ESR series service routers
ESR-10, ESR-12V, ESR-12VF, ESR-14VF, ESR-15V, ESR-20, ESR-21, ESR-30, ESR-100, ESR-200, ESR-1000, ESR-1200, ESR-1500, ESR-1700, ESR-1511, ESR-3100, ESR-3200
Firmware version update guide
Firmware version 1.18.3

Contents

1 Introduction

Abstract

This guide provides instructions on how to update the firmware components of the ESR series service routers, considering the specific models and previous firmware versions of the device being updated.

Target audience

This guide is intended for technical personnel who perform device updates through the command line interface (CLI).

Symbols

Designation	Description
[ ]	In the command line, optional parameters are shown in square brackets; when entered, they provide additional options.
{ }	In the command line, mandatory parameters are shown in curly braces. Select one of the parameters.
"," **"-"**	In the command description, these characters are used to define ranges.
"|"	In the description of the command, this sign means 'or'.
Semibold font	Notes, warnings, or information are shown in bold.
<Semibold italic>	Keyboard keys are shown in bold italic within angle brackets.
Text box	Examples and results of the commands are given within the text boxes.

Notes and warnings

> ⚠ **Notes contain important information, tips or recommendations on device operation and setup.**

> ◆ **Warnings inform users about hazardous conditions which may cause injuries or device damage and may lead to the device malfunctioning or data loss.**

> ⓘ **The information contains information on the use of the device.**

2 Creating a backup copy of the current configuration

Prior to initiating the firmware update on ESR service routers, it is necessary to create a backup of the current configuration.

Copying the current configuration from the ESR service router is possible both using remote file copying protocols and to locally connected USB/MMC media.

> ⬤ **When updating the firmware from version 1.1.0 or earlier, it is important to use the 'fs://running-config' section designation instead of 'system:running config' section.**

> ⚠ **When updating from earlier versions of the firmware, the set of protocols for remote file copying and types of locally connected drives may differ.**

> ⬤ **When migrating from a newer version of the firmware to an older one (downgrade), it is possible that the older version of the firmware will not be able to apply the configuration saved in the newer version. As a result, the configuration will be lost and the ESR Service Router will boot with an empty configuration.**

2.1 Preparation

To create a backup copy of the current configuration of the service router using remote file copy servers, do the following:

1. Start the corresponding server on the PC/server in the network.
2. Provide the ability to save files in the server working directory.
3. Provide IP connectivity between the upgraded ESR service router and the remote file copy server (routing).
4. Ensure operation of the remote copy protocol between the ESR and the remote file copy server (intermediate firewalls).
5. If necessary (for FTP, SFTP, SCP, HTTP protocols), find out the username and password to write the required file.

To create a backup copy of the current configuration of the service router on a locally connected USB/MMC storage:

1. Format USB/MMC partition as FAT32.
2. Connect the USB/MMC storage to the appropriate ESR slot.

2.2 Copying the configuration backup file

2.2.1 Using remote file copy protocols

Depending on the remote file copy protocol, one of the following commands must be executed in the CLI of the service router:

Configuration backup via TFTP protocol

```
esr# copy system:running-config tftp://<tftp-server-ip>:/<config-file-name>
```

Configuration backup via FTP protocol

```
esr# copy system:running-config ftp://<ftp-username>:<ftp-userpassword>@<ftp-server-
ip>:/<config-file-name>
```

Configuration backup via SFTP protocol

```
esr# copy system:running-config sftp://<sftp-username>:<sftp-userpassword>@<sftp-
server-ip>:/<config-file-name>
```

Configuration backup via SCP protocol

```
esr# copy system:running-config scp://<scp-username>:<scp-userpassword>@<scp-server-
ip>:/<config-file-name>
```

Configuration backup via HTTP protocol

```
esr# copy system:running-config http://<http-username>:<http-userpassword>@<http-
server-ip>:/<config-file-name>
```

- <config-file-name> — file name with which the current configuration of the service router will be saved;
- <tftp-server-ip> — IP address of the TFTP server in use;
- <ftp-username> — user name on the FTP server;
- <ftp-userpassword> — user password on the FTP server;
- <ftp-server-ip> — IP address of the FTP server in use;
- <sftp-username> — user name on the SFTP server;
- <sftp-userpassword> — user password on the SFTP server;
- <sftp-server-ip> — IP address of the SFTP server in use;
- <scp-username> — user name on the SCP server;
- <ftp-userpassword> — user password on the FTP server;
- <scp-server-ip> — IP address of the SCP server in use;
- <http-username> — user name on the HTTP server;
- <http-userpassword> — user password on the HTTP server;
- <http-server-ip> — IP address of the HTTP server in use.

