eLux Recovery Procedures

Short Guide

Date 2023-05-17

1. Overview

A recovery installation allows you to install the eLux operating system on a device's flash memory and/or to reset the device to the initial state.

In the following cases a recovery installation can be suitable:

- The client does not boot any more (=> restore)
- The flash memory of the client does not provide an image/is empty
- The local device password was lost
- The operating system on the flash memory shall be replaced by eLux
- A factory reset of the image on the flash memory is required
- Migration to a later eLux version (alternatively see the **Migration** short guide)
- If critical feature-packages (`.fpm`) in the Base OS are updated, the client requires a recovery installation before an update can be performed.

Note
A recovery installation will overwrite all data on the storage medium and install the eLux software. It cannot be undone.

A recovery installation can be performed in two different ways:

- via USB stick if the client hardware supports booting from USB mass storage devices
- via network if the client's network adapter supports PXE

2. Recovery via USB

On our portal myelux.com, you can download **eLux USB Stick** images for all supported eLux versions. By using the tool included in the `.zip` file, transfer the image file to a USB stick and create an eLux recovery stick which you can use for installing eLux on your devices.

To recover your individual firmware image, export your image and the defined software packages in ELIAS via the **Stickwizz** option and create a USB stick with it. For further information, see Exporting an image in the **ELIAS 18** guide.

For further information on creating an individual USB recovery stick in the legacy ELIAS, see USB-recovery stick in the **ELIAS** guide.

2.1. Preparing a recovery image for USB

Requires

PC running Windows 10 or later versions

eLux USB Stick Image

1. From our portal myelux.com, under **eLux USB Stick Images**, download the package for the required eLux version.
2. Unpack the downloaded `.zip` file.

The eLux USB Stick image is available as a `.dd` file in a directory on your PC, along with the `StickWizz.exe` program (and a describing text file with check sum).

Individual Image

1. Provide your individual image on your PC. The image can be one of the following:
   - `.stw` file that has been exported from ELIAS 18 via the **Stickwizz** option
     For further information, see Exporting an image in the **ELIAS 18** guide
   - `.stw` file that has been created via **Create StickWizz image** in the legacy ELIAS
     For further information, see Creating a StickWizz file as installation base in the **ELIAS** guide
   - `.dd` file that has been created as a disk image via **Create USB stick** in the legacy ELIAS
     For further information, see Creating USB recovery stick in the **ELIAS** guide
2. From our portal myelux.com, under **Tools**, download the **StickWizz** program , and then unpack the `.zip` file on your PC.

Your individual image is available as a `.stw` or `.dd` file in a directory on your PC, along with the `StickWizz.exe` program. Continue with "Writing an image to USB (with StickWizz)" on the next page.

2.2. Writing an image to USB (with StickWizz)

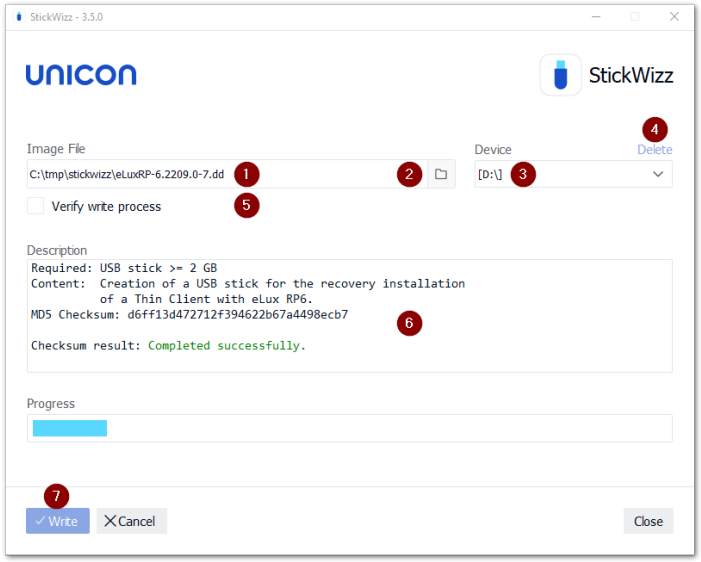
Requires

- Image file as a `.stw` or `.dd` file on a PC running Windows 10 or later versions
- **StickWizz** application on your PC (see "Preparing a recovery image for USB" on the previous page)
- USB stick on local port with 4 GB memory space, write access

1. Plug the USB stick into the PC.
   Note that the Windows Explorer must not be open on the USB drive.
2. Run the `StickWizz.exe` program.

