xTER SmartFilter
Instruction manual

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GENERAL OVERVIEW

1. Definition

xTER SmartFilter is a FREE software solution giving a router functionality to almost any computer.

It has been created as an affordable and easy tool for effective management of internet access and traffic of devices that are connected to this **xTER**-based router, both via Ethernet and Wi-Fi.

Key features are:

- Secure protection by **xTER** SafeContainer technology
- Self-extracting package
- Intuitive Admin panel
- Advanced management of internet connection for web-surfing:
  - ✓ Blacklist – excluding prohibited sites
  - ✓ Whitelist – only allowed sites
  - ✓ AI-added filter and watchdog (pending)
  - ✓ No filtering
- Option to restrict access to Dark-Web and to disable "secure & anonymized" messengers (Telegram), web-browsers (Tor-Browser), anonymizing routers and other similar applications (integral feature of the Whitelist mode)
- Full and detailed log of connections
- **Green design** – **xTER** SmartFilter helps decreasing volumes of Tech-Waste, as it can work on old computers, incl. those missing hard drive, monitor and some or even the whole of the keyboard (might require higher computer skills to bypass hardware problems)

2. Routing options

- The only router at location, providing main Wi-Fi and Ethernet networks. Device can be connected to internet directly or via router (in this case it is recommended to hide/disable Wi-Fi of that router).
- Additional router for the location, providing additional Wi-Fi and Ethernet networks. Device must be connected to the main router.

Hint: *Create an additional "trusted & public" Wi-Fi and Ethernet networks using **xTER** SmartFilter and keep Wi-Fi and Ethernet networks of the main router hidden and available for authorized users. Especially useful solution for protecting users (kids and alike) from accessing prohibited/unwanted web-content and/or employees from wasting working time in social networks and chats.*

3. Operating options

3.1. Bare metal

Launching **xTER** SafeFilter on booting of respective device before/without loading any Operating System (OS) that might be installed on it.

- Respective device will work only as a router.

- Device might have problems with hardware (see Minimum requirements for details)
- OS is not required.

3.2. Within Virtual Machine (VM)

xTER SafeFilter within a VM launched in whatever OS installed on the respective device.

In this case your device will work only as a router.

- Respective device can be used as before.
- Device must be fully operational.
- VM will use some of RAM and hard drive that must be available (check configuration of the device and Minimum requirements of **xTER** SmartFilter).
- You may try using VM from any vendor, but we recommend VirtualBox from Oracle.

4. Minimum requirements

- CPU – Intel/AMD x86_64
- BIOS supporting UEFI and able to load from external drive connected via USB
- RAM 2Gb – as total RAM for Bare metal option or as free RAM for VM option
- Normally functioning Ethernet LAN adaptor
- Hard-drive:
  - ✓ Bare metal option – can be any, including not working or missing
  - ✓ VM option – normally operating with VM software installed or with enough free space for it
- Operating system – can be any, including not working or missing for Bare metal option
- Keyboard and Monitor – if broken or unavailable as an attached device, only Bare metal option with Headless start will be available, provided that BIOS settings of the device match **xTER** requirements

5. Required skills

Even following “Plug & Play” rules and trying our best to make usage of **xTER** SmartFilter as easy as possible we are not in the position to claim that **xTER** SmartFilter can be used by anyone at all regardless their experience, knowledge and awareness of what computers consist of and how they are operated and administered.

We believe that **xTER** SmartFilter can be successfully loaded, configured and used by the most of those who know about computers a bit more than nothing and have some good common sense and persistence.

We usually spend 5-7 minutes to get **xTER** SmartFilter up and running – and most of it just waiting while system is working on its own. But we don’t ’ve have technical issues with BIOS, hardware configuration etc. of our devices being used.

Important: *For the first time it might be difficult. But later it for sure will be a piece of cake.*

To avoid negative experience during the first start and ti increase chances to make things right, we recommend our customers with computer skills below the Advanced User level to arrange support from experienced users and/or specialists. Remote video or audio conference would be very likely to serve the purpose, you may try using our **xTER** Room-House. That support might become useful in case of running into a trouble.

6. xTER SmartFilter is a run-time application

xTER SmartFilter does not use any hard-disk space on your device and resides only in RAM. It means that you would need to load it each time your **xTER** SmartFilter device is rebooted. Though it sounds like a bitch, there are some serious reasons for that:

- Usually you do not reboot your router every day. In most cases you set it up and then it works until something serious happens – it breaks, you want to upgrade or change it etc. With **xTER** SmartFilter you would have just 1 more reason – your device is powered-off.

  Hint: *Using a laptop with a battery or adding a UPS (Uninterruptible Power Supply) would save your time and efforts in cases of short-time power cut-offs.*

- If for whatever reason you decide to use your **xTER** SmartFilter device as you did before, just shut it down, take out the flash-drive and turn it on. You have your device back without any changes.
- Since **xTER** SmartFilter "lives" only in RAM, and does so being encrypted, hacking it or obtaining control over it without your password becomes impossible. You can be sure that only people knowing your password would have access to the admin panel, which is quite useful when you need to enforce on-line limitations to some of the experienced users.

7. xTER SafeFilter is a fast router, but…

Stock routers are designed to assure the fastest possible speed of internet connection. **xTER** SmartFilter router runs on a computer, which is designed to perform calculations and process data. External data exchange is an essential but secondary function of computer devices. For this reason, the speed of Internet connection through **xTER** SmartFilter router will depend on the internet speed you get from your Internet-provider, as well as on:

- Status and performance of Ethernet adapter of your **xTER** SmartFilter device
- Status and performance of Wi-Fi adapter of your **xTER** SmartFilter device
- Overall performance of your **xTER** SmartFilter device – **xTER** SmartFilter routers based on ancient computers might demonstrate lower speed
- Number of devices connected to **xTER** SmartFilter device and cumulative traffic-load from them
- Type of connection between a user and a **xTER** SmartFilter devices – usually Ethernet is faster than Wi-Fi

So far we are able to get stable 40+ Mb p/sec for a device connected to **xTER** SmartFilter device via Wi-Fi and work on increasing this figure.

8. What is takes to launch xTER SmartFilter within xTER SafeContainer

The boot process of **xTER** SmartFilter consists of the following stages:

- Initial setup
- Downloading **xTR SafeContainer** with **xTER** SmartFilter inside
- Unpacking the package
- Starting up **xTER** SmartFilter

The first stage is performed by the user and the other ones are fully automatic.

When settings are correct the whole procedure of launching **xTER** SmartFilter will take as long as a few minutes of your precious time. The actual timing depends on the speed of your Internet connection and on

performance of CPU and RAM of your future **xTER** SmartFilter device. With a very fast internet and a modern computer it takes us about 1 min. to download and about 2-3 min to start **xTER** SmartFilter.

Note: *Launching **xTER** SmartFilter within **xTER** SafeContainer might be a Quest*

Please be aware that your experience with **xTER** SmartFilter might be very different if compared to experience with typical user applications – games, office software and many others. **xTER** SmartFilter and **xTER** SafeContainer belong to a class of system applications and deal with much more fundamental issues.

Experienced and Advanced users know by heart that sometime starting a system application might be a challenge for your temper, character and brain. It also might take more than 1 attempt and quite some time. There are plenty of legends, jokes and "scary stories" about installation of Windows, especially of those elder versions.

xTER SmartFilter and **xTER SafeContainer** are not designed to challenge you, but there are chances that loading and configuring might not be as easy as you have expected or wished for.

Please refer to the "Troubleshooting" section of this manual as required – we tried to outline there the most common problems and solutions you might run into.

9. When xTER SmartFilter and xTER SafeContainer just will not work

- If you cannot connect your **xTER** SmartFilter device to internet with Ethernet cable
- If Plug & Play loading did not work and your router is custom-tailored by internet-provider to such an extent that its configuration cannot be changed
- If the Ethernet card and the keyboard of your designated **xTER** SmartFilter device are on the same USB Bus on the Motherboard (info for advanced users)

BARE METAL: GETTING READY

Critical: *If possible, please check if the Ethernet and Wi-Fi adapters of designated **xTER** SmartFilter device are in place and function normally - that would save your nerves, time and efforts.*

- *If the Wi-Fi adapter is missing or does not work, you have to replace it or plug an external Wi-Fi adapter in one of the available USB slots.*
- *If Ethernet card is missing or does not work, you have to replace it or follow instructions of the "Booting with Dongle" paragraph in the "Troubleshooting" section of this manual.*
- *If you cannot check status of those adapters for whatever reason (operating system does not start, hard drive is missing etc.), you can try your "blind" chances, but please be ready that the process might become much "less exciting".*

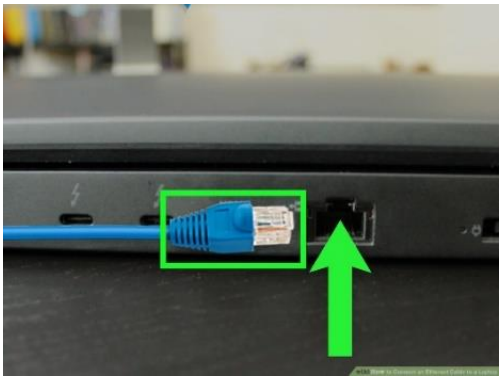
You can choose between "Headless" and "Regular" options of starting the system. Headless is a true fully automatic Plug&Play option, Regular option offers a configurable start.

In both cases you need to download the boot loader file from our GitHub:

Headless https://github.com/kl3eo/room-house/blob/main/router/bootx64.efi.dhcp

Regular https://github.com/kl3eo/room-house/blob/main/router/bootx64.efi.manual

- Go to the downloaded file and change its name to "bootx64.efi".
- Format a generic memory USB-stick in a popular Windows standard FAT32 (not NTFS!). If it is already formatted as FAT32, make sure that it is empty.
- Create folder "EFI" on your memory USB-stick and move/copy the "bootx64.efi" file to it. Plug the stick into a free USB port of your designated **xTER** SmartFilter device.
- Connect **xTER** SmartFilter device to your router or to the source of Internet from your provider. Ethernet cable will be required in most cases.



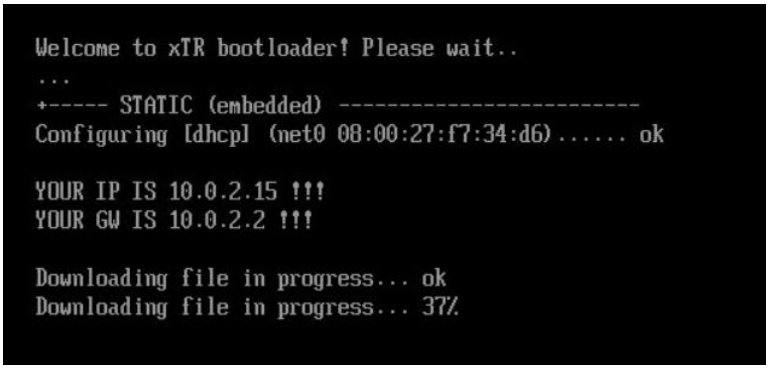
Important: *If your designated **xTER** SmartFiltler device is connected to internet via mobile modem or any other similar device that is directly attached to it, please refer to the "Booting with Dongle" instructions in the "Troubleshooting" section.*

- Connect a keyboard and a monitor to your device, if required.
- If required, change boot order in BIOS setting so, that your **xTER** SmartFilter device will start booting from the memory USB-stick with **xTER** SmartFilter boot loader (should be marked as "UEFI" in the boot priority list).