2.2.2 To a locally connected USB/MMC storage

1. Define the volume label of the connected USB/MMC storage.

Defining the volume label name on a USB storage

```
esr# show storage-devices usb
Name                            Filesystem  Total, MB   Used, MB    Free, MB
------------------------------  ----------  ----------  ----------  ----------
<USB_DISK>                      vfat        7664.01     6391.69     1272.32
```

Defining the volume label name on an MMC storage

```
esr# show storage-devices mmc
Name                             Filesystem  Total, MB   Used, MB    Free, MB
------------------------------   ----------  ----------  ----------  ----------
<MMC_DISK>                       vfat        7664.01     6391.69     1272.32
```

2. Copy the file to the USB/MMC storage that is currently in use.

> ⚠ **When executing copy commands to USB/MMC media, instead of the <USB_DISK> or <MMC_DISK> fields, use the real volume labels defined in step 1.**

Configuration backup to USB storage

```
esr# copy system:running-config usb://<USB_DISK>:/<config-file-name>

|*****************************************| 100% (576B) Success!
```

Configuration backup to MMC storage

```
esr# copy system:running-config mmc://<MMC_DISK>:/<config-file-name>

|*****************************************| 100% (576B) Success!
```

- <config-file-name> — file name with which the current configuration of the service router will be saved;
- <USB_DISK> — partition name on the USB storage;
- <MMC_DISK> — partition name on the MMC storage.

3 Restoring configuration from a backup

In case of configuration loss on the router due to operational issues, firmware update, or rollback to a previous firmware version, the router configuration can be restored using a previously created backup copy.

Copying a configuration backup to the ESR service router is possible both using remote file copying protocols and to locally connected USB/MMC media.

> ⚠️ **When migrating from a newer version of the firmware to an older one (downgrade), it is possible that the older version of the firmware will not be able to apply the configuration saved in the newer version. As a result, the configuration will be lost and the ESR Service Router will boot with an empty configuration.**

3.1 Preparation

To restore the configuration of the service router from a backup copy using remote file copy servers, do the following:

1. Start the corresponding server on the PC/server on the network.
2. Place the file with the previously created backup copy of the router in the server working directory.
3. Configure the service router to establish IP connectivity with the remote file copy server.
4. Provide IP connectivity between the upgraded ESR service router and the remote file copy server (routing).
5. Ensure operation of the remote copy protocol between the ESR and the remote file copy server (intermediate firewalls).
6. If necessary (for FTP, SFTP, SCP, HTTP protocols), find out the username and password to write the required file.

To restore the service router configuration from a backup copy from a locally connected USB/MMC storage, do the following:

1. Format USB/MMC partition as FAT32.
2. File with a previously created backup copy of the service router configuration must be placed on the USB/MMC media.
3. Connect the USB/MMC storage to the appropriate ESR slot.

3.2 Copying configuration backup file

3.2.1 Using remote file copy protocols

Depending on the protocol for remote file copying, run one of the following commands in the CLI of the service router:

Configuration backup via TFTP protocol

```
esr# copy tftp://<tftp-server-ip>:/<config-file-name> system:candidate-config
```

Configuration backup via FTP protocol

```
esr# copy ftp://<ftp-username>:<ftp-userpassword>@<ftp-server-ip>:/<config-file-name>
system:candidate-config
```

Configuration backup via SFTP protocol

```
esr# copy sftp://<sftp-username>:<sftp-userpassword>@<sftp-server-ip>:/<config-file-
name> system:candidate-config
```

Configuration backup via SCP protocol

```
esr# copy scp://<scp-username>:<scp-userpassword>@<scp-server-ip>:/<config-file-name>
system:candidate-config
```

Configuration backup via HTTP protocol

```
esr# copy http://<http-username>:<http-userpassword>@<http-server-ip>:/<config-file-
name> system:candidate-config
```

- <config-file-name> — name of the service router configuration backup file.
- <tftp-server-ip> — IP address of the TFTP server in use;
- <ftp-username> — user name on the FTP server;
- <ftp-userpassword> — user password on the FTP server;
- <ftp-server-ip> — IP address of the FTP server in use;
- <sftp-username> — user name on the SFTP server;
- <sftp-userpassword> — user password on the SFTP server;
- <sftp-server-ip> — IP address of the SFTP server in use;
- <scp-username> — user name on the SCP server;
- <ftp-userpassword> — user password on the FTP server;
- <scp-server-ip> — IP address of the SCP server in use;
- <http-username> — user name on the HTTP server;
- <http-userpassword> — user password on the HTTP server;
- <http-server-ip> — IP address of the HTTP server in use.

3.2.2 From locally connected USB/MMC media

1. Define the volume label of the connected USB/MMC storage.

Defining the volume label name on a USB storage

```
esr# show storage-devices usb
Name                            Filesystem  Total, MB   Used, MB    Free, MB
------------------------------  ----------  ----------  ----------  ----------
<USB_DISK>                      vfat        7664.01     6391.69     1272.32
```

Defining the volume label name on a MMC storage

```
esr# show storage-devices mmc
Name                            Filesystem  Total, MB   Used, MB    Free, MB
------------------------------  ----------  ----------  ----------  ----------
<MMC_DISK>                      vfat        7664.01     6391.69     1272.32
```

2. Copy the file to the USB/MMC storage that is currently in use:

⚠ **When executing copy commands to USB/MMC media, instead of the <USB_DISK> or <MMC_DISK> fields, use the real volume labels defined in step 1.**

Configuration backup to USB storage

```
esr# copy usb://<USB_DISK>:/<config-file-name> system:candidate-config

|*****************************************| 100% (576B) Success!
```

Configuration backup to MMC storage

```
esr# copy mmc://<MMC_DISK>:/<config-file-name> system:candidate-config

|*****************************************| 100% (576B) Success!
```

- <config-file-name> — name of the service router configuration backup file;
- <USB_DISK> — partition name on the USB storage;
- <MMC_DISK> — partition name on the MMC storage.

