INSTALLATION

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| Project : ALCASAR	Author : Rexy with support of "Alcasar team". Thanks to translators.
Object : Installation	Version : 3.4
Keywords : Network Access Control (NAC), accountability, traceability, authentication, captive portal, parental control	Date : 2019, July

1. <u>Introduction</u>

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 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 you 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).
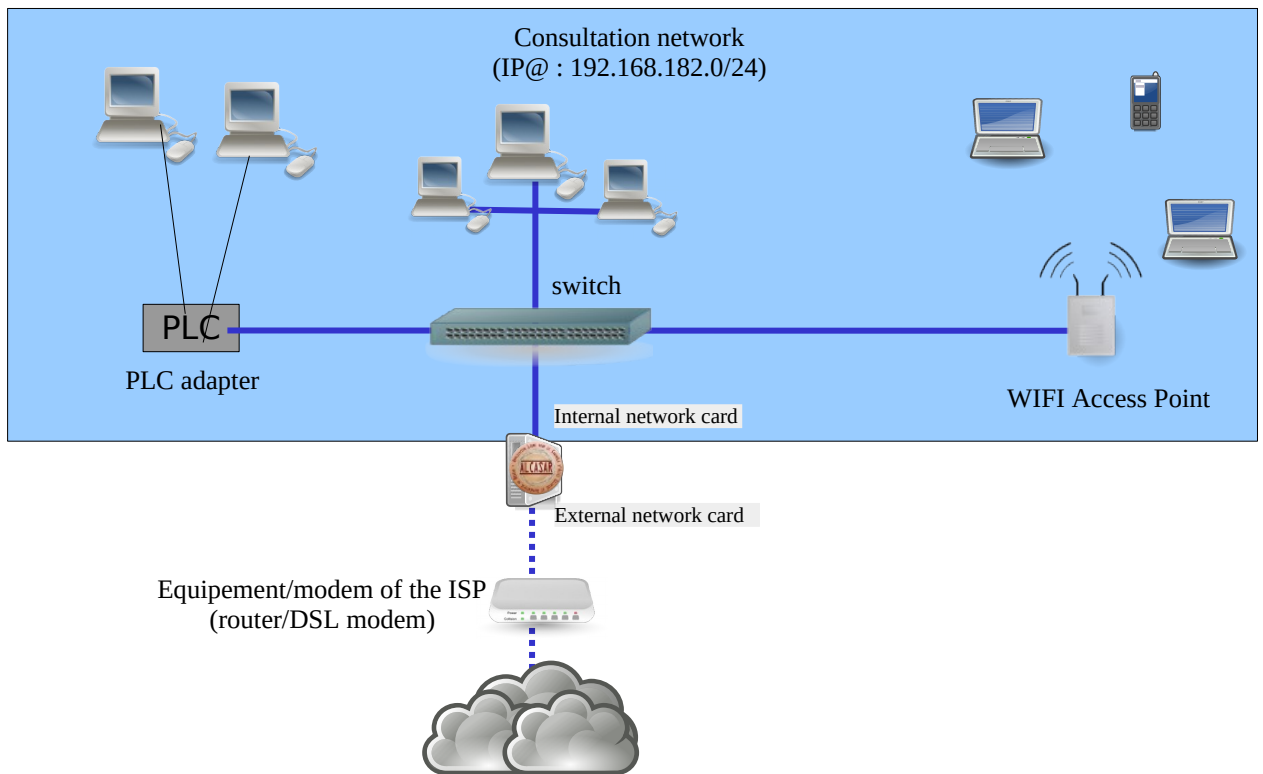
<u>Examples of IP addressing plans</u>

Parameters Classe	@IP of the network	Number of equipment	Network mask	@IP of ALCASAR (this address is the IP address of the DNS server and of the default gateway	DNS suffix
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 $1 \le x \ge 255$	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. <u>Installation</u>

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

2.1. <u>Hardware requirement</u>

ALCASAR only requires one standard computer (PC) or a virtual machine (VM) 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 ;-)).

