure will work for traditionally managed systems (system type **management**). It is not currently available for systems using Salt (system type **salt**).

During the procedure, the machine reboots and performs the system upgrade. The process is controlled by YaST and AutoYaST, not by **zypper** commands.



Only perform this migration procedure on client systems managed by SUSE Manager servers. For upgrading the SUSE Manager server itself, see [\[bp.sp.migration\]](#). This is a viable method for major version upgrades such as an upgrade from SUSE Linux Enterprise 12 to 15.

System Upgrade Preparation

Make sure your SUSE Manager and all the clients you want to upgrade have installed all available updates, including the SUSE Manager tools. This is absolutely necessary, otherwise the system upgrade will fail.

The preparation process contains several steps:

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

Procedure: Download and Save Installation Media

1. On the SUSE Manager 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: Create an Auto-Installation Distribution

For all distributions you want to upgrade, create a SLE 15 distribution in SUSE Manager.

1. In the SUSE Manager Web UI, click **Main Menu** > **Systems** > **Autoinstallation** > **Distributions**.
2. Enter a **Distribution Label** for your distribution (for example, **autumn2018**)
3. Specify the **Tree Path**, which is the root directory of the SLE 15 installation sources (for example, **/mnt/sle15**).
4. For **Base Channel**, use the update target distribution **SLE-Product-SLES15-Pool for x86_64**.
5. Confirm with **Create Autoinstallable Distribution**.

For more information about Autoinstallation, see [\[ref.webui.systems.autoinst\]](#).

Procedure: Create 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. Go to **Main Menu** > **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. 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. Decide about **Add-On System Types**. If in doubt, see https://www.suse.com/documentation/sles-15/book_quickstarts/data/art_modules.html (SLE Modules & Extensions Quick Start).
7. Click [**Create Activation Key**].
8. Click the **Child Channels** tab and select the required channels. Finish with [**Update Key**].

Procedure: Upload an AutoYaST Profile

Create an AutoYaST XML file according to [\[ap-sample-autoinst-system-upgrade\]](#). For more information about AutoYaST, see [\[ref.webui.systems.autoinst.ay_intro\]](#).

1. Go to **Main Menu** > **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. Add `autoupgrade=1` in the **Kernel Options** of the **Details** tab and click [**Update**].
4. Switch to the **Variable** tab.
5. In the text field `registration_key=` enter the key from the preparation above.
6. Click [**Update Variables**].

After you have successfully finished this process, you are ready to perform the upgrade. For upgrade instruction, see [Synchronizing Target Channels](#).



Synchronizing Target Channels

Before successfully initializing the product 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. Watch the mirroring progress in `/var/log/rhn/reposync/sles15-pool-x86_64.log`.

1. Go to the system via **Main Menu** > **Systems** and click the name of the system. Then click **System Details** > **Provisioning** > **Autoinstallation** > **Schedule**, and choose the AutoYaST XML profile you have uploaded above.
2. Click [**Schedule Autoinstallation and Finish**].

Next time the machine asks the SUSE Manager server for jobs, it will receive a reinstallation job which fetches kernel and initrd and writes a new `/boot/grub/menu.lst` (containing pointers to the new kernel and initrd).

When the machine boots, it will use the Grub configuration and boots the new kernel with its initrd. No PXE boot is required for this process. A shutdown of the machine is initiated as well, effectively 3 minutes after the job was fetched.

```
include::bp_ex_autoinst_system-upgrade.adoc[leveloffset=3]
```

Migrating SLE 12 or later to version 12 SP4

Existing SLE 12 clients (SLE) may be upgraded to SP4 with the **SP Migration** procedure provided by the Web UI. The same applies for other supported products based on SUSE Linux Enterprise 12.



Synchronizing Target Channels

Before successfully initializing the product migration, you first must make sure that the migration target channels are completely mirrored. For the upgrade to SLE 12 SP4, at least the [SLES12-SP4-Pool](#) base channel with the [SLE-Manager-Tools12-Pool](#) child channel for your architecture is required. The matching update channels such as [SLE-Manager-Tools12-Updates](#) and [SLES12-SP4-Updates](#) are recommended.

Procedure: Migrating SLE 12 Client to SP4

1. Direct your browser to the SUSE Manager Web UI where your client is registered, and login.
2. On the **Systems** > **All** page select your client system from the table.

