



SUSE Linux Enterprise Server 15 SP1

Repository Mirroring Tool Guide

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SUSE Linux Enterprise Server 15 SP1

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About This Guide

1 Overview

The Repository Mirroring Tool (RMT) for SUSE Linux Enterprise 15 SP1 allows enterprise customers to optimize the management of SUSE Linux Enterprise software updates and subscription entitlements. It establishes a proxy system for SUSE® Customer Center with repositories and registration targets. This helps you to centrally manage software updates within a firewall on a per-system basis, while maintaining your corporate security policies and regulatory compliance.

RMT allows you to provision updates for all of your devices running a product based on SUSE Linux Enterprise. By downloading these updates once and distributing them throughout the enterprise, you can set more restrictive firewall policies. This also reduces bandwidth usage, as there is no need to download the same updates for each device. RMT is fully supported and available as a download for customers with an active SUSE Linux Enterprise product subscription.

Repository Mirroring Tool provides functionality that can be useful in many situations, including the following:

- You want to update SUSE Linux Enterprise servers.
- Not all machines in your environment can be connected to SUSE Customer Center to register and retrieve updates for bandwidth or security reasons.
- There are SUSE Linux Enterprise hosts that are restricted and difficult to update without putting in place a custom update management solution.
- You need to integrate additional external or internal repositories.

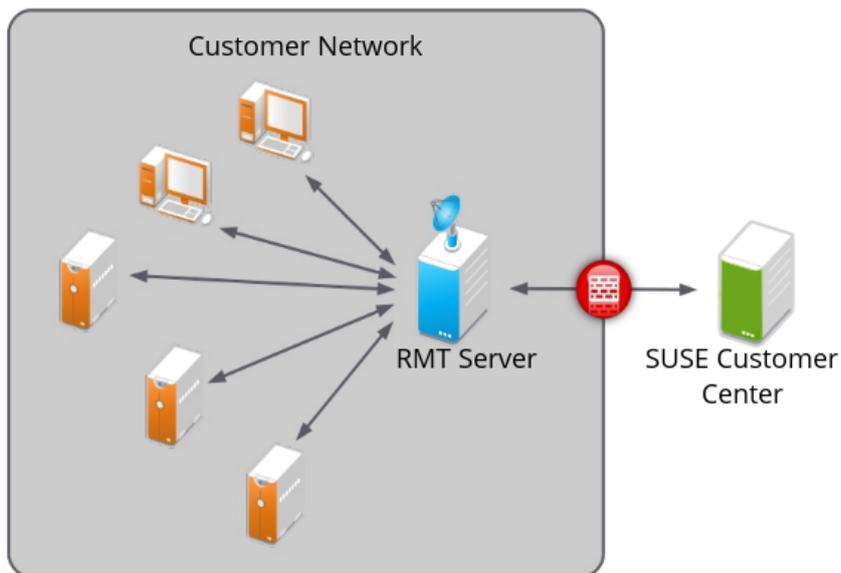


FIGURE 1: RMT

RMT replaces SMT (Subscription Management Tool) which was used for SLE 11 and SLE 12. For a feature comparison between RMT and SMT, see [Table 2.1, "Feature Comparison"](#).

2 Additional Documentation and Resources

Chapters in this manual contain links to additional documentation resources that are available either on the system or on the Internet.

For an overview of the documentation available for your product and the latest documentation updates, refer to <https://documentation.suse.com>.

3 Giving Feedback

Your feedback and contribution to this documentation is welcome! Several channels are available:

Service Requests and Support

For services and support options available for your product, refer to <https://www.suse.com/support/>.

To open a service request, you need a subscription at SUSE Customer Center. Go to <https://scc.suse.com/support/requests>, log in, and click *Create New*.

Bug Reports

Report issues with the documentation at <https://bugzilla.suse.com/>. To simplify this process, you can use the *Report Documentation Bug* links next to headlines in the HTML version of this document. These preselect the right product and category in Bugzilla and add a link to the current section. You can start typing your bug report right away. A Bugzilla account is required.

Contributions

To contribute to this documentation, use the *Edit Source* links next to headlines in the HTML version of this document. They take you to the source code on GitHub, where you can open a pull request. A GitHub account is required.

For more information about the documentation environment used for this documentation, see [the repository's README \(https://github.com/SUSE/doc-sle/blob/master/README.adoc\)](https://github.com/SUSE/doc-sle/blob/master/README.adoc).

Mail

Alternatively, you can report errors and send feedback concerning the documentation to doc-team@suse.com. Make sure to include the document title, the product version and the publication date of the documentation. Refer to the relevant section number and title (or include the URL) and provide a concise description of the problem.

4 Documentation Conventions

The following notices and typographical conventions are used in this documentation:

- /etc/passwd: directory names and file names
- PLACEHOLDER: replace PLACEHOLDER with the actual value
- PATH: the environment variable PATH
- ls, --help: commands, options, and parameters
- user: users or groups
- package name: name of a package
- **Alt**, **Alt-F1**: a key to press or a key combination; keys are shown in uppercase as on a keyboard
- *File*, *File > Save As*: menu items, buttons

- **AMD/Intel** This paragraph is only relevant for the AMD64/Intel 64 architecture. The arrows mark the beginning and the end of the text block. ◀

IBM Z, POWER This paragraph is only relevant for the architectures IBM Z and POWER. The arrows mark the beginning and the end of the text block. ◀

- *Dancing Penguins* (Chapter *Penguins*, ↑Another Manual): This is a reference to a chapter in another manual.
- Commands that must be run with root privileges. Often you can also prefix these commands with the sudo command to run them as non-privileged user.

```
root # command
tux > sudo command
```

- Commands that can be run by non-privileged users.

```
tux > command
```

- Notices



Warning: Warning Notice

Vital information you must be aware of before proceeding. Warns you about security issues, potential loss of data, damage to hardware, or physical hazards.



Important: Important Notice

Important information you should be aware of before proceeding.



Note: Note Notice

Additional information, for example about differences in software versions.



Tip: Tip Notice

Helpful information, like a guideline or a piece of practical advice.

1 RMT Installation and Configuration

RMT is included in SUSE Linux Enterprise Server starting with version 15. Install RMT directly during the installation of SUSE Linux Enterprise Server or install it on a running system. After the packages are installed, use YaST to do an initial configuration.