⚠ **On VM,** the following data must be taken care of:
- the size of the dynamic hard drive <u>must not be smaller than 30G;</u>
- The network cards mustn't be "virtio" type (choose "e1000" or "Intel-pro1000" for example);
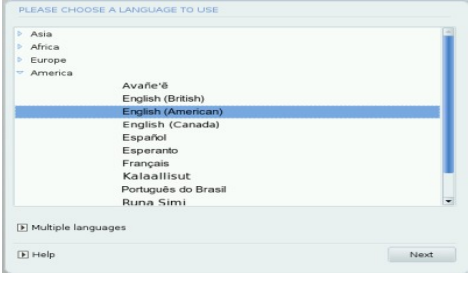- The graphic card should be as simple as possible ("VGA" generally).
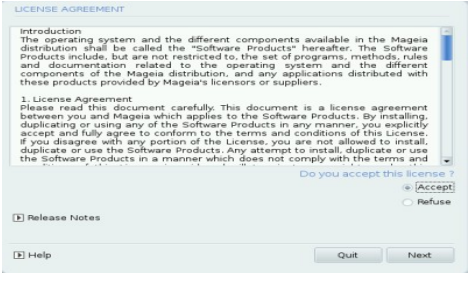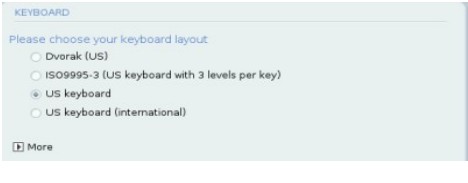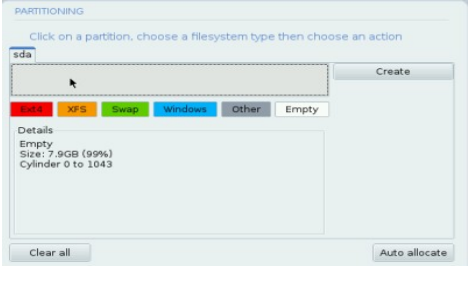
2.2. <u>Installation of the system</u>
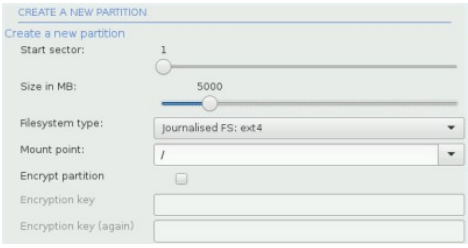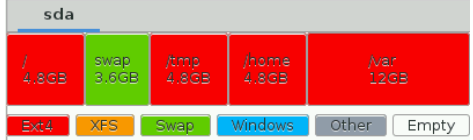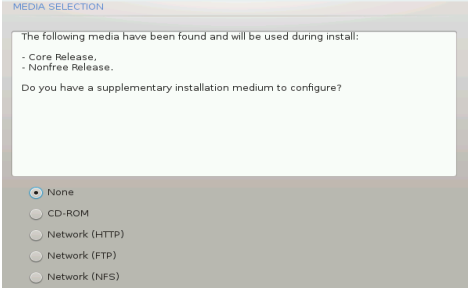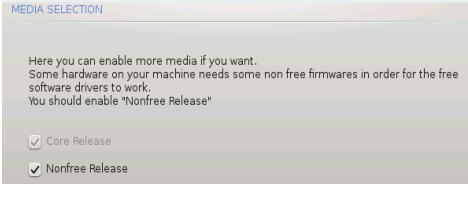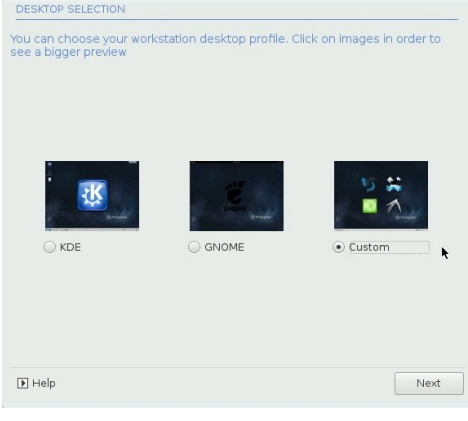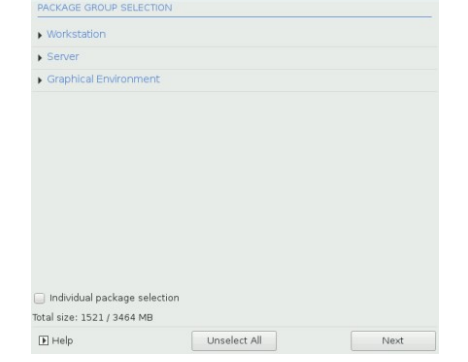
The installation procedure of the operating system is the following (estimated time : 6') :
- Retrieve the ISO file of Linux-Mageia (file : « mageia-6-x86_64-DVD.iso ») on <u>Mageia website</u> as well as on several <u>mirror sites of Mageia</u>. An other solution is to retrieve the ISO file of Mageiar 3.4 (Linux-Mageia adapted to ALCASAR 3.4) on the ALCASAR web site or in the folder "iso" of the site <u>ftp.alcasar.net</u>.
