



RAIDIX 5.2 INSTALLATION AND CONFIGURATION GUIDE

Document version 1.0

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INTRODUCTION

Document Purpose


This guide describes the procedure of installation of the RAIDIX 5.2 software for storages. This document is mandatory for partners of RAIDIX LLC that install and configure RAIDIX 5.2.


Guide Conventions

The Guide uses the typefaces and formatting to specify different names and terms:

| Convention | Uses |
|--------------------------------|---|
| Bold | Clickable screen names, values, some titles. |
| <i>Italic</i> | Emphasis, term references, additional information, documentation titles, math operations. |
| Color selection of text | Instructions below are only for specific situations and configurations. |
| <code>Monospace</code> | Commands, command utilities, and typed text. |

Text paragraphs that need your special attention are marked with the following frame.

 *Note* – a note providing valuable information.

 *Warning* – directions to be followed to guarantee the proper work of the software.

Contact Us

To get technical assistance in the RAIDIX software, contact RAIDIX Support Department via support@raidix.com.

1. INSTALLATION PREREQUISITES

Before installing RAIDIX 5.2, please perform the following:

1. Assemble and test the hardware system, on which RAIDIX 5.2 software is to be installed. Connect both nodes to one enclosure.



RAIDIX 5.2 works only on systems with CPUs that support AVX.

1. Connect the storage to Ethernet network.
2. Power on the system (220 V).
3. Set up correct time and date values in UEFI/BIOS.
4. In UEFI/BIOS, turn Hyper-Threading off.
5. If you are using UEFI, turn Secure Boot off.



For proper work of RAIDIX 5.2 with SATA controller, we recommend to enable the «AHCI» controller mode in UEFI/BIOS. For details, see the manual of your motherboard.

By default, to authenticate in CLI under an administrator role, use the login **admin** and the password **raidix-era**.

2. SYSTEM INSTALLATION

The RAIDIX 5.2 software comes as an ISO file of the operating system.

To install the system on RAID 1, attentively check the chapters “Drive(s) Selection” and “Root Partition Creation.”

2.1 Setting up Booting from Installation Media

To boot from an installation media containing ISO image with the RAIDIX system:

1. Remove all drives except system-intended drive(s).
2. Insert an installation media with ISO image of the system.
3. Boot from the installation media.

2.2 Setting up the Installation

On the first dialog page, select **Install RAIDIX 5** and press **Enter** (Figure 1).



Figure 1. RAIDIX 5.2 Software installation page

2.2.1 License Agreement

1. On the opened *INSTALLATION SUMMARY* page, click **END USER LICENSE AGREEMENT** (Figure 2).

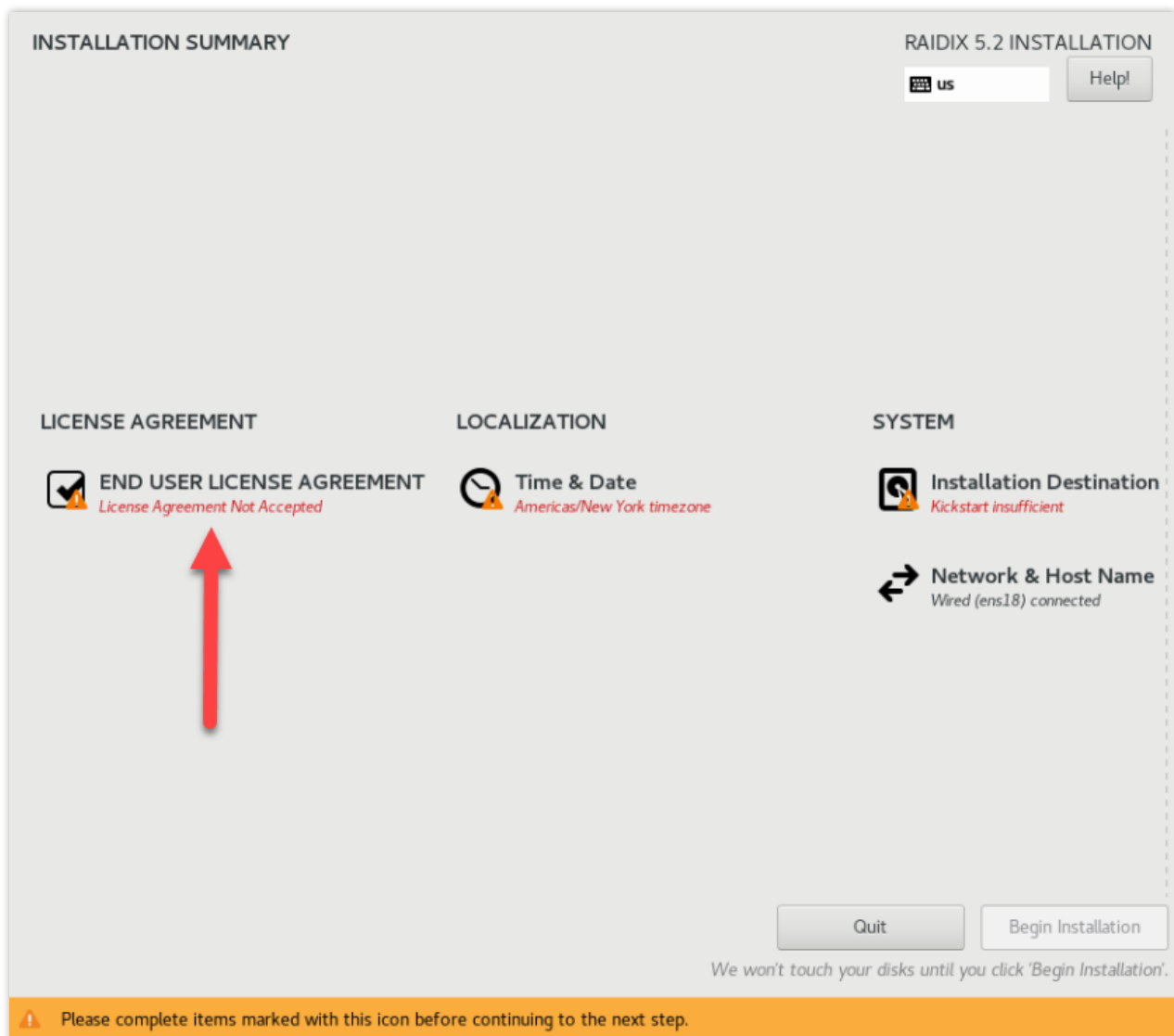


Figure 2. Front page INSTALLATION SUMMARY: selecting LICENSE AGREEMENT

- On the opened *End User License Agreement* page, read the license agreement.

The text is available in English and Russian languages.

- After reading is complete, check **Accept license agreement terms** and click **Done** (Figure 3).

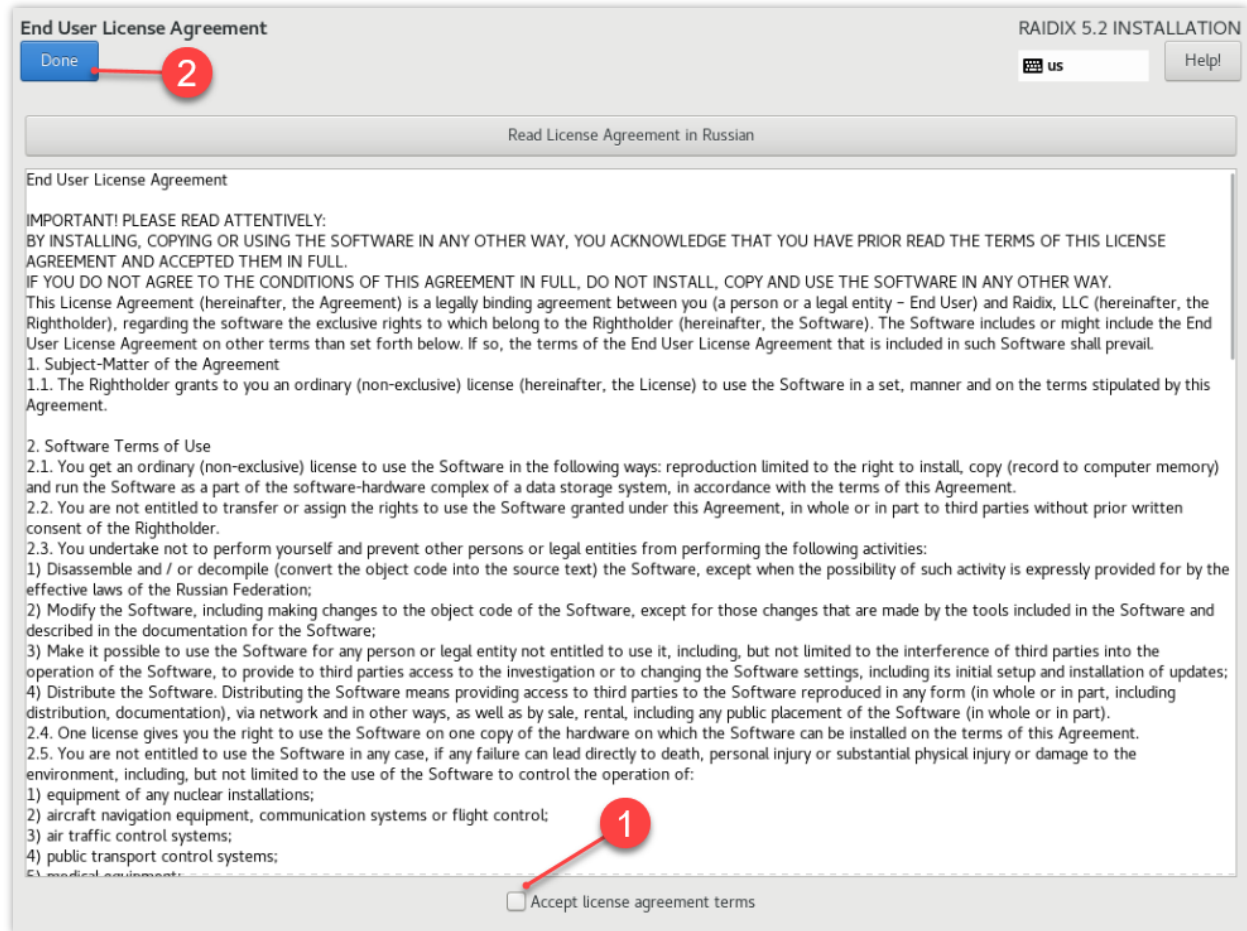


Figure 3. End User License Agreement page

2.2.2 Localization

1. On the *INSTALLATION SUMMARY* page, click **Time & Date** (Figure 4).

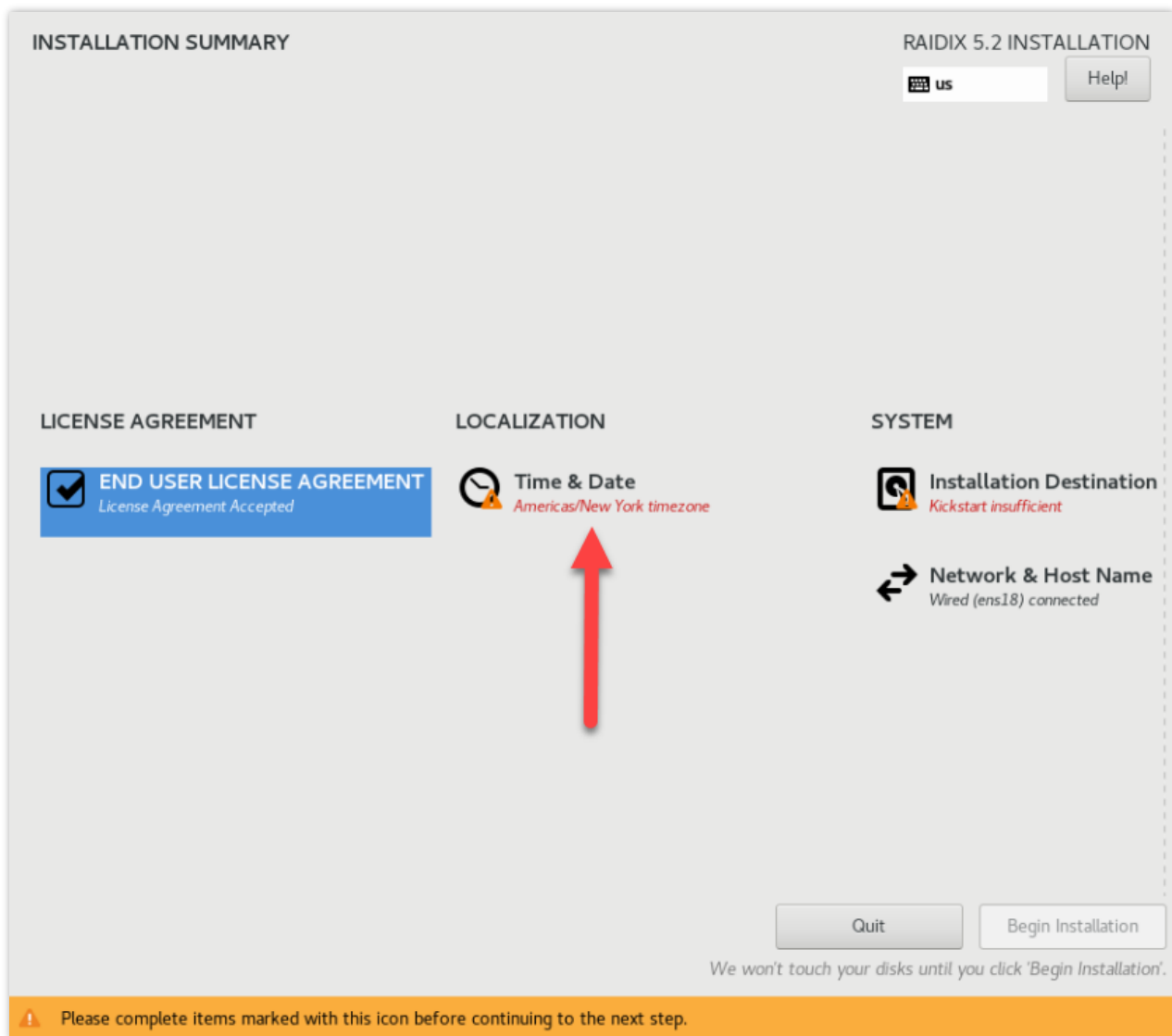


Figure 4. Front page: selecting LOCALIZATION

2. On the opened page, select your local time zone by marking it on the map.
3. Make sure the **Network time** option is on (Figure 5).

