



# INSTALLATION

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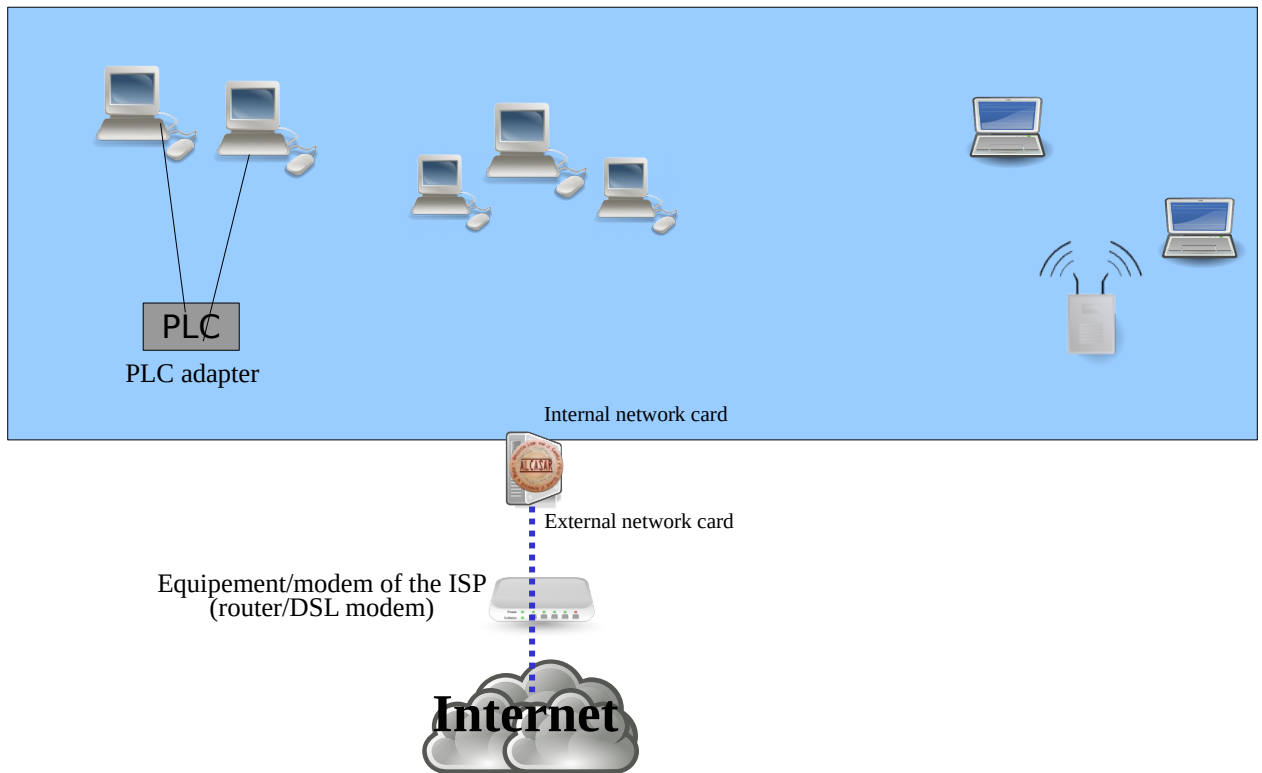
|   |  |
|---|--|
| Project : ALCASAR   | Author : Rexy with support of “Alcasar team”. Thanks to translators. |
| Object : Installation   | Version : 3.2  |
| Keywords : Network Access Control (NAC), accountability, traceability, authentication, captive portal, parental control | Date : 2018, January   |

# 1. Introduction

This document describes the installation procedure of the ALCASAR portal. It is supplemented with three other documents : the presentation document, the operating instructions document and the technical document. If you already have a working version of ALCASAR and you want to upgrade it, please refer to the operating instructions document (chapter « update »).