BARE METAL: HEADLESS START

- Turn on your **xTER** SmartFilter device.

  You should see the following screen:

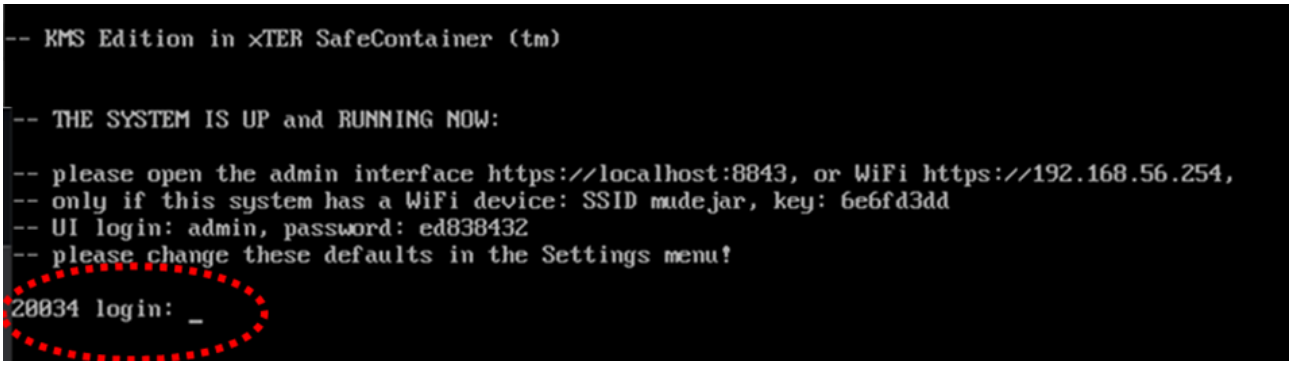


  If not, your device would start booting as it did before. In this case reboot and proceed to the next step.

  Important: *If it did not work after the first attempt, unplug Ethernet cable from the router, pause for 3-5 seconds and plug into a different slot. Then repeat the sequence. You might need to do that more than once – but you should know that yourself, probably. Or refer to the "Playing with Ethernet cable" paragraph in the "Troubleshooting" section.*

  It would be useful to check configuration of your router for whether or not DHCP Server in On. If it is OFF, turn it ON and repeat the start.

- When downloading is complete, **xTER** SmartFilter will automatically start unpacking itself – service messages will appear on the screen. At the end you should see the following screen:



  This screen means that your **xTER** SmartFilter device is up and running.

  Important: *The welcome message will include URL (as IP) address, default login and password to the Admin panel of **xTER** SmartFilter, as well as default name and key for the **xTER** SmartFilter Wi-Fi network (if **xTER** SmartFilter device has a working Wi-Fi module). You might want to write them down for your convenience.*

- Check if you have "mudejar" on the list of available Wi-Fi networks – that's the default name of the **xTER** SmartFilter Wi-Fi network.

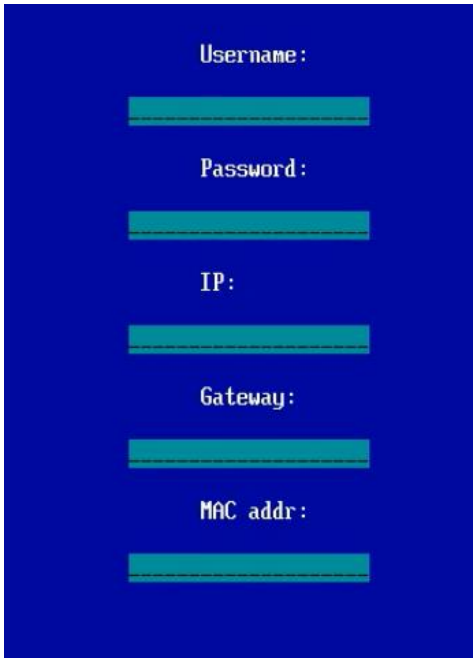
BARE METAL: REGULAR START (for experienced users)

The process of launching is very straight-forward and clear.

1. Initial setup

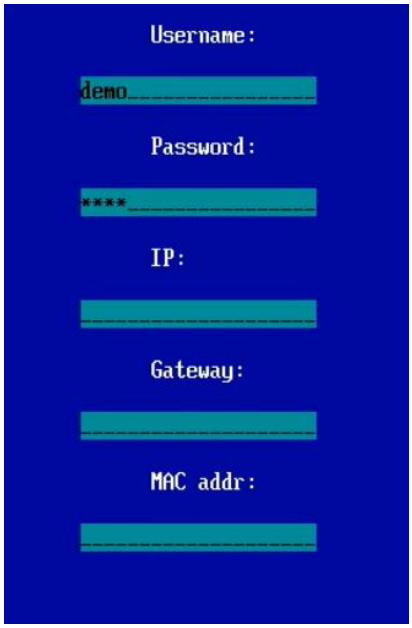
- Turn on your **xTER** SmartFilter device.

You should see the following screen:



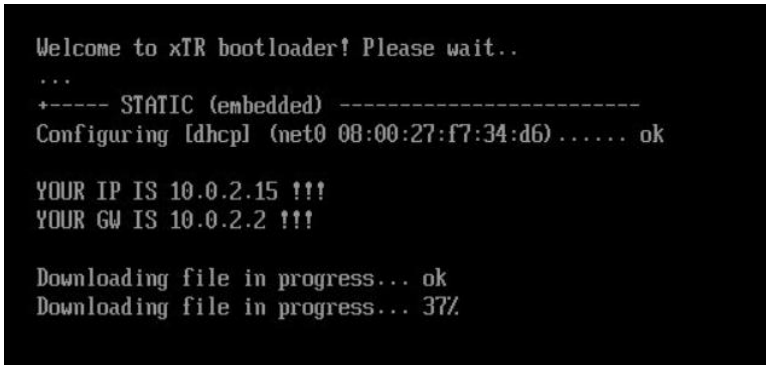
2. Plug & Play boot

The boot loader supports routers with DHCP server, so please enter “demo” for both Username and Password and press Enter.



Important: *If for whatever reason you cannot input anything into the slots (the keyboard does not respond), please refer to the "Troubleshooting" section of this manual.*

If your router supports DHCP, you would get the following screen:



If not, you would either get the previous screen or your device would start booting as it did before. In the second case please reboot and proceed to the next step.

Important: *If Plug & Play did not work after the first attempt, unplug Ethernet cable from the router, pause for 3-5 seconds and plug into a different slot. Then repeat the sequence. You might need to do that more than once – but you should know that yourself, probably. Or refer to the "Playing with Ethernet cable" paragraph in the "Troubleshooting" section.*

It would be useful to check configuration of your router for whether or not DHCP Server in On. If it is OFF, turn it ON and repeat the Plug & Play start.

3. Static IP boot

Now in addition entering Username and Password ("demo") to the respective fields you have to specify IP address (field "IP") and gateway (field "Gateway")

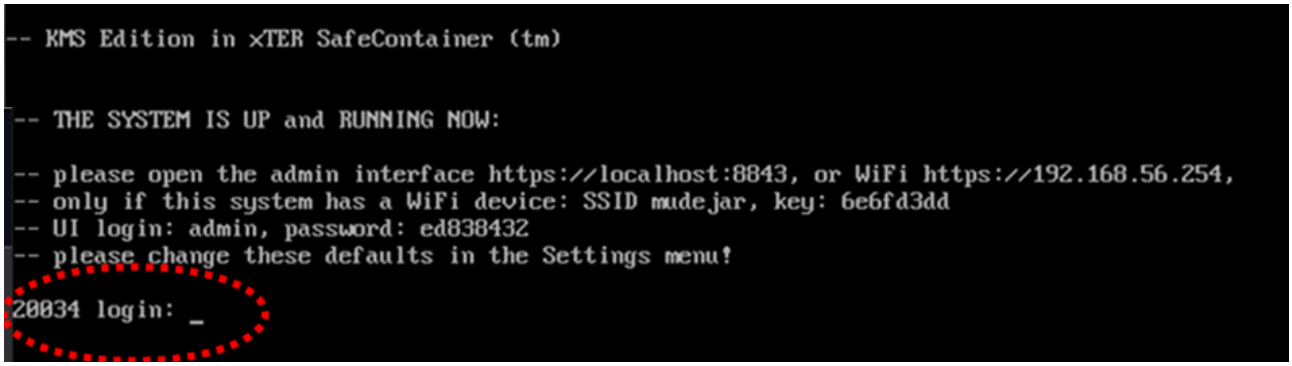
- If your device already has the static IP address, that would be the easiest case – enter Username, Password, IP and Gateway, and press "Enter" at the bottom.

Important: *If it did not work after the first attempt, you might want to play with cables again.*

- If not, go to the Admin panel of your router and reserve an IP address for the MAC Address of the Ethernet card of your **xTER** SmartFilter device. Do not forget to select the check-box and apply/save changes.
- Try Static IP start again, now entering the newly reserved IP address into the respective field. If this still doesn't work, please refer to the "Booting with dongle" paragraph in the "Troubleshooting" section of this manual.

4. Checking xTER SmartFilter status

When downloading is complete, **xTER** SmartFilter will automatically start unpacking itself – service messages will appear on the screen. At the end you should see the following screen:



This screen means that your **xTER** SmartFilter device is up and running.

Important: *The welcome message will include URL (as IP) address, default login and password to the Admin panel of **xTER** SmartFilter, as well as default name and key for the **xTER** SmartFilter Wi-Fi network (if **xTER** SmartFilter device has a working Wi-Fi module). You might want to write them down for your convenience.*

- Check if you have "mudejar" on the list of available Wi-Fi networks – that's the default name of the **xTER** SmartFilter Wi-Fi network.

BARE METAL: REGULAR START STEP-BY-STEP (for less experienced users)

1. Check how you are connected to Internet

You might be connected to Internet by the following methods:

- Through some router that is physically present in your location. In its turn, this router might be connected to internet via:
  - ✓ Ethernet cable – the most favorable option for you, which might give you the super safe and secure configuration by connecting your **xTER** SmartFilter device to Internet directly (please refer to "Advanced settings" section, viability of this option depends on your Internet-provider)
  - ✓ Optic cable, TV-cable, phone cable, satellite connection, mobile connection (3G to 5G) or Wi-Fi – does not really matter, they do not give an option of connecting **xTER** SmartFilter to Internet directly
- Through Wi-Fi connection (public or private via personal account) to a router that is located somewhere in your building – each device would connect to this router individually. This router would be administered by respective specialist or officer. In this case you would have to obtain your own router, which you would connect to this Wi-Fi network. As the result, you would get confirmation described in the paragraph above.