Warning: RMT Server Will Conflict with Installation Server

Configuring a server to be an RMT server installs and configures the NGINX Web server, listening on port 80.

However, configuring a machine to be an installation server automatically installs the Apache Web server and configures it to listen on port 80.

Do not try to enable both these functions on the same server. It is not possible for a single server to host both simultaneously.

1.1 Installation During System Installation

To install it during installation, select the `rmt-server` package. The package selection is available in the *Installation Settings* step of the installation when selecting *Software*.

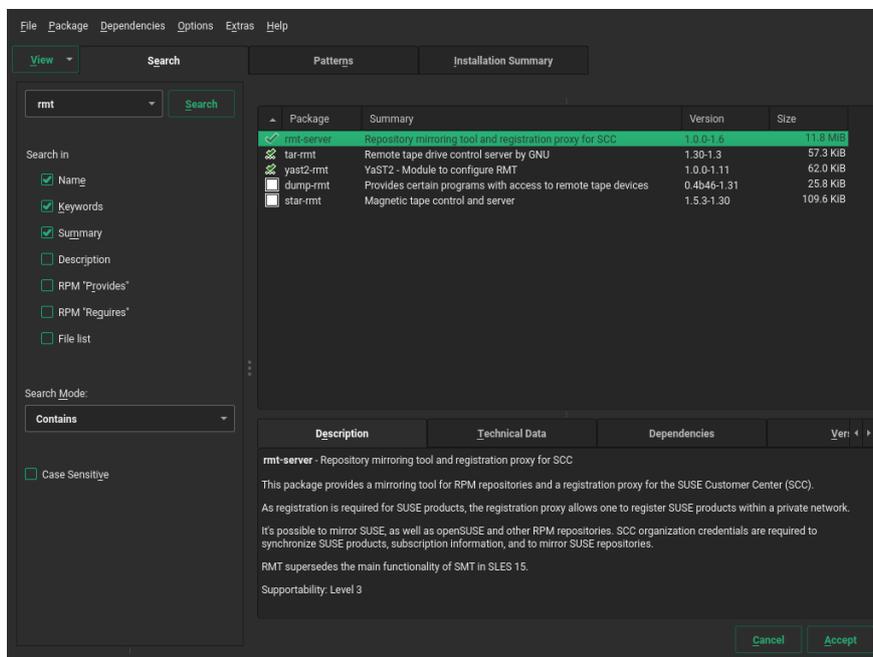


FIGURE 1.1: RMT PATTERN

We recommend to check for available RMT updates immediately after installing SUSE Linux Enterprise Server using the `zypper patch` command. SUSE continuously releases maintenance updates for RMT, and newer packages are likely to be available.

1.2 Installation on Existing System

To install RMT on a running SUSE Linux Enterprise Server installation, use `zypper`:

```
tux > sudo zypper in rmt-server
```

1.3 RMT Configuration with YaST

Configure RMT with YaST as described in the following procedure. It is assumed that this procedure is executed on a newly installed system.

1. Start YaST with the `rmt` module.

```
tux > sudo yast2 rmt
```

Alternatively, start YaST and select *Network Services > RMT Configuration*.

2. Enter your organization credentials. To retrieve your credentials, refer to [Section 3.1, "Mirroring Credentials"](#).
3. Enter credentials for a new MariaDB user and database name. This user will then be created. Then select *Next*.
If a password for the MariaDB `root` user is already set, you are required to enter it. If no password is set for `root`, you are asked to enter a new one.
4. Enter a common name for the SSL certificates. The common name should usually be the *fully qualified domain name (FQDN)* of the server. Enter all domain names and IP addresses with which you want to reach the RMT server as alternative common names.
When all common names are entered, select *Next*.
5. If `firewalld` is enabled on this system, enable the checkbox to open the required ports.

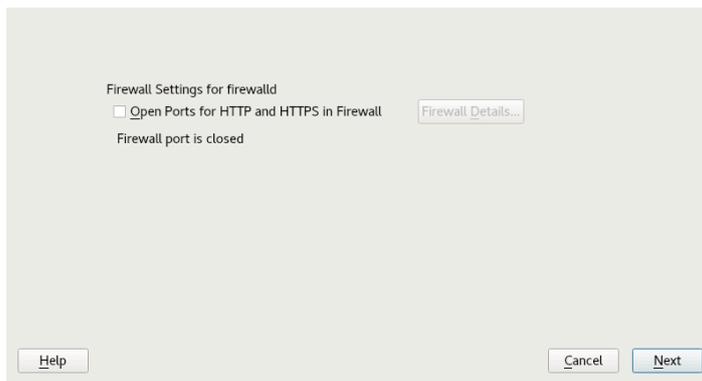


FIGURE 1.2: ENABLING PORTS IN `firewalld`

If `firewalld` is not enabled now and you plan to enable it later, you can always open relevant ports by running the `yast2 rmt` module.



Tip: Fine-tuning `firewalld` Settings

By clicking *Firewall Details*, you can open the relevant ports for specific network interfaces only.

Continue with *Next*.

6. To view the summary, click *Next*. Close YaST by clicking *Finish*. YaST then enables and starts all `systemd` services and timers.

1.4 Enabling SLP Announcements

RMT includes the SLP service description file `/etc/slp.reg.d/rmt-server.reg`. To enable SLP announcements of the RMT service, follow these steps:

1. If `firewalld` is running, open relevant ports and reload the `firewalld` configuration:

```
tux > sudo firewall-cmd --permanent --add-port=427/tcp
success
tux > sudo firewall-cmd --permanent --add-port=427/udp
success
tux > sudo firewall-cmd --reload
```

2. Verify that SLP server is installed and possibly install it:

```
tux > sudo zypper install openslp-server
```

3. Enable and start the SLP service:

```
tux > sudo systemctl enable slpd.service  
tux > sudo systemctl restart slpd.service
```

2 Migrate from SMT to RMT

This chapter describes the migration from SMT on SLES 11 or 12 to RMT on SLES 15.

2.1 Important Notes



Warning: Read This Section Carefully

Carefully read this section. It contains vital information about the migration process.

Use New Host

We recommend that you install RMT on a newly-installed SLES 15 host. RMT is not a complete replacement for SMT. It has a different workflow than SMT and only supports registering SUSE Linux Enterprise Server 12 systems and newer.

