

How to install the LCS-, QETH-, and QDIO-OCO-modules on the Red Hat Linux 7.2 for S/390 distribution

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1 Who should read this document?

The status of this description is experimental and only some of the steps described here have been rudimentarily tested. Please refer to the “Warranty Disclaimer and Limitation of Liability”-statement on [3].

If you intend to do a network-installation of a Red Hat Linux 7.2 for S/390 (kernel version 2.4.9-17) system that uses a QETH- or LCS-based network device (Ethernet, Fast Ethernet, Gigabit Ethernet, Token Ring) you should follow the instructions described in section 2.

If you intend to update an already installed Red Hat Linux 7.2 for S/390 system you should read section 3.

You do not need to read this document if you install a Red Hat Linux 7.2 for S/390 system via a CTC- or an IUCV-network device, if you do not do a network installation or if you do not intend to use a QETH- or LCS-based network device.

2 Installation with OCO-modules

2.1 Known restrictions

You will not be able to perform an installation with OCO-modules directly from CD or a mounted CD-ISO-image.

2.2 Overview

The installation is carried out as described in [1] and [2] with the following additional steps:

1. Add the OCO-modules to the ramdisk image file provided on the first CD of the Red Hat Linux 7.2 for S/390 distribution (cf. section 2.4).
2. Add the OCO-modules to the installed system (cf. section 2.6).

2.3 Preparatory steps

You need a Linux system, named `linuxhost` in the following, running on any architecture (e.g. Red Hat Linux 7.2 on a PC), with the following properties:

- You need to be able to login as user `root` on the system.
- Support for loop back-device must be compiled into the kernel or must be loadable as a module.
- The following commands must be available:
 - `dd`
 - `du`
 - `expr`
 - `gzip`
 - `losetup` (version 2.11 or higher¹)
 - `mke2fs`
 - `mount` (supporting the “-o loop”-option)
 - `tar` (GNU)
 - `umount`
 - `zcat`

Furthermore it is assumed in the following that you already set up your installation server as described in [1], section *Common steps needed for installing Red Hat Linux to a VM or LPAR*.

¹This version refers to the version of the `util-linux`-package which provides the `losetup`-program. The `util-linux`-package can be found on [4].

2.4 Modification of the ramdisk image file

Carry out the following steps in order to modify the ramdisk image file:

1. Log into `linuxhost` as user `root`.
2. Change to the directory where you want to carry out the change of the ramdisk image file (e.g. `/root` or `/tmp`).
3. Get the tarball `redhat-oco-2.4.9-17-s390-2.tar.gz` with the OCO-modules from [3].

4. Unpack the tarball:

```
linuxhost> tar -xzf redhat-oco-2.4.9-17-s390-2.tar.gz
```

This creates a directory `redhat-oco/` in the current working directory.

5. Change to the `redhat-oco/`-directory:

```
linuxhost> cd redhat-oco
```

6. Get the original Red Hat ramdisk image file from the `images/`-directory on the first CD-ROM of the Red Hat Linux 7.2 for S/390 distribution or on the server you set up beforehand as described in [1]. You need to get the file named

- `initrd.img` in case you use the VM-reader installation method and
- `tapeinrd.img` in case you intend to install from tape or emulated tape or if you intend to install in an LPAR with IPL from FTP-server as described in [1], section *Installing in an LPAR without the Red Hat Linux CD using a recent SEW*.

7. Modify the ramdisk image by running

- `linuxhost> ./mkocord initrd.img vm`

in case you use the VM-reader installation method and

- `linuxhost> ./mkocord tapeinrd.img tape`

in case you intend to install from tape or emulated tape or if you intend to install in an LPAR with IPL from FTP-server as described in [1], section *Installing in an LPAR without the Red Hat Linux CD using a recent SEW*.

Note: If the `mkocord`-script loops infinitely, `linuxhost` most probably has installed an `losetup`-command with version < 2.11 . In this case you have to upgrade the `losetup`-command on `linuxhost` to a version ≥ 2.11 .²

8. After successful termination of the `mkocord`-script you will find a file named `initrd_oco.img` in the current working directory. This is the file you will have to use instead of the original Red Hat ramdisk image. It contains the OCO-modules needed for installation via network.

²This version refers to the version of the `util-linux`-package which provides the `losetup`-program. The `util-linux`-package can be found on [4].