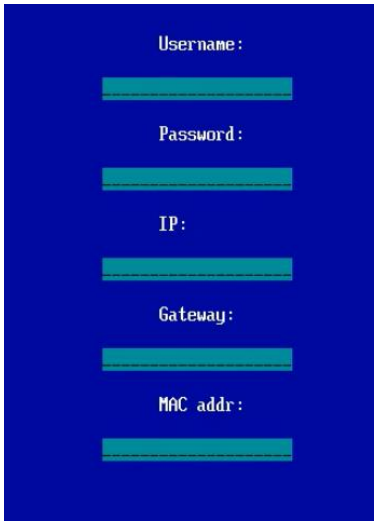
Important *Please do not forget to make sure that devices in your location are not able to connect to the Wi-Fi network of your building as use to do before, otherwise their traffic will not be controlled by your **xTER** SmartFilter device.*

2. Initial setup and start up

The following instructions are quite lengthy and might give misleading feeling of difficulty and complexity. Instructions are provided in such a manner that even an average user, such as parents concerned about online activities of their kids, would be able to start using **xTER** SmartFilter without any help.

2.1. Initial setup

- Connect your memory USB-stick with the boot loader to any of USB ports of the device which you would like to use as **xTER** SmartFilter device (if you used another computer for downloading the file).
- Turn on or reboot your designated **xTER** SmartFilter device. In a few seconds you should see this:



Seeing the screen means that the device started as expected and we can proceed.

If your device starts as before, you need to change BOOT setting in BIOS.

BIOS settings define the initial setup and configuration of your computer. If you do not have any experience with it, you might be better off by calling someone more experienced to help you, because crashing BIOS can blackbox your device.

Nothing serious, BIOS can be restored, but that should be better done by someone with appropriate skills and experience.

If you wish to change BIOS yourself, please follow the guidelines provided in the next paragraph.

2.2. Changing BIOS settings (if applicable)

- First of all, you need to open BIOS setup. The only way and time for it is to reboot your computer and watch the screen – soon after the "black screen" you would see a line saying something like "Press F5 to enter setup". The button might be "F5" or "F2" or "Del"/"Delete" or any other assigned to open the BIOS setup panel. You would have just a few (2 to 4 seconds) to press the button mentioned in the respective line. If computer starts normally after you pressed the button – too late, you have to repeat. If you get some interface – here you are, we can carefully take another step.
- Now you are in the BIOS setup. Look for a section that is called "Boot priority" or something very similar. In that section you will see the list of drives your computer recognizes, including the memory USB-stick with **xTER** SmartFilter boot loader. Do not change anything, just find the right section.
- In the section make sure that your memory USB-stick becomes #1 – you would have arrows to change its current position (move up) or an option to drag & drop with your mouse. Do not reorder positions of other drives, just move up only the memory USB-stick.

Important: *Your memory USB-stick can be listed twice – as a regular USB device and as a UEFI device. Move the UEFI device to the #1 position in the boot priority list.*

- When done, look for the button or a line saying "Save and Exit" or something very close. You need to save your changes, exit BIOS setup and reboot (reboot will be done automatically upon exit). Usually "Save and Exit" action is assigned to F12 or F10 – but please make sure that you are following instructions given by your device.

  If after reboot your computer device starts as usual – your attempt was unsuccessful, you will have to repeat the sequence.

  If you get just a black screen for a long time, you've done something wrong and BIOS setup has to be repaired = rolled back to its original configuration. Better call someone experienced for that.

  If you get the expected screen (see above), congratulations – you've done a great job and are ready to proceed to another step.

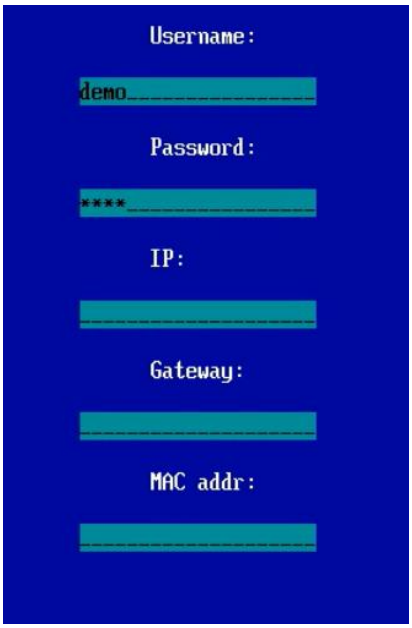
Important: *Sometimes it is very necessary to make sure that BIOS allows using the onboard LAN controller during boot, because up to 50% of BIOS'es do not have this option enabled by default. In complicated BIOS this option might be located quite deep in various menus and submenus. Try to find your right combination of BIOS, concentrating on options (menus) related to the network setup and UEFI. Some of them may magically turn the dead onboard Ethernet LAN adaptor alive – very useful for easy booting.*

2.3. Plug & Play boot

Our boot loader supports routers with DHCP server, which automatically assign IP addresses to all devices that are connected to them via Ethernet or Wi-Fi.

If your router has a built-in active DHCP server (true in most cases), then you can use the Plug & Play start. If you are not sure about DHCP server, trying Plug & Play would not take long – go for it.

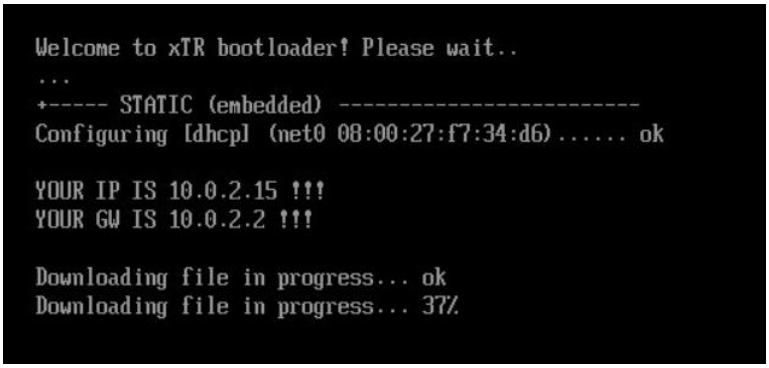
Input "demo" (case-sensitive!) both as Username and Password as shown on the picture below, leaving other fields empty, and then push "Enter" in the last field ("MAC Addr").



Hint: *You can navigate between the fields by pushing "Enter" (changes positions from the top to the bottom and starts the boot when pushed in the last position) or "Tab" (changes positions from the top to the bottom and then jumps to the top being pushed in the last position) or with a mouse.*

Important: *If for whatever reason you cannot input anything into the slots (the keyboard does not respond), please refer to the "Troubleshooting" section of this manual.*

If your router supports DHCP, you would get the following screen:



If not, you would either get the previous screen or your device would start booting as it did before. In the second case please reboot and proceed to the next step.

Important *If Plug & Play did not work after the first attempt, do not give up and check the "Playing with Ethernet cable" paragraph in the "Troubleshooting" section of this manual.*

2.4. Static IP boot

Now in addition entering Username and Password ("demo") to the respective fields you have to specify IP address (field "IP") and gateway (field "Gateway")

- The default gateway of most routers is either "192.168.0.1" or "192.168.1.1" – you can try them or, to make sure, check it in the admin panel of the router (you would need admin login and password for that), or try finding it on one of the labels that might be located on the body of your router.

  You can check if the gateway address is right by entering it into the web-address field of your browser. The right combination would give a screen prompting you for login and password or providing general information about configuration of your router.

  Important *Please make sure that digits are separated by "." (dot) and not by "," (comma) or any other sign. Spaces and any other characters are also not allowed.*

- Check if your device already has the static IP address, that would be the easiest case. IP address might be written on the wall-socket in which you've plugged the Ethernet cable. Or you might get it from the IT administrator of your building, if it has a centralized connection to Internet and some internal cabling and networking equipment.
- Enter Username, Password, IP and Gateway, and press "Enter" at the bottom.

  Important *Please double-check that values are correct and entered in the right way: digits in IP and Gateway are separated by "." (dot) and not by "," (comma) or any other sign. Spaces and any other characters are also not allowed.*

If done correctly, you will see on the screen that downloading has started.

Important *If it did not work after the first attempt, do not give up and check the "Playing with Ethernet cable" paragraph in the "Troubleshooting" section of this manual.*

If you have tried hard but **xTER** SmartFilter still is not boot loading, you would have to change configuration of your router. That is a sensitive thing, so you might want to call for assistance at this point, or to stick to our instructions and proceed to the next step. The problem might be not as big as it sounds and we will guide your every little step. But please be very careful. We will not bear responsibility for unwanted results of your actions.

Important *All routers, including yours, have an option to restore factory or default settings (or reset to them). That can be done either by clicking the respective button in the administrative web-panel of your browser or by pressing and holding for 10-20 seconds the respective button on the body of your router (this button would be hidden in the tiny hole to avoid accidental initiation).*
During this procedure your router must be connected to internet and turned on – it will reboot several times until becoming stable. The timing might range from a few minutes to 2-3 hours. Your individual timing would depend on manufacturer of the router, internet provider (quite often they add their own software) and speed of your internet connection.

2.5. Changing configuration of your router

First of all, you need to open the administrative panel of your router.

- Make sure that you have login and password for your router.
  The login usually is "admin" or "Admin" (might be case-sensitive), if otherwise, it should be written

somewhere on the body of your router or in the relevant Manual.
The password should be written on the body of your router or in the contractual documents received from your Internet-provider. Sometimes it can be found in papers included in the box with your router – on a separate sheet, small leaflet, on a sticker placed in the manual etc. Password is unique and is never printed in the manual, it can be placed there before your router is shipped to you.

If you have the password, you can proceed further. If not, you may try to hack the password to your router (takes time, knowledge and effort) or get another router – ask your Internet-provider (if you received your router there) or buy a new one (price of basic routers is around $20-25). Otherwise – forget it, unless you want to connect your **xTER** SmartFilter device to Internet directly = without any router at all (please refer to "Advanced settings" section of this manual).

- Open web-browser on any device that is connected to your router by Ethernet or Wi-Fi and input the gateway address ("192.168.0.1", "192.168.1.1" or another combination which you should know by now) into the web-address field of your browser. If done correctly, you would get:

  ✓ A screen with general information about configuration of your router. There will be a button allowing to enter the router, exact wording on this button can be different. Click that button and to be prompted for login and password.

  ✓ A prompt for login and password – please input as required.

  After that your browser would open the administrative panel of your router.