Repository Metadata and Settings

The settings of staged repositories will *not* be exported from SMT. Repositories that have been marked to be mirrored will be exported.

Custom Repositories

It's only possible to export repositories that are marked for mirroring.

Expired Subscriptions

Products no longer available on the organization subscriptions will not be available on RMT.

Client Information

Systems and their activated products will be exported. SMT client jobs and patch status will not be exported from SMT.

TABLE 2.1: FEATURE COMPARISON

Feature	SMT	RMT
Available on SLES 11	yes	no
Available on SLES 12	yes	no
Available on SLES 15	no	yes

Feature	SMT	RMT
Synchronize products with SUSE Customer Center	yes	yes
Mirror RPMs from repositories	yes	yes
Selective mirroring (specifying products to mirror)	yes	yes
Serve RPMs via HTTP	yes	yes
Registration of SLE 15 systems	yes	yes
Registration of SLE 12 systems	yes	yes
Registration of SLE 11 systems	yes	no
Support for migrating SLE 12 to 15	yes ¹	yes
Support for migrating SLE 15 SPx to 15 SPx + 1	yes ¹	yes
Staging repositories	yes	no ²
Offline mirroring	yes	yes
NTLM Proxy support	yes	yes
Custom repositories	yes	yes
YaST installation wizard	yes	yes
YaST management wizard	yes	no
Client management	yes	no
Red Hat 7 and earlier support (Expanded Support (https://www.suse.com/products/expandedsupport/))	yes	no

Feature	SMT	RMT
Red Hat 8 support (Expanded Support (https://www.suse.com/products/expandedsupport/))	yes	yes
Files deduplication	yes	yes
Data transfer from SMT to RMT	n/a	yes
Transfer registration data to SUSE Customer Center	yes	no
Reporting	yes	no
Custom TLS certificates for Web server	yes	yes
Clean up data from repositories that are not used any longer	yes	yes
Bash completion	no	yes
Available on openSUSE Leap 15 (https://github.com/SUSE/rmt/blob/master/docs/installation.md#installation-on-opensuse-leap-15)	no	yes ³
Option to run as container (https://github.com/SUSE/rmt/blob/master/README.md#development-setup---docker-compose)	no	yes ³
Easy development setup + contribution guide (https://github.com/SUSE/rmt/blob/master/docs/CONTRIBUTING.md)	no	yes

Feature	SMT	RMT
100% test coverage (https://coveralls.io/github/SUSE/rmt?branch=master) ↗	no	yes
Plugin functionality (https://github.com/SUSE/rmt/blob/master/docs/PLUGINS.md) ↗	no	yes
Web server	Apache2	Nginx
Platform	Perl	Ruby

1) SMT only partially supports migrating systems to SLE 15. SLE 15 is composed of multiple modules and extensions. Some modules are not required, as they provide additional functionality. RMT fully supports migrations into and within SLE 15, therefore it will only add the minimum of required modules. SMT does not fully support these migrations, and it will enable all available modules on the system.

2) Functionality is offered by [SUSE Manager](https://documentation.suse.com/suma/) ↗.

3) Only available with [self-support](https://www.suse.com/support/self-support/) ↗.

2.2 Exporting SMT Data

PROCEDURE 2.1: EXPORT SMT DATA

1. Update your SMT server installation by running `zypper up`.
2. If you want to export your SSL certificates along with the rest of the data, run `smt-data-export`. Remember to keep your certificates in a safe place.
If you do not want to export the SSL certificates from SMT, run `smt-data-export --no-ssl-export`.
3. The exported configuration is now saved to `smt-data-export.TIMESTAMP.tar.gz`. Copy the file to a location that can be accessed by the new RMT server.

2.3 Importing SMT Data to RMT

1. To make sure your RMT installation is up to date, run `zypper up`.
2. Copy the exported `.tar.gz` file to an empty directory and unpack it. Then enter the new directory:

```
tux > mkdir EMPTY_DIR
tux > cd EMPTY_DIR
tux > tar xf /PATH/TO/smt-data-export.TIMESTAMP.tar.gz
tux > cd smt-data-export
```

3. If you chose to export the SSL certificates from SMT, copy the CA private key and certificate to `/etc/rmt/ssl/`:

```
tux > sudo cp ssl/cacert.key /etc/rmt/ssl/rmt-ca.key
tux > sudo cp ssl/cacert.pem /etc/rmt/ssl/rmt-ca.crt
```

4. Run the YaST RMT configuration module as described in [Section 1.3, "RMT Configuration with YaST"](#). If you imported the SMT CA certificate, add the domain of the SMT server to the common names of the new SSL certificate.
5. Run the RMT synchronization to get the products and repositories data from SUSE Customer Center.

```
tux > sudo rmt-cli sync
```

6. Import the data from the SMT server.

```
tux > sudo rmt-data-import -d ./
```

7. Optional: If the URL of the RMT server changed, change the URL parameter of clients in `/etc/SUSEConnect` to point to the new RMT server. Alternatively, change the DNS records to re-assign the host name to the RMT server.
8. Optional: Move the mirrored repository data from SMT to RMT, and adjust the ownership of the copied data.

```
tux > sudo cp -r /var/www/htdocs/repo/* /usr/share/rmt/public/repo/
tux > sudo chown -R _rmt:nginx /usr/share/rmt/public/repo
```



Tip

The path for storing custom repositories' data on the RMT server is different from that of SMT. With RMT, it replicates the directory structure of the source server's URL into a top level directory. For example, if the URL of the custom repository is

```
http://download.opensuse.org/debug/distribution/leap/15.1/repo/oss
```

its path on the RMT server will be

```
/usr/share/rmt/public/repo/debug/distribution/leap/15.1/repo/oss
```

9. Custom repositories on the SMT server are disabled by default. If you want to mirror them to the RMT enable them before mirroring.

- a. Check for custom repositories by running:

```
tux > sudo rmt-cli repos custom list
```

A table of all custom repositories will be shown. the first column contains the ID of each repository and the Mirror? column will show false.

- b. Enable each custom repository you would like to mirror by running:

```
tux > sudo rmt-cli repos custom enable ID
```

10. Update the packages in the repositories by starting the mirroring process:

```
tux > sudo rmt-cli mirror
```

3 Mirroring Repositories on the RMT Server

You can mirror the installation and update repositories on the RMT server. This way, you do not need to download updates on each machine, which saves time and bandwidth.