3.3 Applying and confirming the loaded configuration

To apply and confirm operation of the configuration loaded earlier in the 'system:candidate-config' section, run the following commands:

Configuration backup to MMC storage

```
esr# commit
Configuration has been successfully applied and saved to flash. Commit timer started,
changes will be.
esr# confirm
Configuration has been confirmed. Commit timer canceled.
```

4 Checking the current firmware version and secondary bootloader (U-boot) version

Currently used secondary bootloader (U-Boot) and main firmware versions can be checked:

- in the CLI of the main firmware;
- in the console interface output when loading the service router.

4.1 Checking current software version and version of the secondary bootloader (U-boot) in the main firmware CLI

To check the current firmware version and the version of the secondary bootloader (U-boot) in the CLI of the main software, execute the 'show version' command:

Obtaining secondary bootloader and main firmware versions in CLI

```
esr# show version
Boot version:
 1.17.3.11 (date 14/11/2022 time 13:30:27)            <-- secondary bootloader
(U-boot) version
SW version:
 1.17.3 build 11[a813b5c65] (date 14/11/2022 time 13:20:25) <-- active image version
of the service router main firmware
HW version:
 1v2                                                  <-- hardware version of
the service router
```

4.2 Checking the current firmware version and the version of the primary (X-Loader) and secondary (U-boot) loaders in the output of the console interface when loading the service router

To check the current firmware version and the version of the secondary bootloader (U-boot) in the output of the console interface when loading the service router, do the following:

1. Connect to the ESR service router via the Console interface on the front panel of the router using the following parameters of the PC RS-232 interface:

- Baud rate: 115200 bps
- Data bits: 8 bits;
- Parity: no;
- Stop bits: 1;
- Flow control: no.

2. Reboot the router using one of the following methods:

- Switch the power off and then switch it back on. The interval between switching off and on must be at least 20 seconds.
- Briefly press the function button F on the front panel of the router (on the side panel for ESR-10).
- Execute the 'reload system' command in the CLI of the main firmware of the router.

Reboot using a command in the main firmware CLI

```
esr-21# reload system
Do you really want to reload system ? (y/N): y
```

3. During the loading, information about the versions will be displayed in the console::

- Primary loader (sbi, bl1 or X-loader depending on the router model):

Primary bootloader version on ESR-10/12V/12VF/14VF/15

```
SBI:1.17.3.11 (14/11/2022 - 12:55:55)
   Chip is NSP B1
   Booting from SPI-NOR
```

Primary bootloader version on ESR-20/21/30

```
INFO: mdio_update: phy_id 4, addr 9, value 0x120c
INFO: mdio_update: phy_id 2, addr 0, value 0x808

BL1:1.17.3.9 (01/11/2022 - 18:40:36)

INFO: BL1: RAM 0x6517a800 - 0x65180000
INFO: Using crypto library 'mbed TLS'
```

Primary bootloader version on ESR-100/200/1000/1200/1500/1511/1700/3100/3200

```
BRCM XLP Stage 1 Loader (X-Loader:1.17.3.11) [Big-Endian] (14/11/2022 - 13:21:58)
XLP316B2: Node 0 frequency: CPU=1400MHz, SOC=1999MHz, REF=133MHz
POWER ON RESET CFG:43F94FA8,VRM: 0x6868, PRID: 0xC1104
```

- Secondary bootloader (U-boot):

Secondary bootloader version

```
INFO: Entry point address = 0x85000000
INFO: SPSR = 0x3c9

U-Boot:1.17.3.9 (01/11/2022 - 18:40:36)

        Watchdog enabled
```

- Main firmware version:

> **Main firmware version**
>
> ```
> [ 0.000000] Initializing cgroup subsys cpu
> [ 0.000000] Initializing cgroup subsys cpuacct
> [ 0.000000] Software version: 1.14.5 build 6[596cabe53] date 20/04/2022 time
> 11:37:10
> ```

5 Firmware update via CLI of the ESR main firmware

5.1 Firmware update from version 1.17.3 and later

Firmware version 1.18.3 is cumulative (it contains updated versions of the primary and secondary loaders). Firmware versions 1.17.3 and later support cumulative updating of all software components, so it will be enough to:

- Upload the firmware file to the ESR service router.
- Select the firmware image version 1.18.3 for the next upload.
- Reboot the service router.

5.1.1 Preparation for firmware upload

When uploading firmware using remote file copy servers:

1. Start the corresponding server on the network (TFTP/FTP/SFTP/HTTP/HTTPS/SCP).
2. Copy the firmware file (esrXXXX-1.18.3-build2.firmware) to the working directory of the remote file copy server. <esrXXXX>must be replaced with the name corresponding to the router model.
   - For ESR-10/12V/12VF/14VF/15 service routers, files starting with esr1x are loaded.
   - For ESR-20/21 service routers, files starting with esr2x are loaded.
   - For ESR-100/200 service routers, files starting with esr200 are loaded.
   - For ESR-1500/1511 service routers, files starting with esr15xx are loaded.
   - For service routers of other models, the index in the file name corresponds to the router model.
3. Provide IP connectivity between the upgraded ESR service router and the remote file copy server (routing).
4. Ensure operation of the remote copy protocol between the ESR and the remote file copy server (intermediate firewalls).
5. If necessary (for FTP, SFTP, SCP, HTTP protocols), find out the username and password to write the required file.