  Important *You might be prompted to change password or make some other changes to your router. Please refuse them unless you know what, why and how to do.*

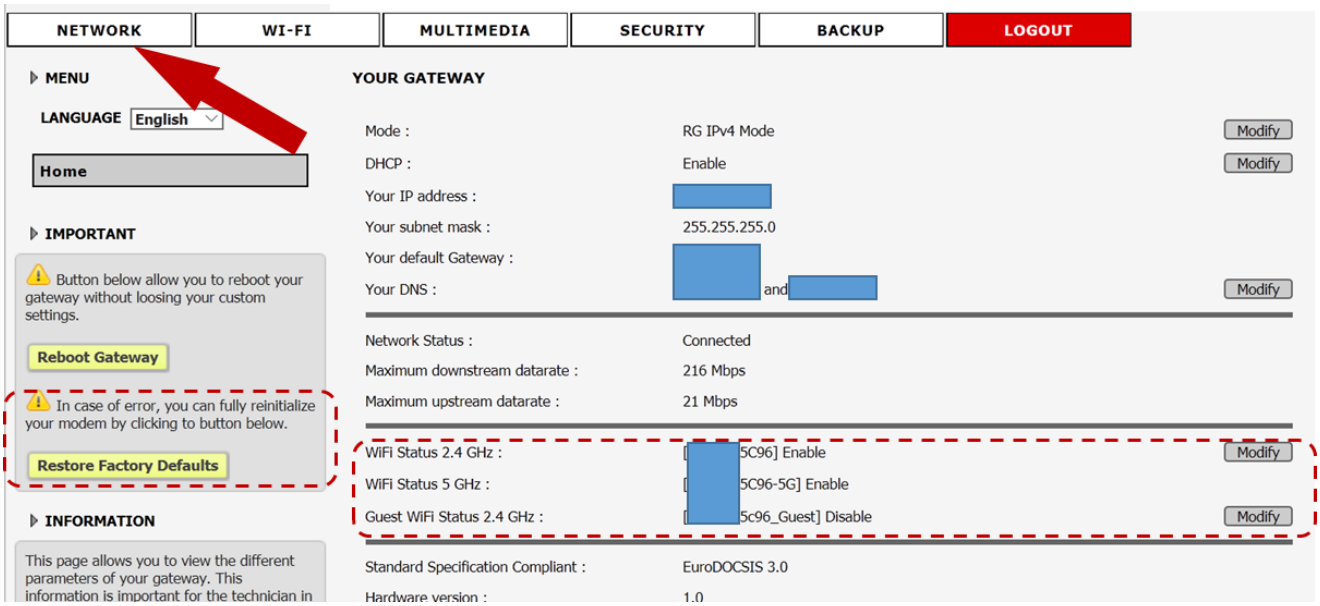
  Important *Interfaces of routers are manufacturer-specific and look very different, however they all have similar structure. Related to the subject illustrations that are provided below serve as an example only. Please be careful and rely on your common sense when using administrative panel of your router.*

  Important *If you leave administrative panel for long time open and idle, your session as an admin would expire and you will be kicked-out to maintain security of your router. You would have to re-enter.*

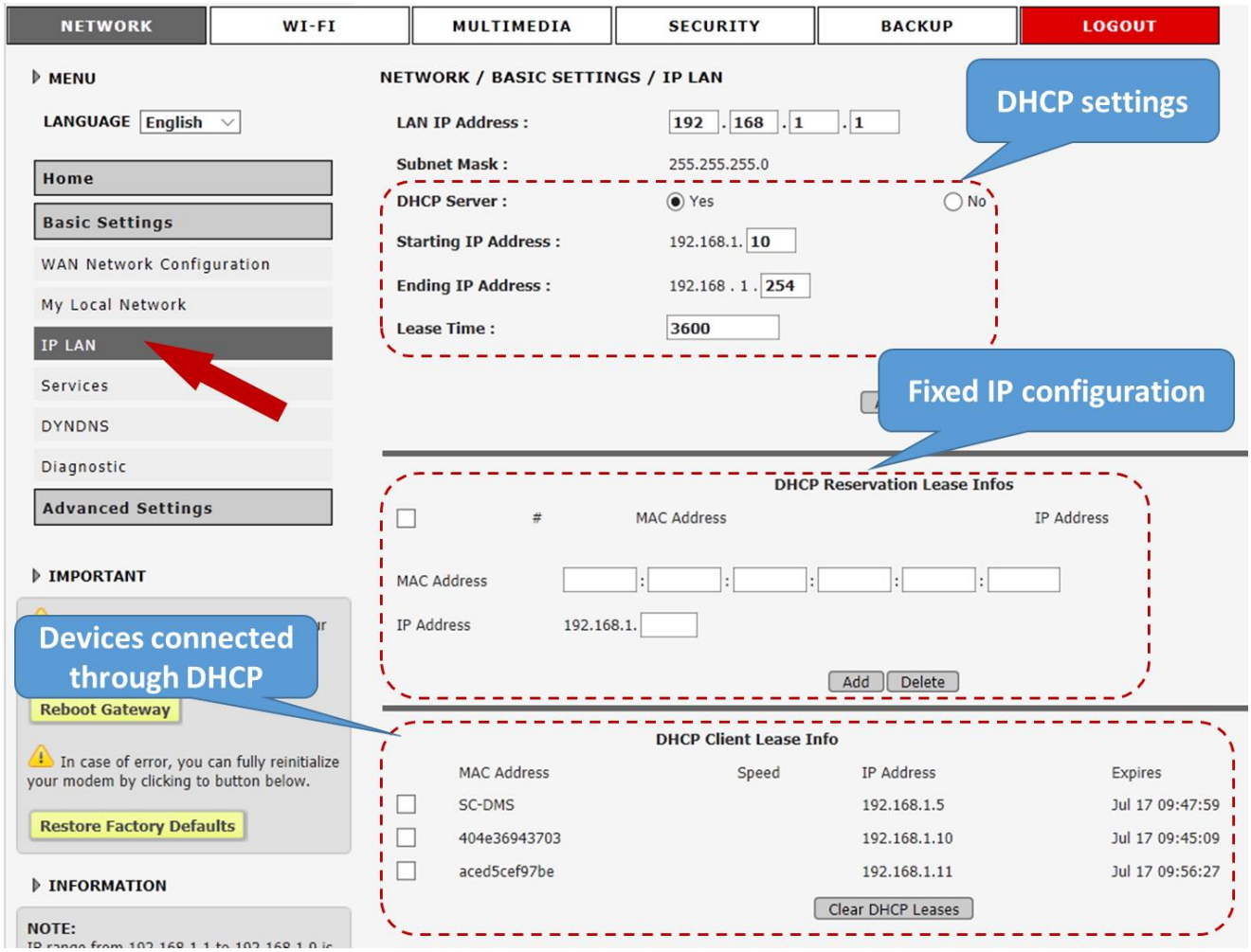
- Administrative panel of your router will look something similar to the following picture. Please follow to the section named "NETWORK" – in your case it might have a different name with similar meaning. You might check sections one by one without any worries, since you are just looking and not touching anything yet. We are looking for the secondary menu with item "IP LAN" or any other with "IP" as a part of its name.

  Note *Please look at the marked area in the lower-left area of the picture. This is where you can reset your router to factory (or "default") settings if needed. For example, if you have done something very wrong.*

  Note *Please look at the marked area in the lower-left area of the picture. This is where you can see configuration of your original Wi-Fi network and jump to respective section to change them (by clicking those "Modify" or similarly named buttons). DO NOT make any changes yet, we will come back to it in a due course.*



- Find areas with “DHCP” – they might look like the ones on the picture below.



First of all, check whether your DHCP Server is switched ON or OFF (DHCP Settings area on the picture above). If your DHCP Server is switched OFF, you have a lucky chance of enabling Play & Play booting by switching it ON.

- ✓ Check if "Fixed IP configuration" area does not have any records. If there are some and quite a few, you might face a risk of damaging your network configuration. Usually those records are created for a reason by knowledgeable specialists to make some specific (not in the Plug & Play style) settings. If you received your router not as obviously new (packed in the box, no scratches on the body, still smelling fresh plastic etc.), those records might have been created by the previous owner. You call the Customer Support of your Internet-provider to make it sure.

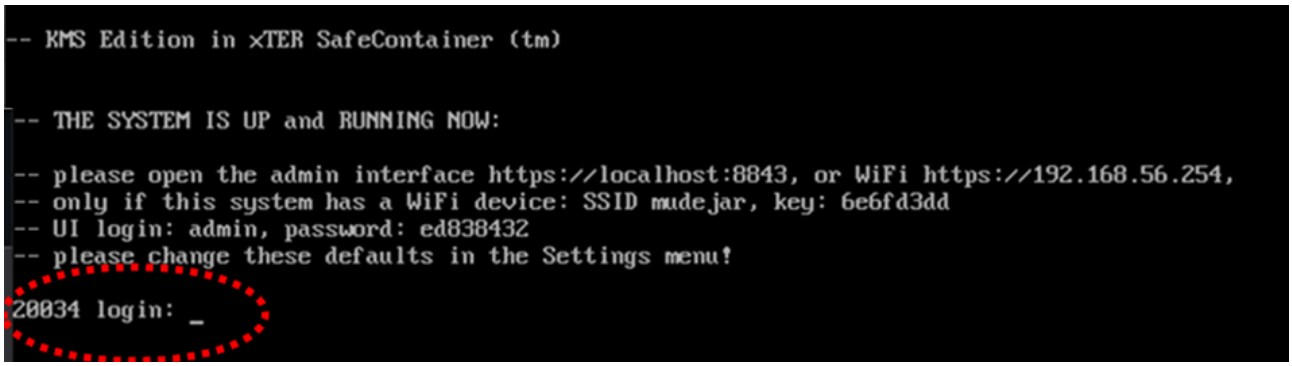
  Note *Take a screenshot of this area just in case. You may try to remove those records now or later on, but please be ready that some computer and "smart" devices might stop working – you will have to restore these settings.*

- ✓ Switch DHCP Server ON and click "Apply", "Save" or any other button with similar meaning – you have to save the change you've just made to your router.
- ✓ Try Plug & Play boot one more time (Playing with Ethernet cable still might be useful). If it still does not work, proceed further with your quest. Create a fixed IP address for your **xTER** SmartFilter device by adding respective reservation record to the "Fixed IP configuration" area (see picture above).
- ✓ Get the MAC Address of your **xTER** SmartFilter device. MAC Address is a universal global standard for networking devices. It is represented by the unique combination of 12 digits and letters. You need address for LAN, address for Wi-Fi would not work, please do not confuse them! Look for MAC Address (LAN) on the body of your **xTER** SmartFilter device or in the papers you received with it.
- ✓ If MAC Address is unavailable, you still can retrieve it, but that would require starting your designated **xTER** SmartFilter device in a regular mode and going into its deep settings to find the MAC Address of Ethernet adapter. If you've never done that, please better call for assistance, as that might be difficult for unexperienced user. Otherwise, you may try to refer to Internet – there are plenty of "How to" manuals and videos, so can look for those that would be applicable to your situation (type of device and its operating system) and serve you best. It is not realistic for us to guide you through this with our manual. Once successfully done, take another step. If not – it's just too bad, we are sorry but not guilty.
- ✓ Specify the IP address that you would like to reserve for your **xTER** SmartFilter device. You must:
  - MAC Address (LAN). It is entered in 6 pairs of 2 signs, either in 6 pre-set boxes as on the picture above, or with ":" (colon) between them if there is a single field for the MAC Address. For example, the 1245DB1B00C9 combination must be entered as 12:45:DB:1B:00:C9. Please keep in mind that MAC Address is not case-sensitive. It is usually printed in AllCap's, but is used as lower case (can be 12:45:db:1b:00:c9 in our example).
  - Specify the IP Address. You can enter only the last part of the IP address. The value must be in the range between the Starting IP Address and Ending IP Address – please look at the picture above (10 and 254 respectively).
  - Check the check-box.
  - Click "Add" or "Save" button and confirm your action, if prompted.
  - Check that the desired address appears in the list of reservations.
- ✓ Try Static IP boot of **xTER** SmartFilter one more time, entering the newly created IP address. Username, Password remain the same, as well as the Gateway (unless you changed it the Admin panel). Playing with Ethernet cable still might be useful. If **xTER** SmartFilter still doesn't boot,

please refer to the “Booting with dongle” paragraph in the “Troubleshooting” section of this manual.