   The language depends on the Windows display language selected.
   The checksum is calculated and compared to the one provided.
3. Check whether the appropriate source under **Image file** (1) and the appropriate destination under **Device** (3) are selected.
4. Click **Write** (7).

The image is written to the USB stick. A message confirms the successful completion.



1	After StickWizz is started, it shows a `.stw` or `.dd` file located in the same directory.
2	Browse to select your image file from another directory, if required.
3	Device /drive, on which a USB stick is connected Choose a different drive if required.
4	Delete all data from the selected device (before writing the image)
5	During the write process, each written data packet will be compared to the source.
6	As soon as StickWizz opens with the specified file, the checksum is calculated and displayed.
7	Start writing

2.3. Performing a USB recovery

Requires

- PC, mobile device or other client device providing a boot option from **USB HDD**
- 4 GB (2 GB for limited functionality) memory space on the flash memory / hard disk

1. Configure the BIOS of your device for boot from USB.
2. Connect the USB stick to a USB port and boot the device.
3. To call the boot menu, during the boot process, press F12 or the relevant key specified by the supplier.
4. On the eLux boot menu, select the **Install eLux XX** option.

> **Important** During the installation process, all data and the entire operating system are deleted from the hard disk (system recovery).
> All eLux and Management license information is kept as is.

After the installation is completed, the client restarts. Depending on the network configuration, the device is automatically assigned to a Scout Server via DHCP or DNS, or the First Configuration Wizard starts.

3. Network recovery (PXE)

The PXE network protocol (Preboot Execution Environment) enables devices to boot via LAN. The devices do not need a bootable storage medium but their BIOS must support PXE.

The PXE code in the BIOS of the network adapter allows the devices to communicate with the DHCP and TFTP server. From the DHCP server, the client receives the IP configuration. The TFTP server provides the boot file. The boot file calls the core installer which installs a minimal system, formats the flash memory and prepares the installation of the eLux operating system from the web server.

With the **Recovery service** of the Scout Enterprise Management Suite, a TFTP server and the required functions are installed. The **Recovery service** is included in the standard installation.

3.1. PXE recovery requirements

- The relevant devices are provided with a PXE-capable BIOS and a LAN connection.
  For UEFI devices, a PXE recovery can be used with Scout Enterprise Management Suite 15.4 and eLux RP 6.4 and later versions.
- Scout Enterprise Management Suite including the **Recovery service** (included in standard installation)
- eLux software container for the relevant eLux version, installed on a HTTP or FTP server
- DHCP server (included in Microsoft Windows Server operating system)

The TFTP server is installed and registered as a service by the Scout Enterprise Management Suite. Make sure that there is no other TFTP server running on the system.

3.2. Configuring PXE recovery in Scout Console

1. In the Scout Console, click **Options > Recovery settings**.
2. Edit the following fields:

Option	Description
Protocol	Network protocol of the web server for the software package transfer to the devices (`HTTP, HTTPS, FTP, FTPS`)
Server	Name (FQDN) or IP address of the web server providing the eLux software packages and image definition file, optionally followed by a port number Example: `192.168.10.1:80`
Proxy (optional)	IP address and port (3128) of the proxy server Example: `192.168.10.2:3128`
User and Password (optional)	Username and password (if required) to access the eLux software container of the FTP server