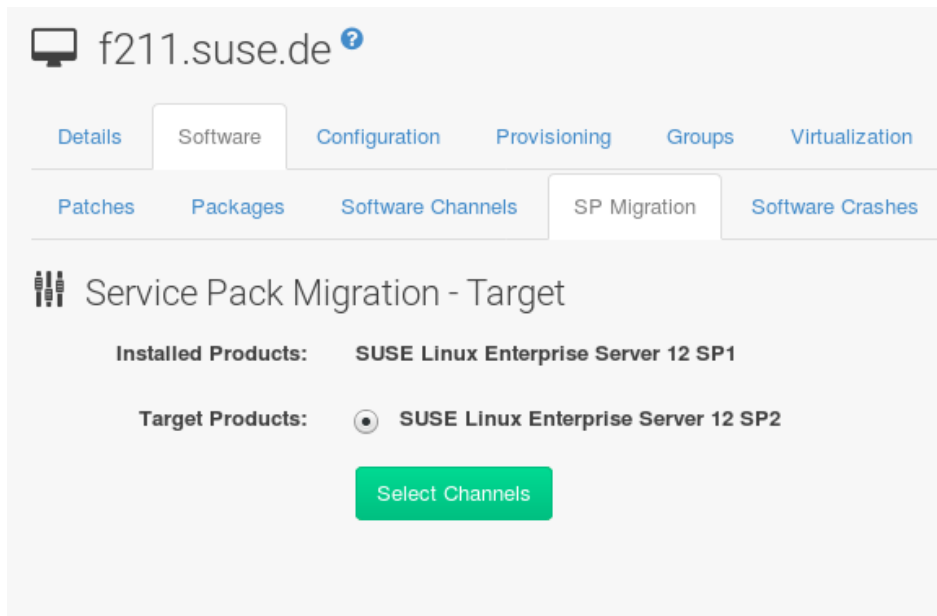
The screenshot shows the SUSE Manager Web UI interface for a client system. The browser address bar shows `f211.suse.de`. The interface has a top navigation bar with tabs: Details, Software, Configuration, Provisioning, Groups, and Virtualization. Below this is a secondary navigation bar with tabs: Overview, Properties, Remote Command, Connection, Reactivation, and Hardware. The main content area is divided into several sections:

- System Status:** Displays a warning icon and text: "Software Updates Available Critical: 10 Non-Critical: 9 Packages: 29".
- System Info:** A table-like section showing system details:

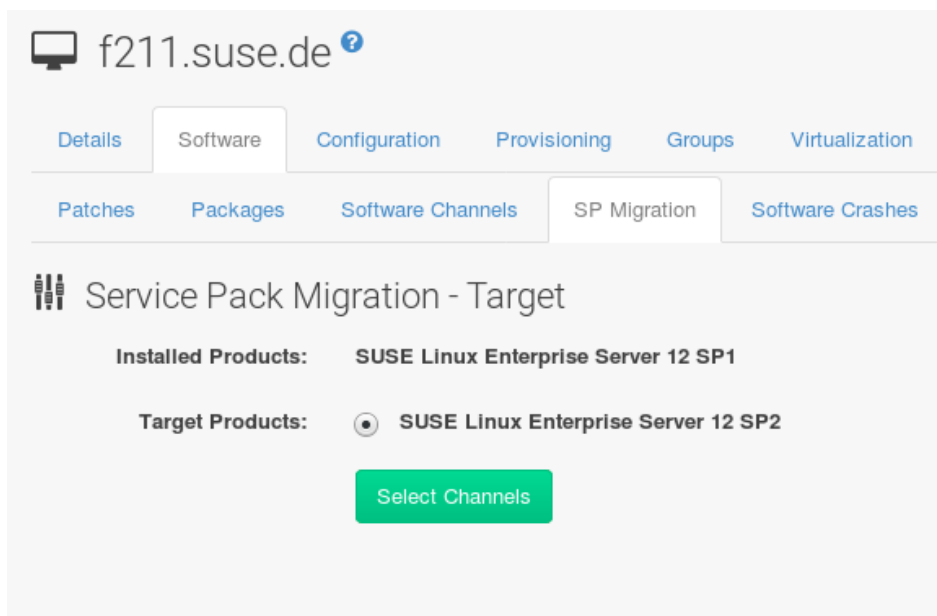
Hostname:	f211.suse.de
IP Address:	10.160.66.211
IPv6 Address:	::1
Kernel:	3.12.69-60.64.35-default
SUSE Manager System ID:	1000010005
Activation Key:	1-SLES-12-SP1
Installed Products:	SUSE Linux Enterprise Server 12 SP1
Lock Status:	System is unlocked (Lock system)
- Subscribed Channels (Alter Channel Subscriptions):** A list of channels:
 - [SLES12-SP1-Pool for x86_64](#)
 - [SLE-Manager-Tools12-Pool x86_64 SP1](#)
 - [SLE-Manager-Tools12-Updates x86_64 SP1](#)
 - [SLES12-SP1-Updates for x86_64](#)

If there are **Software Updates Available** >] in the menu: **System Status**[notification install these updates first to avoid trouble during the migration process.