2.6. Checking xTER SmartFilter status

When downloading is complete, **xTER** SmartFilter will automatically start unpacking itself – service messages will appear on the screen. At the end you should see the following screen:



This screen means that your **xTER** SmartFilter device is up and running.

Important: *The welcome message will include URL (as IP) address, default login and password to the Admin panel of **xTER** SmartFilter, as well as default name and key for the **xTER** SmartFilter Wi-Fi network (if **xTER** SmartFilter device has a working Wi-Fi module). You might want to write them down for your convenience.*

- Check if you have “mudejar” on the list of available Wi-Fi networks – that’s the default name of the **xTER** SmartFilter Wi-Fi network.

VIRTUAL MACHINE (VM)

1. Getting ready

- Check that Virtualization is ENABLED in your BIOS.
- Check that Hyper-V (Windows only) is NOT running.

2. Installation

- Download the latest VirtualBox for your OS from https://www.virtualbox.org/wiki/Downloads
- Run the installation of VirtualBox to its default Windows location:"C:\Program Files\Oracle\VirtualBox"

  In case you're on a different OS, like Linux, the rest of this is manual is still valid.

Now your will need to launch and setup the VM with **xTER** SmartFilter inside.

If you are an experienced user, here is a shortcut of all the commands in one script:

https://github.com/kl3eo/room-house/blob/main/router/create_router.sh

2.1. Setup VM

- Open the command line (terminal) - it usually prompts to "C:\Users**Bob**" - if you're a User named **Bob**.

  Important: *Don't forget to replace in the following commands **Bob** to the correct user name. Below is an example how that should be done.*

```
C:\Users\ User \VMs\xTER_router>vboxmanage createmedium --filename 2SF.vdi --siz
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Medium created. UUID: 8454094d-60ed-42cd-aae1-b47992220d36

C:\Users\ User \VMs\xTER_router>vboxmanage storageattach xTER_router --storagect
 hdd

C:\Users\ User \VMs\xTER_router>vboxmanage modifyvm xTER_router --boot1 disk --b

C:\Users\ User \VMs\xTER_router>
```

- Set a correct PATH to the VirtualBox binary files:

  set PATH=%PATH%;"C:\Program Files\Oracle\VirtualBox"

- Check if Windows understands the "VBoxManage" command - type "*VBoxManage*" in the terminal and see the output. If Windows doesn't understand this command, this link explains why not:

  https://www.roelpeters.be/vboxmanage-is-not-recognized-and-how-to-solve-it/

  Important: *If you have installed VirtualBox in a different folder, don't forget to set a correct PATH in the terminal before running the rest of this setup.*

If Windows understands the "VBoxManage" command, and there is some old VM named "xTER_router ", you may want to delete it:

VBoxManage unregistervm xTER_router --delete

- If there is no folder "C:\Users**Bob**\VMs", now make one:

  *mkdir "C:\Users**Bob**\VMs"*

- Create a new VM named "xTER" of type "Linux Red Hat 64-bit":

  *vboxmanage createvm --name xTER_router --ostype RedHat_64 --register --basefolder "C:\Users**Bob**\VMs"*

New folder should appear – "C:\Users**Bob**\VMs\xTER_router".

- Change to the new folder:

  *cd "C:\Users**Bob**\VMs\xTER_router"*

- Set up your new VM with minimum 2Gb of RAM, 1 or 2 CPU cores, no audio, with EFI, port forwarding and logging external request IPs.

  Note: *You can increase the RAM size and # of CPU cores according to what is actually there on your host computer. Do so by changing the command line accordingly.*

  vboxmanage modifyvm xTER_router --memory 2048 --cpus 2 --audio none --firmware efi --nic1 nat --nataliasmode1 proxyonly

- Set up internal host-to-guest port forwarding for the HTTPS Admin web interface:

  vboxmanage modifyvm xTER_router --natpf1 "admin,tcp,,8843,,443"

- Create at least 2Gb file for **xTER** SmartFilter database, logs, etc:

  vboxmanage createmedium --filename 2G.vdi --size 2000

- Create a virtual SATA controller:

  vboxmanage storagectl xTER_router --name SATA --add sata

- Download **xTER** SmartFilter bootloader file from

  https://github.com/kl3eo/room-house/blob/main/router/loop_router.vdi

  and put it to "C:\Users**Bob**\VMs\xTER_router"

- Attach **xTER** SmartFilter bootloader to the VM as Disk 0:

  vboxmanage storageattach xTER_router --storagectl SATA --medium loop_router.vdi --port 0 --type hdd

- Attach the 2G.vdi file as Disk 1:

  vboxmanage storageattach xTER_router --storagectl SATA --medium 2G.vdi --port 1 --type hdd

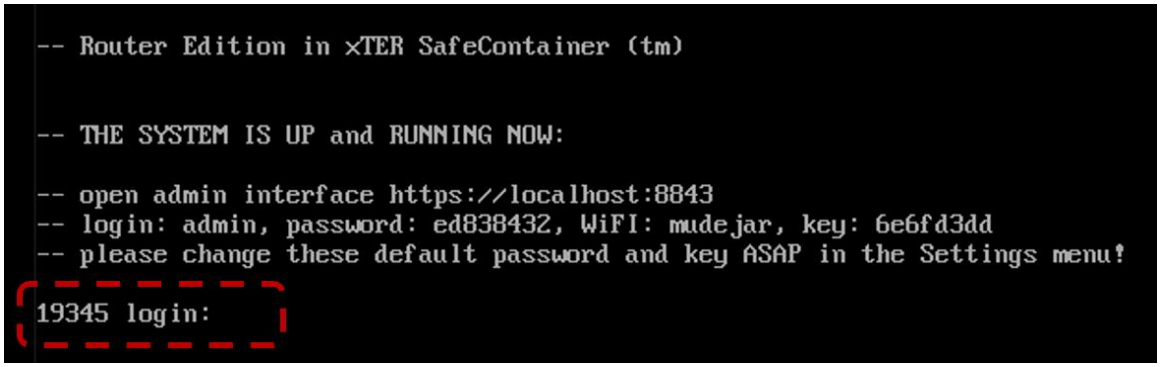
- Add a directive to boot from Disk 0:

vboxmanage modifyvm xTER_router --boot1 disk --boot2 none --boot3 none --boot4 none

2.2. Boot

Boot via VirtualBox interface

- Boot the **xTER** SmartFilter VM from the VirtualBox graphical manager – it's quite intuitive. You should see another window opening and **xTER** starting in it. **xTER** SafeContainer will download and unpack **xTER** SmartFilter – service messages will appear on the screen.
- After the **xTER** SmartFilter VM has booted, you'll see a confirmation in that new window.



This screen means that your **xTER** SmartFilter VM is up and running.

Important: *The welcome message will include URL (as IP) address, default login and password to the Admin panel of **xTER** SmartFilter, as well as default name and key for the **xTER** SmartFilter Wi-Fi network (if **xTER** SmartFilter device has a working Wi-Fi module). You might want to write them down for your convenience.*

- Check if you have "mudejar" on the list of available Wi-Fi networks – that's the default name of the **xTER** SmartFilter Wi-Fi network.

Boot via Command Line

If graphical manager is not availalbe (e.g. for a remote host), use the command line.

- Start the **xTER** SmartFilter VM with the command:

VBoxHeadless --startvm xTER_router

Important: *You will NOT see any output from the loading xTER SmartFilter in this case - just wait. Waiting time will depend on the speed of your internet channel and performance of your designated xTER SmartFilter device.*

Size of the download is ~200 Mb (divide it by downloading speed to estimate required time), self-unpacking and starting time averages to 2-5 minutes.

- Check if you have "mudejar" on the list of available Wi-Fi networks – that's the default name of the **xTER** SmartFilter Wi-Fi network.

CONFIGURING YOUR XTER SMARTFILTER

Having completed booting **xTER** SmartFilter device, you need to configure your already-running **xTER** SmartFilter. You can do that using the administrative panel of **xTER** SmartFilter, which you can access from either another LAN computer with Ethernet connection to your router or from any Wi-Fi device with established connection to **xTER** SmartFilter Wi-Fi network. The default name of **xTER** SmartFilter Wi-Fi network is “mudejar”.

1. Initial setup

1.1. Check connection of your xTER SmartFilter Wi-Fi network

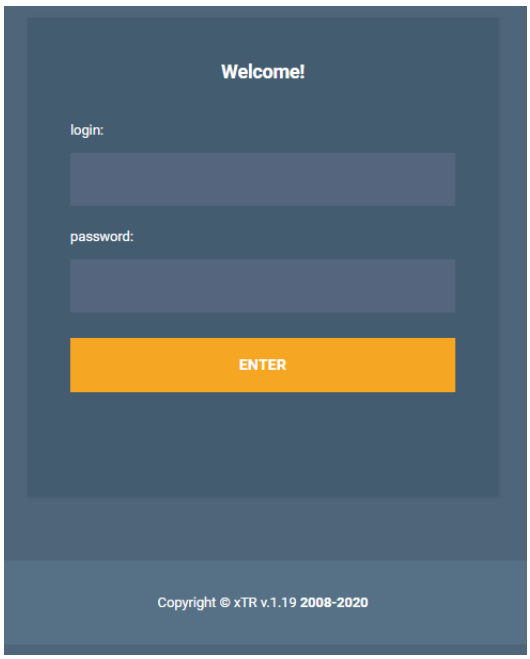
- Connect any of available computers or smartphones to the new Wi-Fi network named “mudejar”. The default network key (or password) is “6e6fd3dd”.
- Try to open any web-site to check the Internet-connection.