Option	Description
Path	Directory path to the eLux software packages on the web or FTP server Use slashes `/` to separate directories. Example: `eluxng/UC_RP6_X64` corresponds to the IIS web server directory `C:\inetpub\wwwroot\eluxng\UC_RP6_X64` To handle different eLux versions, the container directory can be parameterized by the container parameter.
Image file	Name of the image definition file (`.idf`) on the web server for recovery installation Do not use spaces. The file name is case-sensitive and requires the file extension `.idf`. Example: `recovery.idf` If you have both, UEFI devices and non-UEFI devices, Base System parameter within the IDF name.
User must confirm	The user on the client is required to confirm before the recovery installation is started.
Operating system	Relevant eLux version

3. Confirm with **OK**.

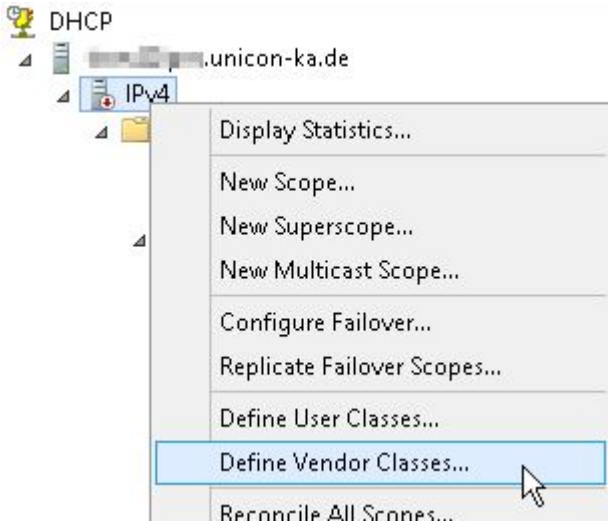
3.3. DHCP configuration for eLux RP 6 X64 devices

Requires
Windows Server 2012 or later

A network recovery for eLux RP 6 X64 devices (UEFI and non-UEFI) requires that individual vendor classes for UEFI and non-UEFI devices are defined on the DHCP server. With suitably defined DHCP policies, the relevant boot file can then be set as a DHCP option for each device class.

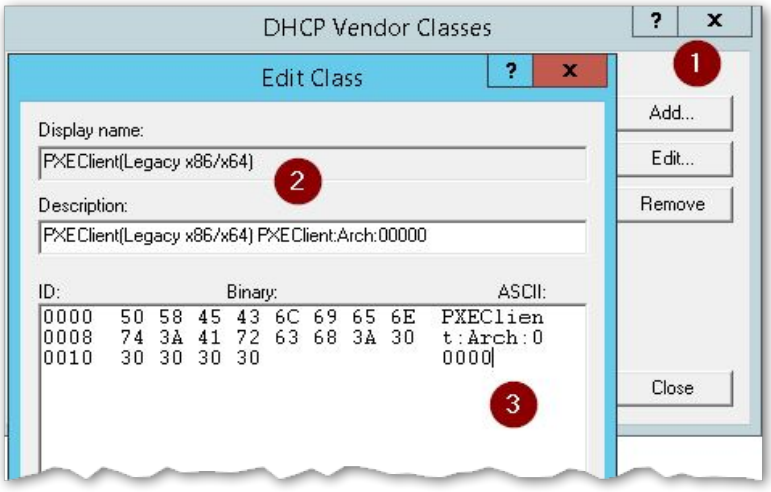
Creating user-defined vendor classes

1. Open the DHCP manager with administrator rights.
2. Select the relevant DHCP server, and then click **Action > Define...**
   Alternatively, use the context menu:



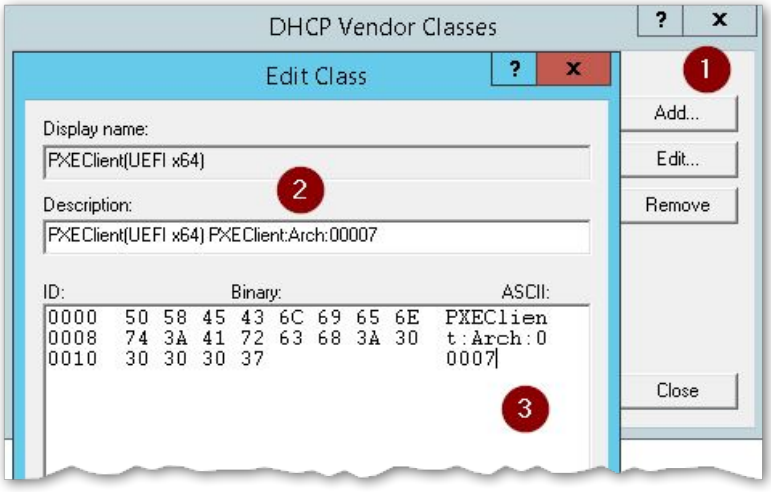
3. Click **Add...** to create a new class for the non-UEFI devices specifying the following options:

Option	Value
Display name	*Choose a descriptive name for your legacy (non-UEFI) devices.*
Description	*Type a description.*
Code (in **ASCII** column)	PXEClient:Arch:00000



4. Click **Add...** to create a new class for the UEFI devices specifying the following options:

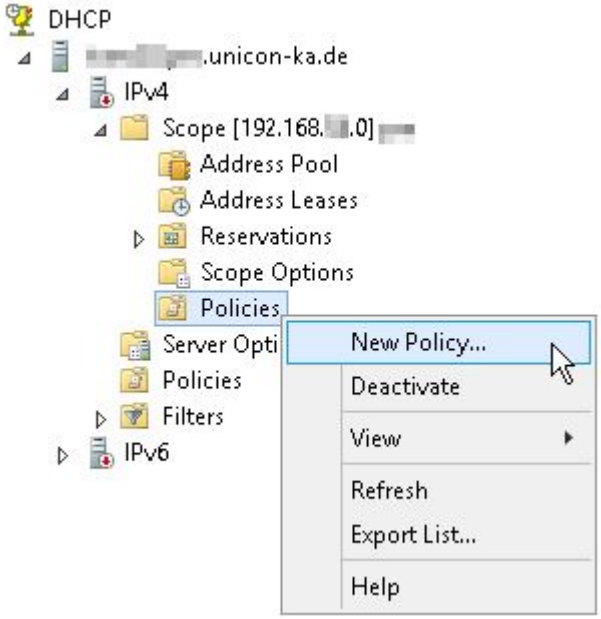
Option	Value
Display name	*Choose a descriptive name for your UEFI devices.*
Description	*Type a description.*
Code (in **ASCII** column)	PXEClient:Arch:00007



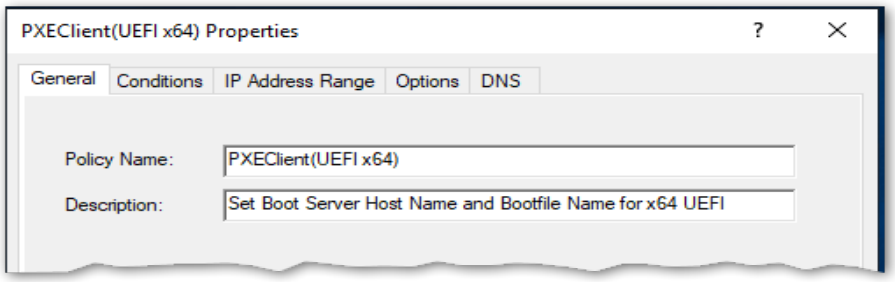
3.3.1. Defining a DHCP policy for UEFI devices

After you have created an individual vendor class in DHCP Manager for your DHCP server, you now create a DHCP policy for that device class.

