Upgrade Guide

Uyuni 2020.06

June 15, 2020

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Introduction

Publication Date: 2020-06-15

Uyuni has three main components, all of which need regular updates. This guide covers updating the Uyuni Server, Proxy, and clients, as well as some underlying components, such as the database.

It is possible to automate some of the upgrades, but others need to be performed manually.

> 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.

Uyuni uses an `X.Y.Z` versioning schema. To determine which upgrade procedure you need, look at which part of the version number is changing.

X upgrades

Upgrading to the next major version. For example, upgrading from 3.2 to 4.0.

Y upgrades

Upgrading to the next minor version. This is often referred to as a service pack migration. For example, upgrading from 4.0 to 4.1.

Z upgrades

Upgrading within the same minor version. This is often referred to as a maintenance update. For example, upgrading from 4.0.0 to 4.0.2.

If you are updating a Uyuni Proxy, see **[Upgrade › Proxy-intro ›]**.

If you are updating clients, see **[Upgrade › Client-intro ›]**.

In addition to updating the server, you need to update other underlying technologies, including the database. For more information about updating the database, see **[Upgrade › Db-intro ›]**.

Upgrade the Server

Uyuni uses an `X.Y.Z` versioning schema. To determine which upgrade procedure you need, look at which part of the version number is changing.

X upgrades

> Upgrading to the next major version. For example, upgrading from 3.2 to 4.0. See **[Upgrade › Server-x ›]**.

Y upgrades

> Upgrading to the next minor version. This is often referred to as a service pack migration. For example, upgrading from 4.0 to 4.1. See **[Upgrade › Server-y ›]**.

Z upgrades: Upgrading within the same minor version. This is often referred to as a maintenance update. For example, upgrading from 4.0.0 to 4.0.2. See **[Upgrade › Server-z ›]**.

Server - X Upgrade

Migrating Uyuni from one major version to the next major version 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 **[Upgrade › Db-migration-10 ›]**.

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/spacewalk/tmp` on the target system.

The `/var/spacewalk/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.

> **i** 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.

Server - Y Upgrade

You can upgrade Uyuni to the next minor version 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. For more information about the database upgrade, see **[Upgrade › Db-migration-12 ›]**.

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).

Server - Y Upgrade with 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 **[Upgrade › Server-z ›]**.

   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.

Server - Y Upgrade with 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.

Server - Z Upgrade

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.

Upgrade the 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.

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 ›]**.

Uyuni uses an `X.Y.Z` versioning schema. To determine which upgrade procedure you need, look at which part of the version number is changing.

X upgrades

> Upgrading to the next major version. For example, upgrading from 3.2 to 4.0 or to 4.1. See **[Upgrade › Proxy-x ›]**.

Y upgrades

> Upgrading to the next minor version. This is often referred to as a service pack migration. For example, upgrading from 4.0 to 4.1. See **[Upgrade › Proxy-y-z ›]**.

Z upgrades: Upgrading within the same minor version. This is often referred to as a maintenance update. For example, upgrading from 4.0.0 to 4.0.2. See **[Upgrade › Proxy-y-z ›]**.

Proxy - X Upgrade

Uyuni Proxy can be upgraded from one major version to the next. 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 Proxy 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.

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 SP2, because Uyuni 4.1 is part of the SUSE Linux Enterprise 15 SP2 product family.

Procedure: Preparing Installation Media

1. On the Uyuni Server, create a local directory for the SLE 15 SP2 installation media:

   ```
   mkdir -p /srv/images/sle15sp2
   ```

2. Download an ISO image with the installation sources, and mount the ISO image on your server:

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

3. Copy everything from the mounted ISO to your local file system:

```
cp -r /mnt/* /srv/images/sle15sp2
```

4. When the copy is complete, unmount the ISO image:

```
umount /mnt
```

> ℹ️ This image is the unified installer and can be used for multiple autoinstallation distributions.

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. For example, `proxy_41-x86_64`.

   ◦ In the `Tree Path` field, type an absolute path to the installation source. For example, `/srv/images/sle15sp2`.