When loading the software using a USB/MMC media:

1. Format USB/MMC media partition as FAT32 or exFAT.
2. Copy firmware file (esrXXXX-1.18.3-build2.firmware) to the root directory of the USB/MMC media. Rules for using firmware files for different models are listed above.
3. Connect the USB/MMC storage to the appropriate ESR slot.
4. Define the volume label of the connected USB/MMC storage.

5.1.1.1 Firmware upload

Using one of the remote file upload protocols

Firmware upload via TFTP

```
esr# copy tftp://<tftp-server-ip>:/esrXXXX-1.18.3-build2.firmware system:firmware
|*****************************************| 100% (0B) Firmware updated successfully.
```

Firmware upload via FTP

```
esr# copy ftp://<ftp-username>:<ftp-userpassword>@<ftp-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|*****************************************| 100% (0B) Firmware updated successfully.
```

Firmware upload via SFTP

```
esr# copy sftp://<sftp-username>:<sftp-userpassword>@<sftp-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|*****************************************| 100% (0B) Firmware updated successfully.
```

Firmware upload via SCP

```
esr# copy scp://<scp-username>:<scp-userpassword>@<scp-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|*****************************************| 100% (0B) Firmware updated successfully.
```

Firmware upload via HTTP

```
esr# copy http://<http-username>:<http-userpassword>@<http-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|*****************************************| 100% (0B) Firmware updated successfully.
```

Firmware upload via HTTPS

```
esr# copy https://<https-username>:<https-userpassword>@<http-server-ip>:/
esrXXXX-1.18.3-build2.firmware system:firmware

|*****************************************| 100% (0B) Firmware updated successfully.
```

- <config-file-name> — name of the service router configuration backup file.
- <tftp-server-ip> — IP address of the TFTP server in use;
- <ftp-username> — user name on the FTP server;
- <ftp-userpassword> — user password on the FTP server;
- <ftp-server-ip> — IP address of the FTP server in use;
- <sftp-username> — user name on the SFTP server;
- <sftp-userpassword> — user password on the SFTP server;
- <sftp-server-ip> — IP address of the SFTP server in use;
- <scp-username> — user name on the SCP server;
- <ftp-userpassword> — user password on the FTP server;
- <scp-server-ip> — IP address of the SCP server in use;
- <http-username> — user name on the HTTP server;
- <http-userpassword> — user password on the HTTP server;

- <http-server-ip> — IP address of the HTTP server in use.

Rules for using firmware files for different models are listed in the Preparation for firmware upload section.

Using a USB/MMC media

1. Define the volume label of the connected USB/MMC storage:

Defining the volume label name of the USB storage

```
esr# show storage-devices usb
Name                            Filesystem  Total, MB   Used, MB    Free, MB
------------------------------  ----------  ----------  ----------  ----------
<USB_DISK>                      vfat        7664.01     6391.69     1272.32
```

Defining the volume label name of the MMC storage

```
esr# show storage-devices mmc
Name                            Filesystem  Total, MB   Used, MB    Free, MB
------------------------------  ----------  ----------  ----------  ----------
<MMC_DISK>                      vfat        7664.01     6391.69     1272.32
```

---

2. Copying file from the USB/MMC storage:

> ⚠ **When executing copy commands to USB/MMC media, instead of the <USB_DISK> or <MMC_DISK> fields, use the real volume labels defined above.**

Upload software from USB

```
esr# copy usb://<USB_DISK>:/esrXXXX-1.18.3-build2.firmware system:firmware

|*****************************************| 100% (73786kB) Firmware updated
successfully
```

Upload software from MMC

```
esr# copy mmc://<MMC_DISK>:/esrXXXX-1.18.3-build2.firmware system:firmware

|*****************************************| 100% (73786kB) Firmware updated
successfully.
```

- <USB_DISK> – partition name on the USB storage;
- <MMC_DISK> – partition name on the MMC storage.

5.1.1.2 Selecting version 1.18.3 firmware image for the next boot

ESR service routers store two firmware images (image-1 and image-2) at the same time.

    1. Check the contents of the firmware images uploaded to the service router:

```
esr# show bootvar
Image   Version                    Date                  Status         After reboot
-----   ------------------------   --------------------  ------------   ------------
1       1.18.3 build 3[0ce3307fa]  date 28/02/2023 time  Not Active
                                   12:06:26


2       1.17.3 build               date 14/11/2022 time  Active            *
        11[a813b5c65]              12:51:54
```

When loading a firmware file into the system:firmware partition, the upload is always made to the currently inactive partition.