In its default configuration, RMT mirrors enabled product repositories automatically once every night.

By default, the mirrored repositories are stored in `/var/lib/rmt/public/repo`.

When enabled repositories are fully mirrored, you can register your client systems against RMT by running `SUSEConnect --url https://RMT_HOSTNAME` on the client machine. After successful registration, the repositories from the RMT server will be used by zypper on the client machine.



Important: SUSE Linux Enterprise Server 11 Clients

RMT does not support clients with SUSE Linux Enterprise Server versions 11 and below.

3.1 Mirroring Credentials

Before you create a local mirror of the SUSE Linux Enterprise repositories, you need appropriate organization credentials. You can obtain the credentials from SUSE Customer Center.

To get the credentials from SUSE Customer Center, follow these steps:

1. Visit SUSE Customer Center at <http://scc.suse.com> and log in.
2. If you are a member of multiple organizations, select the organization you want to work with from the sidebar on the left.
3. Select *Proxies* in the top menu.
4. The credentials are displayed in the top right corner.
5. To see the password, click the  icon.

The obtained credentials should be set with the YaST RMT Server Configuration module or added directly to the `/etc/rmt.conf` file. For more information about the `/etc/rmt.conf` file, see [Section 5.3.1, "/code>/etc/rmt.conf".](#)

3.2 Synchronizing Repository Metadata

The local RMT database needs to be updated periodically with the information downloaded from SUSE Customer Center. This includes information about available products and repositories.

The synchronization is done with the `systemd` timer `rmt-server-sync.timer`. To view the status, for example the next running time, use `systemctl status`:

```
root # systemctl status rmt-server-sync.timer
● rmt-server-sync.timer - RMT Sync timer
   Loaded: loaded (/usr/lib/systemd/system/rmt-server-sync.timer; enabled; vendor preset: disabled)
   Active: active (waiting) since Fri 2018-06-22 04:22:34 EDT; 2h 34min ago
   Trigger: Sat 2018-06-23 03:53:00 EDT; 20h left

Jun 22 04:22:34 d31 systemd[1]: Started RMT Sync timer.
```

To update the RMT database manually, use the `rmt-cli sync` command. For details, see [Section 5.1.2, “sync”](#).

3.3 Mirroring Packages

Packages for enabled repositories are mirrored on your RMT server. Packages are downloaded periodically once a day. But the download can also be triggered manually at any time.

The periodic mirroring is done by the `systemd` timer `rmt-server-mirror.timer`. To show the status, for example the next running time, use `systemctl status`:

```
root # systemctl status rmt-server-mirror.timer
● rmt-server-mirror.timer - RMT Mirror timer
   Loaded: loaded (/usr/lib/systemd/system/rmt-server-mirror.timer; enabled; vendor preset: disabled)
   Active: active (waiting) since Fri 2018-06-22 04:22:34 EDT; 2h 34min ago
   Trigger: Sat 2018-06-23 02:17:57 EDT; 19h left

Jun 22 04:22:34 d31 systemd[1]: Started RMT Mirror timer.
```

To update the mirrored packages manually, use the `rmt-cli mirror` command. For details, see [Section 5.1.6, “mirror”](#).

3.4 Enabling and Disabling Mirroring of Repositories

Mirroring of repositories can be enabled or disabled individually or by stating a product. You can specify one or more repositories or products at once. When repositories are enabled, their packages are downloaded and updated during the mirroring process. To enable or disable mirroring of repositories, you either need the product string or ID, or the repository name or ID. In general, enabling or disabling a product is desired, because this automatically enables or disables all repositories associated with the product.

3.4.1 Using Products

To enable or disable all repositories of a product, use the `rmt-cli products enable ID` and `rmt-cli product disable ID` commands. To retrieve an ID for a disabled but available product, use the `rmt-cli products list --all` command. To retrieve an ID for an enabled product, use the `rmt-cli product list` command.

Example:

```
tux > sudo rmt-cli products list --all
+-----+-----+-----+-----+-----+-----+
| ID   | Product                               | Version | Arch  | Mirror? | Last mirrored |
+-----+-----+-----+-----+-----+-----+
[... ]
| 1743 | SUSE Package Hub                     | 15      | x86_64 | Don't Mirror |               |
|     | PackageHub/15/x86_64                 |         |        |             |               |
[... ]

tux > sudo rmt-cli products enable 1743
Found product by target 1743: SUSE Package Hub 15 x86_64.
Enabling SUSE Package Hub 15 x86_64:
  SUSE Package Hub 15 x86_64:
    Enabled repository SLE-Module-Packagehub-Subpackages15-Pool.
    Enabled repository SLE-Module-Packagehub-Subpackages15-Updates.
    Enabled repository SUSE-PackageHub-15-Pool.
    Enabled repository SUSE-PackageHub-15-Standard-Pool..

tux > sudo rmt-cli products disable 1743
Found product by target 1743: SUSE Package Hub 15 x86_64.
Disabling SUSE Package Hub 15 x86_64:
  SUSE Package Hub 15 x86_64:
    Disabled repository SLE-Module-Packagehub-Subpackages15-Pool.
    Disabled repository SLE-Module-Packagehub-Subpackages15-Updates.
    Disabled repository SUSE-PackageHub-15-Pool.
```

Disabled repository SUSE-PackageHub-15-Standard-Pool.