ALCASAR can be installed on a standard computer with two Ethernet network cards. The first one (eth0) is connected to the Internet Service Provider's equipment. The second one (eth1) is connected to the switch used to service the network consultation computers.

By default, the IP address of this second network card is : 192.168.182.1/24. This allows to have a class C network (254 equipment). This network addressing plan can be modified during the installation stage. For all equipment of consultation network, ALCASAR is the DHCP server, the DNS server, the network time server and the default router (gateway). **Thus, on this network, there must be no other DHCP server and gateway** (check your Wi-Fi access points).



## Examples of IP addressing plans

| Parameters                        | @IP of the network                   | Number of equipment | Network mask  | @IP of ALCASAR<br>(this address is the IP address of the DNS server and of the default gateway) | DNS suffix  |
|-----------------------------------|--------------------------------------|---------------------|---------------|---|-------------|
| Classe                            |                                      |                     |               |   |             |
| Default IP address plan (C class) | 192.168.182.0/24                     | 253                 | 255.255.255.0 | 192.168.182.1/24  | localdomain |
| B class IP plan                   | 172.16.x.0/16<br>$1 \leq x \leq 255$ | 65533               | 255.255.0.0   | 172.16.x.1/16   | localdomain |

Even if it is possible to define a class A network, you shouldn't do it because the embedded DHCP server will have to manage over than 16 million IP addresses. The management of such volume of addresses would spend too much memory.

## 2. Installation

The installation of ALCASAR consists of two steps. The first one is the installation of a minimalist Linux operating system based on Mageia 6. The second step installs and configures all the components of ALCASAR.

### 2.1. Hardware requirement

ALCASAR only requires one standard computer with two network cards and a hard drive with a capacity of at least 100 Go in order to be able to store logs related to connections tracing. Only 64b architectures are supported. ALCASAR includes several optional filtering systems (network protocols, URL, IP addresses, domain names and antimalware). If you decide to enable these filtering systems, it is recommended to install at least 8 GB of RAM in order to ensure an acceptable processing speed (ALCASAR loves the RAM ;-)





In case of using a Virtual Machine (VM): be sure that the size of the hard drive **isn't smaller than 30G**.

### 2.2. Installation of the system

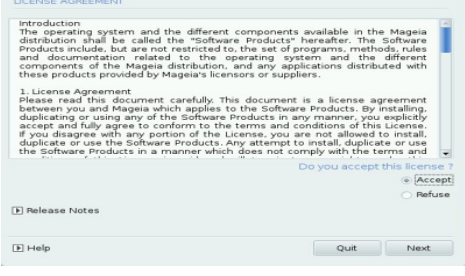
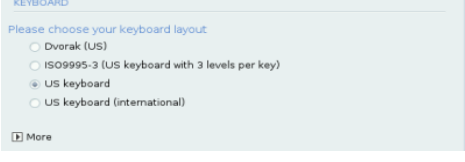
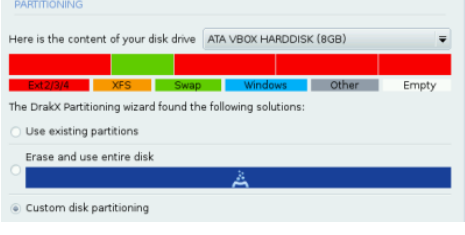
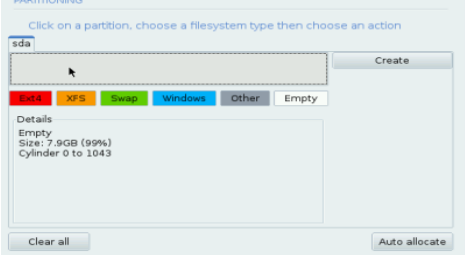
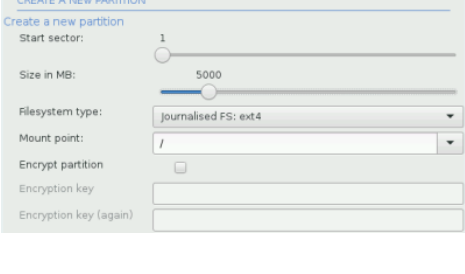