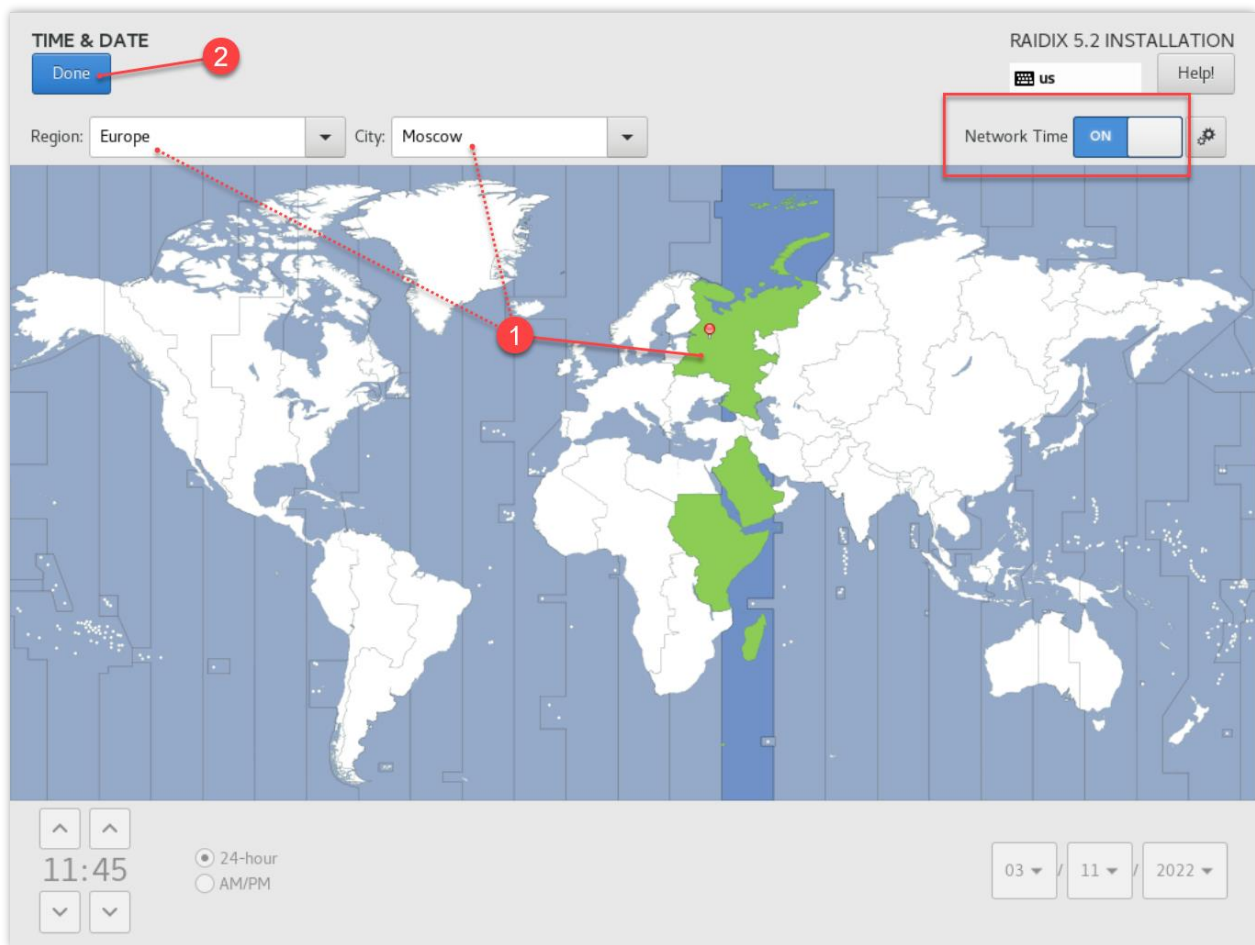


Figure 5. Date & Time page

2.2.3 System

On the *INSTALLATION SUMMARY* page, click **Installation Destination** (Figure 6).

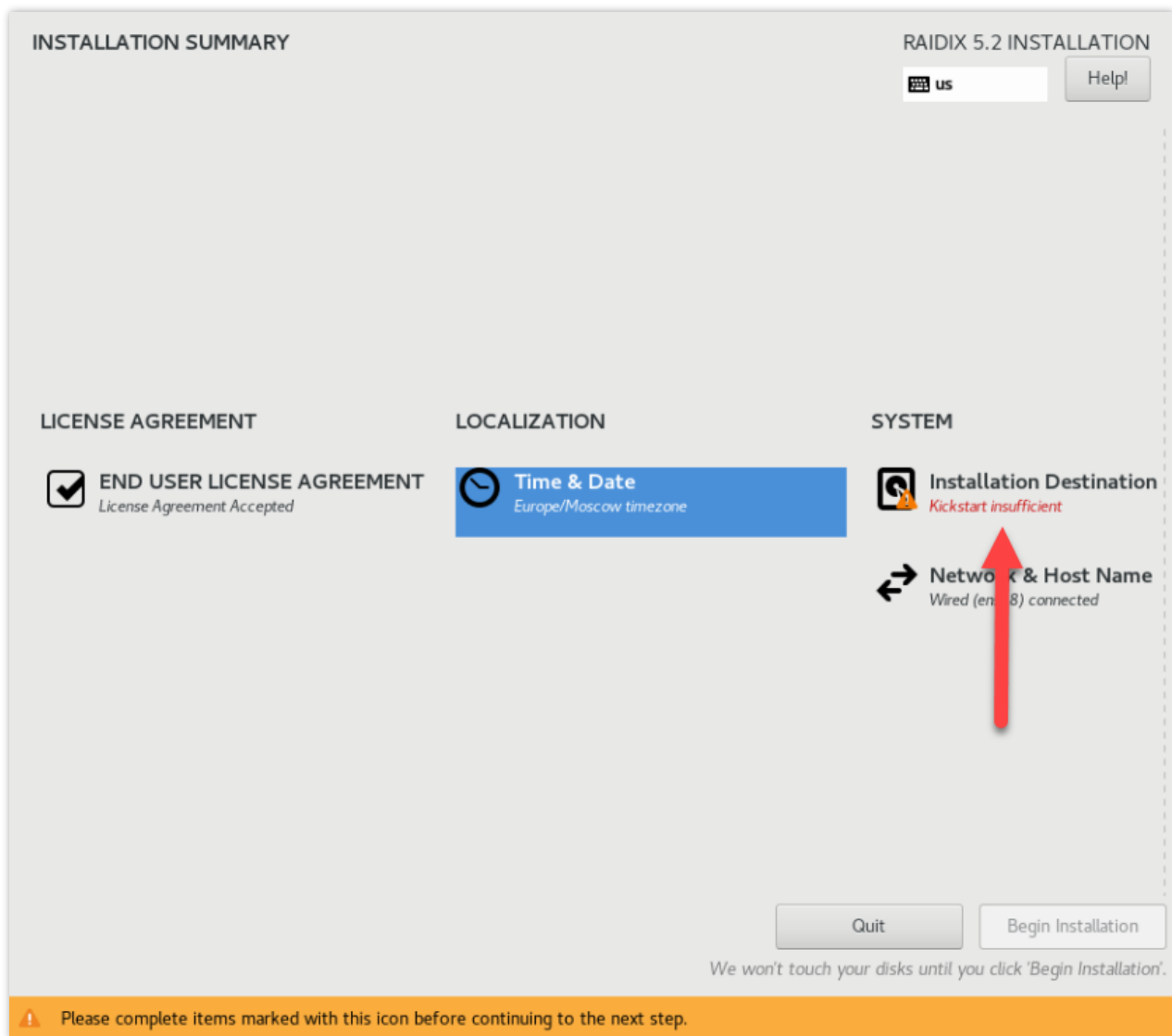


Figure 6. Front page: selecting SYSTEM

2.2.3.1 Drive(s) Selection

1. In the opened window, select a drive for installation of RAIDIX (Figure 7).

If you are installing the system on RAID 1, select at least two drives (Figure 8).

! Sizes of the RAID 1 drives must be identical.

2. Click **Done**.

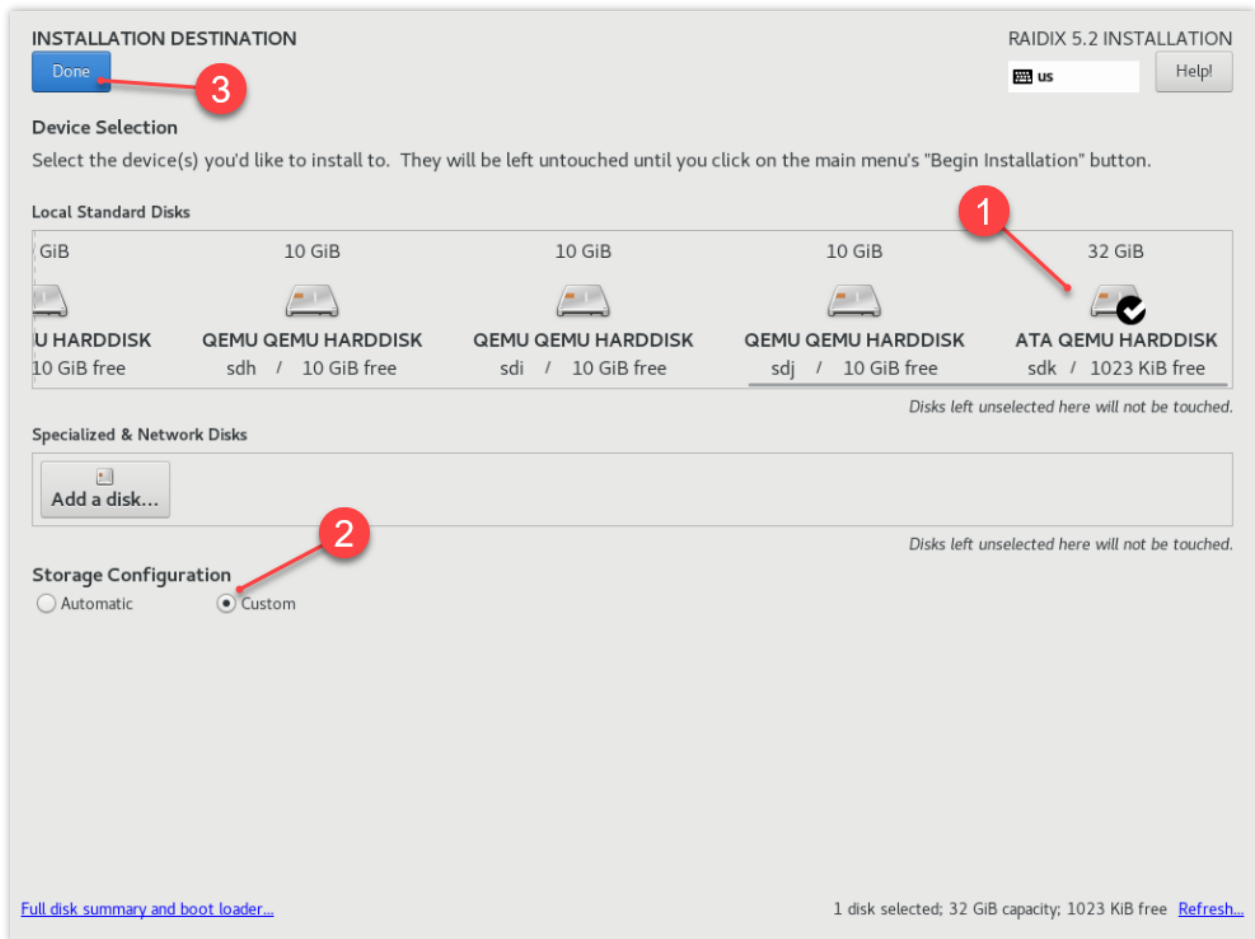


Figure 7. Drive Selection

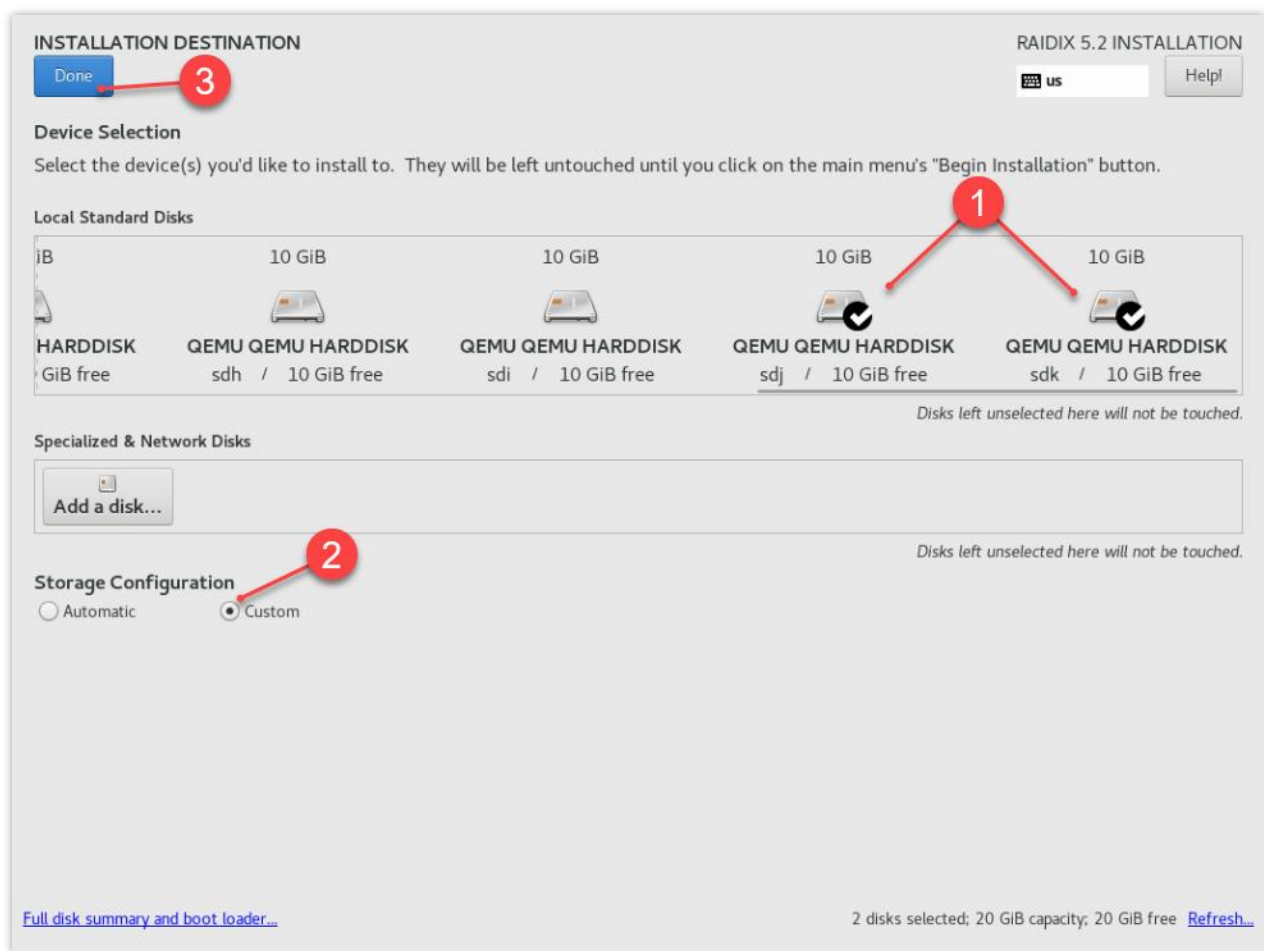


Figure 8. Two drives are selected for the RAID 1 installing

The *MANUAL PARTITIONING* page will open.