To clean up downloaded files, run 'rmt-cli repos clean'



Tip: Enabling and Disabling Multiple Products at Once

To enable or disable multiple products at once, specify a space delimited list of their IDs or product strings, for example:

```
tux > sudo rmt-cli products enable 1743 SLES/15/x86_64 SLES/12
Found product by target 1743: SUSE Package Hub 15 x86_64.
Enabling SUSE Package Hub 15 x86_64:
  SUSE Package Hub 15 x86_64:
    Enabled repository SLE-Module-Packagehub-Subpackages15-Pool.
    Enabled repository SLE-Module-Packagehub-Subpackages15-Updates.
    Enabled repository SUSE-PackageHub-15-Pool.
    Enabled repository SUSE-PackageHub-15-Standard-Pool.
Found product by target SLES/15/x86_64: SUSE Linux Enterprise Server 15 x86_64.
Enabling SUSE Linux Enterprise Server 15 x86_64:
  SUSE Linux Enterprise Server 15 x86_64:
    Enabled repository SLE-Product-SLES15-Pool.
    Enabled repository SLE-Product-SLES15-Updates.
    Enabled repository SLE15-Installer-Updates.
  Basesystem Module 15 x86_64:
    Enabled repository SLE-Module-Basesystem15-Pool.
    Enabled repository SLE-Module-Basesystem15-Updates.
  Server Applications Module 15 x86_64:
    Enabled repository SLE-Module-Server-Applications15-Pool.
    Enabled repository SLE-Module-Server-Applications15-Updates.
Found product by target SLES/12: SUSE Linux Enterprise Server 12 x86_64.
Enabling SUSE Linux Enterprise Server 12 x86_64:
  SUSE Linux Enterprise Server 12 x86_64:
    Enabled repository SLES12-Pool.
    Enabled repository SLES12-Updates.
```

3.4.2 Using Repositories

To enable or disable mirroring of specific repositories, use the `rmt-cli repos enable ID` and `rmt-cli repos disable ID` commands. To retrieve an ID for a disabled but available repository, use the `rmt-cli repos list --all` command. To retrieve an ID for an enabled repository, use the `rmt-cli repos list` command.

Example:

```
tux > sudo rmt-cli repos list --all
+-----+-----+-----+
| ID      | Name                               | Description                               |
+-----+-----+-----+
[...]  
| 3061    | SUSE-PackageHub-15-Pool           | SUSE-PackageHub-15-Pool for sle-15-x86_64 |
[...]  
+-----+-----+-----+
```

```
tux > sudo rmt-cli repos enable 3061
Repository by ID 3061 successfully enabled.
```

```
tux > sudo rmt-cli repos disable 3061
Repository by ID 3061 successfully disabled.
```

To clean up downloaded files, please run 'rmt-cli repos clean'



Tip: Enabling and Disabling Multiple Repositories at Once

To enable or disable multiple repositories at once, specify a space delimited list of their IDs, for example:

```
tux > sudo rmt-cli repos enable 2526 3263
Repository by ID 2526 successfully enabled.
Repository by ID 3263 successfully enabled.
```

```
tux > sudo rmt-cli repos disable 2526 3263
Repository by ID 2526 successfully disabled.
Repository by ID 3263 successfully disabled.
```

To clean up downloaded files, please run 'rmt-cli repos clean'

3.5 Deleting Mirrored Data

After you disable the mirroring of a repository or product as described in [Section 3.4, “Enabling and Disabling Mirroring of Repositories”](#), the mirrored data still remains on your local hard disk. This includes the mirrored RPM packages.

To delete disabled repository's data, use the command `rmt-cli repos clean`. With this command, RMT verifies that only enabled repositories are mirrored and provides a way to delete invalid data.

Before removing any data, the command lists the affected repositories and requires the user to input "yes" to continue.

```
tux > sudo rmt-cli repos clean
RMT found locally mirrored files from the following repositories which are not marked to
be mirrored:

SLE-Product-SLES15-Updates for sle-15-x86_64
SLE-Product-SLES15-Pool for sle-15-x86_64
SLE15-Installer-Updates for sle-15-x86_64

Would you like to continue and remove the locally mirrored files of these repositories?
Only 'yes' will be accepted.

Enter a value: yes

Deleted locally mirrored files from repository 'SLE-Product-SLES15-Updates for sle-15-
x86_64'.
Deleted locally mirrored files from repository 'SLE-Product-SLES15-Pool for sle-15-
x86_64'.
Deleted locally mirrored files from repository 'SLE15-Installer-Updates for sle-15-
x86_64'.

Clean finished. An estimated 157 MB were removed.
```



Tip: Manually Remove Repository Data

To delete disabled repository data, manually remove its corresponding directory:

```
tux > sudo rm -r /usr/share/rmt/public/repo/SUSE/
Products/PRODUCT/VERSION/ARCHITECTURE/
```

3.6 Adding Custom Repositories

You can mirror custom repositories with the RMT server. These repositories are not provided by the SUSE Customer Center. Repositories can be provided by, for example, the Open Build Service, third-party vendors, or created with [createrepo](#).

Custom repositories can either be standalone, or you can attach them to products. This allows you to connect multiple repositories with one command on a client registered to the RMT server. The following example procedure illustrates the mirroring of a third-party repository.

1. Add the remote repository to the RMT server. Replace URL with the URL to the repository. Replace NAME with a name of your choice for the repository.

```
root # rmt-cli repos custom add URL NAME
```

2. List all custom repositories to get the ID of the new repository.

```
root # rmt-cli repos custom list
```

3. Optionally attach the new custom repository to a product. For example, if the new custom repository is required by all desktop clients, it can be attached to the SUSE Linux Enterprise Desktop product.

```
root # rmt-cli repos custom attach REPOSITORY_ID PRODUCT_ID
```

Replace REPOSITORY_ID with the ID of the new custom repository. Replace PRODUCT_ID with the ID of a product you want the repository to be attached to. If you need to retrieve the PRODUCT_ID, use the command `rmt-cli products list --all`.

Important

When custom repositories are attached to a product, clients registering to that product will have such repository added in a disabled state. To enable the repository, find its ID with the command `zypper lr` and run:

```
root # zypper mr -e REPO_ID
```

4. Enable mirroring of the new custom repository.

```
root # rmt-cli repos custom enable REPOSITORY_ID
```

To get a list of all available custom repositories commands, see [Section 5.1.4, “repos”](#).

3.7 Exporting and Importing Repositories

RMT has built-in functions to import and export data about available repositories and the mirrored packages. For example, this can be used to speed up the setup of a new RMT server by locally copying already mirrored RPM packages.

Another use case is the *offline mode*. It allows the transfer of data to a disconnected RMT server, for example to provide updates to computers in an air-gapped network.

The following procedure describes the transfer of data and mirrored RPMs between two RMT servers with a USB drive. The server sun is connected to the SUSE Customer Center, while sirius is a server in an air-gapped network.