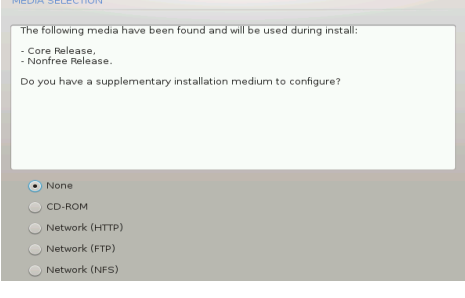
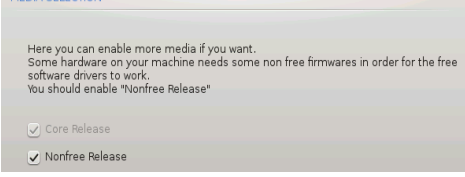
The installation procedure of the operating system is the following (estimated time : 6') :

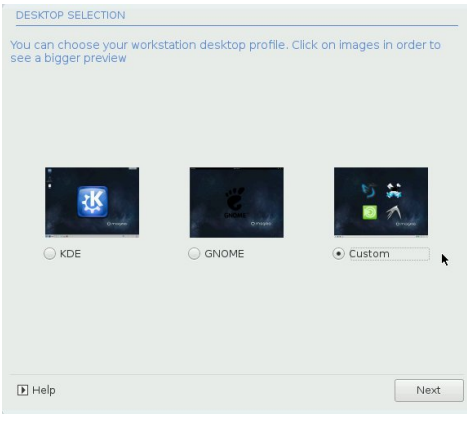
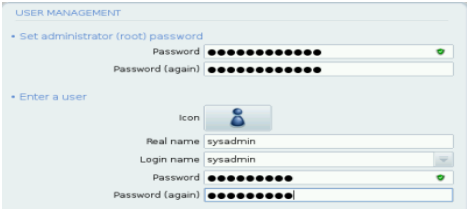
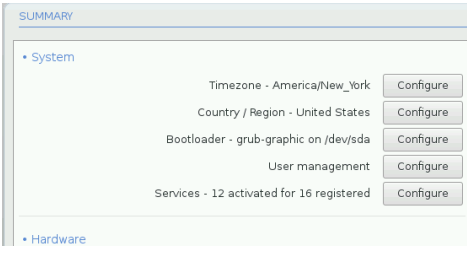
- Retrieve the Mageia-6 ISO image file for your architecture (ie : « mageia-6-x86\_64-DVD.iso » for 64b architecture). This ISO image is available on [Mageia website](http://www.mageia.org) as well as on several [mirror sites of Mageia](#). For example :
  - <http://www.mirror-service.org/sites/mageia.org/pub/mageia/iso/6/>
  - <http://distrib-coffee.ipsl.jussieu.fr/pub/linux/Mageia/iso/6/>
- burn this ISO image file on a DVDROM or create a bootable USB flash drive<sup>1</sup>. You can also use an external USB disk which simulates a bootable device (ex : zalman zm-ve300 or 400).
- Configure the BIOS settings to unset the “Secure Boot” option, to set the date and time and to enable booting from the CD or USB flash drive. At the end of the installation, configure, once again, the BIOS settings to only boot from the hard drive ;
- insert the CD-ROM or the USB flash drive, reboot the computer and follow the instructions below :

| Screen display   | Comments  | Actions to achieve                |
|--|---|-----------------------------------|
|  | <p>After starting the computer, this screen is displayed.</p> <p>* If the graphical mode doesn't work, you have to configure the BIOS settings to allocate more than 2 MB of shared memory for the graphics card.</p> | <p>Select “Install Mageia 6”.</p> |
|  |   | <p>Select your language.</p>      |