2.2.3.2 Deleting Unknown Partitions

If the system drive already contains partitions (shown on the *MANUAL PARTITIONING* page, in the *Unknown* section), delete them as follows (Figure 9):

1. Click **Unknown** to expand the partition list and select a partition.
2. Click **-**.
3. In the opened window, select **Delete all file systems which are only used by Unknown**.
4. Click **Delete It**.

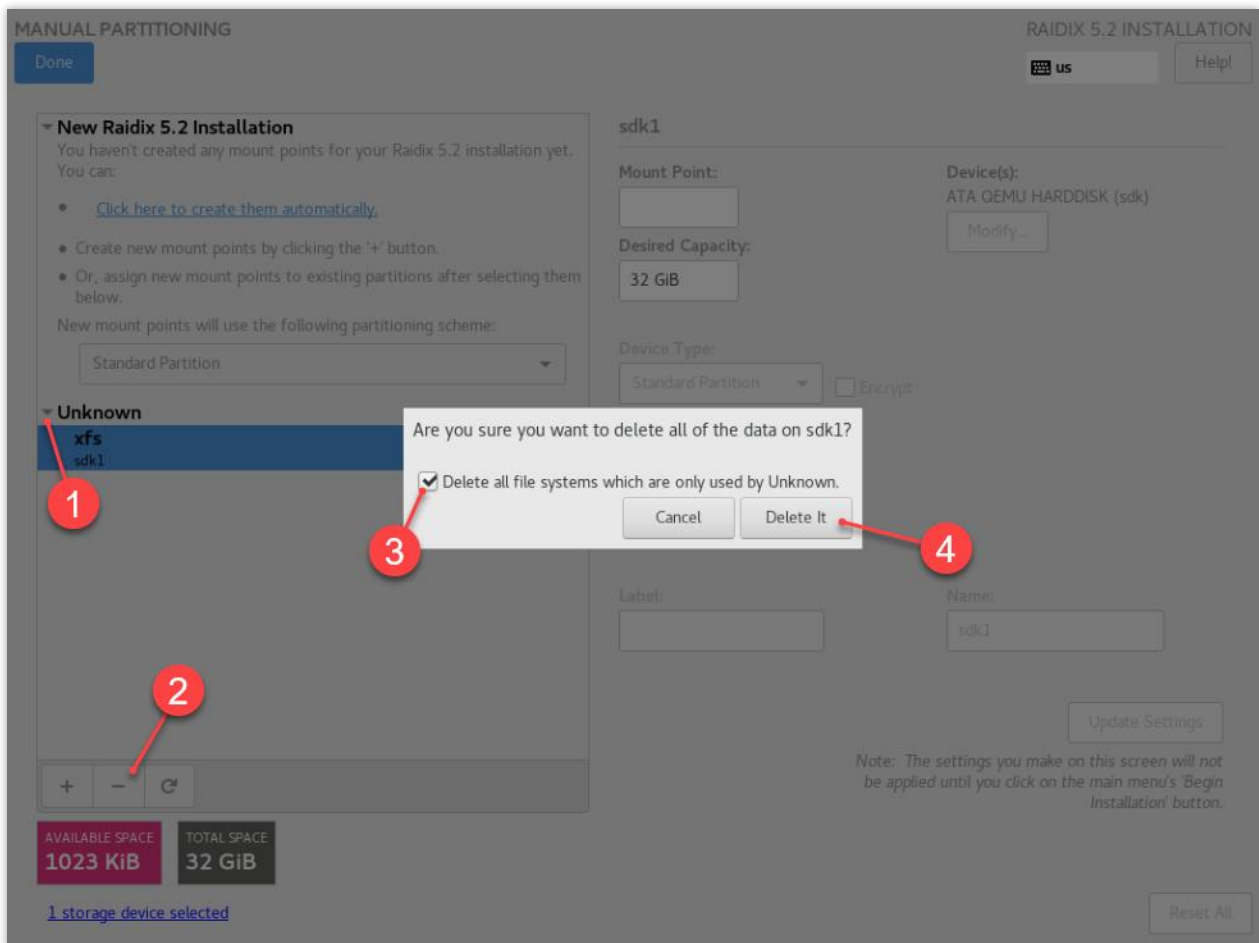


Figure 9. Deleting Unknown partitions

2.2.3.3 EFI Partition Creation

If you are installing RAIDIX 5.2 on an UEFI system:

1. On the opened *MANUAL PARTITIONING* page, in the drop-down list, select or leave **Standard Partition** (Figure 10).

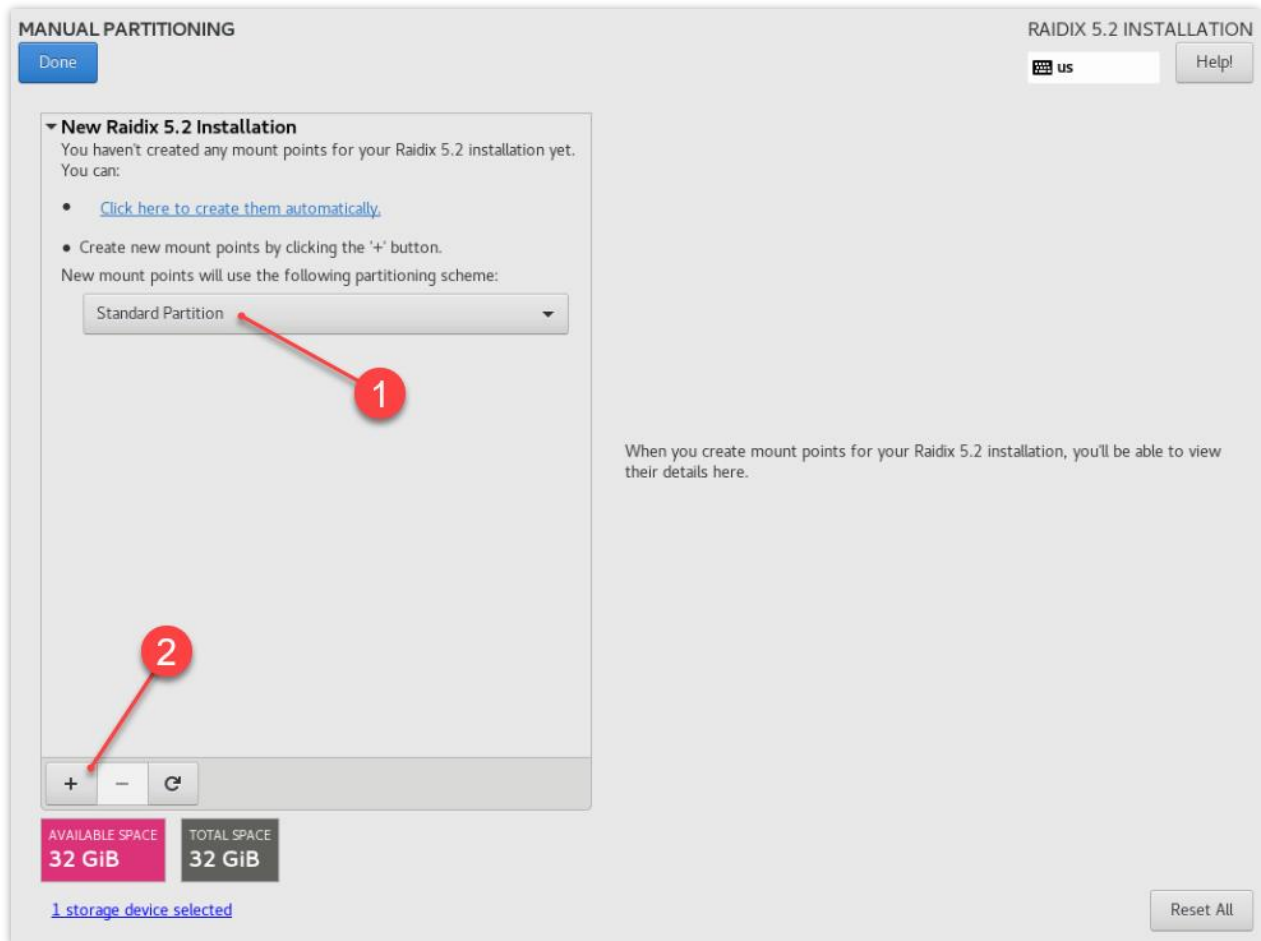

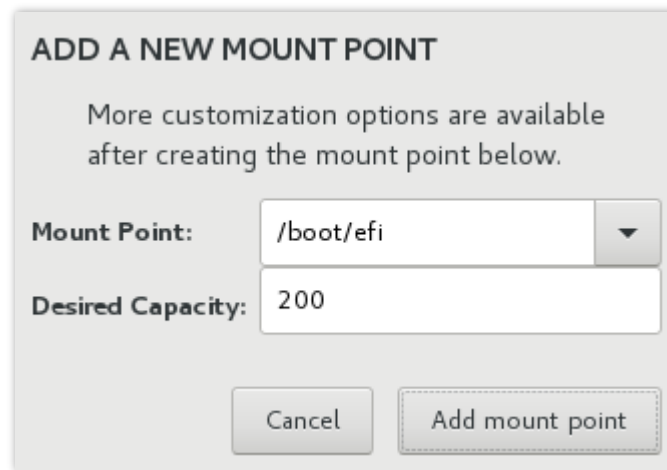


Figure 10. Manual Partitioning window with no partitions

2. In the bottom-left of the window, click , then, in the opened window, specify following parameters (Figure 11):
 - Mount Point: **/boot/efi**
 - Desired Capacity: **200**
 Click **Add mount point**.



ADD A NEW MOUNT POINT

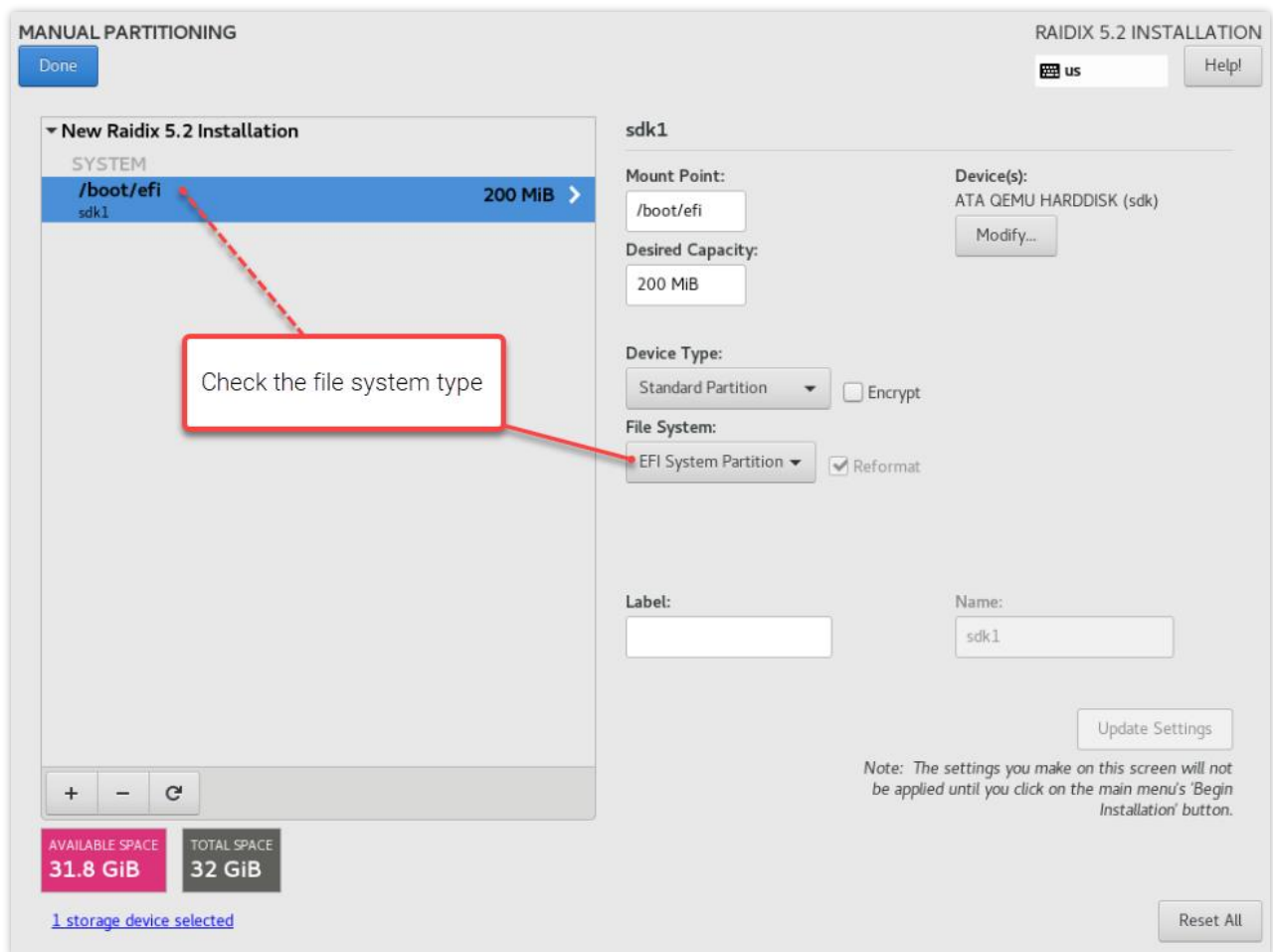
More customization options are available after creating the mount point below.

Mount Point:

Desired Capacity:

Figure 11. Specified parameters for an EFI partition

- Make sure that in the **File System** field, the **EFI System Partition** item is selected (Figure 12).



MANUAL PARTITIONING RAIDIX 5.2 INSTALLATION

▼ New Raidix 5.2 Installation

SYSTEM

| | |
|-----------|---------|
| /boot/efi | 200 MiB |
| sdk1 | |

Check the file system type

sdk1

Mount Point:

Desired Capacity:

Device(s): ATA QEMU HARDDISK (sdk)

Device Type: ☐ Encrypt

File System: ☒ Reformat

Label:

Name:

Note: The settings you make on this screen will not be applied until you click on the main menu's 'Begin Installation' button.

AVAILABLE SPACE 31.8 GiB

TOTAL SPACE 32 GiB

[1 storage device selected](#)

Figure 12. Manual Partitioning page with UEFI boot partition

- If you are installing the system on RAID 1, for EFI partition Device Type, select RAID (Figure 13). Note that the /boot/efi partition will occupy space on each system disk.

MANUAL PARTITIONING

RAIDIX 5.2 INSTALLATION

Done

us

Help!

▼ New Raidix 5.2 Installation

SYSTEM

/boot/efi

boot_efi

200 MiB

>

When you are installing the system on RAID 1, select RAID for Device Type

The partition /boot/efi will occupy space on each system drive

+

-

↺

AVAILABLE SPACE

19.61 GiB

TOTAL SPACE

20 GiB

[2 storage devices selected](#)

boot_efi

Mount Point:

/boot/efi

Desired Capacity:

200 MiB

Device(s):

QEMU QEMU HARDDISK (sda) and 1 other

Modify...

Device Type:

RAID

RAID Level:

RAID1

File System:

EFI System Part...