    2. Select partition containing firmware version 1.18.3 as bootable:

Select firmware section for boot

```
esr# boot system image-1
This command cannot be interrupted, do not turn off device during process.
Continue? (y/N): y
2000-01-07T18:51:19+00:00 %FILE_MGR-I-INFO: operation started: 'boot system
image-1' (index: 4, origin: CLI)
2000-01-07T18:51:22+00:00 %FIRMWARE-I-INFO: Writing data...
2000-01-07T18:51:31+00:00 %FIRMWARE-I-INFO: Writing data...
2000-01-07T18:51:37+00:00 %FILE_MGR-I-INFO: operation is finished: 'boot system
image-1' (index: 4, origin: CLI)
Boot image set successfully.
```

    3. Check that the image containing firmware version 1.18.3 is selected for boot:

```
esr# show bootvar
Image   Version                    Date                  Status         After reboot
-----   ------------------------   --------------------  ------------   ------------
1       1.18.3 build 1[0ce3307fa]  date 28/02/2023 time  Not Active        *
                                   12:06:26


2       1.17.3 build               date 14/11/2022 time  Active
        11[a813b5c65]              12:51:54
```

> ⛔ **If a firmware version is older than the firmware currently in use is chosen to be uploaded at a later time, then after rebooting, it will not be possible to convert the current configuration, and an empty configuration (without factory settings) will be applied. With an empty configuration, the router can only be accessed using the console connection and the default login/password (admin/password).**

5.1.2 Rebooting the service router

Reboot the service router using the following command:

Reboot the router via CLI of the main firmware

```
esr# reload system
Do you really want to reload system ? (y/N): y
```

5.2 Firmware update from versions 1.4.4–1.14.5 (for ESR-1500/1511 1.8.7–1.14.5)

Unlike firmware version 1.17.3, earlier versions do not support cumulative updating. Therefore, in addition to the main firmware, in some cases it is necessary to update the secondary bootloader. As a result, the update process will be as follows:

- Load secondary bootloader (U-boot).
- Load firmware file to the ESR service router.
- Select firmware image version 1.18.3 for the next boot.
- Reboot the service router.

> ⬧ **Updating the secondary bootloader (Uboot) is required if the current version of the secondary bootloader is older than version 1.12.X, inclusive (1.12.X, 1.11.X, 1.10.X, etc.).**
> **Updating the secondary bootloader (U-boot) is not required if the current version is 1.13.0 or later (1.13.0, 1.14.0, etc.).**

> ⬧ **When updating from earlier versions of the software, the set of protocols for remote file copying and types of locally connected drives may differ.**

> ⬧ **To update firmware of the ESR-3100 routers from version 1.14.x, contact technical support service using the platform** https://servicedesk.eltex-co.ru/**.**

5.2.1 Preparing the configuration when updating from versions 1.4.x and earlier

Before updating firmware from versions 1.4.x and earlier to version 1.6.x, it is necessary to take into account changes in operation modes of physical interfaces.

For physical interfaces starting from firmware version 1.6.2, the default routed port mode is:

```
interface gigabitethernet 1/0/1
  mode routerport
exit
```

During firmware update, the switched port modes will be removed from the physical ports, for example:

Configuration on 1.4.x and earlier	Configuration on 1.6.2 and later
| ```
interface gigabitethernet 1/0/1
  description "WAN"
  switchport mode trunk
  switchport trunk allowed vlan add 150
exit
interface gigabitethernet 1/0/1.200
  ip firewall disable
exit
``` | ```
interface gigabitethernet 1/0/1
  description "WAN"
exit
interface gigabitethernet 1/0/1.200
  ip firewall disable
exit
``` |
| ```
interface gigabitethernet 1/0/1
  description "WAN"
  switchport forbidden default-vlan
  switchport access vlan 10
exit
interface gigabitethernet 1/0/1.200
  bridge-group 1
exit
``` | ```
interface gigabitethernet 1/0/1
  description "WAN"
exit
interface gigabitethernet 1/0/1.200
  bridge-group 1
exit
``` |

5.2.2   Preparation for firmware upload (firmware and secondary bootloader)

When uploading firmware using remote file copy servers:

1. Start the corresponding server on the network (TFTP/FTP/SFTP/HTTP/HTTPS/SCP).
2. Copy the firmware file (esrXXXX-1.18.3-build2.firmware esrXXXX-1.18.3-build2.uboot) to the working directory of the remote file copy server. <esrXXXX> must be replaced with the name corresponding to the router model.
   - For ESR-10/12V/12VF/14VF/15 service routers, files starting with esr1x are loaded.
     - For ESR-12V/12VF/14VF service routers and hardware version (HW-version) 3v0 and later, use file with a 'spi_uboot' extension instead of file with a 'uboot' extension.
     - For ESR-10 service routers and hardware version (HW-version) 2v0 and later, use file with a 'spi_uboot' extension instead of file with a 'uboot' extension.
   - For ESR-20/21 service routers, files starting with esr2x are loaded.
   - For ESR-100/200 service routers, files starting with esr200 are loaded.
   - For ESR-1500/1511 service routers, files starting with esr15xx are loaded.
   - For service routers of other models, the index in the file name corresponds to the router model.
3. Provide IP connectivity between the upgraded ESR service router and the remote file copy server (routing).
4. Ensure operation of the remote copy protocol between the ESR and the remote file copy server (intermediate firewalls).
5. If necessary (for FTP, SFTP, SCP, HTTP protocols), find out the username and password to write the required file.