   ◦ In the `Base Channel` field, select `SLE-Product-SUSE-Manager-Proxy-4.1-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.

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.

Create an Autoinstallation Profile

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. For example scripts that you can

use as a starting point, see **[Upgrade › Upgrade-script-example ›]**.

Procedure: Creating an Autoinstallation Profile

1. In the Uyuni Web UI, navigate to **Systems › Autoinstallation › Profiles** and upload your autoinstallation profile script. For example scripts that you can use as a starting point, see **[Upgrade › Upgrade-script-example ›]**.

2. In the `Kernel Options` field, type `autoupgrade=1`. Optionally, you can also include the `Y2DEBUG=1` option. The debug setting is not required but can help with investigating any future problems you might encounter.

3. Paste the autoinstallation profile or use the file upload field.

4. Click **[Create]** to save.

5. When the uploaded profile requires variables to be set, navigate to **Systems › Autoinstallation › Profiles**, select the profile to edit, and navigate to the `Variables` tab. Specify the required variables, using this format:

```
<key>=<value>
```

> ℹ️ For proxies that were registered using Salt, use the `spacewalk/minion_script` snippet to register the proxy again after migration has completed.

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 › System List**, select the proxy, navigate to the `Provisioning` tab, and select the autoinstallation profile you uploaded.

2. 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, it shows the originally assigned channels. Cleaning up after the migration ensures the correct channels are shown.

> ⚠️ If the server reports that there are updates available for the proxy, do not apply them before completing the cleanup.

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-4.1-Pool for x86_64`.

4. In the `Child Channels` field, select all the recommended channels.

Proxy - Y or Z Upgrade

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 Proxy, stop the proxy service:

```
spacewalk-proxy stop
```

2. In the Uyuni Server Web UI, navigate to **Systems › Proxy** and click the name of the proxy.

3. Select packages to be updated on the proxy, and then apply the selection.

4. On the Uyuni Proxy, start the proxy service:

```
spacewalk-proxy start
```

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

Upgrade the Clients

Clients use the versioning system of their underlying operating system. For clients using SUSE operating systems, you can perform upgrades within the Uyuni Web UI.

To upgrade clients running SLE 12 to SLE 15, the upgrade is automated, but you will need to do some preparation steps before you begin.

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

Client - X Upgrade

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 SP2, 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 SP2 installation media:

   ```
   mkdir -p /srv/images/sle15sp2
   ```

2. Download an ISO image with the installation sources, and mount the ISO image on your server:

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

3. Copy everything from the mounted ISO to your local file system:

   ```
   cp -r /mnt/* /srv/images/sle15sp2
   ```

4. When the copy is complete, unmount the ISO image:

```
umount /mnt
```

> ℹ️ This image is the unified installer and can be used for multiple autoinstallation distributions.

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. For example, `sles15sp2-x86_64`.

   - In the `Tree Path` field, type an absolute path to the installation source. For example, `/srv/images/sle15sp2`.

   - In the `Base Channel` field, select `SLE-Product-SLES15-SP2-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 base channel to the new SLE 15 SP2 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-SP2-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]**.

Create an Autoinstallation Profile

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. For example scripts that you can use as a starting point, see **[Upgrade › Upgrade-script-example ›]**.

Procedure: Creating an Autoinstallation Profile

1. In the Uyuni Web UI, navigate to **Systems › Autoinstallation › Profiles** and upload your autoinstallation profile script. For example scripts that you can use as a starting point, see **[Upgrade › Upgrade-script-example ›]**.

2. In the `Kernel Options` field, type `autoupgrade=1`. Optionally, you can also include the `Y2DEBUG=1` option. The debug setting is not required but can help with investigating any future problems you might encounter.

3. Paste the autoinstallation profile or use the file upload field.

4. Click **[Create]** to save.

5. When the uploaded profile requires variables to be set, navigate to **Systems › Autoinstallation › Profiles**, select the profile to edit, and navigate to the `Variables` tab. Specify the required variables, using this format:

```
<key>=<value>
```

> For clients that were registered using Salt, use the `spacewalk/minion_script` snippet to register the client again after migration has completed.