1.2. Access Admin panel of xTER SmartFilter

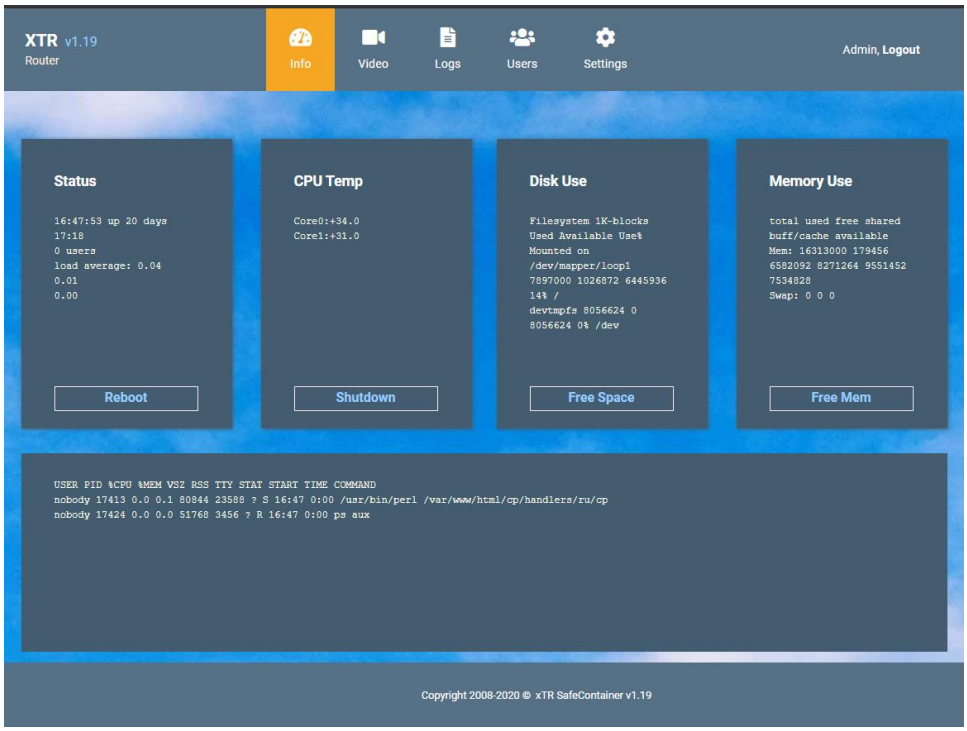
- In a browser on a LAN computer or on a Wi-Fi device with "mudejar" connection established, open internet-browser and type “http://your_xTER_SmartFilter_device_IP” (or just IP address combination of your **xTER** SmartFilter device).

  Note *For your convenience IP address of your **xTER** SmartFilter device and Gateway of your router were provided in a “Welcome” message on the screen of your **xTER** SmartFilter device.*

- If everything is correct, you should see the following screen:



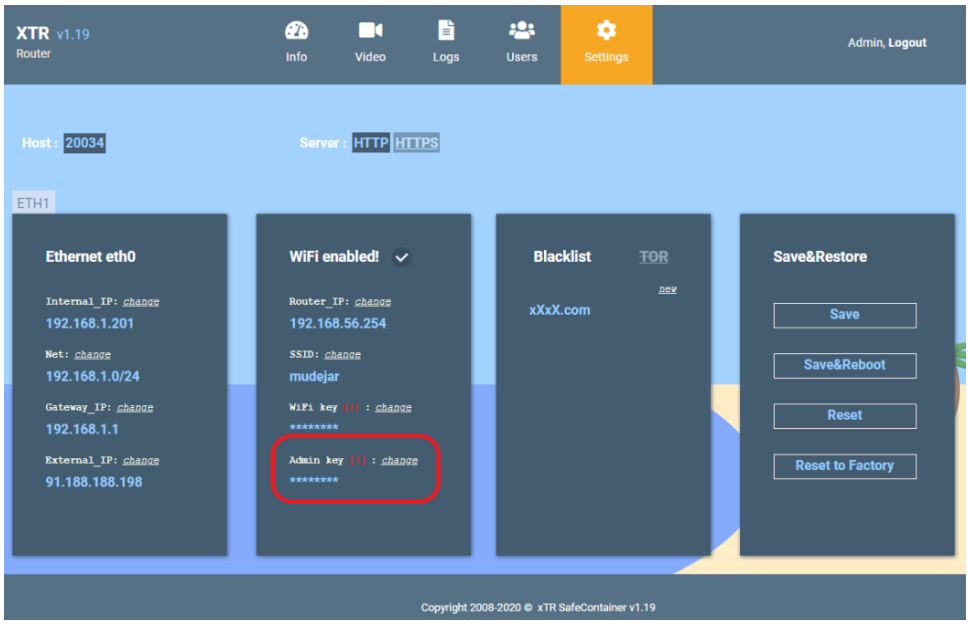
- Use “admin” as the Login and “ed838432” as the default password – we will change it a bit later. Here is what Admin Panel looks like:



1.3. Change admin password

Important *You are strongly advised to change the default admin password of your running system. By doing this immediately after logging in with your default admin password, you will protect your* **xTER** SmartFilter *device against unauthorized access.*

- Go to “Settings” and find the “Admin key” option of the menu, click on the red "!" exclamation mark to display the current password.

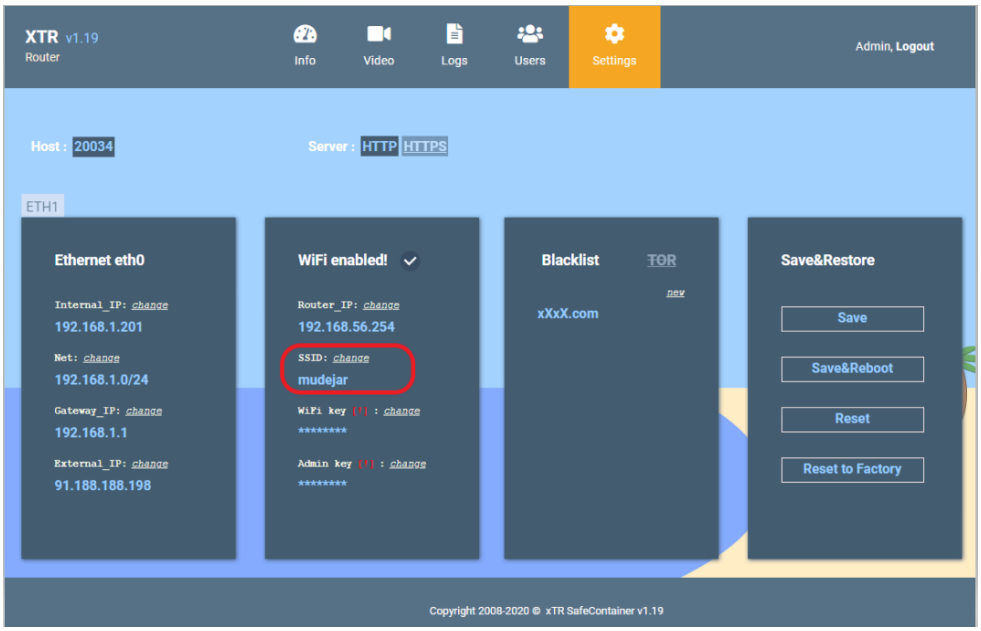


- Click on “change” to display the current “key phrase”.
- Change this key phrase as you wish and hit "Enter". Click on the red "!" exclamation mark again and WRITE DOWN the 8-symbol combination that will appear - this is your current admin password!

Important *Keep this password secure. You will have to use it as the admin password during your next login. The change will be applied after you hit the "Save" button on the last menu and do confirm. After that router will close your session and you will have to re-enter the Admin Panel using the new admin password.*

1.4. Rename your xTER SmartFilter Wi-Fi network

- Click on “Change” and input the desired name.



Important *After changing the name all connected devices will lose their connections and will have to re-connect using current name of the **xTER** SmartFilter Wi-Fi network name and its key.*

1.5. Re-Configure your original Wi-Fi network

It is very likely that you want **xTER** SmartFilter to manage Internet traffic of devices in your network.

But if you do not make changes to your original Wi-Fi network, all devices will keep using it and your Smart Internet-filter will stay rather useless.

Please go to the Wi-Fi section of the administrative panel of your router (see picture below). Do not forget, that interface of your router looks different, look for similar elements on it!

Note *Your router supports either 1 or 2 Wi-Fi networks, it will be reflected on the Admin panel.*

You have the following options, use them as a stand-alone or in a combination, it’s your choice:

- **Shut-down your Wi-Fi network**

  Your Wi-Fi network(s) would be shut down and none of devices would have access to your original Wi-Fi network.

  You can shut-down Wi-Fi network in the top marked area. Unselect the “Enable Wi-Fi Network” check-box (or select “Disable” option, if applicable) for the network you want to shut-down and click the “Apply” or “Save” button and confirm your action, if prompted. It’s done.

  Wi-Fi network(s) can be restored by performing the opposite action in the Admin panel.

Important *Shutting down your original Wi-Fi network is most effective way to assure that all Wi-Fi devices will have to switch to your new "mudejar" Wi-Fi network.*

Important *All devices connected to the shut-down Wi-Fi network(s) will immediately lose connection. If you are managing your router through device connected to it via Wi-Fi, it will also lose connection and access to the Admin panel. You will be able to open the Admin panel of your router only by connecting it to your device using an Ethernet cable.*

- **Hide your Wi-Fi network**

  Name(s) of your Wi-Fi network(s) will disappear from the list of available Wi-Fi networks but still will be functioning. That means that any new device can be connected to your Wi-Fi network only if a user of this device would know the name of your hidden Wi-Fi network (and key/password, if applicable) and use the "connect to a hidden network" procedure. All devices that have been connected to your hidden Wi-Fi network and remember its name and key/password, would be able to connect to it without any problems and use as they did before.

  You can shut-down Wi-Fi network in the top marked area. Unselect the "Enable SSID Broadcasting" check-box (or select "Hide" option, if applicable) for the network you want to hide and click the "Apply" or "Save" button and confirm your action, if prompted. It's done.

  Wi-Fi network(s) can be shown again by performing the opposite action in the Admin panel.