- On a PC:
  - Burn this ISO image file on a removable support (CD, DVD, USB flash drive)[1];
  - Configure the BIOS settings to remove 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 your removable support. Reboot the computer and follow the instructions below :
- On a VM:
  - Copy the ISO file in the dedicated zone of the hypervisor. Link this ISO image to your VM. Boot your VM.
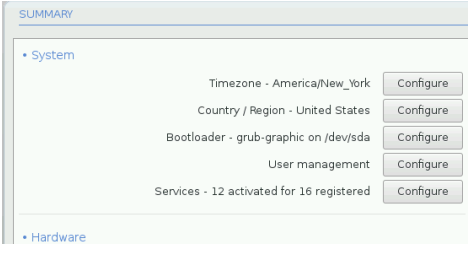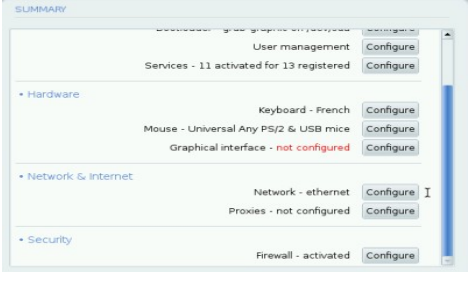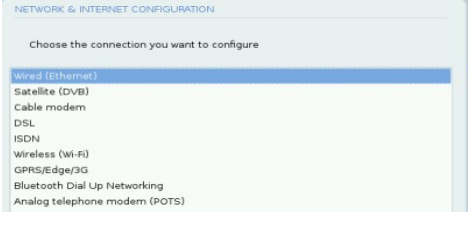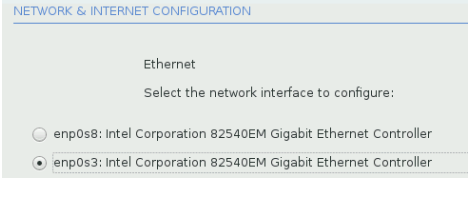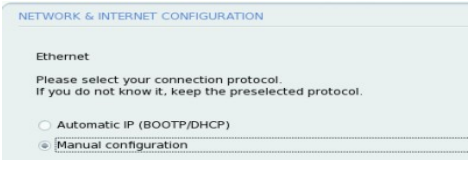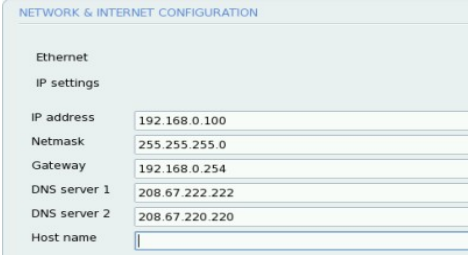
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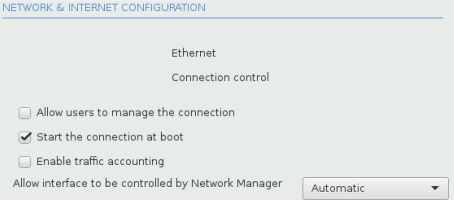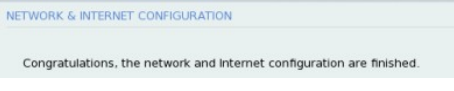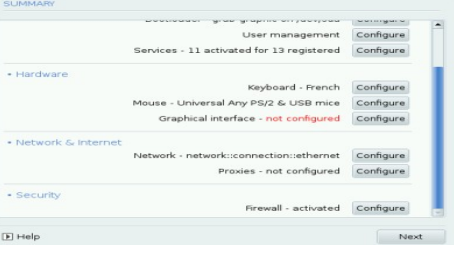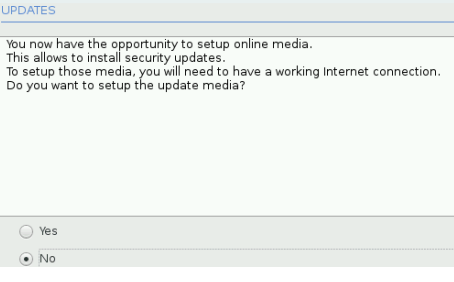
1 Two solutions are used to create a bootable USB flash drive :
- in graphical mode you can use "rufus" or "win32 disk image" (Windows) or "isodumper" (Linux)
- in console mode on Linux, plug the USB flash drive and get the name of the device with the "*fdisk -l*" command (an USB flash drive is usually "/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
	After starting the computer, this screen is displayed. * 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.	Select "Install Mageia 6".
		Select your language and click "Next".
		Accept the license agreement then click "Next". Info : this license agreement explains that the installed software is free (GPL).
		Choose your keyboard layout and click "Next".
	The hard disk partitioning will be adapted to the needs of ALCASAR (see next step).	Select "Custom disk partitioning" then click "Next".
	After removing all the partitions, create the following 5 or 6 partitions : ! Create the 1st "/boot/efi" partition only on UEFI BIOS. • /boot/EFI/ : 300 MB (type "efi") • / : 5 GB (type ext4) • swap : keep the default size • /tmp : 5 GB (type ext4) • /home : 5 GB (type ext4) • /var : (type ext4) the rest of the hard drive (! **size bigger than 10G even on a virtual machine**).	Click on "Clear all". Then click on the area of the disk (sda) to create each new partition.

