Using `zypper` on the Immutable SUSE Linux Enterprise Server

On the immutable SLES the root file system is mounted read-only to ensure stability and reliability. While file system modifications are handled in the background by the **`transactional-update`** command, a built-in wrapper enables administrators to execute standard zypper commands directly. This article provides an overview of how **`zypper`** interacts with an immutable system, covering both native read-only operations and seamless system modifications..

Prerequisites

- Basic knowledge of **`zypper`**
- Knowledge of the **`transactional-update`** command

Publication Date: 05 Nov 2026

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1 `zypper` commands not modifying the file system

Operations that query external repositories or the local database do not require write access to the root file system. Because these commands do not alter the system state, they bypass the transactional wrapper and do not create a Btrfs snapshot.

The following **`zypper`** commands function exactly as they do on a standard system:

- **`zypper search`** *PACKAGE_NAME*
- **`zypper info`** *PACKAGE_NAME*
- Repository modification commands

For more details about the above mentioned commands, refer to the zypper article.

2 Modifying the immutable system

Without the transactional wrapper, the system modification commands like **`zypper install`**, **`zypper patch`**, or **`zypper update`** fail and the user is instructed to use the **`transactional-update`** command instead.

When the transactional wrapper is enabled, **`zypper`** detects the immutable mode and spawns the transactional wrapper as a child process to execute the requested write operations. The transactional wrapper retrieves the exact command-line arguments of its parent process directly from the `/proc` file system. This ensures the command is replicated perfectly without requiring any syntax changes from the user.



Warning: Reboot between consecutive transactions

When executing multiple **`zypper update`** commands, you must activate the snapshot created by the previous transaction by rebooting before running the next command. If you run subsequent **`zypper`** commands without activating the intermediate snapshots, earlier modifications are discarded. For example, executing **`zypper in foo`** followed by **`zypper in bar`**, and then rebooting, results in a system where only the `bar` package is installed.

The transactional wrapper is usually installed and enabled by default. If it is not present on your system, see the following section for installation instructions.

2.1 Installing the transactional wrapper

To install the package, perform the following steps:

1. Install the package:

```
> sudo transactional-update pkg in transactional-wrapper
```

2. Reboot the system to switch to the new snapshot.

3 Configuring the transactional wrapper

The transactional wrapper has a configuration file, `transactional-wrapper.conf`, that enables you to switch the functionality off or modify its behavior after performing modifications to the file system.

To change the default configuration, copy `transactional-wrapper.conf` to `/etc/`.

```
> sudo cp /usr/etc/transactional-wrapper.conf /etc/transactional-wrapper.conf
```

Modify the file as described in the following sections.

3.1 Disabling the transactional wrapper

In the file, you can switch off the transactional wrapper by setting the attribute `ENABLE_TRANSACTIONAL_WRAPPER` to 0:

```
ENABLE_TRANSACTIONAL_WRAPPER=0
```

Keep in mind that this disables calling **`zypper`** directly on the immutable system. To perform modifications to the file system, you must use the **`transactional-update`** command.

3.2 Configuring post-transaction behavior

You can configure what the system does after an operation finishes by changing the value of `ACTION`. The following values are supported:

apply

This option calls **`transactional-update apply`**, and the system switches to the new snapshot with no need to reboot.

reboot

The system is rebooted immediately after an operation successfully completes.

soft-reboot

A soft reboot is performed immediately after an operation successfully completes.

kexec

The system is rebooted immediately using **kexec**.

info

This is the default value. The system informs you that a reboot is needed to apply the changes.

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