Encrypt

Reformat

Label:

Name:

boot_efi

Update Settings

Note: The settings you make on this screen will not be applied until you click on the main menu's 'Begin Installation' button.

Reset All


Figure 13. Setting up an EFI partition when installing the system on RAID 1

2.2.3.4 Root Partition Creation

The partitioning is differ depending on system configuration:

- The system drive size *does not exceed 32 GB*.
- The system drive *is larger than 32 GB*.
- You are installing the system on RAID 1.

To create a root partition, on the *MANUAL PARTITIONING* page:

1. Click  and do one of three possible ways:

- **If the system drive size is ≤ 32 GB:**

Specify the following parameters for the root partition:

- Mount Point: /
- Desired Capacity: don't specify.

Thus, the root partition will take all space on the drive. The /var partition will not be created.

Click **Add mount point**.

- **If the system drive is > 32 GB:**

1. Specify the following parameters for the root partition:

- Mount Point: /
- Desired Capacity: **16384**

Click **Add mount point**.

2. Click .

3. Specify the following parameters for the /var partition:

- Mount Point: **/var**
- Desired Capacity: don't specify.

Thus, the /var partition will take all the free space left on the drive.

Click **Add mount point**.

- **If you are installing the system on RAID 1:**

1. Specify the following parameters for the root partition:

- Mount Point: /
- Desired Capacity: don't specify.

Thus, the root partition will take all space on the drive. The /var partition will not be created.

Click **Add mount point**.

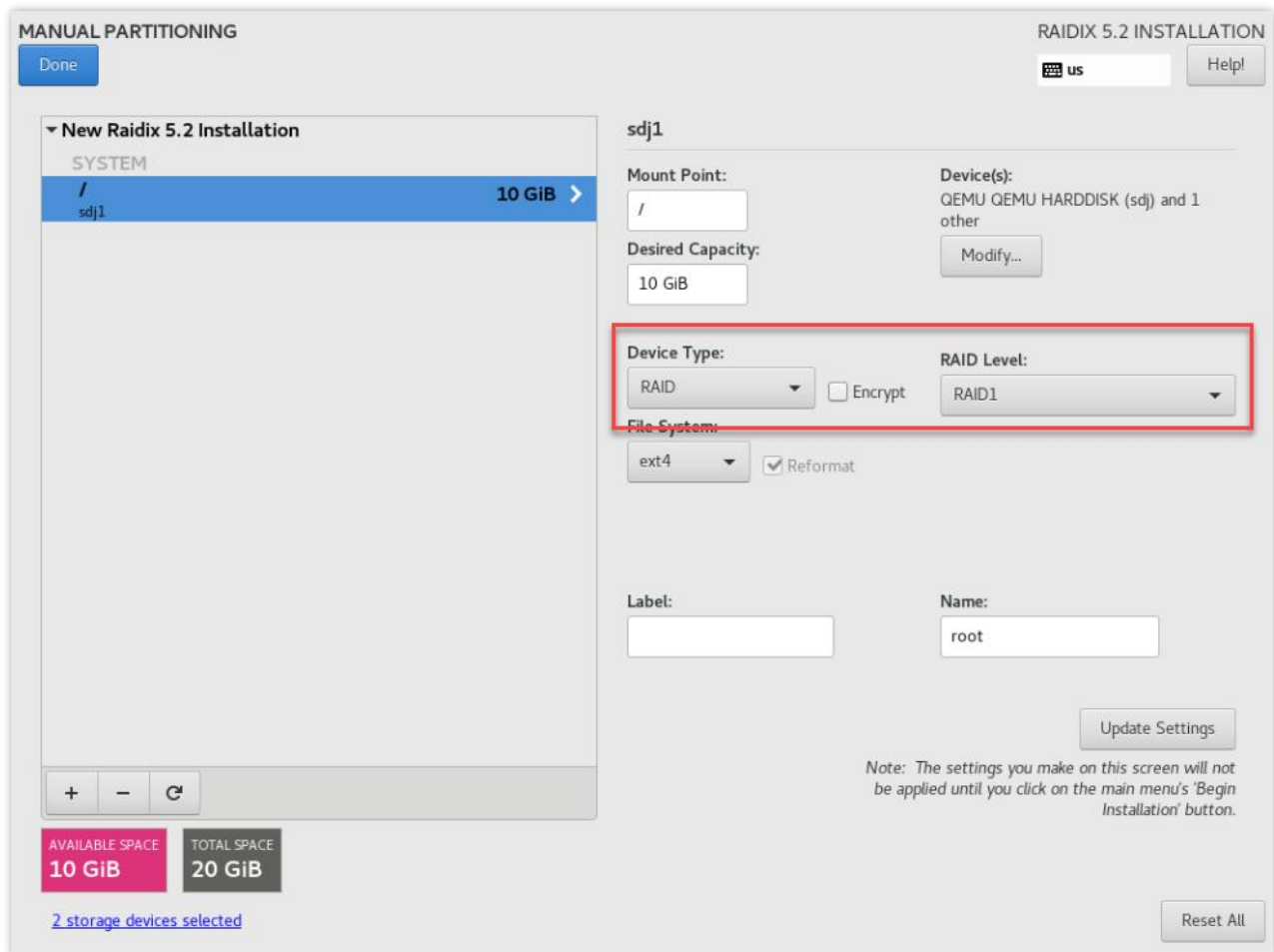
2. configure the partition as follows (Figure 14):

- 2.1 Device Type: **RAID**.

After choosing the Device Type parameter, the next ones appear:

2.2 RAID Level: RAID1 (Redundancy).

2.3 File system: **ext4**.



MANUAL PARTITIONING

Done

New Raidix 5.2 Installation

SYSTEM

/ sdj1 10 GiB >

sdj1

Mount Point: /

Desired Capacity: 10 GiB

Device(s): QEMU QEMU HARDDISK (sdj) and 1 other

Modify...

Device Type: RAID

RAID Level: RAID1

File System: ext4

Reformat

Label:

Name: root

Update Settings

Note: The settings you make on this screen will not be applied until you click on the main menu's 'Begin Installation' button.

Reset All

AVAILABLE SPACE: 10 GiB

TOTAL SPACE: 20 GiB

2 storage devices selected

Figure 14. Partition configuration for installing on RAID 1

- Click **Done**. After the warning message appears, click **Done** again to confirm the partitioning (Figure 15).

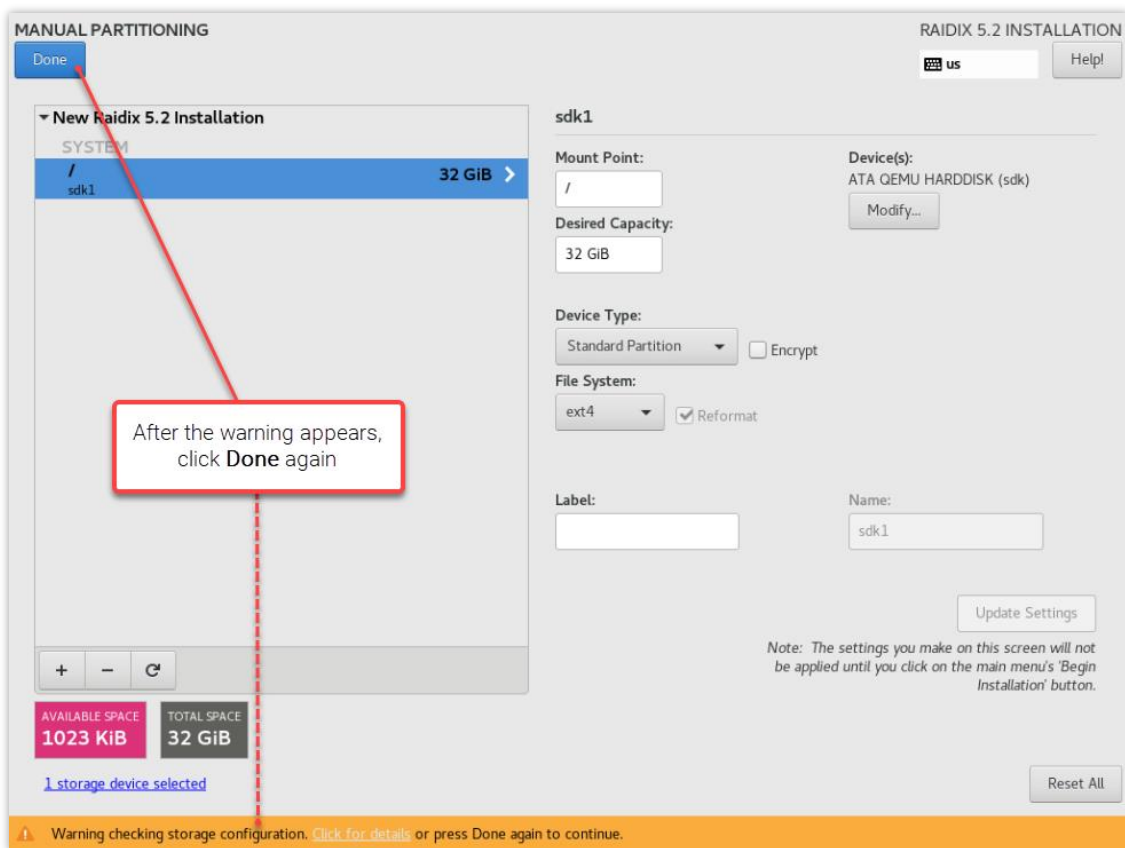


Figure 15. Confirmation of partitioning

- In the opened *SUMMARY OF CHANGES* window, click **Accept Changes** (Figure 16).

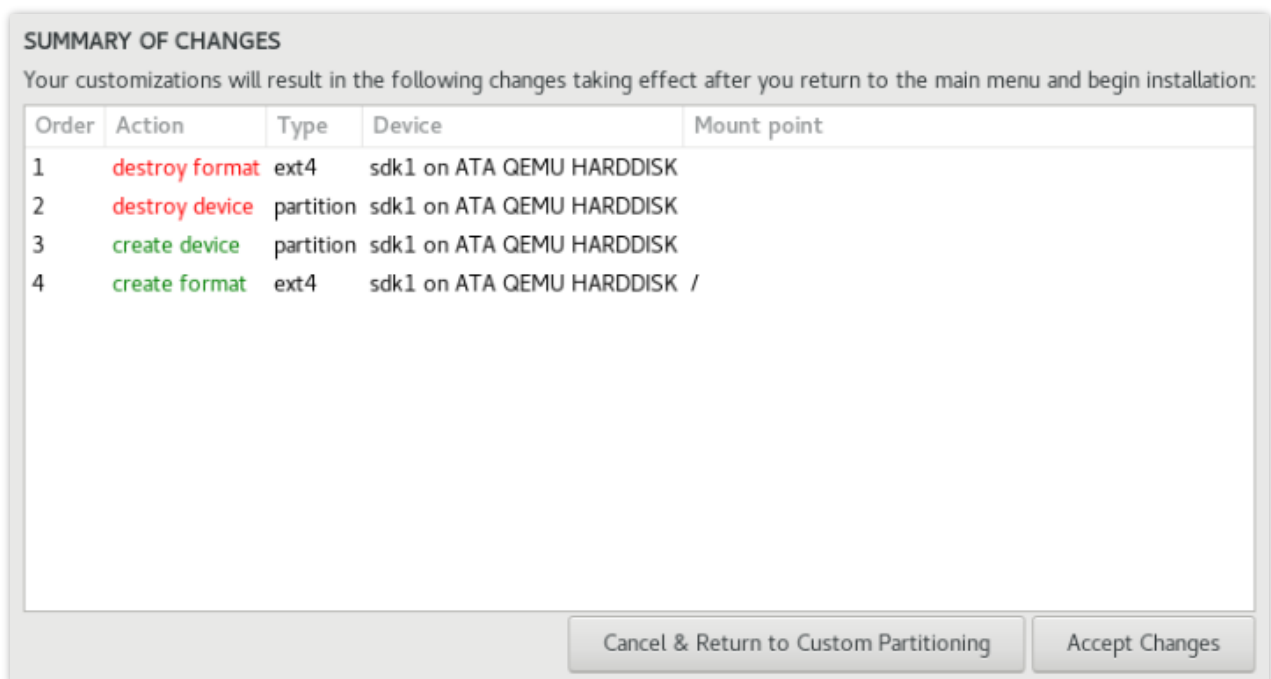


Figure 16. Summary of changes window

2.2.4 Network & Host Name

The configuration described in this chapter is not necessary for the installation. You can configure network and host name after the installation.

1. On the *INSTALLATION SUMMARY* page, click **Network & Host Name** (Figure 17).

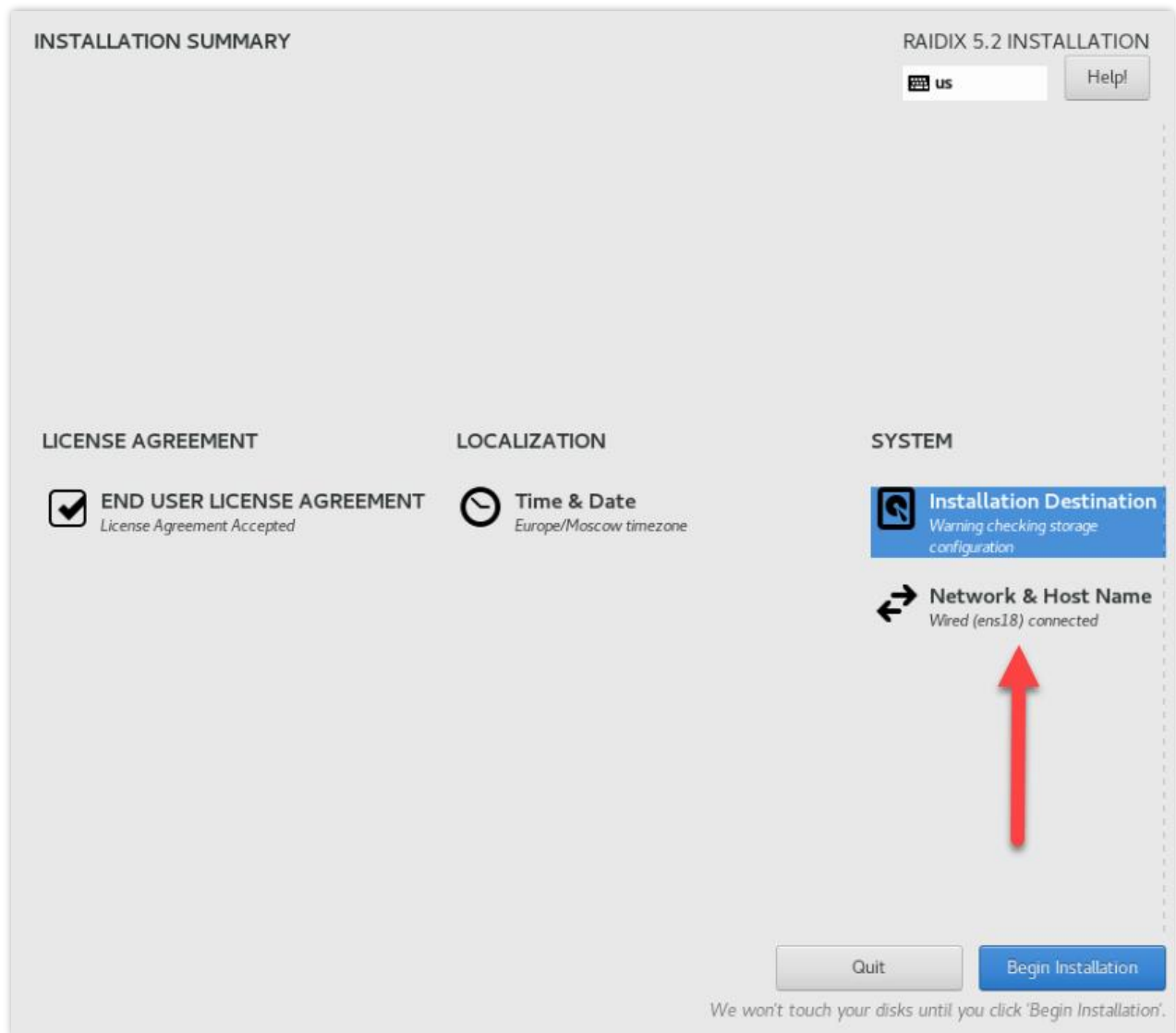


Figure 17. Front page: selecting NETWORK & HOST NAME

2. On the opened *NETWORK & HOST NAME* page (Figure 18), you can configure detected networks, or create new ones as well as rename the host.