Screen display	Comments	Actions to achieve
	At the end of this operation, and depending on the size of your hard drive, the partitioning should look like this :	- Create the root partition (/). Choose its size (5 Go) and its filesystem (ext4). Repeat this step for all the partitions. - Once the partitioning completed, click on "Done".
	For ALCASAR, it does not need any other media.	Select "None" then click "Next".
	This screen isn't displayed if you use the "Mageiar" ISO file.	Leave the "Nonfree Release" media enabled then click "Next".
	This screen isn't displayed if you use the "Mageiar" ISO file. ALCASAR doesn't need a graphical environment (it is controlled from a WEB browser).	Select "Custom" then click "Next."
	This screen isn't displayed if you use the "Mageiar" ISO file. Package group selection : ALCASAR only requires a very minimal install.	Select "Unselect All" then click "Next". Info : On Linux, a package is an archive file containing all the components of a software (binary files, help files, configuration files, etc.).
	This screen isn't displayed if you use the "Mageiar" ISO file.	Select only "Install recommended packages" and the basic documentation, then click "Next". The copy of the packages is launched. Estimated time : 2'

Screen display	Comments	Actions to achieve
USER MANAGEMENT • Set administrator (root) password Password ●●●●●●●●●●●●● Password (again) ●●●●●●●●●●●●● • Enter a user Icon 👤 Real name sysadmin Login name sysadmin Password ●●●●●●●●●● Password (again) ●●●●●●●●●●		Assign a password to the "root" account, then, create the "sysadmin" account and assign it a password. Then, click "Next".
SUMMARY • System Timezone - America/New_York [Configure] Country / Region - United States [Configure] Bootloader - grub-graphic on /dev/sda [Configure] User management [Configure] Services - 12 activated for 16 registered [Configure] • Hardware	Configuration of your time zone and your country	In the group "System", click on "Configure" in "time zone" section then in "Country" section. Select your time zone and your country.
SUMMARY User management [Configure] Services - 11 activated for 13 registered [Configure] • Hardware Keyboard - French [Configure] Mouse - Universal Any PS/2 & USB mice [Configure] Graphical interface - not configured [Configure] • Network & Internet Network - ethernet [Configure] Proxies - not configured [Configure] • Security Firewall - activated [Configure]		Click on "Configure" in "Network-ethernet" in the "Network & Internet" section.
NETWORK & INTERNET CONFIGURATION Choose the connection you want to configure Wired (Ethernet) Satellite (DVB) Cable modem DSL ISDN Wireless (Wi-Fi) GPRS/Edge/3G Bluetooth Dial Up Networking Analog telephone modem (POTS)		Select the type of Internet connection. In the case of the use of an ISP broadband modem, choose "Wired (Ethernet)". Then, click "Next". <u>Info :</u> no test has yet been made on other types of Internet access.
NETWORK & INTERNET CONFIGURATION Ethernet Select the network interface to configure: ○ enp0s8: Intel Corporation 82540EM Gigabit Ethernet Controller ◉ enp0s3: Intel Corporation 82540EM Gigabit Ethernet Controller	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.	Select the interface to configure, then click "Next". <u>Tips :</u> Choose the interface with the smallest index. **Write the name of this interface on a paper.** <u>Info :</u> the names of interfaces are linked with the physical architecture of your PC. They could differ from the printscreen.
NETWORK & INTERNET CONFIGURATION Ethernet Please select your connection protocol. If you do not know it, keep the preselected protocol. ○ Automatic IP (BOOTP/DHCP) ◉ Manual configuration		Select "Manual configuration", then click "Next". <u>Info :</u> While it is possible to let this interface in "bootp/dhcp" mode, we recommended configuring it manually (static mode).
NETWORK & INTERNET CONFIGURATION Ethernet IP settings IP address 192.168.0.100 Netmask 255.255.255.0 Gateway 192.168.0.254 DNS server 1 208.67.222.222 DNS server 2 208.67.220.220 Host name	Example : • IP address : this address must be in the same sub-net as the address of the broadband modem. • Netmask : 255.255.255.0 • Gateway : This is the address of the broadband modem. • DNS 1 and DNS 2 :* • Host name : Leave the default value (or blank)	Enter the parameters of this interface * Enter the IP addresses of the DNS servers provided by your ISP. You can also use other DNS servers. Examples: • Free project "OpenNic" (see the web site to know the closest servers for you) • project "OpenDNS" (DNS1=208.67.222.222, DNS2=208.67.220.220) • Google (DNS1=8.8.8.8, DNS2=8.8.4.4).