- **Change name of your Wi-Fi network**

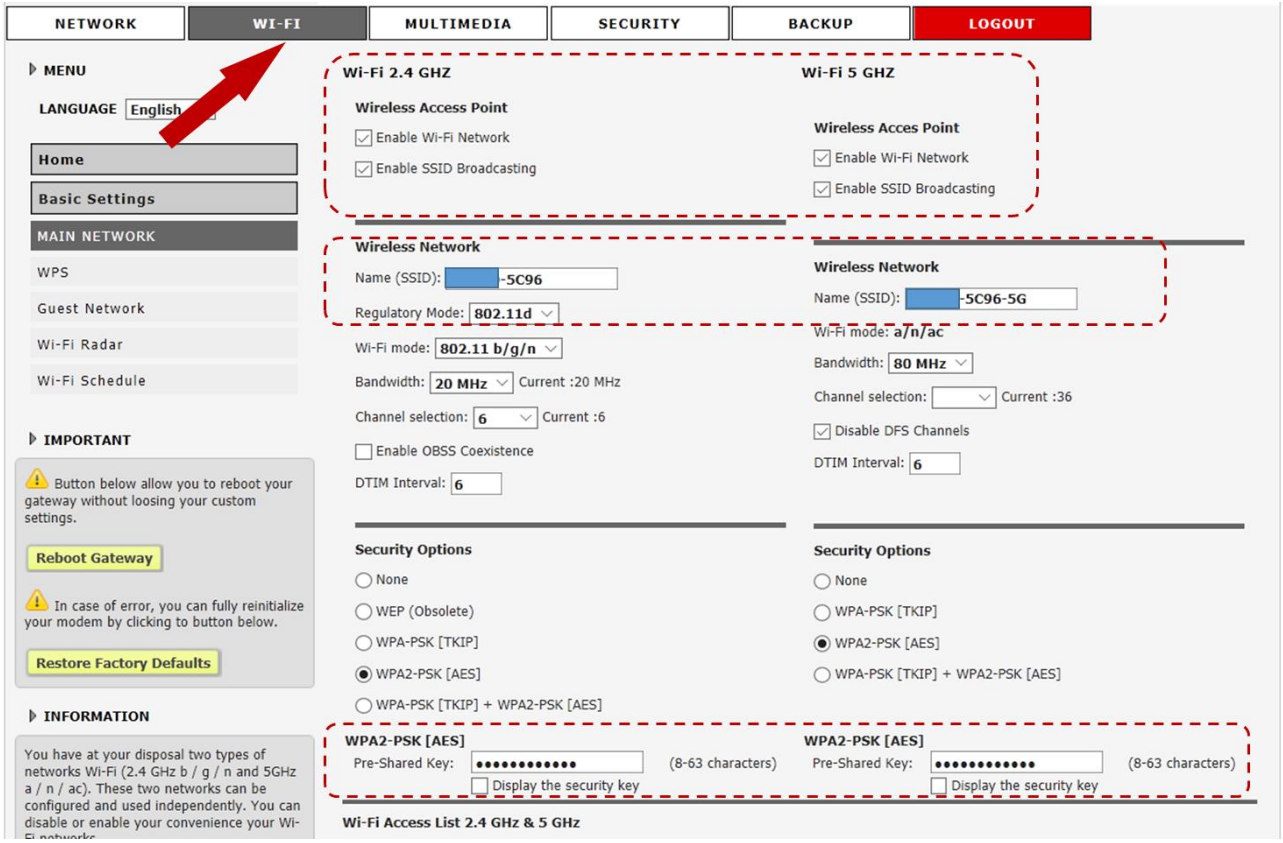
  Your Wi-Fi network will keep functioning and will be listed in the list of available Wi-Fi networks under a different respective name. That means that all devices connected to this Wi-Fi network will lose their connection immediately after renaming, since it will become "another" and unknown network. Any new device can be connected to your renamed Wi-Fi network by selecting it from the list of available Wi-Fi network and providing its key/password (if applicable). In most cases that can be done only manually.

  You can re-name your Wi-Fi network in the middle marked area. Provide new name (your router might reject certain signs) and click the "Apply" or "Save" button and confirm your action, if prompted. It's done.

- **Change the Key/Password for your Wi-Fi network**

  Your Wi-Fi network will keep functioning and will be listed in the list of available Wi-Fi networks, but will request new key/password from every device trying to connect to it. That means that most of devices connected to this Wi-Fi network will lose their connection immediately after changing the password (in some cases they will keep the connection). Any new or previously connected device can be connected to your Wi-Fi network only after providing its key/password (if applicable). In most cases that can be done only manually.

  You can change (or remove) the key/password to your Wi-Fi network in the lower marked area. Provide new password (your router might reject certain signs) and click the "Apply" or "Save" button and confirm your action, if prompted. It's done.



2. Configuring filter for internet connections

Internet traffic through your **xTER** SmartFilter device is configured via Black and White lists. Some of advanced routers have similar logic and respective structure of interface, however in most cases they are missing functionality since belonging to a very basic type of equipment.

2.1. Blacklist

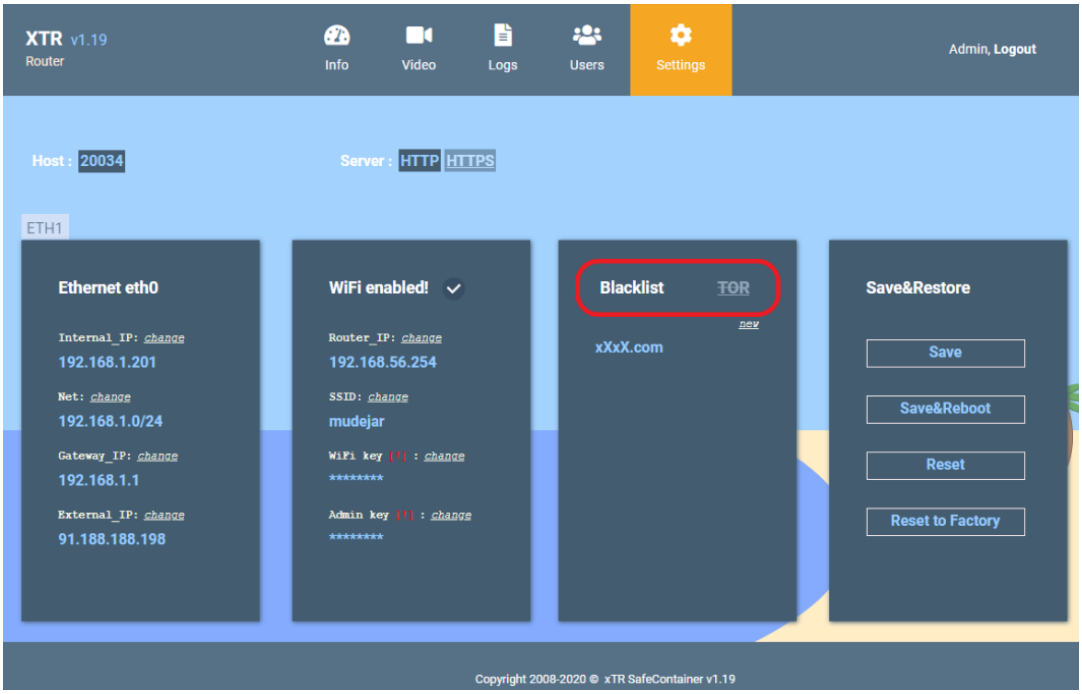
Compiling your own Blacklist is pretty much straightforward – just add one by one sites that you don't want Wi-Fi users to have access to. Remember though that in the "Blacklist" mode your router is not able to intercept TOR browsers so in this case a user with a TOR browser will bypass the Blacklist.

Critical *Please be aware that the most common tool to get connected to the Dark-Net are TOR browsers. Those TOR browsers can be freely downloaded and installed by any user. Certain popular Messengers (like Telegram) and social networks, which advertise super-secure connection & data exchange and provide to their users & members with access to "Private channels" or "Closed Communities" (quite often with illegal content – sex/porn, drugs, weapons, suicide & terrorists' communities etc.), also use technologies similar to TOR browsers.*
In case you still do not understand: All that above means that Dark-Net (or content associated with the Dark-Net) is just a step-away from any user with access to regular Internet. No age verification is required!

To kill all those TOR-like connections you will have to switch to the "Whitelist" mode (labeled as "~~TOR~~" in the **xTER** SmartFilter interface).

2.2. Whitelist

Since this mode de-facto is focused on blocking TOR-like connections to internet, we labeled it in the **xTER** SmartFilter interface as "~~TOR~~". Do not look for the "Whitelist" label!



Compiling your own custom Whitelist is a bit tricky.

For example, if you want YouTube to be in this list (as it is already). We have had to add a bunch of sites in order to be able to watch YouTube videos in browsers, like these:

- gstatic.net
- pki.goog
- 64.233.0.0
- 173.194.0.0
- ytimg.com
- ggpht.com
- googleusercontent.com
- doubleclick.net

As we have tested these sites and addresses must be on the list. Adding only "youtube.com" would not work because these are so called dependencies of "youtube.com".

Besides, with only these sites on the Whitelist you will not be able to watch YouTube videos from your YouTube mobile apps for Android and iOS. But you will be able to watch them in a browser: right-click on the video link, select "Copy link address" and then paste this address in the browser's URL – the video should open for your pleasure.

If you want to allow watching YouTube with mobile apps, you have to add to the Whitelist some more "dependencies". Finding those "dependencies" will be your own task – and that might become a challenge.

2.3. No filtering

In fact this is the Blacklist mode but with no sites specified = filter is set to 'Nothing".

3. Connecting other routers to xTER SmartFilter device

You can build a local Wi-Fi infrastructure, using **xTER** SmartFilter device as the central element and a number of routers as remote points of access to the Internet.

Important *Each point of access will have its own name and key for the respective Wi-Fi network.* ***xTER*** *SmartFilter router will only filter the traffic according to Blacklist/Whitelist settings.*

3.1. Low-capacity configuration

Can be used for locations with relatively low expected number of devices that would be connected to Wi-Fi infrastructure built on **xTER** SmartFilter device and with low-medium intensity of internet-traffic: household, small office or cafe etc.

- Connect USB-to-Ethernet Dongle to a free port of **xTER** SmartFilter device before booting (refer to the respective part of the manual)
  USB Dongle might look like on the picture below:

- Remove USB Dongle from the **xTER** SmartFilter device while files are being downloaded (after downloading starts and before it is finished)
- Reconnect USB Dongle to the **xTER** SmartFilter device when system is up and running
- Setup your local Wi-Fi infrastructure:
  - ✓ In case 1 router is used: connect it to USB Dongle using a regular Ethernet cable
  - ✓ In case 2+ routers are used: connect routers to a LAN concentrator/hub as required and then connect this LAN concentrator/hub to USB Dongle

Important: *Actual overall/cumulative speed of connection to internet via local Wi-Fi network built on* ***xTER*** *SmartFilter device will depend on performance of routers used as access points and on computer used as* ***xTER*** *SmartFilter device, with the latter being the key limitation factor. The remaining factors are the speed of internet connection given by internet provider and specifics of this connection, if applicable (number of active sessions and other of similar nature).*

3.2. High-capacity configuration

Should be used for locations with relatively high expected number of devices that would be connected to Wi-Fi infrastructure built on **xTER** SmartFilter device and with high intensity of internet-traffic: educational facilities (school, college etc.), rather big office, café, shopping center, hotel or another public place.