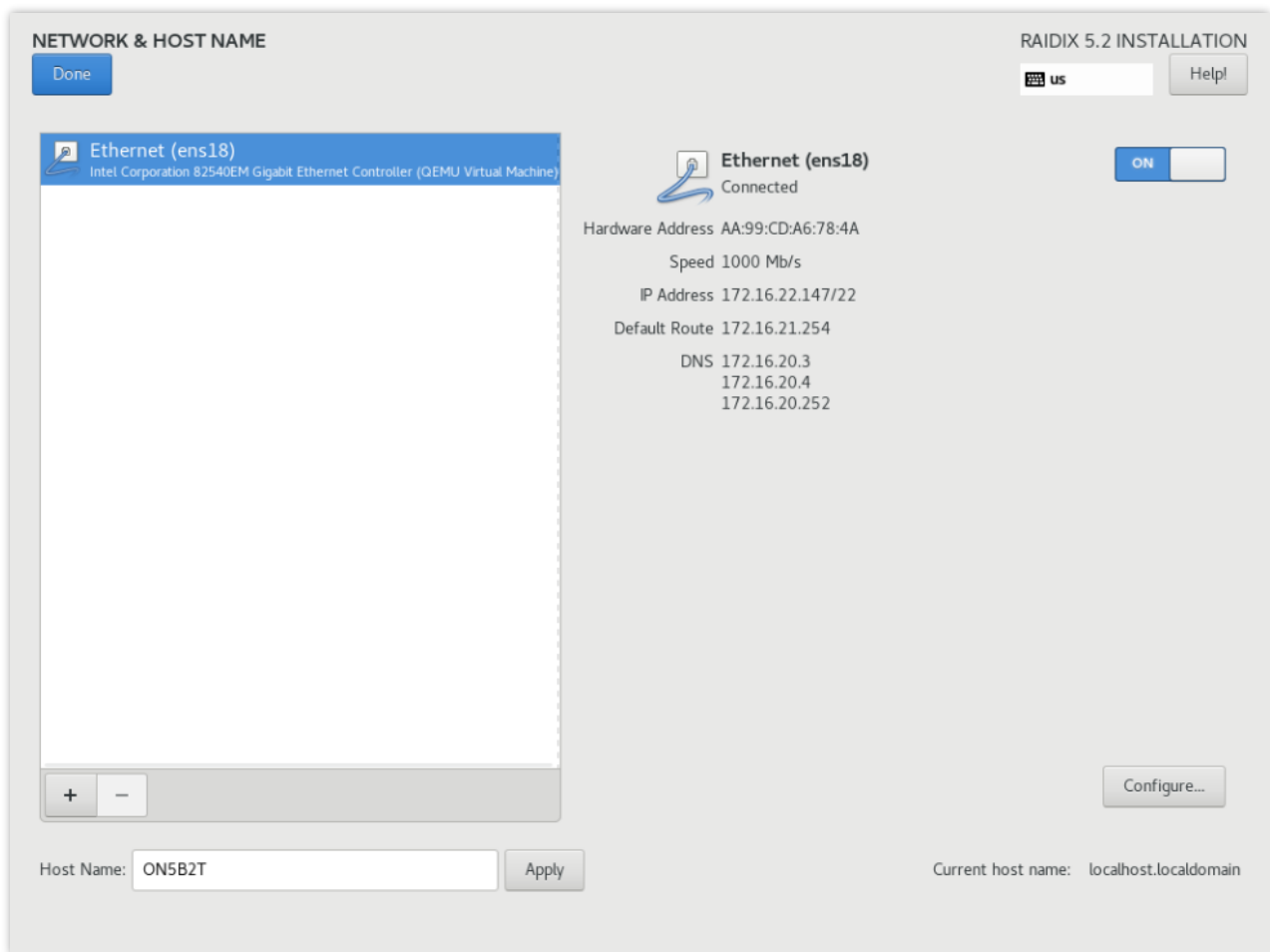


Figure 18. NETWORK & HOST NAME page

i To automatically connect to the selected network after installation completes, on the *NETWORK & HOST NAME* page do the following:

1. Select a network.
1. Click **Configure...**
2. In the opened window (Figure 19), click the **General** tab.
3. Select **Connect automatically with priority**.
4. Click **Save**.

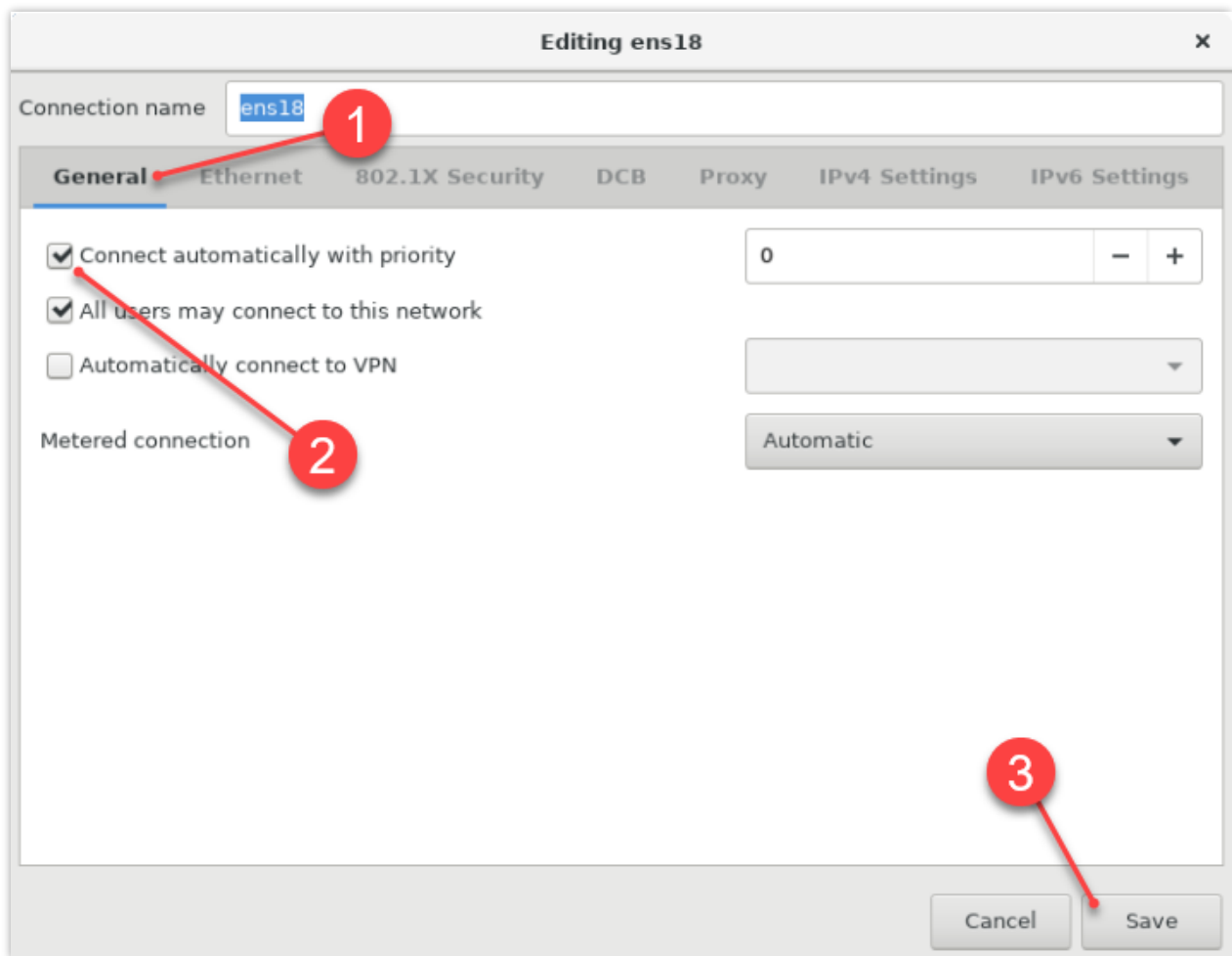


Figure 19. Setting up an automatic network connection

3. After you complete network configuration, click **Done** at the upper left of the *NETWORK & HOST NAME* page.

2.3 Begin Installation

1. On the *INSTALLATION SUMMARY* page, click **Begin Installation**.

At the bottom of the window, the progress bar appears to display the installation process (Figure 20).

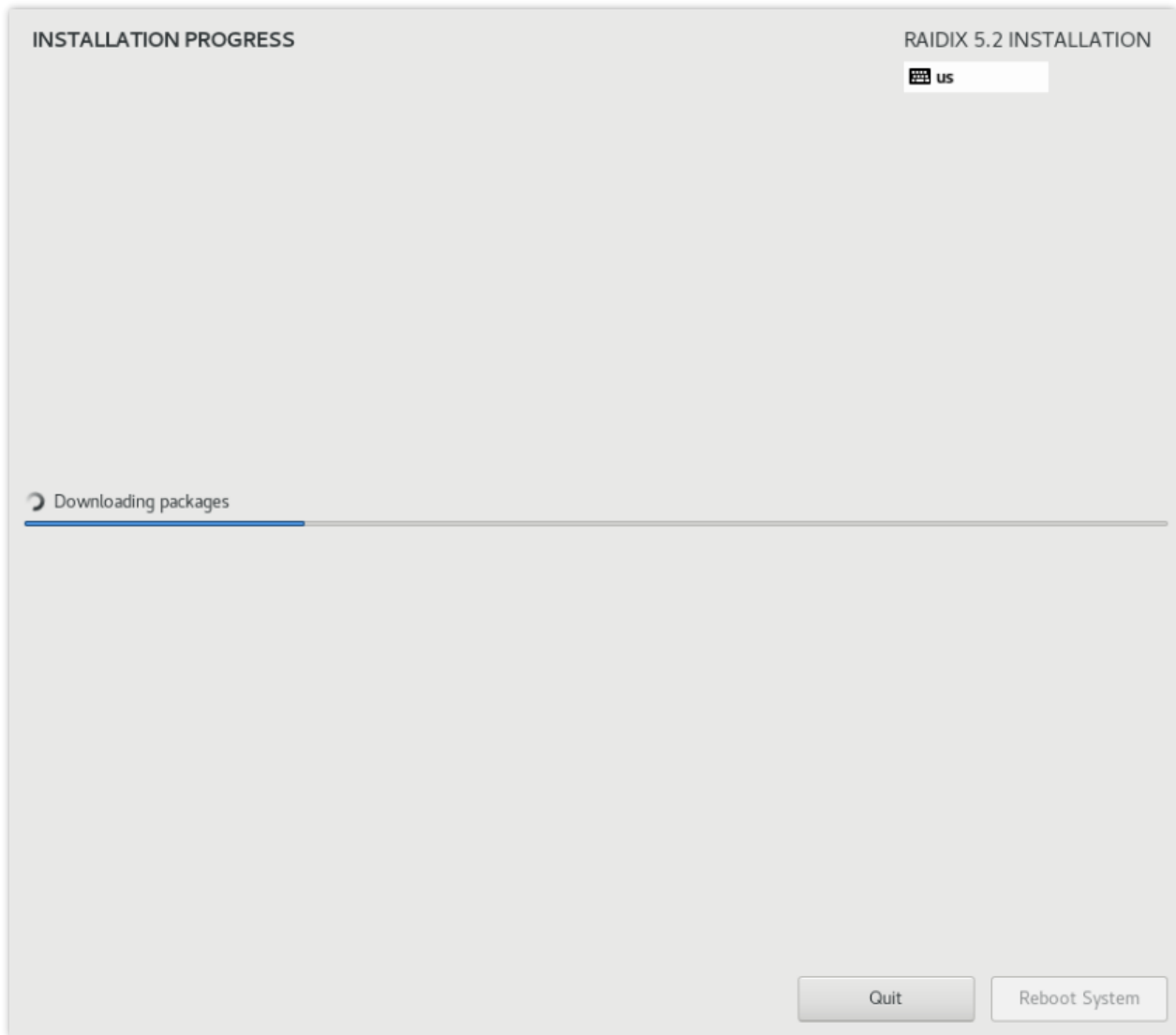


Figure 20. Installation in progress

2. After the installation is complete, the appropriate message will show. Click **Reboot System**.
3. Return drives that were removed at the start of the system installation into the system.



Remember that you can't see drives in GUI or CLI until you add the license.

If the system is installed on a drive connected through *SAS LSI 93xx/94xx* or *Lenovo 430-8e/430-16e* adapter, you have to [add the crash dump module](#).

Otherwise, the installation is complete.

2.4 Adding the Crash Dump Module

If the system is installed on a drive connected through SAS LSI 93xx/94xx or Lenovo 430-8e/430-16e adapter, add the crash dump module manually.

If you use another configuration, skip this chapter.

To add the crash dump module:

1. In the file `/etc/kdump.conf`, replace the string

```
dracut_args --add-drivers "qla2xxx" --omit-drivers "mpt3sas"
```

with the string

```
dracut_args --add-drivers "qla2xxx"
```

2. Remove the current `*.img` by running the command:

```
# rm /boot/initramfs-3.10.0-693.2.1.el7.x86_64kdump.img
```

3. Remount the new image by running the command:

```
# service kdump restart
```



3. NETWORK SETUP

If your network uses DHCP, the system will obtain an IP address at the first launch. Get the IP address and use it to log in the system.



The real (not virtual) IP addresses of two or more interfaces must belong to different IP networks.

To configure a static IP address:

1. Log in to RAIDIX 5.2 web interface.
2. Select **SYSTEM > NETWORK**.
3. In the *Network Interfaces Parameters* section, choose the interface to which you want to assign a static IP address.
4. In the network interface line of your choice, click  and select **Edit**.
5. In the network interface configuration pane, turn off **DHCP**.
6. Specify **IP address** and **Netmask**.