3. On the system's detail page select the **Software** >] tab > then the menu: **SP Migration**[tab.





4. From this tab you will see the installed products listed on your client. Select the wanted **Target Products** (if there is more than one), which is **SUSE Linux Enterprise Server 12 SP4**.



Then confirm with **Select Channels**.



The screenshot shows the SUSE Manager web interface for a system named 'f211.suse.de'. The top navigation bar includes tabs for Details, Software, Configuration, Provisioning, Groups, and Virtualization. Below this, a secondary navigation bar highlights Patches, Packages, Software Channels, SP Migration (the active tab), and Software Crashes. The main content area is titled 'Service Pack Migration - Channels'. It displays the 'Installed Products' as 'SUSE Linux Enterprise Server 12 SP1' and the 'Target Products' as 'SUSE Linux Enterprise Server 12 SP2'. The 'Target Base Channel' is set to 'SLES12-SP2-Pool for x86_64'. A list of 'Mandatory Child Channels' is shown with three items checked: 'SLE-Manager-Tools12-Pool x86_64 SP2', 'SLE-Manager-Tools12-Updates x86_64 SP2', and 'SLES12-SP2-Updates for x86_64'. A list of 'Optional Child Channels' follows with six items unchecked: 'SLE-Module-Adv-Systems-Management12-Pool for x86_64', 'SLE-Module-Adv-Systems-Management12-Updates for x86_64', 'SUSE-Manager-Proxy-3.0-Pool for x86_64 SP2', 'SUSE-Manager-Proxy-3.0-Updates for x86_64 SP2', 'SUSE-Manager-Proxy-3.1-Pool for x86_64', and 'SUSE-Manager-Proxy-3.1-Updates for x86_64'. A green 'Schedule Migration' button is located at the bottom of the configuration area.

f211.suse.de   Delete System

Details Software Configuration Provisioning Groups Virtualization

Patches Packages Software Channels SP Migration Software Crashes

Service Pack Migration - Channels

Installed Products: SUSE Linux Enterprise Server 12 SP1



Target Products: SUSE Linux Enterprise Server 12 SP2

Target Base Channel: SLES12-SP2-Pool for x86_64

- **Mandatory Child Channels:**
 - ☒ SLE-Manager-Tools12-Pool x86_64 SP2
 - ☒ SLE-Manager-Tools12-Updates x86_64 SP2
 - ☒ SLES12-SP2-Updates for x86_64
- **Optional Child Channels:**
 - ☐ SLE-Module-Adv-Systems-Management12-Pool for x86_64
 - ☐ SLE-Module-Adv-Systems-Management12-Updates for x86_64
 - ☐ SUSE-Manager-Proxy-3.0-Pool for x86_64 SP2
 - ☐ SUSE-Manager-Proxy-3.0-Updates for x86_64 SP2
 - ☐ SUSE-Manager-Proxy-3.1-Pool for x86_64
 - ☐ SUSE-Manager-Proxy-3.1-Updates for x86_64

[Schedule Migration](#)


5. Select **Schedule Migration** >] > and then menu:Confirm[.

 f211.suse.de 

[Delete System](#) | [Add to SSM](#)

[Details](#) | [Software](#) | [Configuration](#) | [Provisioning](#) | [Groups](#) | [Virtualization](#) | [Audit](#) | [Events](#)

[Patches](#) | [Packages](#) | [Software Channels](#) | [SP Migration](#) | [Software Crashes](#)



Service Pack Migration - Confirm



Please confirm below to schedule the migration of this system to the following products:



- **SUSE Linux Enterprise Server 12 SP2**

Channel subscriptions after the migration:

- [SLES12-SP2-Pool for x86_64](#)
 - [SLE-Manager-Tools12-Pool x86_64 SP2](#)
 - [SLE-Manager-Tools12-Updates x86_64 SP2](#)
 - [SLES12-SP2-Updates for x86_64](#)

Schedule action for no sooner than:

 5/3/17  10:42 am CEST

 In order to detect any possible problems it is recommended to always do a **Dry Run** before scheduling the actual Service Pack Migration. 

[Go Back](#) [Dry Run](#) [Confirm](#)

Check the **System Status** on the system's details when the migration is done.

f211.suse.de

Details Software Configuration Provisioning Groups Virtual Machines

Overview Properties Remote Command Connection Reactive

System Status

Software Updates Available **Critical: 6** **Non-Critical: 5** **Packages: 26**

System Info

Hostname:	f211.suse.de
IP Address:	10.160.66.211
IPv6 Address:	::1
Kernel:	4.4.49-92.14-default
SUSE Manager System ID:	1000010005
Activation Key:	1-SLES-12-SP1
Installed Products:	SUSE Linux Enterprise Server 12 SP2
Lock Status:	System is unlocked (Lock system)

Subscribed Channels ([Alter Channel Subscriptions](#))

- [SLES12-SP2-Pool for x86_64](#)
- [SLE-Manager-Tools12-Pool x86_64 SP2](#)
- [SLE-Manager-Tools12-Updates x86_64 SP2](#)
- [SLES12-SP2-Updates for x86_64](#)

If the **System Status >] notification does not report a successful migration but lists menu:Software Updates Available**, install the update now and then check again.