When loading the software using a USB/MMC media:

1. Format USB/MMC media partition as FAT32 or exFAT (supported starting from 1.13.0 firmware version).
2. Copy firmware and secondary bootloader files (esrXXXX-1.18.3-build2.firmware esrXXXX-1.18.3-build2.uboot) to the root directory of the USB/MMC media. Rules for using firmware files for different models are listed above.
3. Connect the USB/MMC storage to the appropriate ESR slot.
4. Define the volume label of the connected USB/MMC storage.

5.2.3   Firmware files and secondary bootloader upload (esrXXXX-1.18.3-build2.firmware esrXXXX-1.18.3-build2.uboot)

5.2.3.1   Using one of the remote file upload protocols

Firmware upload via TFTP

```
esr# copy tftp://<tftp-server-ip>:/esrXXXX-1.18.3-build2.firmware system:firmware
|****************************************| 100% (0B) Firmware updated successfully.
esr# copy tftp://<tftp-server-ip>:/esrXXXX-1.18.3-build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

Firmware upload via FTP

```
esr# copy ftp://<ftp-username>:<ftp-userpassword>@<ftp-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|****************************************| 100% (0B) Firmware updated successfully.
esr# copy ftp://<ftp-username>:<ftp-userpassword>@<ftp-server-ip>:/esrXXXX-1.18.3-
build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

Firmware upload via SFTP

```
esr# copy sftp://<sftp-username>:<sftp-userpassword>@<sftp-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|****************************************| 100% (0B) Firmware updated successfully.
esr# copy sftp://<sftp-username>:<sftp-userpassword>@<sftp-server-ip>:/esrXXXX-1.18.3-
build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

Firmware upload via SCP

```
esr# copy scp://<scp-username>:<scp-userpassword>@<scp-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|****************************************| 100% (0B) Firmware updated successfully.

esr# copy scp://<scp-username>:<scp-userpassword>@<scp-server-ip>:/esrXXXX-1.18.3-
build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

Firmware upload via HTTP

```
esr# copy http://<http-username>:<http-userpassword>@<http-server-ip>:/esrXXXX-1.18.3-
build2.firmware system:firmware

|****************************************| 100% (0B) Firmware updated successfully.

esr# copy http://<http-username>:<http-userpassword>@<http-server-ip>:/esrXXXX-1.18.3-
build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

Firmware upload via HTTPS

```
esr# copy https://<https-username>:<https-userpassword>@<http-server-ip>:/
esrXXXX-1.18.3-build2.firmware system:firmware

|****************************************| 100% (0B) Firmware updated successfully.

esr# copy https://<https-username>:<https-userpassword>@<http-server-ip>:/
esrXXXX-1.18.3-build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

- <config-file-name> — file name with which the current configuration of the service router will be saved;
- <tftp-server-ip> — IP address of the TFTP server in use;
- <ftp-username> — user name on the FTP server;
- <ftp-userpassword> — user password on the FTP server;
- <ftp-server-ip> — IP address of the FTP server in use;
- <sftp-username> — user name on the SFTP server;
- <sftp-userpassword> — user password on the SFTP server;
- <sftp-server-ip> — IP address of the SFTP server in use;
- <scp-username> — user name on the SCP server;
- <ftp-userpassword> — user password on the FTP server;
- <scp-server-ip> — IP address of the SCP server in use;
- <http-username> — user name on the HTTP server;
- <http-userpassword> — user password on the HTTP server;
- <http-server-ip> — IP address of the HTTP server in use.

Rules for using firmware and secondary bootloader (U-boot) for different models see in section Preparation for firmware upload (firmware and secondary bootloader).

5.2.3.2 Using USB/MMC media

1. Define the volume label of the connected USB/MMC storage:

Defining the volume label name on a USB storage

```
esr# show storage-devices usb
Name                            Filesystem  Total, MB   Used, MB    Free, MB
------------------------------- ----------  ----------  ----------  ----------
<USB_DISK>                      vfat        7664.01     6391.69     1272.32
```

Defining the volume label name of the MMC storage

```
esr# show storage-devices mmc
Name                            Filesystem  Total, MB   Used, MB    Free, MB
------------------------------- ----------  ----------  ----------  ----------
<MMC_DISK>                      vfat        7664.01     6391.69     1272.32
```

2. Copying file from the USB/MMC storage

> ⚠ **When executing copy commands to USB/MMC media, instead of the <USB_DISK> or <MMC_DISK> fields, use the real volume labels defined above.**

Load firmware from USB

```
esr# copy usb://<USB_DISK>:/esrXXXX-1.18.3-build2.firmware system:firmware

|****************************************| 100% (73786kB) Firmware updated
successfully

esr# copy usb://<USB_DISK>:/esrXXXX-1.18.3-build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

Load firmware from MMC

```
esr# copy mmc://<MMC_DISK>:/esrXXXX-1.18.3-build2.firmware system:firmware

|****************************************| 100% (73786kB) Firmware updated
successfully.