If there is no DHCP server in the network, configure a static IP address by CLI. To learn about CLI authenticating, see the [information](#).

To configure a static IP address by CLI:

1. Define the interfaces to which the network cable is connected.
2. Select the interface to be used for system administration.
3. Run the command:

```
$ rdcli network interface modify -n <interface name> -a <IP  
address> -m <subnet mask> -u 1
```

4. Log in the web interface using the specified IP address.

4. CONFIGURING SAS CONNECTION

You can use SAS 12G:

- to synchronize nodes' caches – Initiator and Target mode;
- to connect a drive enclosure – Initiator mode.



We do not recommend using one SAS adapter at the same time to synchronize and connect the enclosures.

Such configuration may increase the RAID rebuild time with the possibility of a temporary change in RAID status (online/offline) when the node is rebooted.

To configure connection via LSI adapter 93xx or *earlier*, use `managesas`.

To configure connection via LSI adapter 94xx or *later*, use `scrtctl`.

Definitions

SAS controller has one or many controllers. Each controller has 4 phys. Phys can be grouped to a port. A port is a wide port if there are multiple phys in the port. A port is a narrow port if there is only one phy in the port.

4.1 Configuring SAS with managesas

To configure a connection via LSI adapter 93xx or earlier.

4.1.1 Preparation

Before you start configuring your SAS adapter:

1. Disable the SAS adapter in UEFI/BIOS when starting the system.
2. Make sure the system drive is not connected to the adapter that you're planning to use as a target.
3. If you have a switch, perform the switch zoning.

4.1.2 Firmware Updating

Make sure your SAS adapter has the required firmware version and – if necessary – update the firmware:

1. Perform the command `managesas`.
2. Select the required adapter.
3. To see current firmware version, select the option 1 (Identify firmware, BIOS, and/or FCode).

You need the firmware version *IT (IT mode)* for the correct adapter operation.

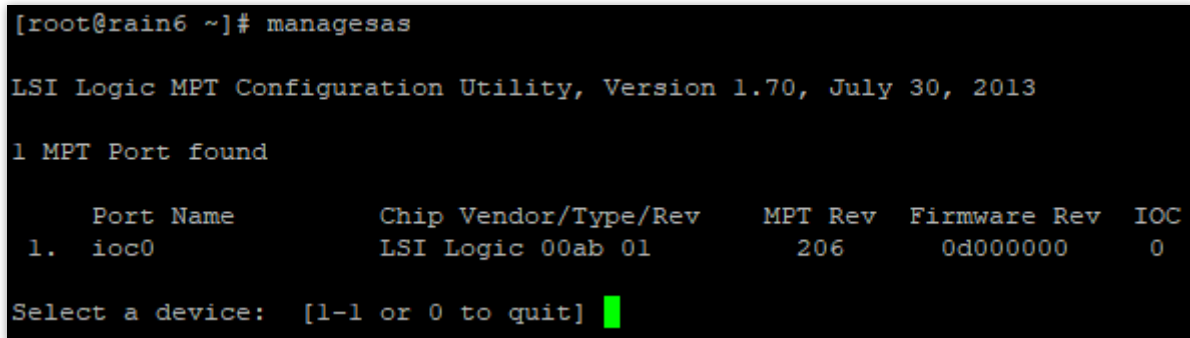
4. If the adapter uses another firmware version:

- 4.1. Update the firmware by using the option **2** (Download firmware).
- 4.2. After updating, reset the adapter by using the option **99** (Reset port to force a reset of the chip).

4.1.3 Configuring SAS Adapter

To configure SAS adapter of versions 93xx or earlier via using managesas utility:

1. Run managesas.
2. Select a SAS adapter (Figure 21).



```
[root@rain6 ~]# managesas

LSI Logic MPT Configuration Utility, Version 1.70, July 30, 2013

1 MPT Port found

      Port Name      Chip Vendor/Type/Rev    MPT Rev  Firmware Rev  IOC
1.  ioc0             LSI Logic 00ab 01        206      0d000000      0

Select a device:  [1-1 or 0 to quit] █
```

Figure 21. managesas: adapter list

The command displays the list of available options (Figure 22).

```
Select a device: [1-1 or 0 to quit] 1

1.  Identify firmware, BIOS, and/or FCode
2.  Download firmware (update the FLASH)
4.  Download/erase BIOS and/or FCode (update the FLASH)
8.  Scan for devices
801. Scan for 1 LUN
810. Scan for 10 LUN's
10. Change IOC settings (interrupt coalescing)
13. Change SAS IO Unit settings
16. Display attached devices
20. Diagnostics
21. RAID actions
23. Reset target
42. Display operating system names for devices
43. Diagnostic Buffer actions
45. Concatenate SAS firmware and NVDATA files
59. Dump PCI config space
60. Show non-default settings
61. Restore default settings
66. Show SAS discovery errors
69. Show board manufacturing information
97. Reset SAS link, HARD RESET
98. Reset SAS link
99. Reset port
e   Enable expert mode in menus
p   Enable paged mode
w   Enable logging

Main menu, select an option: [1-99 or e/p/w or 0 to quit] █
```

Figure 22. managesas main menu

- 2.1. Enter the option **13 (Change SAS I/O Unit)**.
- 2.2. Set the values for the parameters offered by the utility (we recommend default values):
 - SATA Maximum Queue Depth: **128**
 - SAS Max Queue Depth, Narrow: **256**
 - SAS Max Queue Depth, Wide: **256**
 - Device Missing Report Delay: **0**
 - Device Missing I/O Delay: **0**
- 2.3. After that the utility will show a list with Phys (Figure 23).

For the selected connector of your SAS adapter, identify the 4 phy belonging to the connector. You can find the connector numbers in the documentation of your SAS adapter.

```

Main menu, select an option: [1-99 or e/p/w or 0 to quit] 13

SATA Maximum Queue Depth: [0 to 255, default is 128]
SAS Max Queue Depth, Narrow: [0 to 65535, default is 256]
SAS Max Queue Depth, Wide: [0 to 65535, default is 256]
Device Missing Report Delay: [0 to 2047, default is 0]
Device Missing I/O Delay: [0 to 255, default is 0]

PhyNum  Link      MinRate  MaxRate  Initiator  Target  Port
  0    Enabled    3.0     12.0    Enabled   Enabled  0
  1    Enabled    3.0     12.0    Enabled   Enabled  0
  2    Enabled    3.0     12.0    Enabled   Enabled  0
  3    Enabled    3.0     12.0    Enabled   Enabled  0
  4    Enabled    3.0     12.0    Enabled   Enabled  1
  5    Enabled    3.0     12.0    Enabled   Enabled  1
  6    Enabled    3.0     12.0    Enabled   Enabled  1
  7    Enabled    3.0     12.0    Enabled   Enabled  1
  8    Enabled    3.0     12.0    Enabled   Disabled 2
  9    Enabled    3.0     12.0    Enabled   Disabled 2
 10    Enabled    3.0     12.0    Enabled   Disabled 2
 11    Enabled    3.0     12.0    Enabled   Disabled 2
 12    Enabled    3.0     12.0    Disabled  Enabled  3
 13    Enabled    3.0     12.0    Disabled  Enabled  3
 14    Enabled    3.0     12.0    Disabled  Enabled  3
 15    Enabled    3.0     12.0    Disabled  Enabled  3
 16    Disabled    1.5     1.5     Enabled   Enabled  Auto
 17    Disabled    1.5     1.5     Enabled   Enabled  Auto
 18    Disabled    1.5     1.5     Enabled   Enabled  Auto
 19    Disabled    1.5     1.5     Enabled   Enabled  Auto
 20    Disabled    1.5     1.5     Enabled   Enabled  Auto

Select a Phy: [0-20, 21=AllPhys, RETURN to quit] 

```

Figure 23. Adapter configuration menu

2.4. Select a Phy number and configure the parameters:

- Link: 1
- MinRate: 1
- MaxRate: 3

Set up the next parameters depending on the role:

For synchronization of nodes cache:

- Initiator: 1 (Enabled)
- Target: 1 (Enabled)
- Port: select manual and set up Wide port

DC sync connection

Choose 4 **phys** from the same **Connector** and configure each **phy**:

Initiator: **1** (enabled)

Target: **1** (enabled)

Port: **manual**

Manual Port configuration

For all chosen **phys**, set the same **Port number** (in this example, 0). Such setting is called "wide port".

The **SAS address** of the first in order **phy** (in this example, *phy0*) will be used for DC sync as a **Port** address

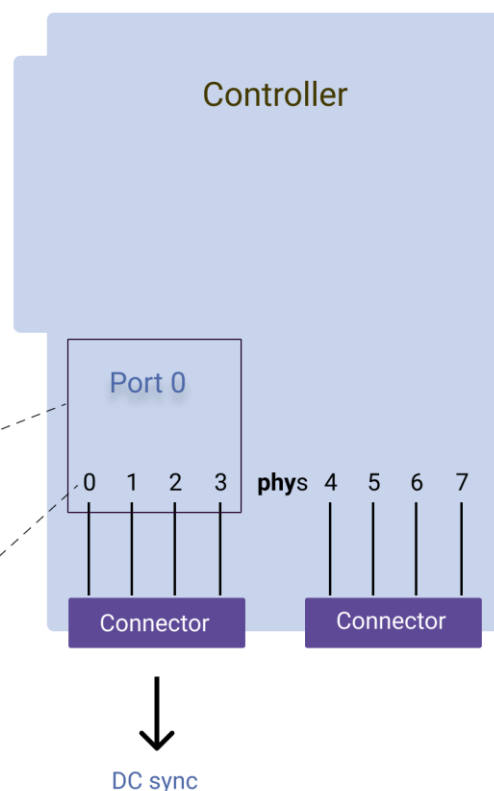


Figure 24. Example of configuring SAS with managesas for DC synchronisation

For connection to the drive enclosure:

- Initiator: **1** (Enabled)
- Target: **0** (Disabled)
- Port: auto

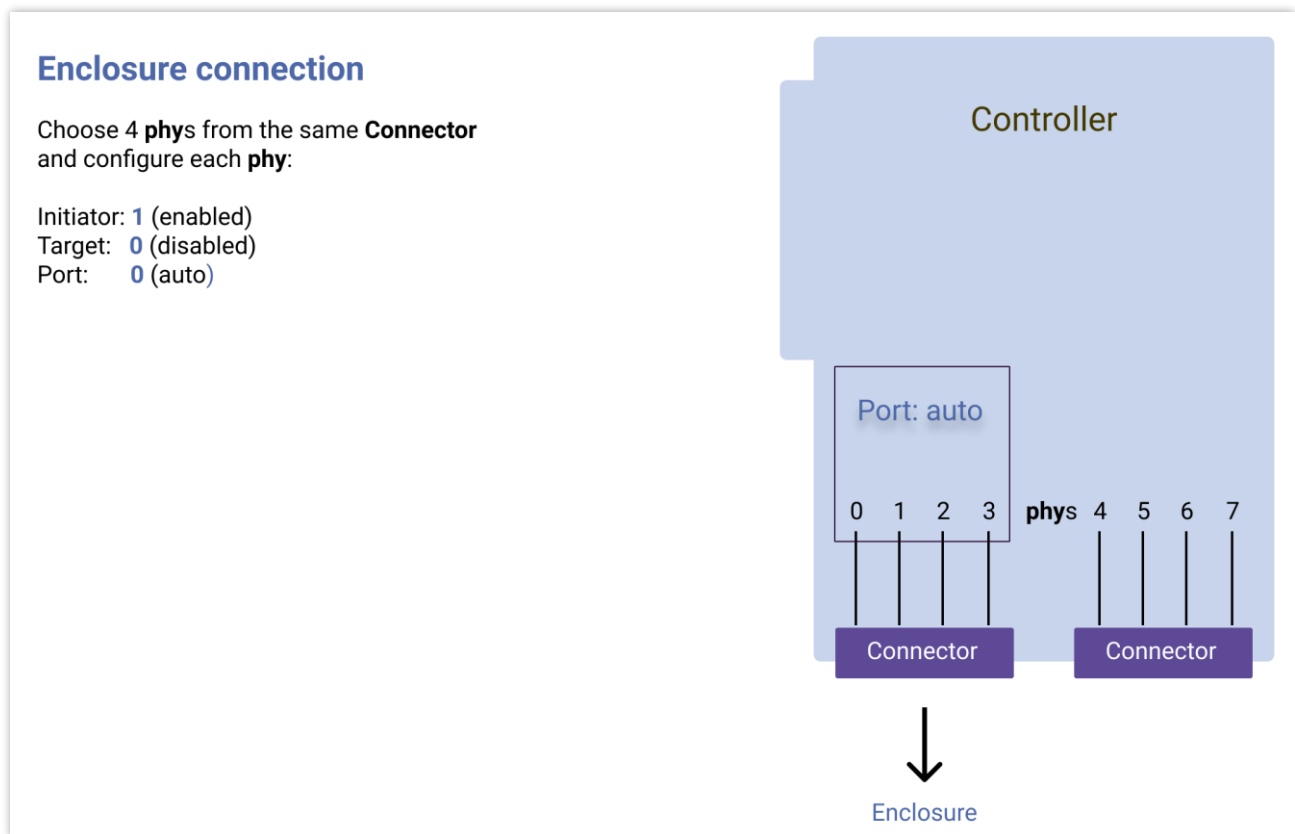


Figure 25. Example of configuring SAS with managesas to connect to an enclosure

- 2.5. Repeat the settings for each PhyNum of 4 phys of the selected connector.
- 2.6. Press Enter to show the previous menu.
3. Reset the adapter by using the option **99** (Reset port).
4. Reboot the nodes.
5. To see connected devices and other adapters, enter the option **16** (Display attached devices).
6. To configure DC mode, set up the heartbeat connection and select targets for synchronization.
To learn more, see [Set up SAS synchronization](#).

4.2 Configuring SAS with scrtnycli

To configure a connection via LSI apapter 94xx or later.

4.2.1 Preparation

Before you start configuring your SAS adapter:

1. Disable the SAS adapter in UEFI/BIOS when starting the system.
2. Make sure the system drive is not connected to the adapter that you're planning to use as a target.
3. If you use a switch, perform the switch zoning.