1. Log in on the server sun.

```
root@sun # rmt-cli sync
root@sun # rmt-cli mirror
```

2. Connect a USB drive, assumed to be /dev/sdb and mount it, for example in /mnt/external.

```
root@sun # mount /dev/sdb1 /mnt/external
```

3.
 - a. Export the data about available repositories and products.

```
root@sun # rmt-cli export data /mnt/external/
```

- b. Export the list of enabled repositories. The exported file is required for exporting the repositories in the next step.

```
root@sun # rmt-cli export settings /mnt/external/
```

- c. Export mirrored RPM packages. Depending on the size of mirrored repositories, this can take a long time.

```
root@sun # rmt-cli export repos /mnt/external/
```

4. Unmount and unplug the disk from sun and go to sirius.

```
root@sun # umount /mnt/external
```

5. Connect the USB drive to sirius and mount it in /mnt/external.

```
root@sirius # mount /dev/sdb1 /mnt/external
```

6. a. Import the meta data about available repositories and products.

```
root@sirius # rmt-cli import data /mnt/external/
```

- b. Import mirrored RPM packages. Depending on the size of mirrored repositories, this can take a long time.

```
root@sirius # rmt-cli import repos /mnt/external/
```

7. Enable repositories as required on the sirius. For details, see [Section 3.4, "Enabling and Disabling Mirroring of Repositories"](#).



Note: Exporting Enabled Settings from Air-Gapped Server

If your air-gapped server (sirius) has many enabled repositories, or if the enabled repositories change frequently, we recommend to export the repository settings from this server.

The server connected to the SUSE Customer Center (sun) can then import the exported settings. This ensures that sun downloads all data required by sirius.

4 Configuring Clients to Use RMT

Any machine running SUSE Linux Enterprise 12 or newer can be configured to register against RMT and download software updates from there, instead of communicating directly with the SUSE Customer Center.



Tip: Register with RMT Server over HTTP

Although we recommend registering with the RMT server over a secured HTTPS protocol and all examples in this documentation use it, you can generally register with the RMT server over an insecure HTTP protocol. Use this approach only if your setup benefits from it **and** only in a trusted environment where security is not crucial.

To configure clients to use the RMT server, use one of the following methods:

- Provide the required information with boot parameters. See [Section 4.1, “Configuring Clients with Boot Parameters”](#).
- Configure the clients using an AutoYaST profile. See [Section 4.2, “Configuring Clients with AutoYaST Profile”](#).
- Use the `rmt-client-setup` command. See [Section 4.3, “Configuring Clients with rmt-client-setup”](#).
- Use the YaST registration module during installation or later. See [Section 4.4, “Configuring Clients with YaST”](#).



Tip: CA Certificate

If you need the CA certificate of the RMT server, find it at `/etc/rmt/ssl/rmt-ca.crt` and https://RMT_SERVER/rmt.crt.

4.1 Configuring Clients with Boot Parameters

Any client can be configured to use RMT by providing the `regurl` parameter during machine boot.

The parameter needs to be entered as `regurl=RMT_SERVER_URL`. The URL needs to be in the following format: `https://FQDN` with `FQDN` being the fully qualified host name of the RMT server. It must be identical to the FQDN of the server certificate used on the RMT server. Example:

```
regurl=https://rmt.example.com
```



Warning: Beware of Typing Errors

Make sure the values you enter are correct. If `regurl` has not been specified correctly, the registration of the update source will fail.



Note: Change of RMT Server Certificate

If the RMT server gets a new certificate from an untrusted CA, the clients need to retrieve the new CA certificate file. YaST displays a dialog for importing a new certificate. If you confirm importing the new certificate, the old one is replaced with the new one.

4.2 Configuring Clients with AutoYaST Profile

Clients can be configured to register with RMT server via AutoYaST profile. For general information about creating AutoYaST profiles and preparing automatic installation, refer to the *AutoYaST Guide*. In this section, only RMT specific configuration is described.

To configure RMT specific data using AutoYaST, follow the steps for the relevant version of RMT client.

1. As `root`, start YaST and select *Miscellaneous > Autoinstallation* to start the graphical AutoYaST front-end.
From a command line, you can start the graphical AutoYaST front-end with the `yast2 autoyast` command.
2. Open an existing profile using *File > Open*, create a profile based on the current system's configuration using *Tools > Create Reference Profile*, or work with an empty profile.
3. Select *Software > Product Registration*. An overview of the current configuration is shown.
4. Click *Edit*.

5. Check *Register the Product*, set the URL of the RMT server in *Use Specific Server URL Instead of the Default*, and you can set the *Optional SSL Server Certificate URL*. The possible values for the server URL are the same as for the kernel parameter `regurl`. For the SSL certificate location, you can use either HTTP or HTTPS based URLs.
6. Perform all other configuration needed for the systems to be deployed, then click *Finish* to return to the main screen.
7. Select *File > Save As* and enter a file name for the profile, such as `autoinst.xml`.

4.3 Configuring Clients with `rmt-client-setup`

The `/usr/share/rmt/public/tools/rmt-client-setup` script is provided in the package `rmt-server`. This script allows you to configure a client machine to use an RMT server. It can also be used to reconfigure an existing client to use a different RMT server.

To configure a client machine to use RMT with `rmt-client-setup`, follow these steps:

1. Download `rmt-client-setup` from the RMT server:

```
root # curl http://RMT_SERVER/tools/rmt-client-setup --output rmt-client-setup
```

2. Run the script with the URL of the RMT server as parameter.

```
root # sh rmt-client-setup https://RMT_SERVER/
```

Executing this script will import the RMT CA's certificate into the trusted store.

Alternatively, you can specify the correct fingerprint or path to the server certificate. For details, see `sh rmt-client-setup --help`.

3. The script downloads the server's CA certificate. Accept it by pressing `Y`. The tool now performs all necessary modifications on the client.
4. Use `SUSEConnect` to add more products. For details, run `SUSEConnect --help`.

4.4 Configuring Clients with YaST

To configure a client to perform the registration against an RMT server use the YaST *Product Registration* module `yast2 registration`.

On the client, the credentials are not necessary and you may leave the relevant fields empty. Click *Local Registration Server* and enter its URL. Then click *Next* until the exit from the module.

4.5 Configuring Clients for Custom Stand-alone Repositories

If you created a custom stand-alone repository on the RMT server, it will not be registered on client machines with **SUSEConnect** because it has no parent product.