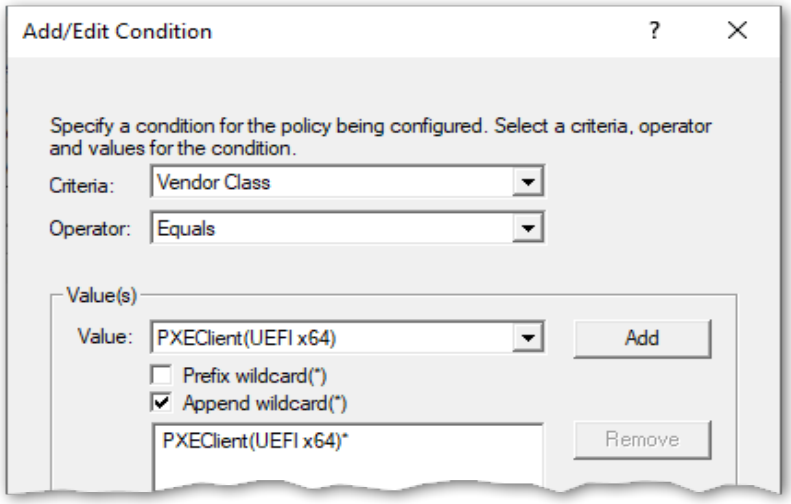
1. For the relevant scope, on the context menu, select **New policy...**



2. Type a descriptive name and description for the UEFI policy.

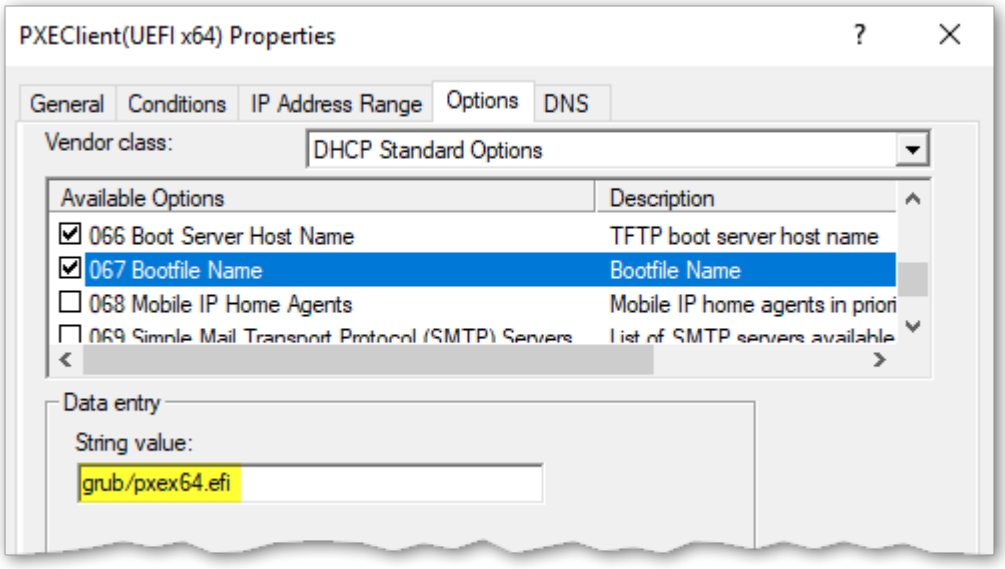


3. On the **Conditions** tab, create a condition for the UEFI devices:



4. On the **Options** tab, define the standard options 66 and 67.

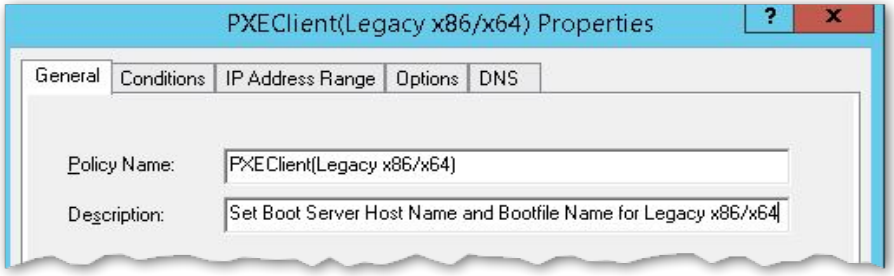
Option	Value
066 Boot Server Host Name	*<P address of the TFTP server>* (normally same as Scout Server IP address)
067 Bootfile Name	`grub/pxex64.efi`