4.2.2 Configure SAS adapter

To configure SAS adapter 94xx or later models by using `scrtnycli` utility:

1. Run `scrtnycli`.
2. Select a SAS adapter (Figure 26).

```
-----
Scrutiny CLI v11.0.3.0 - Avago Technologies (c) 2016
-----

      DeviceId/RevId      WWID              FwVersion
1) SAS3008 C0            50015b2-a-2000-92ff  14.00.00.00
2) Dev D1 Rev 02         500605b-0-0db9-0d60  07.00.00.00
3) SAS3x48 C1            50015b2-1-4008-8d7f  255.255.255.255

Enter the target index to connect with : 1
SAS3008 C0> 
```

Figure 26. `scrtnycli`: adapters list

3. Enter the command `ioc -configsas` to configure parameters of the adapter (Figure 27).

For the selected connector of your SAS adapter, identify the 4 phy belonging to the connector. You can find the connector numbers in the documentation of your SAS adapter.

```
SAS3008 C0> ioc -configsas

SATA Native Command Queuing      : Enabled (0)
SATA Write Caching                : Enable write cache (0)
SATA maximum queue depth         : 128
SAS maximum queue depth, Narrow  : 256
SAS maximum queue depth, Wide    : 256
Device missing report delay      : 0 seconds
Device missing I/O delay         : 0 seconds
Interrupt Coalescing             : Enabled, Timeout is : 10us, Depth : 4

PHY      Link      Link Rate      SSP      SSP      Port      Port
         Enabled   Max  Min      Initiator Target Config  Number
00       Yes      12.0 3.0      Yes      No      Auto      0
01       Yes      12.0 3.0      Yes      No      Auto      0
02       Yes      12.0 3.0      Yes      No      Auto      0
03       Yes      12.0 3.0      Yes      No      Auto      0
04       Yes      12.0 3.0      Yes      No      Auto      0
05       Yes      12.0 3.0      Yes      No      Auto      0
06       Yes      12.0 3.0      Yes      No      Auto      0
07       Yes      12.0 3.0      Yes      No      Auto      0

SATA Native Command Queuing [0=Enabled, 1=Disabled, ENTER=Do not change] : 
```

Figure 27. Adapter parameters

3.1. Set up the general parameters (we recommend default values):

- SATA Native Command Queuing: 0
- SATA Write Caching: 0
- SATA maximum queue depth: 128
- SAS maximum queue depth, Narrow: 256
- SAS maximum queue depth, Wide: 256
- Device missing report delay: 0
- Device missing I/O delay: 0

3.2. Select a Phy and set up:

- Phy link
- Max Link Rate
- Min Link Rate

Next, depending on the role, set up:

For synchronization of nodes caches:

- SSP Initiator: 0 (Enabled)
- SSP Target: 0 (Enabled)
- Port Config: 0 (Manual)
 - Port number: from 0 to 255 (Wide port)

DC sync connection

Choose 4 **phys** from the same **Connector** and configure each **phy**:

SSP Initiator: 0 (enabled)
SSP Target: 0 (enabled)
Port: 0 (manual)

Manual Port configuration

For all choosed **phys**, set the same **Port number** (in this example, 0). Such setting is called "wide port".

The **SAS address** of the first in order **phy** (in this example, *phy0*) will be used for DC sync as a **Port** address

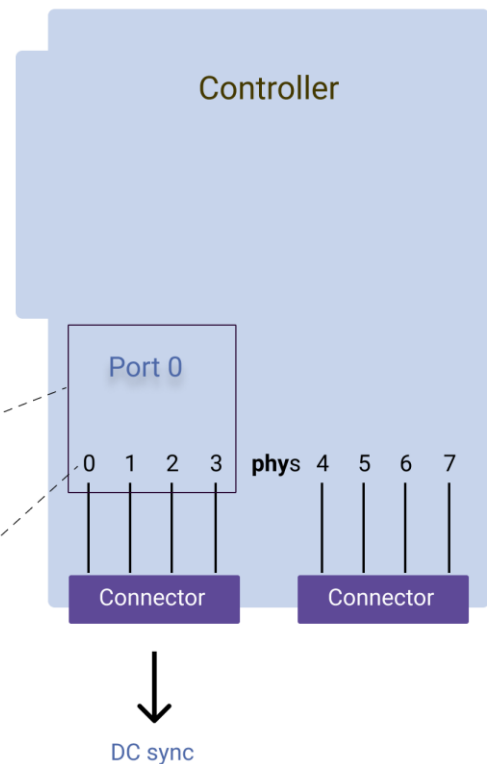


Figure 28. Example of configuring SAS with `scrtncly` for DC synchronisation

For connection to the drive enclosure:

- SSP Initiator: 0 (Enabled)
- SSP Target: 1 (Disabled)
- Port Config: 1 (Auto)

Enclosure connection

Choose 4 **phys** from the same **Connector** and configure each **phy**:

SSP Initiator: **0** (enabled)
SSP Target: **1** (disabled)
Port: **1** (auto)

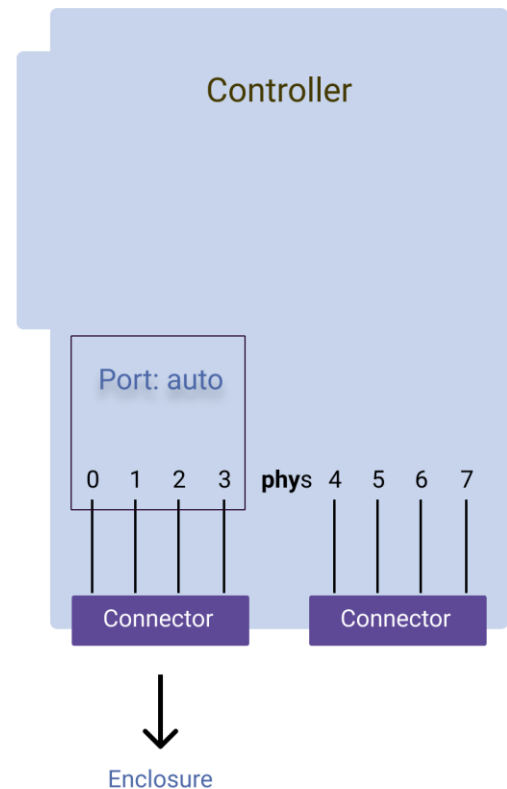


Figure 29. Example of configuring SAS with `scrtnycli` to connect to an enclosure

- 3.3. Repeat the settings for each PhyNum of 4 phys of the selected connector.
- 3.4. Press Enter to exit from configuration menu, and reset the adapter via `reset -c`.
- 3.5. To exit the utility run `quit`.
4. Reboot the nodes.
5. To see the connected devices and other adapter, run `scan` (Figure 30).

```
SAS3008 C0> scan
SAS Host 0's SAS links are
Links <00-07>: SAS-12.0 G, SAS-12.0 G, SAS-12.0 G, SAS-12.0 G, SAS-12.0 G, SAS-12.0 G, SAS-12.0 G, SAS-12.0 G

B  T  L  DH  Type      Vendor  Product      Rev  WWID          Phy
0  1  0  a  Disk      SEAGATE  ST373455SS   0002 5000c5000a829d11 01
0  2  0  b  Disk      HITACHI  HUS156030VLS600 A5D0 5000cca02a78a1c5 02
0  3  0  c  Disk      SEAGATE  ST3300657SS   0006 5000c50028bdb605 27
0  4  0  d  Disk      HITACHI  HUS156030VLS600 A5D0 5000cca02a868c7d 32
0  5  0  e  Disk      SEAGATE  ST373455SS   0002 5000c5000a829689 34
0  0  0  f  Disk      SEAGATE  ST3300657SS   0006 5000c50028bdb991 38
0  6  0  10 EnclServ  AIC 12G  HA401 Expander 0c0a 50015b2140088d7d 48
SAS3008 C0> █
```

Figure 30. Scan command output

6. To configure DC mode, set up the heartbeat connection and select targets for synchronization.
To learn more, see [Set up SAS synchronization](#).

5. SETTING UP THE LICENSE

- i** The RAIDIX software with the applied License can be installed on only one hardware platform and can't be reinstalled on others.

Features:

1. You can change SAN and NAS adapters, as well as components of the drives subsystem, without limitations.
2. To ensure the possibility of replacing failed hardware components, the RAIDIX software allows you to change 2 such components (excluding paragraph 1) without reissuing the License.

- !** After installing the system, available to the system drives will *not* be displayed until the license file is uploaded. To show available drives, upload the license file to the system.

The DC system must have licenses on both nodes.

- i** You can add license by CLI. The managing commands are described in the "Appendix A. Command Console Interface Features and Syntax" in *RAIDIX 5.2 Administrator's Guide*.

To upload a license file into the system:

- !** Make sure cookies are enabled in your browser.

1. Open a browser and enter

```
http://<RAIDIX_IP_address>
```

where <RAIDIX_IP_address> is an IP address to manage the system through the RAIDIX 5.2 web interface.

2. By default, you can log in with the username **admin** and the password **raidix-era**.

- i** Define the port assigned as *primary* by using the command

```
$ rdcli network show
```

Get the assigned IP by using the command

```
$ rdcli network interface show
```

To learn how to change an IP address assigned to the system, see "Setting Up Network Interfaces Parameters" in *RAIDIX 5.2 Administrator Guide*.

3. On the one of the nodes, open the **SYSTEM | LICENSE** page.
4. From the **System Key** field, copy the System Key.
5. To configure the dual-controller mode, repeat steps 1-4 on the second node.
6. Send the System Key (for DC system, send Keys from both nodes) to the RAIDIX technical support center (support@raidix.com).
7. On the **LICENSE** page, upload the received license file by clicking **Add a License File**.
8. Information on the uploaded license file will show in the *License Files* section (Figure 31).

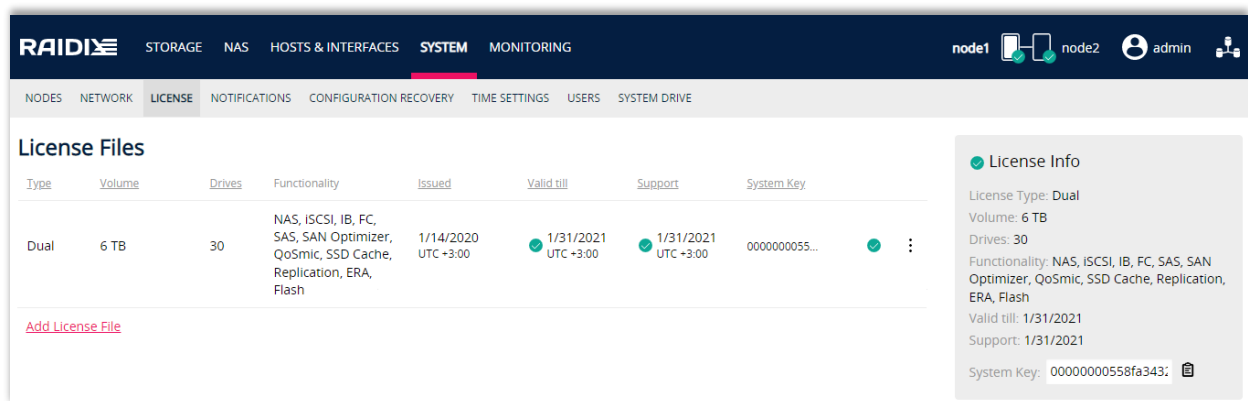


Figure 31. License page after dual-controller license file was added

- After the license file is uploaded, you can create system user accounts. To do this, use the following CLI command:

```
$ rdcli system user create -l <login> -p <password> -la
<language>
```

For the DC system, the next steps should be configuring the heartbeat network and synchronizing the caches on both nodes.

6. DUAL-CONTROLLER MODE CONFIGURATION

After you connected the nodes to the one enclosure, installed the system, and configured license parameters, configure DC mode [to set up heartbeat connection](#) and [cache synchronization](#).

i After configuring dual-controller mode, you can manage both nodes from the web interface of any of them by clicking the links to the remote node.

i Use different paths for heartbeat and for cache synchronization.
Both connections between system nodes must be point-to-point.

! If on one of the nodes a share has Active Directory users, you will be unable to create a DC.
In this case, configure Active Directory on the second node as well or disable AD on the first node.

6.1 Setting up Heartbeat

You can set up DC through:

- the *widget* **Create DC** on the page **SYSTEM | NODES**;
- the *wizard* **CONFIGURE DC** on the page **SYSTEM | NODES**;

To set up *Heartbeat* connection via the *widget*:

! While using two-port Mellanox VPI adapters, avoid the configuration with one port in Ethernet mode and another port in InfiniBand mode.

- Set up network interfaces on the first node:
 - At any node, select **SYSTEM > NETWORK**.
 - In the *Network Interface Parameters* section, select the line of the port, that you want to use for the Heartbeat, then click **:** and select **Edit**. The widget to set up the network interfaces parameters opens (Figure 32).

The screenshot shows a table titled "Network Interfaces Parameters" with columns: Port Name, Status, Link Speed, Enabled, DHCP, IP Address, Netmask, and MTU. The row for 'ens18' shows Status as 'Up', Link Speed as '1,000 Mb/s', and MTU as '1500'. The 'Enabled' column has a toggle switch that is currently turned off. The 'DHCP' column has a dropdown menu set to 'Off'. The 'IP Address' field contains '172.16.22.143' and the 'Netmask' field contains '255.255.252.0'. At the bottom right, there are 'APPLY' and 'CANCEL' buttons.

| Port Name | Status | Link Speed | Enabled | DHCP | IP Address | Netmask | MTU |
|-----------|--------|------------|--------------------------|------|---------------|---------------|------|
| ens18 | Up | 1,000 Mb/s | <input type="checkbox"/> | Off | 172.16.22.143 | 255.255.252.0 | 1500 |

Figure 32. Setting up heartbeat connection parameters

- Toggle the switch **Enabled** to the **On** position, then enter the IP address and Netmask parameters in the appropriate fields. To learn more, see [Set up network interfaces parameters](#).

! Heartbeat IP address on both nodes must be from one subnet.

- 1.4. To save settings, click **APPLY**.
2. Repeat the step 1 for the second node.
3. Create DC:
 - 3.1. At any node, select **SYSTEM > NODES**.
 - 3.2. Click **Create DC**. The widget to add the remote node settings opens (Figure 33).

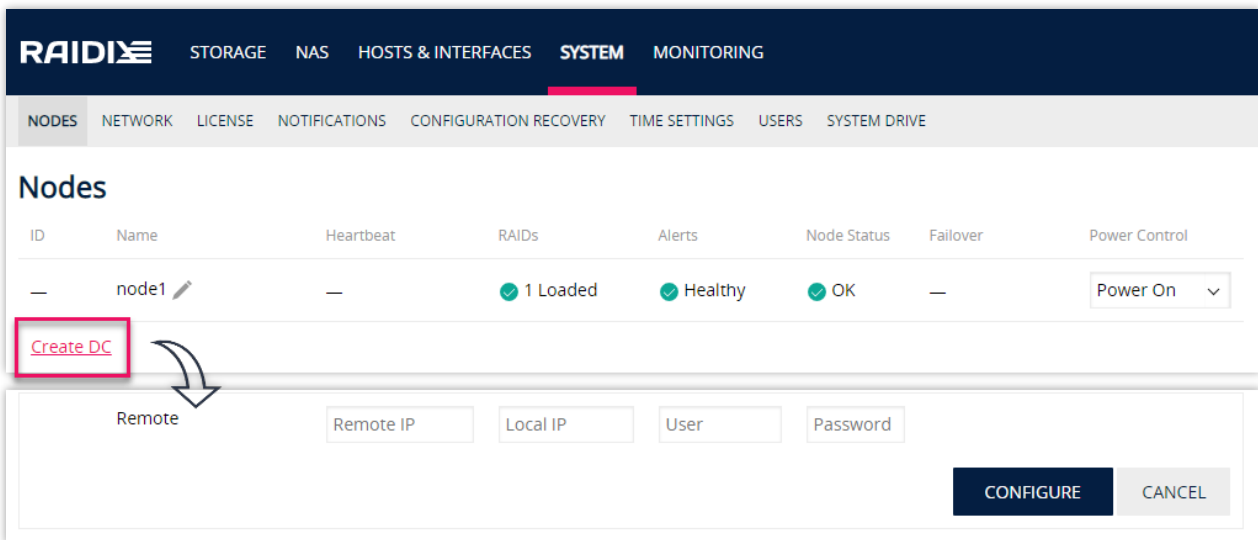


Figure 33. NODES page in SC

- 3.3. In the Remote IP field, enter the Heartbeat IP address of the remote node (specified in step 3) and click **CONFIGURE**.