esr# copy usb://<USB_DISK>:/esrXXXX-1.18.3-build2.uboot system:boot-2

|****************************************| 100% (697kB) Bootloader updated
successfully.
```

- <USB_DISK> – partition name on the USB storage;
- <MMC_DISK> – partition name on the MMC storage.

5.2.4 Selecting version 1.18.3 firmware image for the next upload

ESR service routers store two firmware images (image-1 and image-2) at the same time.

    1. Check the contents of the firmware images uploaded to the service router:

```
esr# show bootvar
Image  Version                   Date                 Status       After reboot
-----  ------------------------  -------------------  -----------  ------------
1      1.18.3 build 1[0ce3307fa] date 28/02/2023 time  Not Active
                                 12:06:26


2      1.14.5 build 5[596cabe53] date 20/04/2022 time  Active          *
                                 11:37:26
```

When loading a firmware file to the system:firmware partition, the upload is always made to the currently inactive partition..

    2. Select the partition containing firmware version 1.18.3 as bootable:

Selecting firmware section to upload

```
esr# boot system image-1
Do you really want to set boot system image? (y/N): y
```

    3. Check that the image containing firmware version 1.18.3 is selected for upload:

```
esr# show bootvar
Image  Version                   Date                 Status       After reboot
-----  ------------------------  -------------------  -----------  ------------
1      1.18.3 build 1[0ce3307fa] date 28/02/2023 time  Not Active      *
                                 12:06:26


2      1.14.5 build 5[596cabe53] date 20/04/2022 time  Active
                                 11:37:26
```

⬥ **If a firmware version is older than the firmware currently in use is chosen to be uploaded at a later time, then after rebooting, it will not be possible to convert the current configuration, and an empty configuration (without factory settings) will be applied. With an empty configuration, the router can only be accessed using the console connection and the default login/password (admin/password).**

5.2.5 Rebooting the service router

Reboot the service router using the command:

Reboot the router via CLI of the main firmware
| ```
esr# reload system
Do you really want to reload system ? (y/N): y
``` |

5.3 Firmware update from 1.4.3 version (1.8.6 for ESR-1500/1511) and earlier to an intermediate version

> ⚠ **When updating from earlier versions of the firmware, the set of protocols for remote file copying and types of locally connected drives may differ.**

Table of models and firmware versions that require update through an intermediate version:

Device model	Firmware version
ESR-10	esr10-1.4.3 and earlier
ESR-12V	esr12v-1.4.3 and earlier
ESR-12VF	esr12vf-1.4.3 and earlier
ESR-100	esr100-1.4.3 and earlier
ESR-200	esr200-1.4.3 and earlier
ESR-1500	esr1500-1.8.6 and earlier

When updating firmware on service routers of models and firmware versions listed in the table above, firmware version 1.18.3 will not be loaded, resulting in an error of the following type:

```
esr-12vf# copy tftp://<tftp-server-ip>:/esrXXXX-1.18.3-build2.firmware system:firmware
|*****************************************| 100% (71907kB) Unsupported board.
```

The problem is explained by the fact that in versions 1.6.0 (for ESR-10/12V/12VF/100/200) and 1.9.0 (for ESR-1500/1511) there was a merge of firmware images and bootloaders for service router models of similar hardware platforms.

To update service router firmware from versions listed in the table above, first update the firmware to an intermediate version. In this case, there is no need to update the loaders.

The update process will be the same as the one described in the 'Firmware update from version 1.17.3 and later' section with the following differences:

- The following files must be used as firmware files when booting:
    - For ESR-10 — esr10-1.4.4-build8.firmware;
    - For ESR-12V — esr12v-1.4.4-build5.firmware;
    - For ESR-12VF — esr10vf-1.4.4-build5.firmware;
    - For ESR-100 — esr100-1.4.4-build4.firmware;

- For ESR-200 — esr200-1.4.4-build5.firmware;
- For ESR-1500 — esr1500-1.8.7-build4.firmware.
- If the current firmware version on service router is 1.1.0 or earlier (1.1.0, 1.0.9, 1.0.8), then use the 'fs://firmware' section designation instead of the 'system:firmware' section..

After updating to an intermediate version of the firmware, make sure that the update was successful. Next, update the firmware according to the procedure described in the section 'Firmware update from versions 1.4.4–1.14.5 (for ESR-1500/1511 1.8.7–1.14.5)'.

5.4 Firmware update on ESR-1000 from version 1.0.6 and earlier

When updating ESR-1000 from version 1.0.6 and earlier, the version of the primary loader (X Loader) must be taken into account. Check the current X-loader version using the method described in the section 'Checking the current firmware version and the version of the primary (X-Loader) and secondary (U-boot) loaders in the output of the console interface when loading the service router'.