Screen display	Comments	Actions to achieve
NETWORK & INTERNET CONFIGURATION Ethernet Connection control ☐ Allow users to manage the connection ☑ Start the connection at boot ☐ Enable traffic accounting Allow interface to be controlled by Network Manager Automatic ▼		Select only "Start the connection at boot", the click "Next".
NETWORK & INTERNET CONFIGURATION Do you want to start the connection now? ○ Yes ◉ No	It is not necessary to start the connection now.	Select "No", then click "Next".
NETWORK & INTERNET CONFIGURATION Congratulations, the network and Internet configuration are finished.		Click on "Finish"
SUMMARY User management Configure Services - 11 activated for 13 registered Configure • Hardware Keyboard - French Configure Mouse - Universal Any PS/2 & USB mice Configure Graphical interface - not configured Configure • Network & Internet Network - network::connection::ethernet Configure Proxies - not configured Configure • Security Firewall - activated Configure ▶ Help Next		Click "Next"
UPDATES You now have the opportunity to setup online media. This allows to install security updates. To setup those media, you will need to have a working Internet connection. Do you want to setup the update media? ○ Yes ◉ No	If you use the "Mageiar" ISO file, the installation will continue (white screen) and the system will reboot automatically. Security updates will be managed during the installation of ALCASAR.	Select "No" and click on "Next".
CONGRATULATIONS Congratulations, installation is complete. Remove the boot media and press Enter to reboot. For information on fixes which are available for this release of Mageia, consult the Errata available from: http://www.mageia.org/ Information on configuring your system is available in the post install chapter of the Official Mageia User's Guide. ▶ Help Reboot	If you use the "Mageiar" ISO file, the installation will continue (white screen) and the system will reboot automatically. The installation is finished.	Click on "Reboot" Remove the CDROM or the USB flash drive. 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
Mageia release 6 (Official) for x86_64 Kernel 4.9.35-desktop-1.mga6 on a x86_64 / tty1 localhost login: root Password:	Disconnect the cables of the two network cards. Log in as root	
	Run the blinking of the LED of the network card configured previously. Stop the blinking	*ethtool -p enp0s3* *On this blinking interface, connects the cable linked to the ISP broadband modem (Internet access).* *<Ctrl> + c* Info : *replace "enp0s3" with the name of the network card you've configured previously (see page 5). The commands « ifconfig » or « ip link » display the name of all the network card connected in your PC.*
Link detected: yes	Verify that the link is up on this interface.	*watch ethtool enp0s3* Info : *the last line display the link state (Link detected <yes/no>)* 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 *<Ctrl> + c keys*
	Do the same operation with the second card (eth1) and the cable connected to the consultation network.	*watch ethtool xxxxxx* 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.
[root@localhost ~]# ping -c3 www.google.fr PING www.google.fr (216.58.211.99) 56(84) bytes of data. 64 bytes from par03s15-in-f99.1e100.net (216.58.211.99): icmp_s 64 bytes from par03s15-in-f99.1e100.net (216.58.211.99): icmp_s 64 bytes from par03s15-in-f99.1e100.net (216.58.211.99): icmp_s --- www.google.fr ping statistics --- 3 packets transmitted, 3 received, 0% packet loss, time 2003ms rtt min/avg/max/mdev = 28.971/29.768/30.546/0.658 ms	Test your Internet connectivity	*ping -c3 www.google.com*