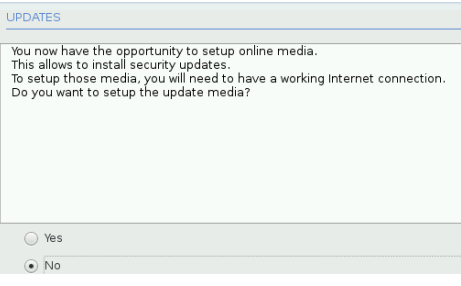
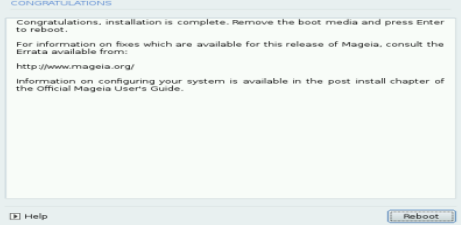
1 Two solutions are used to create a bootable USB flash drive :

- in graphical mode you can use “rufus” or “win32 disk image” (Windows) or “isodumper” (Linux)
- in console mode on Linux, plug the USB flash drive and get the name of the device with the “`fdisk -l`” command (an USB flash drive is usually “/dev/sdb” or “/dev/sdc”). Run the command : “`dd if=<name_of_ISO_image> of=<name_of_usb_drive> bs=1M`”.

| Screen display   | Comments   | Actions to achieve   |
|--|--|--|
|    |  | <p>Accept the licence agreement.</p> <p><b>Info:</b> this licence agreement explains that the installed software is free (GPL).</p>  |
|    |  | <p>Choose your keyboard layout.</p>  |
|    | <p>The hard disk partitioning will be adapted to the needs of ALCASAR (see next step).</p>   | <p>Select “Custom disk partitioning”.</p>  |
|   | <p>After removing all the partitions, create the following 5 or 6 partitions :</p> <p><b>! Create the 1<sup>st</sup> partition only if you have an UEFI BIOS.</b></p> <ul style="list-style-type: none"> <li>• /boot/EFI/ : 300MB (type fat32)</li> <li>• / : 5 GB (type ext4)</li> <li>• swap : keep the default size</li> <li>• /tmp : 5 GB (type ext4)</li> <li>• /home : 5 GB (type ext4)</li> <li>• /var : (type ext4) the rest of the hard drive (! <b>size bigger than 10G even on a virtual machine</b>).</li> </ul> | <p>Click on “Clear all”.<br/>Then click on the area of the disk (sda) to create each new partition.</p>  |
|  | <p>At the end of this operation, and depending on the size of your hard drive, the partitioning should look like this :</p>    | <p>- Create the root partition (/). Choose its size (5 Go) and its filesystem (ext4). Repeat this step for all the partitions.<br/>- Once the partitioning completed, click on “Done”.</p> |
|  | <p>For ALCASAR, it does not need any other media.</p>  | <p>Select “None” then click “Next”</p>   |
|  |  | <p>Leave the “Nonfree Release” media enabled then click “Next”</p>   |

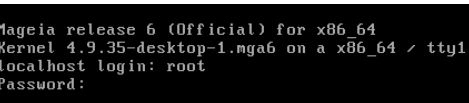

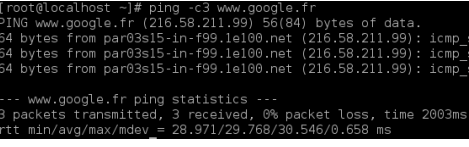
| Screen display   | Comments  | Actions to achieve  |
|--|---|---|
|    | <p>ALCASAR doesn't need a graphical environment (it is controlled from a WEB browser)</p> | <p>Select "Custom" then click "Next"</p>  |
|    | <p>Package group selection : ALCASAR only requires a very minimal install.</p>            | <p>Select "Unselect All" then click "Next".</p> <p><u>Info:</u> On Linux, a package is an archive file containing all the components of a software (binary files, help files, configuration files, etc.).</p> |
|   |   | <p>Select only "Install recommended packages" and the basic documentation, then click "Next". The copy of the packages is launched. Estimated time : 2'</p>   |
|  |   | <p>Assign a password to the "root" account, then, create the "sysadmin" account and assign it a password.</p>   |
|  | <p>Configuration of your timezone and your country</p>                                    | <p>In the group "System", click on "Configure" in "timezone" section then in "Country" section. Select your timezone and your country.</p>  |
|  |   | <p>Click on "Configure" in "Network-ethernet" in the "Network &amp; Internet" section.</p>  |