If the current X-Loader version is 1.0.5 or earlier, the update is only possible using CLI of the secondary bootloader (U-boot):

1. Disconnect cables from all ESR-1000 interfaces.
2. Connect a PC with an installed TFTP server to the gi 1/0/1 interface.
3. Create a subdirectory named 'esr1000' in the working directory of the TFTP server.
4. Copy the following files to the 'esr1000' subdirectory and rename them:
   - 'esr1000-1.18.3-build2.firmware' to 'firmware';
   - 'esr1000-1.18.3-build2.uboot' to 'u-boot.bin';
   - for ESR-1000 with hardware version later than 1v7, rename the 'esr1000-1.18.3-build2.xload' file to 'xload.bin';
   - for ESR-1000 with 1v7 hardware version and older, rename the 'esr1000-1.18.3-build2.1v7.xload' file to 'xload.bin'.
5. Connect to the ESR service router via console port on the front panel of the router using the following RS-232 interface parameters on PC:
   - Baud rate: 115200 bps
   - Data bits: 8 bits;
   - Parity: no;
   - Stop bits: 1;
   - Flow control: no.
6. Reboot the router using one of the following methods:
   - Switch the power off and then switch it back on. The interval between switching off and on must be at least 20 seconds.
   - Briefly press the function button F on the front panel of the router (on the side panel for ESR-10).
   - Execute the 'reload system' command in the CLI of the main firmware of the router.

     Reboot using a command in the main firmware CLI

     ```
     esr-21# reload system
     Do you really want to reload system ? (y/N): y
     ```

7. After appearance of a message of the following type:

> Temp: MAX6657 temperature (int) 38 C
> Temp: MAX6657 temperature (ext) 64 C
> Temp: LM75/0 temperature (PHYs 1G) 33 C
> Temp: LM75/1 temperature (SFP+ 10G) 31 C
> Temp: LM75/2 temperature (Switch) 43 C
> **Hit any key to stop autoboot: 0**

Press the 'Esc' button.

8. In the CLI of the secondary bootloader (U-boot) that appears, configure the IP parameters to establish communication with the connected PC.

> **Assign IP address to the router**
>
> BRCM.XLP316Lite Rev B2.u-boot# **setenv ipaddr 192.0.2.1**

> **Specify IP address assigned on the interface connected to gi1/0/1 of the router**
>
> BRCM.XLP316Lite Rev B2.u-boot# **setenv serverip 192.0.2.2**

> ❗ **IP addresses of the PC and the router may differ from those shown in the example above, but must be from the same /24 subnet.**

9. Load files of primary (X-Loader) and secondary (U-boot) bootloaders and main firmware:

> **Loading secondary bootloader (U-boot)**
>
> BRCM.XLP316Lite Rev B2.u-boot# **run tftp_update_uboot**
>
> Using nae-0-1 device
> TFTP from server 192.0.2.2; our IP address is 192.0.2.1
> Filename 'esr1000/u-boot.bin'.
> Load address: 0xa800000078020000
> Loading: TftpStart:TftpTimeoutMsecs = 10000, TftpTimeoutCountMax = 6
> ##
> done
> Bytes transferred = 981776 (efb10 hex)
> SF: Detected MX25L12805D withpagesize 256, total 16777216 bytes
> 0x4000 KiB MX25L12805D at 0:0 isnowcurrentdevice
> U-Boot update OK

Loading primary loader (X-Loader)

```
BRCM.XLP316Lite Rev B2.u-boot# run tftp_update_xload
Using nae-0-1 device
TFTP from server 192.0.2.2; our IP address is 192.0.2.1
Filename 'esr1000/xload.bin'.
Load address: 0xa800000078000000
Loading: Tftp Start: Tftp Timeout Msecs = 10000, Tftp Timeout Count Max = 6
#########
done
1. Bytes transferred = 123096 (1e0d8 hex)
SF: Detected MX25L12805D with page size 256, total 16777216 bytes
0x4000 KiB MX25L12805D at 0:0 is now current device
X-Loader update OK
```

Loading main firmware

```
BRCM.XLP316Lite Rev B2.u-boot# run tftp_update_image1
Using nae-0-1 device
TFTP fromserver 115.0.0.10; our IP address is 115.0.0.1
Filename 'esr1000/firmware'.
Load address: 0xa800000060000000
Loading: Tftp Start:Tftp Timeout Msecs = 10000, Tftp Timeout Count Max =
6#############################################################

........
#######################################
done
Bytes transferred = 59767378 (38ffa52 hex)
Device 0: MT29F8G08ABBCAH4 ... is now current device
NAND erase: device 0 offset 0x1440000, size 0x6400000
Erasingat 0x7800000 -- 1895825408% complete..
OK
NAND write: device 0 offset 0x1440000, size 0x6400000
104857600 bytes written: OK
Firmware update OK
```

10. Specify the first image to boot:

```
BRCM.XLP316Lite Rev B2.u-boot# run set_bootpart_1
SF: Detected MX25L12805D with page size 256, total 16777216 bytes
0x4000 KiB MX25L12805D at 0:0 is now current device
```

11. Reboot the router by switching the power off and then on. The interval between switching off and on must be at least 20 seconds.

TECHNICAL SUPPORT

For technical assistance in issues related to handling Eltex Ltd. equipment, please, address to Service Center of the company:

http://www.eltex-co.com/support

You are welcome to visit Eltex official website to get the relevant technical documentation and software, to use our knowledge base or consult a Service Center Specialist in our technical forum.

http://www.eltex-co.com/

http://www.eltex-co.com/support/downloads/