Download the ALCASAR installation archive

This file is an archive file named : alcasar-x.y.tar.gz ('x.y' means the version number you want).
If you've installed Mageiar (Mageia + ALCASAR), this file is already on "/root" directory.
If you've installed Linux Mageia, you can download ALCASAR installation archive with two different ways (via HTTP or via a USB flash drive):
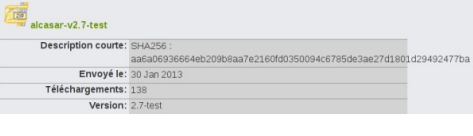
- Via HTTP : on the ALCASAR PC, download the archive file from the server "ftp.alcasar.net":

Screen display	Comments	Actions to achieve
| ```
[root@localhost ~]# lftp http://ftp.alcasar.net/stable
cd: received redirection to 'http://ftp.alcasar.net/stable/'
cd ok, cwd=/stable
lftp ftp.alcasar.net:/stable> ls
drwxr-xr-x   --  /
-rw-r--r--        46M  2017-07-05 08:17  alcasar-2.9.2.tar.gz
-rw-r--r--        49M  2017-05-18 14:02  alcasar-3.0.1.tar.gz
-rw-r--r--        65M  2017-12-07 22:00  alcasar-3.1.4-2.tar.gz
-rw-r--r--        63M  2017-12-30 20:32  alcasar-3.2.tar.gz
-rw-r--r--        68M  2018-09-17 08:55  alcasar-3.3.1.tar.gz
-rw-r--r--        68M  2018-11-06 23:44  alcasar-3.3.2.tar.gz
-rw-r--r--        65M  2018-08-05 20:48  alcasar-3.3.tar.gz
lftp ftp.alcasar.net:/stable> get alcasar-3.3.2.tar.gz_
``` | • Connect to the FTP server with the "lftp" command<br>• list its content<br>• download the archive file<br>• quit | *lftp   http://ftp.alcasar.net/stable*<br><br>*ls*<br>*get  alcasar-x.y.tar.gz*<br>*bye* |

- via a USB flash drive : Download the latest version available 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
| ```
[root@localhost ~]# fdisk -l

Disque /dev/sda: 80.0 Go, 80032038912 octets
255 heads, 63 sectors/track, 9730 cylinders
Units = cylindres of 16065 * 512 = 8225280 bytes
Disk identifier: 0x75adc3f6

Périphérique Amorce  Début    Fin    Blocs   Id  Système
/dev/sda1    *        1      1275  10241406    7  HPFS/NTFS
/dev/sda2           1276     6630  43014037+   f  W95 Etendu (LBA)
/dev/sda5           1276     2550  10241406    7  HPFS/NTFS
/dev/sda6           2551     3832  10297633+  83  Linux
/dev/sda7           3833     4081   2000061   82  Linux swap / Solaris
/dev/sda8           4082     6630  20474811   83  Linux

Disque /dev/sdb: 1031 Mo, 1031798784 octets
16 heads, 32 sectors/track, 3936 cylinders
Units = cylindres of 512 * 512 = 262144 bytes
Disk identifier: 0xcd1d7d24

Périphérique Amorce  Début    Fin    Blocs   Id  Système
/dev/sdb1    *        1      3936   1007600    e  W95 FAT16 (LBA)
[root@localhost ~]#
``` | Insert the USB flash drive.<br><br>Display information on mass media storage to get the name of your USB flash drive. In this example, "/dev/sdb1" is a 1 GB USB flash drive. | *fdisk  -l*<br><br><br>Info : You also can display the system log to get this name (journalctrl  -f). |
| ```
[root@localhost ~]# mkdir /media/usb

[root@localhost ~]# mount /dev/sdb1 /media/usb/

[root@localhost ~]# cp /media/usb/alcasar-* .

[root@localhost ~]# umount /media/usb/
``` | • Create a directory and mount the USB flash drive on it.<br>• Copy the archive of ALCASAR to the directory "/root".<br>• Unmount the USB flash drive.<br>• Unplug it. | *mkdir  -p /media/usb*<br>*mount /dev/sdb1  /media/usb/*<br>*cp /media/usb/alcasar-*  /root/*<br>*umount  /media/usb*<br><br><br>Info : Replace "sdb1" with the device name retrieved in the previous step. |

Installation

Screen display	Comments	Actions to achieve
| ```
[root@localhost ~]# sha256sum alcasar-2.7-test.tar.gz
aa6a06936664eb209b8aa7e2160fd0350094c6785de3ae27d1801d29492477ba
```<br>alcasar-v2.7-test<br>Description courte: SHA256 : aa6a06936664eb209b8aa7e2160fd0350094c6785de3ae27d1801d29492477ba<br>Envoyé le: 30 Jan 2013<br>Téléchargements: 138<br>Version: 2.7-test | • Compute the SHA256 digital footprint of this archive and compare it with that of the website. | *sha256sum  alcasar-x.y.tar.gz*<br><br><br>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. |
| ```
[root@localhost ~]# tar -xvf alcasar-3.0.tar.gz_