Migration

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

You can monitor the mirroring progress in `/var/log/rhn/reposync/<channel-label>.log`.

Procedure: Migrating

1. In the Uyuni Server Web UI, navigate to `Systems` and select the client to be upgraded.

2. Navigate to the `Provisioning` tab, and select the autoinstallation profile you uploaded.

3. Click **[Schedule Autoinstallation and Finish]**. The system will download the required files, change the bootloader entries, reboot, and start the upgrade.

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
```

Upgrade the Database

To successfully perform a major Uyuni update, you might need to upgrade the underlying database.

If you are using PostgreSQL 9, and you are upgrading to version 10, see **[Upgrade › Db-migration-10 ›]**. If you are using PostgreSQL 10, and you are upgrading to version 12, see **[Upgrade › Db-migration-12 ›]**.

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.

Database Migration from Version 9 to 10

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.

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 from Version 10 to 12

This section covers upgrading the PostgreSQL database from version 10 to version 12. If you are already using PostgreSQL 12, you do not need to perform this migration. If you are using an older version, such as version 9.6, see **[Upgrade › Db-migration-10 ›]**.

If you want to upgrade to the latest Uyuni version, you must be using PostgreSQL version 10 or 12. You migrate to PostgreSQL version 12 after you upgraded your Uyuni Server to version 4.1.

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 10, you can upgrade to PostgreSQL 12.

If you are already using PostgreSQL version 12, 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.

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-10-to-12.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-pg10`.

The `pg-migrate-10-to-12.sh` script performs these operations:

- Stop spacewalk services

- Shut down the running database

- Check if PostgreSQL 12 is installed and install it if necessary

- Switch from PostgreSQL 10 to PostgreSQL 12 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-10-to-12.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-pg10`.

Troubleshooting

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

Not Enough Disk Space

Check the available disk space before you begin migration. We recommend locating `/var/spacewalk` 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/pqsql` 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.

Schema Upgrade Fails

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 @mcalmer mcalmer added documentation docs-squad labels 10 days ago

The 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`.

Sample Autoinstallation Script

This section contains example autoinstallation scripts.

If you use these profiles, check which variables they use. When the uploaded profile requires variables to be set, navigate to **Systems › Autoinstallation › Profiles**, select the profile to edit, and navigate to the `Variables` tab. Specify the required variables, using this format:

```
<key>=<value>
```

For all installations, the `$redhat_management_server` variable will be set automatically and does not need to be defined.

These examples use the `$distrotree` variable, which must be defined as the distribution label used with this profile. Set the variable to the same value that you selected in `Autoinstall Tree` in the `Details` tab. Example:

```
distrotree=sles_sap15sp2-x86_64
```

when the distribution label is `sles_sap15sp2-x86_64`.

Upgrading from SLES 12 SPn to SLES 15 SP2

Use this script as the basis for an upgrade from SLES 12 SPn to SLES 15 SP2. Check the official product documentation to find the supported upgrade paths.

Listing 1. Example: Script for Upgrading from SLES 12 SPn to SLES 15 SP2

```xml
<?xml version="1.0"?>
<!DOCTYPE profile>
<profile xmlns="http://www.suse.com/1.0/yast2ns"
         xmlns:config="http://www.suse.com/1.0/configns">
  <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/sle-product-sles15-sp2-
updates-x86_64/$distrotree</media_url>
        <name>SLE-Product-SLES15-SP2-Updates for x86_64</name>
        <product>SUSE Linux Enterprise Server 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-manager-tools15-pool-
x86_64-sp2/$distrotree</media_url>
```