| Screen display | Comments  | Actions to achieve   |
|----------------|---|--|
|                |   | <p>Select the type of Internet connection. In the case of use of an ISP broadband modem, choose "Wired (Ethernet)".</p> <p><u>Info</u> : no test has yet been made on other types of Internet access.</p>  |
|                | <p>At that time, only the interface connected to the broadband modem of the ISP has to be configured. The second interface, connected to the consultation network, will be configured later, during the installation of ALCASAR.</p>  | <p>Select the interface to configure.</p> <p><u>Tips</u> : Choose the interface with the smallest index.<br/><b>Write the name of this interface on a paper.</b></p> <p><u>Info</u> : the names of interfaces are linked with the physical architecture of your PC. They could differ from the printscreen.</p>  |
|                |   | <p>Select "Manual configuration"</p> <p><u>Info</u> : While it is possible to let this interface in "bootp/dhcp" mode, we recommended configuring it manually in static mode.</p>  |
|                | <p>Example :</p> <ul style="list-style-type: none"> <li>• IP address : this address must be in the same subnet as the address of the broadband modem.</li> <li>• Netmask : 255.255.255.0</li> <li>• Gateway : This is the address of the broadband modem</li> <li>• DNS 1 and DNS 2 :*</li> <li>• Host name : Leave the default value (or blank)</li> </ul> | <p>Enter the parameters of this interface</p> <p>* Enter the IP addresses of the DNS servers provided by your ISP. You can also use other DNS servers.<br/>Examples:</p> <ul style="list-style-type: none"> <li>• Free project "OpenNic" (see the web site to know the closest servers for you)</li> <li>• project "OpenDNS" (DNS1=208.67.222.222, DNS2=208.67.220.220)</li> <li>• google (DNS1=8.8.8.8, DNS2=8.8.4.4).</li> </ul> |
|                |   | <p>Select only "Start the connection at boot"</p>  |
|                | <p>It is not necessary to start the connection now.</p>   | <p>Select "No"</p>   |
|                |   | <p>Click on "Finish"</p>   |
|                |   | <p>Click on "Next"</p>   |

| Screen display   | Comments   | Actions to achieve  |
|--|--|---|
|  | Security updates will be managed during the installation of ALCASAR. | Select "No" and click on "Next"   |
|  | The installation is finished.  | Click on "Reboot"<br>Remove the CDROM or the USB flash drive.<br>Reconfigure the BIOS to boot only from the hard drive. |

## 2.3. Installation of ALCASAR

### Configuration of the network cards

| Screen display   | Comments   | Actions to achieve  |
|--|--|---|
|    | Disconnect the cables of the two network cards.<br>Log in as root                                      |   |
|  | Run the blinking of the LED of the network card configured previously.<br><br>Stop the blinking        | <code>ethtool -p enp0s3</code><br><br><i>On this blinking interface, connects the cable linked to the ISP broadband modem (Internet access).</i><br><br><code>&lt;Ctrl&gt; + c</code><br><i>Info: replace "enp0s3" with the name of the network card you've configured previously (see Page 5). The commands &lt; ifconfig &gt; or &lt; ip link &gt; display the name of all the network card connected in your PC.</i> |
|  | Verify that the link is up on this interface.  | <code>watch ethtool enp0s3</code><br><i>Info: the last line display the link state (Link detected &lt;yes/no&gt;)</i><br>Wait until the link is up. Otherwise, plug the cable into the other network card. When the link is detected, stop the command with the <code>&lt;Ctrl&gt; + c</code> keys  |
|  | Do the same operation with the second card (eth1) and the cable connected to the consultation network. | <code>watch ethtool xxxxxx</code><br><i>Info: On the consultation side, connect a network equipment (Ethernet or PLC switch, WIFI AP, etc.) to ensure a permanent network link even if all consultation stations are off.</i>   |
|  | Test your Internet connectivity  | <code>ping -c3 www.google.com</code>  |