If you intend to install a VM-guest with IPL from VM-reader you have to replace the file `initrd.img` you downloaded beforehand on your VM-guest as described in [1], section *Installing in VM*, by the `initrd_oco.img`-file.

If you intend to install in an LPAR with IPL from FTP-server as described in [1], section *Installing in an LPAR without the Red Hat Linux CD using a recent SEW*, you will have to

- rename the `initrd_oco.img`-file to `tapeinrd.img` and
- replace the `tapeinrd.img` on the server with the new `tapeinrd.img`-file.

2.5 System installation

For system installation follow the instructions in [1] with the following deviations:

- *Adaption of the kernel parameter file:* Before the IPL for installation you have to add the parameter `ramdisk_size=9216` to the original Red Hat parameter file (one of `lpar.prm`, `redhat.prm`, or `redhat.parm`).

If you install in a VM-guest with IPL from VM-reader you have to change the parameter file you downloaded beforehand on your VM-guest as described in [1], section *Installing in VM*.

If you install in an LPAR with IPL from FTP-server as described in [1], section *Installing in an LPAR without the Red Hat Linux CD using a recent SEW*, you have to change the file `images/redhat.prm` on the FTP-server.

- During the installation you
 1. should write down the name of the DASD-Partition on which you install your root(/)-file system (e.g. `dasda1`, `dasda2`, ...);
 2. must not enable firewall functionality when using the `anaconda`-installer since otherwise you won't be able to remotely access your system after re-IPL from DASD.

2.6 Installation of the OCO-modules on the installed system

After the installer program (either `anaconda` or `rhsetup`) has finished, you get back to the prompt of your telnet- or ssh-session. You now have to execute

```
# instoco <dasd-partition-name>
```

where `<dasd-partition-name>` is the name of the DASD partition, on which your system was installed (e.g. `dasda1`, `dasda2`, ... cf. section 2.5, step 1.)

After successful installation of the OCO-modules you can re-IPL your system from DASD.

3 Installing the OCO-modules on an already installed system

If you already have an installed Red Hat Linux 7.2 for S/390 system (kernel version 2.4.7-17) with a working CTC- or IUCV-connection you can install the OCO-modules as follows:

1. Log into your Linux/390 system as user `root`.

2. Get the tarball `redhat-oco-2.4.9-17-s390-2.tar.gz` with the OCO-modules from [3]

3. Unpack the tarball:

```
# tar -xzf redhat-oco-2.4.9-17-s390-2.tar.gz redhat-oco/redhat-oco-2.4.9-17-2.tar.gz
| tar -C / -xzf - lib
```

References

[1] Red Hat Linux S/390 7.2 (enigma) disc1: /README

[2] Red Hat Linux S/390 7.2 (enigma) disc1: /RELEASE-NOTES

[3] http://www10.software.ibm.com/developerworks/opensource/linux390/special_oco_rh_2.4.shtml

[4] <http://www.kernel.org/pub/linux/utils/util-linux>

A Contents of `redhat-oco-2.4.9-17-s390-2.tar.gz`

```
redhat-oco/LICENSE
redhat-oco/mkocord
redhat-oco/redhat-oco-2.4.9-17-2.tar.gz
```

B Contents of `redhat-oco/redhat-oco-2.4.9-17-2.tar.gz`

```
lib/modules/2.4.9-17/kernel/drivers/s390/net/lcs.o
lib/modules/2.4.9-17/kernel/drivers/s390/net/qeth.o
lib/modules/2.4.9-17/kernel/drivers/s390/qdio.o

lib/modules/2.4.9-17B00T/kernel/drivers/s390/net/lcs.o
lib/modules/2.4.9-17B00T/kernel/drivers/s390/net/qeth.o
lib/modules/2.4.9-17B00T/kernel/drivers/s390/qdio.o

lib/modules/2.4.9-17B00Ttape/kernel/drivers/s390/net/lcs.o
lib/modules/2.4.9-17B00Ttape/kernel/drivers/s390/net/qeth.o
lib/modules/2.4.9-17B00Ttape/kernel/drivers/s390/qdio.o

lib/modules/2.4.9-17tape/kernel/drivers/s390/net/lcs.o
lib/modules/2.4.9-17tape/kernel/drivers/s390/net/qeth.o
lib/modules/2.4.9-17tape/kernel/drivers/s390/qdio.o

sbin/instoco
```