```
        <name>SLE-Manager-Tools15-Pool for x86_64 SP2</name>
        <product>SUSE Manager Tools 15 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-manager-tools15-
updates-x86_64-sp2/$distrotree</media_url>
        <name>SLE-Manager-Tools15-Updates for x86_64 SP2</name>
        <product>SUSE Manager Tools 15 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp2-pool-x86_64/$distrotree</media_url>
        <name>SLE-Module-Basesystem15-SP2-Pool for x86_64</name>
        <product>Basesystem Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp2-updates-x86_64/$distrotree</media_url>
        <name>SLE-Module-Basesystem15-SP2-Updates for x86_64</name>
        <product>Basesystem Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp2-pool-x86_64/$distrotree</media_url>
        <name>SLE-Module-Server-Applications15-SP2-Pool for x86_64</name>
        <product>Server Applications Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp2-updates-x86_64/$distrotree</media_url>
        <name>SLE-Module-Server-Applications15-SP2-Updates for x86_64</name>
        <product>Server Applications Module 15 SP2 x86_64</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/minion_script')
<!-- when client is traditional registered, please use this snippet
      $SNIPPET('spacewalk/sles_register_script')
-->
    </init-scripts>
  </scripts>
</profile>
```

Upgrading a Uyuni Proxy from 3.2 to 4.1

Use this script as the basis for an upgrade from Uyuni Proxy 3.2 to Uyuni Proxy 4.1.

Listing 2. Example: Script for Upgrading from Uyuni Proxy 3.2 to Uyuni Proxy 4.1

```
<?xml version="1.0"?>
<!DOCTYPE profile>
<profile xmlns="http://www.suse.com/1.0/yast2ns"
xmlns:config="http://www.suse.com/1.0/configns">
  <add-on>
    <add_on_products config:type="list">
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-product-suse-manager-
proxy-4.1-updates-x86_64/$distrotree</media_url>
        <name>sle-product-suse-manager-proxy-4.1-updates-x86_64</name>
        <product>SUSE Manager Proxy 4.1</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp2-pool-x86_64-proxy-4.1/$distrotree</media_url>
        <name>sle-module-basesystem15-sp2-pool-x86_64-proxy-4.1</name>
        <product>SUSE Manager Proxy 4.1</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp2-updates-x86_64-proxy-4.1/$distrotree</media_url>
        <name>sle-module-basesystem15-sp2-updates-x86_64-proxy-4.1</name>
        <product>SUSE Manager Proxy 4.1</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp2-pool-x86_64-proxy-4.1/$distrotree</media_url>
        <name>sle-module-server-applications15-sp2-pool-x86_64-proxy-4.1</name>
        <product>SUSE Manager Proxy 4.1</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp2-updates-x86_64-proxy-4.1/$distrotree</media_url>
        <name>sle-module-server-applications15-sp2-updates-x86_64-proxy-4.1</name>
        <product>SUSE Manager Proxy 4.1</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-suse-manager-
proxy-4.1-pool-x86_64/$distrotree</media_url>
        <name>sle-module-suse-manager-proxy-4.1-pool-x86_64</name>
        <product>SUSE Manager Proxy 4.1</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-suse-manager-
proxy-4.1-updates-x86_64/$distrotree</media_url>
        <name>sle-module-suse-manager-proxy-4.1-updates-x86_64</name>
        <product>SUSE Manager Proxy 4.1</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>
      <init-scripts config:type="list">
        $SNIPPET('spacewalk/minion_script')
<!-- when client is traditional registered, please use this snippet
        $SNIPPET('spacewalk/sles_register_script')
-->
      </init-scripts>
    </scripts>
</profile>
```

Upgrading an SAP Client from SLE 12 to SLE 15 SP2

Use this script as the basis for an upgrade from SLE 12 SPn to SLE 15.1. Check the official product documentation to find the supported upgrade paths.

Listing 3. Example: Script for Upgrading an SAP Client from SLE 12 SP4 to SLE 15