Parameters for the second node will appear in the table. Both nodes will get an automatically assigned ID shown in the ID column (Figure 34).

i If Windows or Hyper-V clusters are used as initiators, toggle the **Persistent reservation synchronization** switch to the **On** position (Figure 34).

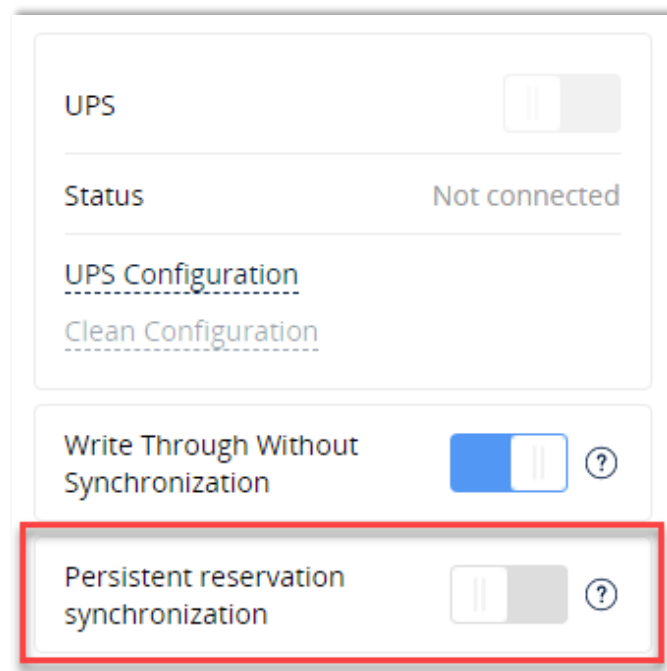


Figure 34. “Persistent reservation synchronization” switch on the NODES page

6.2 Setting up Cache Synchronization of Nodes

For the system to work properly in the dual-controller mode, set up targets for the cache synchronization over InfiniBand (turn on OpenSM as well), iSCSI or SAS.

Set up InfiniBand synchronization



While using two-port Mellanox VPI adapters, avoid the configuration with one port in Ethernet mode and other port in InfiniBand mode.



We recommend using a dedicated InfiniBand channel for cache synchronization.

To set up cache synchronization over InfiniBand:

1. At any node, select **HOSTS & INTERFACES > ADAPTERS**. At the InfiniBand Adapters section, each target corresponds to the one InfiniBand port (Figure 35).

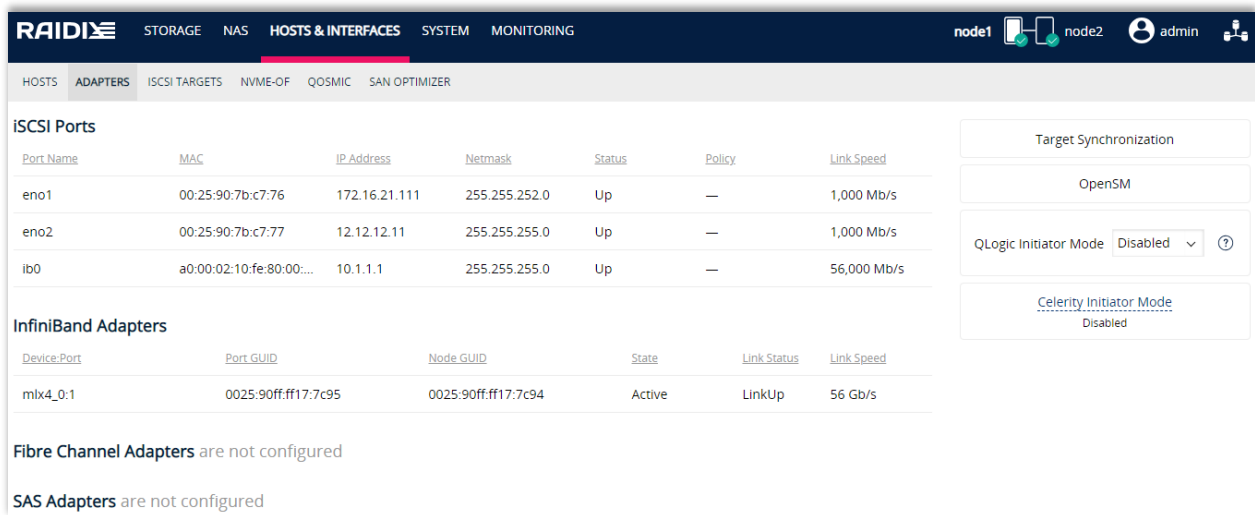


Figure 35. ADAPTERS page

- To open a setup window (Figure 36), click **Target Synchronization**.

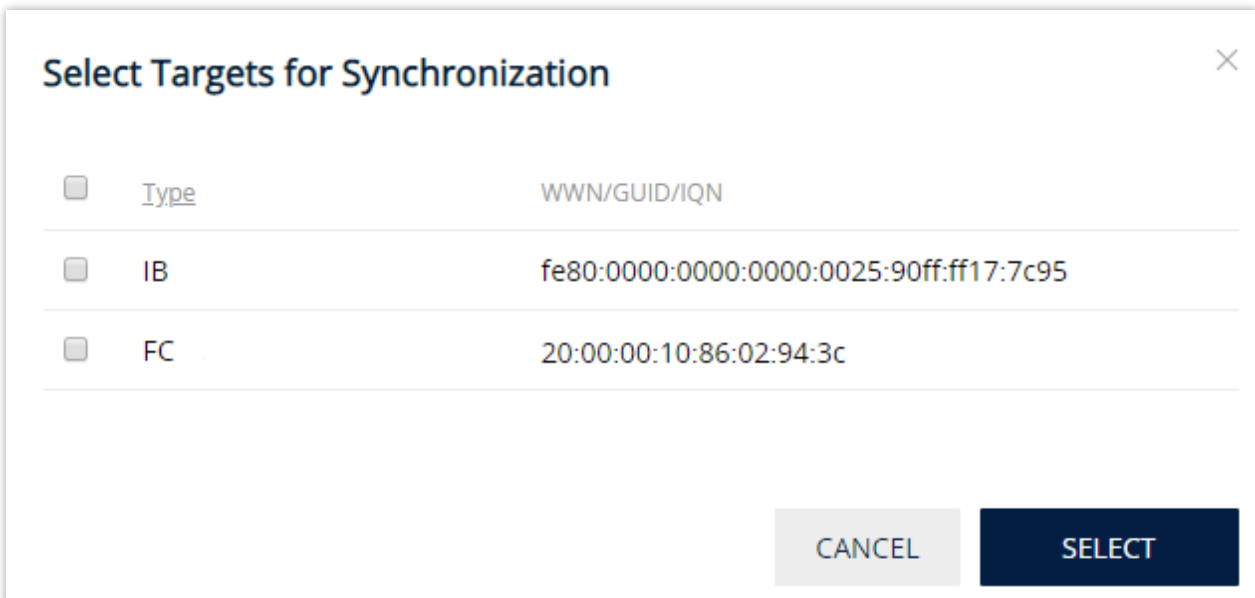


Figure 36. Select Targets for Synchronization window

- Select GUID of the corresponding InfiniBand ports for nodes' cache synchronization and click **SELECT**.
- Repeat steps 1-3 on the second node, selecting the appropriate InfiniBand GUIDs for synchronization.
- Start OpenSM service:
 - Select **HOSTS & INTERFACES > ADAPTERS**.
 - Click the **OpenSM** button. A window to specify OpenSM service parameters opens (Figure 37).

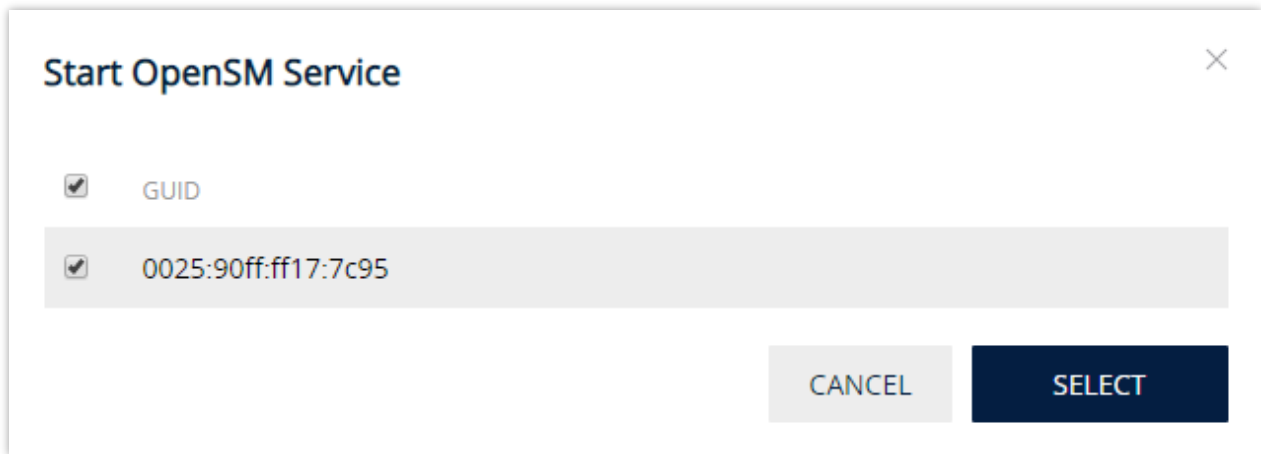


Figure 37. Start OpenSM Service window

5.3. Select ports' GUIDs for synchronization and click **SELECT**.

For cache synchronization, only start OpenSM on one node.

Set up iSCSI synchronization



Before setting up iSCSI synchronization, make sure that IP addresses of ports for synchronization are present in the list of IP addresses in iSCSI settings.



- Use different paths for heartbeat and for cache synchronization.
- Both connections between system nodes must be point-to-point.

To set up cache synchronization over iSCSI:

1. At any node, select **HOSTS & INTERFACES > ISCSI TARGETS**.
2. To turn on iSCSI, in the pane, toggle the **Enable iSCSI** switch to the **On** position (Figure 38).

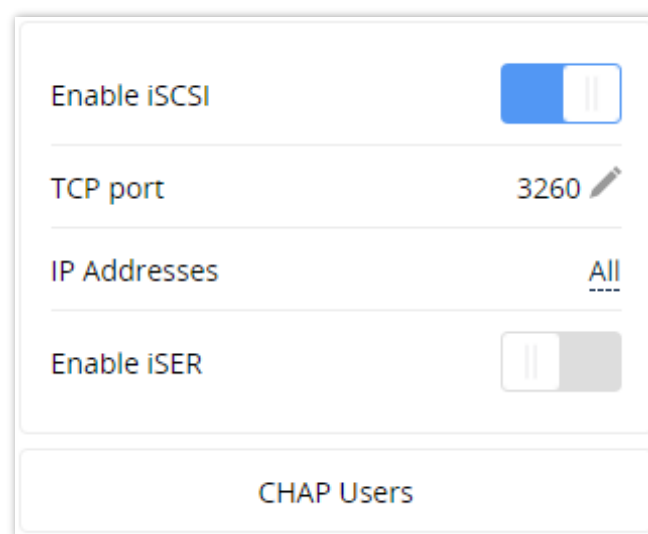


Figure 38. Enabling iSCSI

3. Select **HOSTS & INTERFACES > ADAPTERS**.
4. Click **Target Synchronization** to open a setup window (Figure 39).

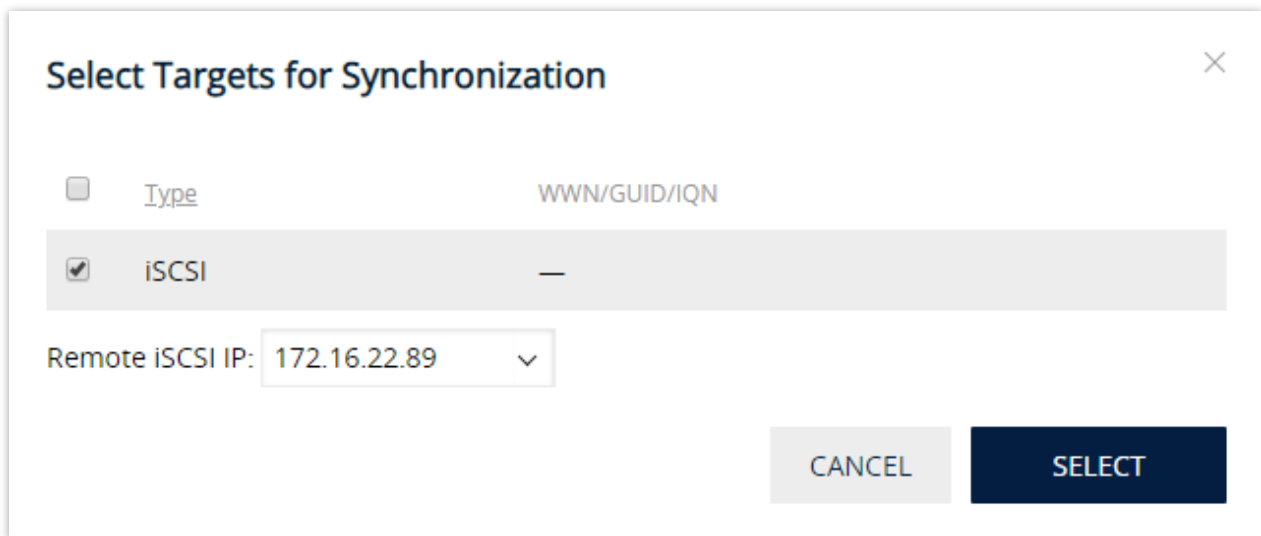


Figure 39. Targets for synchronization window

5. Select the iSCSI target type
6. Enter Remote iSCSI IP for the nodes cache synchronization, and click **SELECT**.

! If the desired IP address of the port is off the list, verify that [network settings of the remote node](#) are correct. To check the network configuration, select **SYSTEM > NETWORK**.

7. Repeat the 3-6 steps on the second node.

Set up SAS synchronization

To set up cache synchronization over SAS:

1. On one of the nodes select **HOSTS & INTERFACES > ADAPTERS**. The table, in which each target corresponds to one SAS ports, appears.
2. Click **Target Synchronization** to open a setup window.
3. Select **SAS Address** of the corresponding SAS ports for nodes' cache synchronization and click **SELECT**.

i The address of the first phy in the group will be the address for the synchronization port. For example, for 2 ports with 4 phys in each, the first port address will be phy0 and the second port address will be phy4.

4. Repeat steps 1-3 on the second node.