[root@localhost ~]# cd alcasar-1.3.0/
[root@localhost alcasar-1.3.0]# _

[root@localhost alcasar-1.3.0]# sh alcasar.sh -i_
``` | • Decompress and extract this archive.<br>• Move to the directory of ALCASAR and run the installation script. | *tar  -xvf  alcasar-x.y.tar.gz*<br>*cd  alcasar-x.y*<br>*sh alcasar.sh  -i* |

Screen display	Comments	Actions to achieve
ALCASAR V3.0rc1 Installation Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau ********************************* **** User License **** ********************************* ALCASAR is an open source software Before install it, you must understand and accept the license 'GPL-V3' you can read this license in the file 'GPL-3.0.txt' The goals of this license are : - the freedom of using the software ; - the freedom of studying et adapting it for its own uses ; - the freedom of redistributing copies of it ; - the compulsory of giving the modify versions to the community Do you accept the terms of this license (Y/n)? : _	Acceptation of the license	ALCASAR is a free software (open source) developed under the GPLV3 license.
ALCASAR V3.0rc1 Installation Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau Network parameters tests : ..... : ok	The network configuration is tested.	

installation de php-ctype-5.1.6-1mdv2007.0.i586.rpm
Préparation ...   ###
    75/100: php-ctype   ###
installation de php-ftp-5.1.6-1.1mdv2007.0.i586.rpm
Préparation ...   ###
warning: php-ftp-5.1.6-1.1mdv2007.0: Header V3 DSA signature: NOKEY, key ID 2245
8a98
    76/100: php-ftp   ###
installation de php-gettext-5.1.6-1mdv2007.0.i586.rpm
Préparation ...   ###
	The installation of about a hundred software (packages) is done from Internet. Estimated time : 3'
	If you previously have used the "Mageiar" ISO file, the estimated time is only a few seconds.	

ALCASAR V2.7 Installation Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau Enter the name of your organism :	Enter the name of your organization (without spaces)	Example : rasacla Info : <u>This name is mandatory</u>. The only characters allowed are : [a-z] [A-Z] [0-9] [-]
ALCASAR V2.7 Installation Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau The default ALCASAR IP address on consultation network is : 192.168.182.1/24 Do you want to use this IP address and this IP addressing plan (recommanded) (Y/n)? : n Enter ALCASAR IP address in CIDR format (a.b.c.d/xx) : 172.16.0.1/24	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 » 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)
ALCASAR V2.7 Installation Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau Define the first account allow to administrate the portal : Account : _	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 "http://alcasar.localdomain". This is not a consultation user account.
### # Enf of ALCASAR install process # # Application Libre pour le Contrôle Authentifié et Sécurisé # # des Accès au Réseau (ALCASAR) # ### - The system will be rebooted in order to operate ALCASAR - Read the exploitation documentation - The ALCASAR Control Center (ACC) is at http://alcasar Hit 'Enter' to continue	The installation is complete. The system can be rebooted.	Hit "Enter"
alcasar-rexy-vm:~# alcasar-daemon.sh 20 services needed by ALCASAR are started. All is ok alcasar-rexy-vm:~# _	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". Logout	If one or more services are not started, the script will attempt to start them. Hit "exit" or "<CRTL> + d"

2.4. Connection to the ALCASAR Control Center

On the consultation network, connect a PC and run a WEB browser with 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 **A**LCASAR **C**ontrol **C**enter (ACC). You must authenticate you with the first account created during the installation process (§2.3 – P10 of this document).

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

3. <u>Stop, uninstall or update ALCASAR</u>

<u>Stop:</u> You can stop the ALCASAR computer with 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").
<u>Uninstall:</u> You can uninstall ALCASAR with the command « *sh alcasar.sh --uninstall* ». This command uninstalls only ALCASAR. The operating system (Linux Mageia) is still present.
<u>Update:</u> 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. <u>Your ALCASAR settings sheet</u>

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 mapped like a "qwerty" keyboard.

Organization name :	
Users authentication page	This page is displayed when a browser tries to access a **HTTP** website.
The welcome page of ALCASAR allows: • to access the ALCASAR Control Center. • log the users out • change the users password • install the certificate of the Certification Authority (C.A.) in the browsers.	http://alcasar.localdomain Info : The possibilities of the ALCASAR Control Center (ACC) are described in the "ALCASAR-exploitation-en.pdf" document.
Linux accounts	root password : .... sysadmin password : ....
First ALCASAR WEB administrative account	Login: .... password : …...................
Network parameters • IP address of the ISP's equipment (router) : • IP address of DNS servers : • IP address of ALCASAR (WAN/Internet side) : • IP address of ALCASAR (LAN side) :	• ____.____.____.____ • DNS1 :____.____.____.____ • DNS2 :____.____.____.____ • ____.____.____.____/___ • ____.____.____.____/___