### Download the installation file

This file is an archive file named : `alcasar-x.y.tar.gz` ('x.y' means the version number you want). You can download it in two different ways (USB flash drive or FTP) :

- via an USB flash drive : Download the latest version on the ALCASAR website and copy it on an USB flash drive. Then, use the following procedure to copy it on ALCASAR computer :

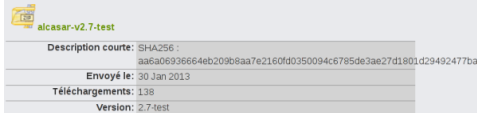
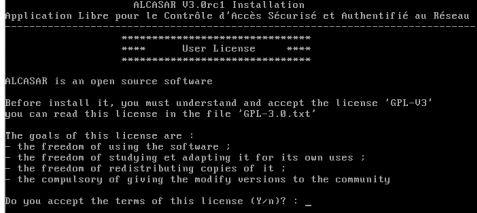
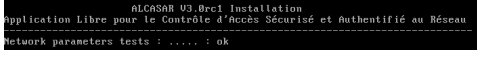
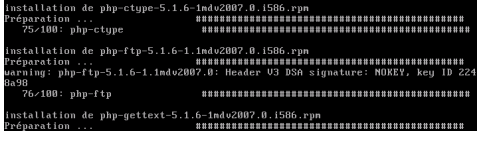

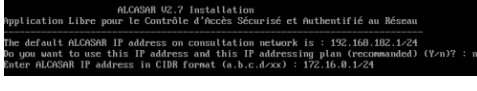

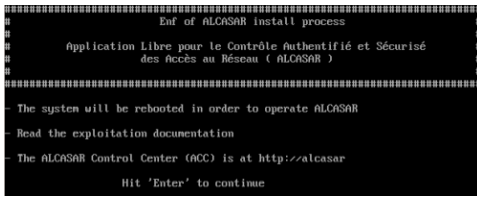
| Screen display   | Comments  | Actions to achieve   |
|--|---|--|
| <pre>[root@localhost ~]# fdisk -l Disque /dev/sda: 80.0 Go, 80032038912 octets 255 heads, 63 sectors/track, 9730 cylinders Units = cylinders of 16065 * 512 = 8225280 bytes Disk identifier: 0x75adc3f6  Périphérique Amorçé Début Fin Blocs Id Système /dev/sda1 * 1 1275 10241406 7 HPFS/NTFS /dev/sda2 1276 9630 4301403+ 7 W95 Etendu (LBA) /dev/sda5 1276 2550 10241406 7 HPFS/NTFS /dev/sda6 2551 3832 10297633+ 83 Linux /dev/sda7 3833 4081 2880961 82 Linux swap / Solaris /dev/sda8 4082 8630 20474911 85 Linux  Disque /dev/sdb: 1024 Mo, 1021798784 octets 16 heads, 32 sectors/track, 9936 cylinders Units = cylinders of 512 * 512 = 262144 bytes Disk identifier: 0xcd10fd24  Périphérique Amorçé Début Fin Blocs Id Système /dev/sdb1 * 1 3936 1907600 e W95 FAT16 (LBA) [root@localhost ~]#</pre> | <p>Insert the USB flash drive.</p> <p>Display information on mass media storage to get the name of your USB flash drive. In this example, <code>"/dev/sdb1"</code> is a 1 GB USB flash drive.</p>   | <p><code>fdisk -l</code></p> <p>Info : You also can display the system log to get this name (<code>journalctl -f</code>).</p>  |
| <pre>[root@localhost ~]# mkdir /media/usb [root@localhost ~]# mount /dev/sdb1 /media/usb/ [root@localhost ~]# cp /media/usb/alcasar-* . [root@localhost ~]# umount /media/usb/</pre>   | <ul style="list-style-type: none"> <li>• Create a directory and mount the USB flash drive on it.</li> <li>• Copy the archive of ALCASAR to the directory <code>"/root"</code>.</li> <li>• Unmount the USB flash drive.</li> <li>• Unplug it.</li> </ul> | <p><code>mkdir -p /media/usb</code><br/> <code>mount /dev/sdb1 /media/usb/</code><br/> <code>cp /media/usb/alcasar-* /root/</code><br/> <code>umount /media/usb</code></p> <p>Info : Replace "sdb1" with the device name retrieved in the previous step.</p> |