```xml
<?xml version="1.0"?>
<!DOCTYPE profile>
<profile xmlns="http://www.suse.com/1.0/yast2ns"
xmlns:config="http://www.suse.com/1.0/configns">
  <add-on>
    <add_on_products config:type="list">
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-product-sles_sap15-sp2-
updates-x86_64/$distrotree</media_url>
        <name>SLE-Product-SLES_SAP15-SP2-Pool for x86_64</name>
        <product>SUSE Linux Enterprise Server for SAP Applications 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
       <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-manager-tools15-pool-
x86_64-sap-sp2/$distrotree</media_url>
        <name>SLE-Manager-Tools15-Pool for x86_64 SAP SP2</name>
        <product>SUSE Manager Tools 15 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-manager-tools15-
updates-x86_64-sap-sp2/$distrotree</media_url>
        <name>SLE-Manager-Tools15-Updates for x86_64 SAP SP2</name>
        <product>SUSE Manager Tools 15 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp2-pool-x86_64-sap/$distrotree</media_url>
        <name>SLE-Module-Basesystem15-SP2-Pool for x86_64 SAP</name>
        <product>Basesystem Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-basesystem15-
sp2-updates-x86_64-sap/$distrotree</media_url>
        <name>SLE-Module-Basesystem15-SP2-Updates for x86_64 SAP</name>
        <product>Basesystem Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-desktop-
applications15-sp2-pool-x86_64-sap/$distrotree</media_url>
        <name>SLE-Module-Desktop-Applications15-SP2-Pool for x86_64 SAP</name>
        <product>Desktop Applications Module 15 SP2 x86_64 </product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-desktop-
applications15-sp2-updates-x86_64-sap/$distrotree</media_url>
        <name>SLE-Module-Desktop-Applications15-SP2-Updates for x86_64 SAP</name>
        <product>Desktop Applications Module 15 SP2 x86_64 </product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp2-pool-x86_64-sap/$distrotree</media_url>
```

```xml
        <name>SLE-Module-Server-Applications15-SP2-Pool for x86_64 SAP</name>
        <product>Server Applications Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-server-
applications15-sp2-updates-x86_64-sap/$distrotree</media_url>
        <name>SLE-Module-Server-Applications15-SP2-Updates for x86_64 SAP</name>
        <product>Server Applications Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-product-ha15-sp2-pool-
x86_64-sap/$distrotree</media_url>
        <name>SLE-Product-HA15-SP2-Pool for x86_64 SAP</name>
        <product>SUSE Linux Enterprise High Availability Extension 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-product-ha15-sp2-
updates-x86_64-sap/$distrotree</media_url>
        <name>SLE-Product-HA15-SP2-Updates for x86_64 SAP</name>
        <product>SUSE Linux Enterprise High Availability Extension 15 SP2 x86_64 </product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-sap-
applications15-sp2-pool-x86_64/$distrotree</media_url>
        <name>SLE-Module-SAP-Applications15-SP2-Pool for x86_64</name>
        <product>SAP Applications Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-sap-
applications15-sp2-updates-x86_64/$distrotree</media_url>
        <name>SLE-Module-SAP-Applications15-SP2-Updates for x86_64</name>
        <product>SAP Applications Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-python2-15-sp2-
pool-x86_64-sap/$distrotree</media_url>
        <name>SLE-Module-Python2-15-SP2-Pool for x86_64 SAP</name>
        <product>Python 2 Module 15 SP2 x86_64</product>
        <product_dir>/</product_dir>
      </listentry>
      <listentry>
        <ask_on_error config:type="boolean">true</ask_on_error>
        <media_url>http://$redhat_management_server/ks/dist/child/sle-module-python2-15-sp2-
updates-x86_64-sap/$distrotree</media_url>
        <name>SLE-Module-Python2-15-SP2-Updates for x86_64 SAP</name>
        <product>Python 2 Module 15 SP2 x86_64 </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>
    <storage>
      <partition_alignment config:type="symbol">align_optimal</partition_alignment>
      <start_multipath config:type="boolean">false</start_multipath>
```

```
    </storage>
  </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/>
    <products config:type="list">
      <listentry>SLES_SAP</listentry>
    </products>
  </software>
  <scripts>
    <init-scripts config:type="list">
      $SNIPPET('spacewalk/minion_script')
<!-- when client is traditional registered, please use this snippet
      $SNIPPET('spacewalk/sles_register_script')
-->
    </init-scripts>
  </scripts>
</profile>
```