To add the repository manually, follow these steps:

1. Point your Web browser to the following RMT server URL:

```
https://RMT_SERVER_HOSTNAME/repo/
```

2. Navigate the browser through the directory structure to your custom repository's `repdata/` subdirectory.
3. On the client machine, add the discovered repository URL:

```
tux > sudo zypper ar CUSTOM_REPO_URL CUSTOM_REPO_NAME
```

4.6 Listing Accessible Repositories

To list available modules and repositories, use **SUSEConnect --list-extensions**. Alternatively, you can also browse the directory listing of the RMT server by visiting `https://RMT_SERVER/repo/` and its subdirectories.

4.7 Online Migration of SUSE Linux Enterprise Clients

SUSE Linux Enterprise clients registered against RMT can be migrated online to the latest service pack of the same major release the same way as clients registered against SUSE Customer Center. Before starting the migration, make sure that RMT has the required products available and mirrored.

For detailed information on the online migration, see *Book "Upgrade Guide", Chapter 1 "Upgrade Paths and Methods"*.

5 RMT Tools and Configuration Files

This chapter describes the most important scripts, configuration files and certificates shipped with RMT.

The `rmt-cli` command and its sub-commands are used to manage the mirroring of repositories, registration of clients, and reporting. `systemd` is used for starting, stopping, restarting the RMT service and for checking its status.

The basic configuration for RMT is stored in the `/etc/rmt.conf`.

5.1 RMT Command Line Interface

5.1.1 `rmt-cli` Overview

The key command to manage the RMT is `rmt-cli` (`/usr/bin/rmt-cli`). The `rmt-cli` command should be used together with the sub-commands described in this section. If the `rmt-cli` command is used alone, it prints a list of all available sub-commands. To get help for individual sub-commands, use `man rmt-cli` or `rmt-cli help [subcommand]`.

The following sub-commands are available:

`rmt-cli sync`

Synchronize database with SUSE Customer Center.

`rmt-cli products`

List and modify products.

`rmt-cli repos`

List and modify repositories.

`rmt-cli mirror`

Mirror repositories.

`rmt-cli systems`

List and modify systems.

`rmt-cli import`

Import commands for the offline mode.

`rmt-cli export`

Export commands for the offline mode.

rmt-cli version

Show RMT version.

The following sections explain each sub-command in detail.

5.1.2 sync

This command triggers synchronization with the SUSE Customer Center instantly. The command has no further options. Synchronization is also triggered each night by the `systemd` timer `rmt-server-sync.timer`.

During synchronization, no data is uploaded to the SUSE Customer Center. This command for example updates local product definitions and repository data.

5.1.3 products

List and modify products.

rmt-cli products list [--all] [--csv]

Lists the products that are enabled for mirroring. Use the `--all` flag to list all available products. Use the `--csv` flag to output the list in CSV format. `ls` can be used as a shortcut for `list`.

rmt-cli products enable [id | string] [--all-modules]

Enables mandatory repositories of a product by its ID or product string. The `--all-modules` flag enables all modules of a product instead of only the recommended ones.

rmt-cli products disable [id | string]

Disables all repositories of a product by its ID or product string.

5.1.4 repos

rmt-cli repos list [--all] [--csv]

Lists the repositories that are enabled for mirroring. Use the `--all` flag to list all available repositories. Use the `--csv` flag to output the list in CSV format. `ls` can be used as a shortcut for `list`.

rmt-cli repos enable [id]

Enables mirroring of a single repository by its ID.

rmt-cli repos disable [id]

Disables mirroring of a single repository by its ID.

rmt-cli repos clean

This command removes locally mirrored files of repositories which are not marked to be mirrored.

5.1.5 repos custom

rmt-cli repos custom list [--csv]

Lists all your custom repositories. Use the `--csv` flag to output the list in CSV format. `ls` can be used as a shortcut for `list`.

rmt-cli repos custom add [url] [name] [--id]

Adds a new custom repository. Use the `--id` flag to specify a custom alphanumeric ID.

rmt-cli repos custom enable [id]

Enables mirroring of a custom repository.

rmt-cli repos custom disable [id]

Disables mirroring of a custom repository.

rmt-cli repos custom remove [id]

Removes a custom repository.

rmt-cli repos custom products [id]

Lists the products attached to the custom repository with the given ID.

rmt-cli repos custom attach [id] [product id]

Attaches an existing custom repository to a product.

rmt-cli repos custom detach [id] [product id]

Detaches an existing custom repository from a product.

5.1.6 mirror

rmt-cli mirror

This command starts the mirroring process manually.

rmt-cli mirror all

This command mirrors all enabled repositories.

rmt-cli mirror repositories [IDs]

This command mirrors enabled repositories by a list of IDs.

rmt-cli mirror products [IDs]

This command mirrors enabled repositories for a product by a list of IDs.

5.1.7 systems

rmt-cli systems list

This command lists registered systems.

rmt-cli systems scc-sync

This command forwards registered systems data to SCC.

rmt-cli systems remove [TARGET]

This command removes a system from RMT as identified by the *Login* column of the output of the **rmt-cli systems list** command.

5.1.8 import

This command is required for the *offline mode*. For details, see [Section 3.7, “Exporting and Importing Repositories”](#).

rmt-cli import data [path]

Run this on the offline RMT to read the JSON files from the given path and fill the local database with data.

rmt-cli import repos [path]

Run this on the offline RMT to import RPM packages.

5.1.9 export

This command is required for the *offline mode*. For details, see [Section 3.7, “Exporting and Importing Repositories”](#).

rmt-cli export data [path]

Run this on an online RMT to get the latest data from SUSE Customer Center and save it as JSON files at the specified path.

rmt-cli export settings [path]

Run this on the offline RMT to save the settings for enabled repositories at a given path as repos.json.

rmt-cli export repos [path]

Run this regularly on the online RMT to mirror the set of repositories specified in the repos.json at the given path. The mirrored repository files will be stored in subdirectories of the same path.

5.1.10 **version**

Display the version of rmt-cli.

5.2 RMT systemd Commands

You can manage RMT-related services with the standard systemd commands. The RMT server has the following services and timers:

rmt-server.target

A systemd target that starts all required RMT components.

rmt-server.service

The RMT server.

rmt-server-migration.service

This service migrates the database to the newest schema, if required. There is no need to manually interact with this service.

rmt-server-sync.timer

This timer is responsible for periodically synchronizing all repository product data from the SUSE Customer Center.

rmt-server-mirror.timer

This timer is responsible for periodically synchronizing all RPMs from the SUSE Customer Center.