Important: *This type of deployment is considered professional, therefor **xTER** SmartFilter device must have 2 separate internal PCI Ethernet adaptors, better high-quality ones. For best performance make sure that CPU, motherboard (incl. BIOS) and RAM of **xTER** SmartFilter device are rather modern.*

- Connect one PCI Ethernet adaptor of **xTER** SmartFilter device to your source of Internet and boot your device
- Setup your local Wi-Fi infrastructure: connect routers to a LAN concentrator/hub as required
- Connect LAN concentrator/hub to a free PCI Ethernet adaptor of **xTER** SmartFilter device when system is up and running

TROUBLESHOOTING

1. Wi-Fi adapter of xTER SmartFilter device does not function

Try fixing or replacing it. Stock USB Wi-Fi modules are quite affordable – their starting price is around $15.

However, please remember that you are going to use your **xTER** SmartFilter device as a Smart Wi-Fi router, which means that users and devices connected to your **xTER** SmartFilter Wi-Fi network might be not very happy with level and quality of Wi-Fi connection provided by a super-cheap USB Wi-Fi module.

2. Wi-Fi network of xTER SmartFilter provides a weak and poor connection

You could have notices that advanced Wi-Fi routers have quite large antennas, and very often more than one. There is only one reason for that – quality of Wi-Fi connection between this router and devices. Quality is described by the speed of connection, as well as by the distance (how far from the router you can get connected and through how many walls) and strength/level of signal (the higher the signal is, the less data would be lost due to interference, "noise" etc.).

Do not expect that your **xTER** SmartFilter device to operate differently – those are the physics you hardly can argue with 😊😊😊.

Please change location of your **xTER** SmartFilter device in more "central" and open space to improve connection with devices around it. You also might want to consider upgrading the Wi-Fi adapter and/or USB Wi-Fi module.

Hint *Instead of buying a new adapter or USB module, it might be wise to check second-hand offerings. You would have high chances to get for the same budget a 2-3 years "old" model with way more advanced functionality and better performance. These devices usually do not wear out – they rather get broken physically. If it works normally after 2-3 years, there are very high chances that it will keep working at least 2-3 years more. But do not hunt for very old models – they might be working well, but their technology could be way too old to give you expected performance.*

3. Keyboard does not respond during the initial setup

Note *Only for Regular Start on Bare Metal.*

Well, the short answer is "S**t happens". ☹☹☹

The long answer is as follows:

It seems that your device uses one USB Bus (element of a computer design, to which available USB ports are connected) for both a network card (adapter) and a keyboard. Manufacturers of budget laptops quite often connect to this USB Bus everything they can. Currently we are not able to overcome this problem, but working on it.

So far either a keyboard, or a network card (adapter), or both should be connected to the PCI Bus (another element of computer design, connecting computer PCU to other parts).

If you have another device that could be used for **xTER** SmartFilter, you can try changing to it.

4. Downloading does not start

4.1. You get "Permission denied" message

One of the most common reasons behind can be that your old laptop has exhausted its BIOS cell battery life time. In such the case, when turned-on, your device would set its date and time of its BIOS clock to default factory setting – years behind the real current ones. Because of these wrong date and time settings you will not be able to download your **xTER** SmartFilter!

Refer to "Changing BIOS settings" paragraph of this manual to enter the BIOS Setup panel.

Please check the BIOS clock (usually date and time are very visibly located) and make necessary corrections, the process is very straight-forward. Do not forget to save changes!

Please replace the battery if necessary, otherwise you might be pushed to correct the BIOS clock after every power shut-down!

4.2. Launching does not proceed beyond "connecting…" message

That means that boot loader cannot reach the server to download the **xTER** SmartFilter package for one of the reasons:

- Your router lost connection to Internet – please check if Internet connection is available on any other device connected to the same router.
- Your router refuses to give IP connection to your device. We have already covered issues with switching DHCP Server ON and Reserving Fixed IP for LAN adapter of your **xTER** SmartFilter device, but you still might want to double-check configuration of your router – it is easy to forget clicking some button, or to confuse MAC of LAN adapter with MAC of Wi-Fi adapter, or to think that you are changing configuration of the router while your session has already expired for whatever reason => your changes were not saved.

  Important *In many cases the problem is caused by the conflict between the data about your **xTER** SmartFilter device that has been cached by your router and the data of new configuration created by the boot loader.*
  *To check if that is your case, enter 00:00:00:00:00:01 into the MAC Address field – that will push your router to avoid cached data. If the trick works, next time use 00:00:00:00:00:02, then *00:03 and so on (back to *00:01 after *00:99).*

- Ethernet adapter of your **xTER** SmartFilter device does not function properly – please refer to the "Booting with dongle" paragraph below.
- Any other unknown reason – we are not able to help here, sorry. ☹☹☹

4.3. You have a black screen for long time or get BIOS setup open

We noticed that in some cases after an attempt to establish connection for downloading the **xTR SafeContainer** the selected **xTER** SmartFilter device can generate a black screen or throw you out to BIOS setup.

We believe that the main reason behind is the conflict between your router and **safe2b** device. In such case do the following:

- Switch OFF your safe2B device
- Take out the Ethernet cable from the router (not from the safe2b device)
- Switch ON the router with a 1-2 sec. pause

- Insert the Ethernet cable from your device into another empty slot of the router
- Switch ON your safe2b device and repeat the sequence

5. Booting with Dongle

The chances that your onboard LAN will be alive when you're trying to download the xTR bootloader are about 50/50, since it really depends on the BIOS. Some motherboards have a friendly BIOS that allows using the onboard LAN interface immediately after the device is powered. Some others have an option of switching BIOS into some friendly mode like disabling Fast Boot, Secure Boot or alike. But in about half of the cases the onboard LAN interface would be as dead as a dodo whatever you try.

No panic, there are two alternatives: changing PCI LAN adaptor and using USB Ethernet dongle. You may choose the appropriate bootloader out of the provided two: regular (load via PCI LAN adaptor) and the other one with "Dongle" as a part of the name (load via USB Ethernet dongle).

Important: *It is very necessary to check if the BIOS of your **safe2b** device allows using the onboard LAN controller during boot, because up to 50% of BIOS'es do not have this option enabled by default. In complicated BIOS this option might be located quite deep in various menus and submenus. Try to find your right combination of BIOS, concentrating on options (menus) related to the network setup and UEFI. Some of them may magically turn the dead onboard Ethernet LAN adaptor alive – very useful for easy booting. Try again the Plug & Play launching if that was your case.*
Please refer to the BIOS-related section of this manual for more info.

It also matters what kind of LAN adaptor your computer has:

- **Onboard Ethernet LAN adaptor** integrated into motherboard – you cannot change it, but can add another one into PCI slot and use it
- **Separate internal PCI or PCI Express Ethernet LAN adaptor**, mounted to PCI slot (changeable)
- **Separate external PCI Ethernet LAN adaptor**, mounted to ExpressCard PCI port (changeable)

Laptops usually have only integrated onboard Ethernet LAN adaptors. Desktops have either onboard, or PIC or both. Some laptops have ExpressCard port for quick mount of external PCI components, you can use it for adding **external ExpressCard Ethernet LAN adaptor**.

Depending on your concrete situation you can choose between available for you options.

Cost of adaptors increases from USB Dongle through internal to external Ethernet LAN adaptors.

Possible appearances of changeable Ethernet LAN adaptor are provided below.

Internal PCI

Internal PCI-Express

External ExpressCard

USB Dongle

Important *We get stable results with Internal PCI and USB Dongle Ethernet LAN adapters. The other two types may or may not function properly.*

Important *After the "System is Up and Running" message is displayed the onboard LAN will be fully functional. Even more than that - it will be designated by the system as you primary LAN.*

For launching via USB Dongle Ethernet LAN adaptor:

- Connect Ethernet-to-USB dongle to a free and working USB port of your **safe2b** device and then reconnect the Ethernet cable from Ethernet port on **safe2b** device to Ethernet port of the dongle.
- Download the other boot loader of **xTR SafeContainer** from https://xter.tech/ind_usb.html and replace the previous boot loader on your memory USB-stick.
- Repeat your Quest from the “Plug & Play boot” position.

Critical *Please watch the screen carefully – as soon as the boot loader finishes downloading and starts unpacking you will see a message "Extracting rootfs". Please unplug the dongle right after that and before the unpacking is finished.*

Now you should check the status of Ethernet adapter on your **safe2b** device:

- Wait until boot is complete.
- Reposition Ethernet cable into the internal Ethernet port on your **safe2b** device.
- On another device, connected to the same router with **safe2b** device enter the IP address which you should know by now:
  - ✓ You get an interface requesting Login and Password = your Ethernet adapter was “sleeping” and just has been “awaken”.
  - ✓ Connection cannot be established = your Ethernet adapter does not function, and you will have to keep using dongle. Reconnect dongle back to USB on your **safe2b** device and reposition Ethernet cable back to the dongle.

For Experienced Users *To avoid future hassle in case Ethernet card on your **safe2b** device does not function, you might want to:*

- *Go to BIOS and disable the onboard network controller*
- *Download the USB boot loader*

- *Repeat the boot but this time do not remove USB dongle.*

6. Playing with Ethernet cable

Computer networks and their elements sometime "misbehave" and do not function as they should even if all requirements seem to be fulfilled. It is especially true for situations when you change configuration of your network or perform some other manipulations. This "time of change" might be very frustrating, but once through it, your network would be very likely to function without major troubles.

Regarding our case, you can try the following:

- Reboot your router. It takes some time but no nerves or efforts. Your router might be overloaded with unfinished Wi-Fi sessions, logs of connections etc., and rebooting it might make a little miracle. Success is not guaranteed but possible. That might be repeated a few times, but more than 3 times would mean that you are very persistent.
- Change Ethernet cable. Wires within Ethernet cable are very tiny and might be broken at some place, or one of the ending plugs might be malfunctioning etc. Or you can swap connections between router and **safe2b** device. That might be repeated a few times.
- Clean connectors of the ending plugs of the Ethernet cable with dissolvent, spirit or some other cleaners. *Be careful and protect yourself from negative effects of those chemicals!*
- Unplug Ethernet cable from the router, pause for 3-5 seconds and plug into a different slot (better when your **safe2b** device is OFF or rebooting). Router quite often cache information about connected devices, and when a "known" device reconnects, use not the new parameters provided by the device, but those cached. By unplugging device from the Ethernet port, waiting and plugging into a different port (any of the available, just not into the same it used to be plugged-in) you might push your router to "forget" or "lose" the cached parameters and use the correct ones, received from the device. That might be repeated quite a few times, but more than a dozen would demonstrate that your chances are rather low and more than 20 – that you are very-very persistent. When making **safe2b** tests, our team limits the number of attempts by 25, and the 25-th attempt was successful more than once.