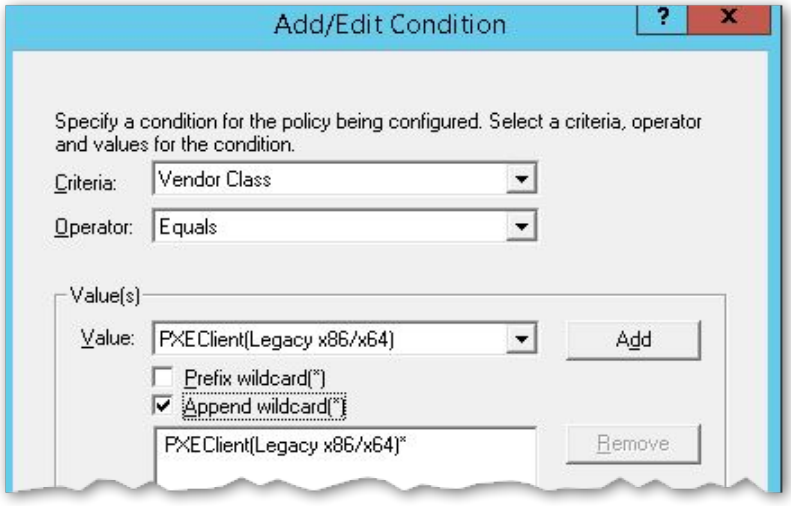
3.3.2. Defining a DHCP policy for non-UEFI devices

After you have created an individual vendor class in DHCP Manager for your DHCP server, you now create a DHCP policy for that device class.

1. For the relevant scope, on the context menu, select **New policy...**
2. Type a descriptive name and description for the non-UEFI policy.

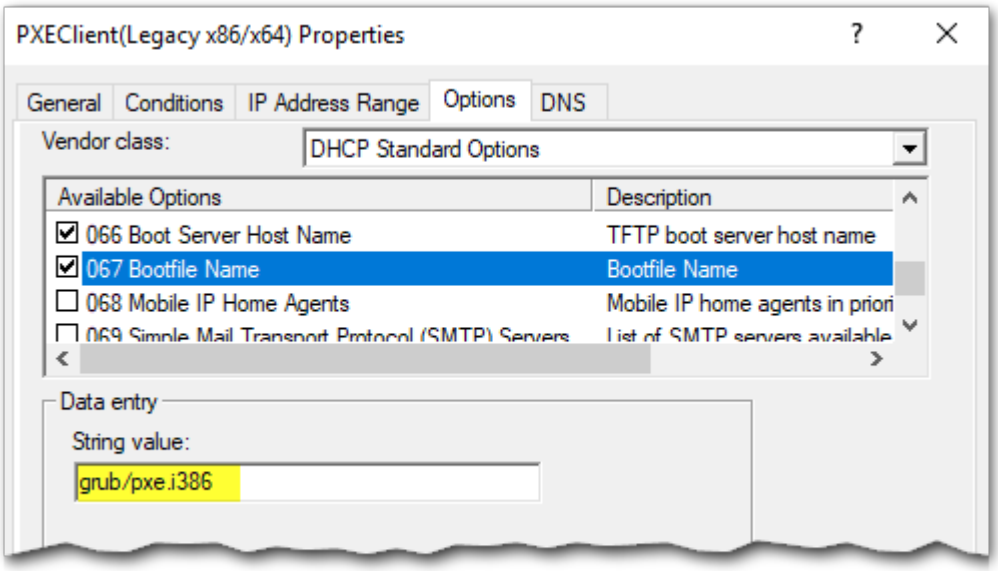


3. On the **Conditions** tab, create a condition for the non-UEFI devices:



4. On the **Options** tab, define the standard options 66 and 67.

Option	Value
066 Boot Server Host Name	*<P address of the TFTP server>* (normally same as Scout Server IP address)
067 Bootfile Name	`grub/pxe.i386`



3.4. Simplified DHCP configuration

- only for homogeneous environment: Only UEFI devices or only non-UEFI devices -

Note

If you are using eLux RP 6 X64 devices with and without UEFI, you will need DHCP policies to select the relevant boot file. For further information, see "DHCP configuration for eLux RP 6 X64 devices" on page 8.