Use `systemctl` to control the RMT services and timers.

5.3 RMT Configuration Files

The main RMT configuration file is `/etc/rmt.conf`. You can set most of the options with the YaST RMT Server module.

5.3.1 `/etc/rmt.conf`

The only supported way of doing the initial configuration is with `yast2 rmt` as described in [Section 1.3, "RMT Configuration with YaST"](#). Only the proxy configuration has to be entered manually. The other configuration parameters are documented for reference.

All available configuration options can be found in the `/etc/rmt.conf` file.

5.3.1.1 Mirroring settings

The `mirroring` section lets you adjust mirroring behavior.

`mirror_src`

Decides whether to mirror source RPM packages (architecture is `src`).

`dedup_method`

Creates hard links during mirroring when set to `hardlink`. If the file system does not support hard links, it can be set to `copy` instead. Possible values: `hardlink`, `copy`.

5.3.1.2 HTTP Client Settings

The `http_client` section defines the global HTTP connection settings of RMT.

`verbose`

Enables additional debug output to the `systemd` journal.

`proxy`

The proxy server URL.

`proxy_auth`

This setting determines the proxy authentication mechanism. Possible values are: none, basic, digest, gssnegotiate, ntlm, digest_ie, ntlm_wb.

proxy_user

The proxy server user name.

proxy_password

The proxy server password.

low_speed_limit

Lower speed limit when a download should be aborted in bytes/sec.

low_speed_time

Time until a download gets aborted, when download speed is below low_speed_limit.

5.3.1.3 Settings for Accessing SUSE Repositories

The scc section contains your mirroring credentials for contacting the SUSE Customer Center. To obtain your mirroring credentials, see [Section 3.1, "Mirroring Credentials"](#).

Valid configuration keys for the section are:

username

Mirroring credentials user name.

password

Mirroring credentials password.

5.3.1.4 Web Server Settings

The web_server section lets you tune the performance of your RMT server.

min_threads

Specifies the minimum number of threads that an RMT server worker should spawn.
Acceptable values: Integer greater than or equal to 1.

max_threads

Specifies the maximum number of threads that an RMT server worker should spawn.
Acceptable values: Integer greater than or equal to 1.

workers

Specifies the number of Web workers for RMT.

Acceptable values: Integer greater than or equal to 1.

5.3.2 SSL Certificates and HTTPS

By default access to API endpoints consumed by **SUSEConnect** is limited to HTTPS only. nginx is configured to use SSL certificate and private key from the following locations:

- Certificate: [/etc/rmt/ssl/rmt-server.crt](#)
- Private key: [/etc/rmt/ssl/rmt-server.key](#)

YaST RMT module generates a custom certificate authority which is used to sign HTTPS certificates, which means that to register, this certificate authority must be trusted by the client machines:

- For registrations during installation from the media or with YaST Registration module, a message will appear, prompting to trust the server certificate.
- For registering a client system on the command line, use the [rmt-client-setup](#) script. For details, see [Section 4.3, "Configuring Clients with rmt-client-setup"](#).

6 Backing Up an RMT Server

This chapter explains how to create a backup of your RMT server and how to restore it.

6.1 Creating a Backup

This procedure details how to create a full backup of your RMT server. It is assumed that you have an external disk or network share mounted in `/mnt/backup` which serves as a target for the backup.

1. Change to the backup directory.

```
root # cd /mnt/backup
```

2. Create a file containing a dump of your SQL database. You need to provide the password you set for the `rmt` database user during the installation.

```
root # mysqldump -u rmt -p rmt > rmt_backup.sql
```

3. Optionally, create a copy of your mirrored data.

```
root # mkdir repos
root # rmt-cli export repos ./repos/
```

6.2 Restoring a Backup

This procedure details how to restore your RMT server from a backup created in [Section 6.1, "Creating a Backup"](#). It is assumed that the backup is mounted in `/mnt/backup`. It is also assumed that you are restoring the server on a newly installed SLES.

1. Install and configure the RMT server as described in [Chapter 1, RMT Installation and Configuration](#).
2. Go to the backup directory.

```
root # cd /mnt/backup/
```

3. Use `mysql` to remove the newly created database and import the data.

```
root # mysql -u rmt -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
[...]

MariaDB [(none)]> DROP DATABASE rmt;
Query OK, 14 rows affected (0.84 sec)

MariaDB [(none)]> CREATE DATABASE rmt;
Query OK, 1 row affected (0.00 sec)

MariaDB [(none)]> use rmt;
Database changed

MariaDB [rmt]> source rmt_backup.sql;
[...]

MariaDB [rmt]> quit
```

4. Optionally, import the exported repositories.

```
root # rmt-cli import repos ./repos/
```

5. Synchronize your data and update your repositories.

```
root # rmt-cli sync
root # rmt-cli mirror
```

7 Managing SSL/TLS Certificates

7.1 Regenerating HTTPS Certificates

HTTPS certificates should be regenerated before they expire or to include additional common alternative names. No additional actions are required on the client machines registered to RMT server if only HTTPS certificates are regenerated.

1. Stop nginx and rmt-server services:

```
root # systemctl stop nginx
root # systemctl stop rmt-server
```

2. Remove previously generated certificates.

```
root # rm /etc/rmt/ssl/rmt-server.*
```

3. Run the **yast rmt** module as described in [Section 1.3, "RMT Configuration with YaST"](#).

7.2 Regenerating CA Certificates and HTTPS Certificates

CA certificates can be regenerated once they have expired or in case of security issues.



Warning: Import CA Certificate on All Clients

The newly generated CA certificate must be imported on all clients registered to the RMT server. This can be done by running the **rmt-client-setup** script on the client machines as described in [Section 4.3, "Configuring Clients with rmt-client-setup"](#).

1. Stop nginx and rmt-server services.

```
root # systemctl stop nginx
root # systemctl stop rmt-server
```

2. Remove previously generated CA and HTTPS certificates.

```
root # rm /etc/rmt/ssl/rmt-ca.*
```

```
root # rm /etc/rmt/ssl/rmt-server.*
```

3. Run the `yast rmt` module as described in [Section 1.3, "RMT Configuration with YaST"](#).

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