- via FTP : directly from the ALCASAR computer, download the archive file from the FTP server :

| Screen display   | Comments  | Actions to achieve  |
|--|---|---|
| <pre>[root@localhost ~]# lftp ftp.alcasar.net/pub ed ok, cwd=pub lftp ftp.alcasar.net:pub&gt; cd stable ed ok, cwd=pub/stable lftp ftp.alcasar.net:pub/stable&gt; ls -rw-r--r-- 1 root root 87551026 Oct 16 05:35 alcasar-2.0.1.tar.gz -rw-r--r-- 1 root root 87547102 Jan 27 2014 alcasar-2.0.tar.gz lftp ftp.alcasar.net:pub/stable&gt; get alcasar-2.0.tar.gz 87547102 octets transférés en 90 secondes (950.4Ko/s) lftp ftp.alcasar.net:pub/stable&gt; bye [root@localhost ~]#</pre> | <ul style="list-style-type: none"> <li>• Connect to the FTP server with the <code>"lftp"</code> command</li> <li>• change to the directory <code>"pub"</code> then <code>"stable"</code> and list its content</li> <li>• download the archive file</li> <li>• quit</li> </ul> | <p><code>lftp ftp.alcasar.net</code><br/> <code>cd pub</code><br/> <code>cd stable</code><br/> <code>ls</code><br/> <code>get alcasar-x.y.tar.gz</code><br/> <code>bye</code></p> |



## Installation

| Screen display   | Comments  | Actions to achieve   |
|--|---|--|
| <pre>[root@localhost ~]# sha256sum alcasar-2.7-test.tar.gz aa6a06936664eb209b8aa7e2160fd0350094c6785de3ae27d1801d29492477ba</pre>  | <ul style="list-style-type: none"> <li>• Compute the SHA256 digital footprint of this archive and compare it with that of the website.</li> </ul>                     | <p><code>sha256sum alcasar-x.y.tar.gz</code></p> <p>Info : If the digital footprint doesn't match, download the archive again. If the problem occurs one more time, ask the developer team via the forum.</p>                                  |
| <pre>[root@localhost ~]# tar -xvf alcasar-3.0.tar.gz [root@localhost ~]# cd alcasar-1.3.0/ [root@localhost alcasar-1.3.0]#</pre>   | <ul style="list-style-type: none"> <li>• Uncompress and extract this archive.</li> <li>• Move to the directory of ALCASAR and run the installation script.</li> </ul> | <p><code>tar -xvf alcasar-x.y.tar.gz</code><br/> <code>cd alcasar-x.y</code><br/> <code>sh alcasar.sh -i</code></p>  |
|    | Acceptation of the licence  | ALCASAR is a free software (open source) developed under the GPLv3 licence.  |
|    | The network configuration is tested.  |  |
|    | The installation of about a hundred software (packages) is done from Internet. Estimated time : 3'  |  |
|   | Enter the name of your organisation (without spaces)  | Example : rashacla<br>Info : This name is mandatory. The only characters allowed are : [a-z] [A-Z] [0-9] [-]   |
|    | Define the IP address of ALCASAR and the network addressing plan of the consultation network. You can accept the default one or change it.                            | Enter « Y » or « N »<br>Info : If you type "N", the script will ask you for the IP address of ALCASAR and the subnet mask in CIDR notation (ex: 172.16.0.1/16)   |
|    | Enter the username and password for a first ALCASAR administrative account.   | Info : This account is used to administer ALCASAR from the consultation network via the graphical control centers at the url " <a href="http://alcasar.localdomain">http://alcasar.localdomain</a> ". This is not a consultation user account. |
|    | The installation is complete. The system can be rebooted.   | Hit "Enter"  |
| <pre>alcasar-pxy-vm:~# alcasar-daemon.sh 20 services needed by ALCASAR are started. All is ok alcasar-pxy-vm:~#</pre>  | Once the system is restarted, login on the system as "root". You can check that all needed services are really started with the command "alcasar-daemon.sh".          | If one or more services are not started, the script will attempt to start them.  |
|  | Logout  | Hit "exit" or "<CTRL> + d"   |