Next to selecting DHCP options for the router, DNS server and domain name which are already required for eLux, for a PXE recovery installation, you need to define the boot server and boot file as DHCP options.

1. Open the DHCP manager as administrator.
2. For the relevant DHCP server, select either the **Server options**, the **Scope Options** or the **Reservations** for individual devices, and then click **Action > Configure Options... > General**.
3. Edit the following DHCP options:

Option	Value
066 Boot Server Host Name	*<IP address of the TFTP server>* (normally same as Scout Server IP address)
067 Bootfile Name	`grub/pxe.i386` for non-UEFI devices `grub/pxex64.efi` for UEFI devices (x64)

4. Confirm with **OK**..

3.5. Performing a PXE recovery

The recovery installation is initiated by the client. The client is required to use the boot medium **LAN** and, depending on the hardware, must be configured accordingly.

- Turn the device on and then, on the boot menu, select the boot medium option `LAN`.

or

- If the boot menu does not provide boot medium options, in the BIOS, configure the **First boot device** to `LAN` and then restart the device.

After the core installer has prepared the system, the software packages are transferred from the web server and are installed. After the installation is completed, the client restarts. Depending on the network configuration, the device is automatically assigned to a Scout Server via DHCP or DNS, or the First Configuration Wizard starts.

3.6. Troubleshooting

Consulting the server log files helps you analyze problems with the recovery installation:

- `tftpd.log` to be found in `Documents\UniCon\Scout\Recovery`
- DHCP server log file

While the software packages are installed, a progress bar is shown on the screen. To switch from graphic mode to test mode, press STRG+ALT+ F4 to read texts or any error messages.

For problems and error messages, see the following table.

Problem	Reason	Solution
PXE recovery cannot be used for UEFI devices.	The eLux version being used does not support PXE recovery for UEFI devices.	Use the versions eLux RP 6.4.0 and Scout 15.4.0 or later. For further information, see "Simplified DHCP configuration" on page 12.
When starting the PXE recovery, the device reports a DHCP timeout.	The DHCP server does not respond.	■ Check the network connection. ■ In the DHCP server log file, check whether the client has received an IP address. Modify your DHCP server if necessary.
The device starts the PXE recovery but then boots normally or reports a TFTP timeout: `TFTP open timeout`	The TFTP server does not respond.	■ Check if the TFTP service is available. ■ Analyze the log file of the TFTPD daemon. ■ Check the entries for the router/gateway and boot server of your DHCP service.

Problem	Reason	Solution
After starting the PXE recovery, the device reports a TFTP error: `TFTP Error - File not found`	The TFTP server failed to send the boot file (`pxelinux.0`)	■ Check the boot file entry of your DHCP server. ■ Analyze the TFTP log file. ■ Check the access rights for the TFTP server root directory.

The recovery stops and a black screen is dispayed with the following message:
`could not find image: eluxrp.krn`
`boot:`
	The TFTP server failed to provide the `eluxrp.krn` file.	■ Analyze the TFTP log file.
		■ Check the access rights and whether the recovery files are available in the TFTP server root directory.

The recovery stops and a black screen is dispayed with the following message:
`could not find ramdisk image: ramfs.rp`
`boot:`
	The TFTP server failed to provide the `ramfs.rp` file.	■ Analyze the TFTP log file.
		■ Check the access rights and if the recovery files are available in the TFTP server root directory.

The recovery stops after the following messages are displayed:
`ec = 406`
`...`
`elux-library....`
`failed http://user:password@webserver`
`or`
`failed ftp://user:password@ftpserver`
	The recovery image file cannot be transferred from the web or FTP server.	Wait for the FTP or HTTP timeout to occur and check whether the displayed address is valid:
		`http://user:passwort@webserver`
		or
		`ftp://user:passwort@ftpserver`
		Modify the values in the **Recovery settings** of the Scout Console if necessary.