Finally, consider to schedule a reboot.

Service Pack Migration

SUSE Manager uses SUSE Linux Enterprise Server 12 as its underlying operating system. Therefore Service Pack migration (for example, from version 12 SP1 to 12 SP3) may be performed in the same way as a typical SLES migration.



Upgrading PostgreSQL to Version 9.6 Before Migrating to SLES12 SP3 or Later

Before migrating the underlying system to SUSE Linux Enterprise 12 SP3 or later, you must upgrade PostgreSQL to version 9.6.

The migration needs PostgreSQL 9.4 and 9.6 installed in parallel and PostgreSQL 9.4 is only available in SUSE Linux Enterprise 12 SP2. For more information, see `<<bp.sect.postgresql.prepare.upgrade>>`.

SUSE offers a graphical and command line tool for upgrading to a new service pack. Comprehensive documentation for executing service pack migration scenarios is located in the SUSE Linux Enterprise Server documentation chapter https://www.suse.com/documentation/sles-12/book_sle_deployment/data/cha_update_sle.html.

PostgreSQL Database Migration

Introduction to PostgreSQL Databases

SUSE Manager 3 uses PostgreSQL 9.4 by default. SUSE Linux Enterprise Server 12 SP3 uses PostgreSQL 9.6 by default.

When you installed SUSE Manager Server 3.1 or earlier on SUSE Linux Enterprise Server 12 SP2 or earlier, it was based on a PostgreSQL 9.4 database, which you can upgrade to PostgreSQL 9.6. This chapter provides information on managing your PostgreSQL database, and provides instructions for upgrading your database to PostgreSQL 9.6. SUSE Manager 3.1 on SUSE Linux Enterprise Server 12 SP3 and SUSE Manager 3.2 use PostgreSQL 9.6 by default. If you use one of those you can skip the following sections.

PostgreSQL stores data at `/var/lib/pgsql/data/`, and logs to `/var/lib/pgsql/data/pg_xlog/`.

Prepare to Upgrade PostgreSQL

Before you begin upgrading you will need to check your existing system is ready for the upgrade, and prepare a database backup.

Procedure: Preparing to Upgrade PostgreSQL

1. Check the active PostgreSQL version:

```
suse-manager-example-srv:~ # psql --version
psql (PostgreSQL) 9.x.y
```

If you are using PostgreSQL 9.4, you can update to PostgreSQL 9.6.

2. Check your system is fully updated:

```
suma-test-srv:~ # rpm -q smdba
smdba-1.5.8-0.2.3.1.x86_64
```

PostgreSQL 9.6 requires smdba version 1.5.8 or higher.

3. Perform a database backup before you begin. For more information on backing up, see [bp_chap_suma_backup.pdf](#).



Always create a database backup before performing a migration

Upgrade PostgreSQL

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. Regular upgrades also require database downtime, your database will not be accessible while the upgrade is running.

A fast upgrade only takes a few minutes, and uses no additional disk space. However, fast upgrades are more likely to fail, and if this occurs you will need to restore the database from backup.

Procedure: Performing a Regular PostgreSQL Upgrade

1. Perform a database backup before you begin. For more information on backing up, see [bp_chap_suma_backup.pdf](#).
2. Begin the upgrade:

```
/usr/lib/susemanager/bin/pg-migrate.sh
```

The **pg-migrate.sh** script performs these operations:

- Stop spacewalk services
- Shut down the running database
- Check if PostgreSQL 9.6 is installed and install it if not already present
- Switch from PostgreSQL 9.4 to PostgreSQL 9.6 as the new default
- Initiate the database migration
- Create a PostgreSQL configuration file tuned for use by SUSE Manager
- Start the database and spacewalk services



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

3. After the upgrade has successfully completed, you can safely delete the old database directory which will have been renamed to **/var/lib/pgsql/data-pg94** to reclaim lost disk space.

Procedure: Performing a Fast PostgreSQL Upgrade

1. Perform a database backup before you begin. For more information on backing up, see [bp_chap_suma_backup.pdf](#).
2. Begin the upgrade:

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

Sample Autoinstallation Script for System Upgrade (SLES 12 SP4 to SLES 15)

Listing 1. Sample Autoinstallation Script for a System Upgrade (SLES 12 SP4 to SLES 15)

```
<?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>
```