## 2.4. Connexion to the ALCASAR Control Center

On the consultation network, switch on a equipment and connect a WEB browser to the URL “<http://alcasar.localdomain>” in order to display the following page :



Click on the small cranted wheel at the bottom right in order to connect to the ALCASAR Control Center (ACC). You must authenticate you with the first account created during the installation process (§2.3 – P9 of this document).

Now, read the exploitation documentation (“alcasar-exploitation-en.pdf”) to create your first “user” accounts.

### 3. Stop, uninstall or update ALCASAR

**Stop:** You can stop the ALCASAR computer with the a brief push on the power button of the PC, or with the command « *poweroff* » or via the WEB ALCASAR Control Center (ACC – menu “system” + “services”).

**Uninstall:** You can uninstall ALCASAR with the command « *sh alcasar.sh --uninstall* ». This command uninstalls only ALCASAR. The operating system (Linux Mageia) is still present.

**Update:** If you launch again the installation script on an already installed ALCASAR, the script will ask you if you want to update or to install again. You can perform a remote update via SSH connection (cf. Exploitation doc).

### 4. Your ALCASAR settings sheet

The file « */root/ALCASAR-passwords.txt* » contains passwords used internally by the different modules of ALCASAR. It contains, more particularly, the password protecting the bootloader (« GRUB2 »). It can be consulted via the command « *cat /root/ALCASAR-passwords.txt* ». Be careful : when you enter the GRUB password, you keyboard is map like a “qwerty” keyboard.

| <b>Organization name :</b>  |  |
|---|--|
| Users authentication page   | This page is displayed when a browser tries to access a <b>HTTP</b> website.   |
| The welcome page of ALCASAR allows: <ul style="list-style-type: none"> <li>• to access the ALCASAR Control Center.</li> <li>• log the users out</li> <li>• change the users password</li> <li>• install the certificate of the Certification Authority (C.A.) in the browsers.</li> </ul> | <a href="http://alcasar.localdomain">http://alcasar.localdomain</a><br><br>Info : The possibilities of the ALCASAR Control Center (ACC) are described in the "ALCASAR-exploitation-en.pdf" document. |
| Linux accounts  | root            password : .....<br>sysadmin       password : .....  |
| First ALCASAR WEB administrative account  | Login: .....    password : .....   |
| Network parameters <ul style="list-style-type: none"> <li>• IP address of the ISP's equipment (router) :</li> <li>• IP address of DNS servers :</li> <li>• IP address of ALCASAR (WAN/Internet side) :</li> <li>• IP address of ALCASAR (LAN side) :</li> </ul>                           | <ul style="list-style-type: none"> <li>• _____</li> <li>• DNS1 : _____</li> <li>• DNS2 : _____</li> <li>• _____/_____</li> <li>• _____/_____</li> </ul>  |