INSTALLATION

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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 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).
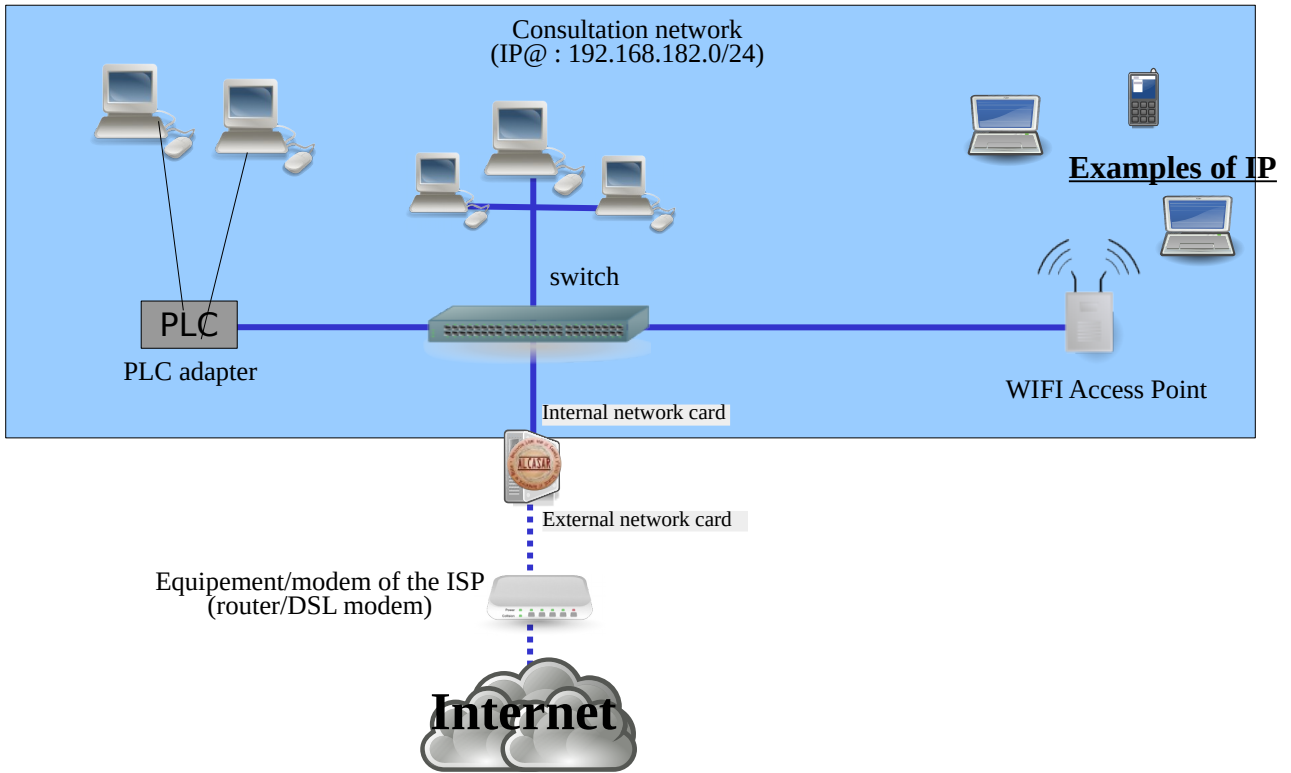
<u>addressing plans</u>

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. __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 ;-))
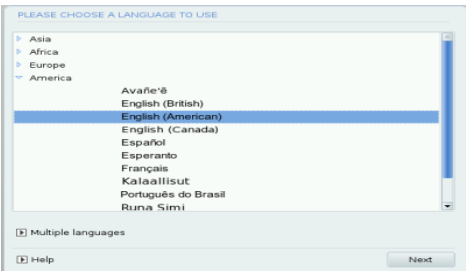
⚠️ In case of using a Virtual Machine (VM) : be sure that the size of the hard drive **isn't smaller than 30G.**
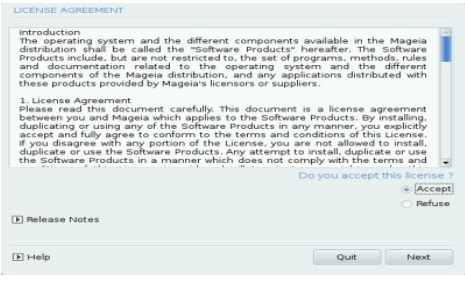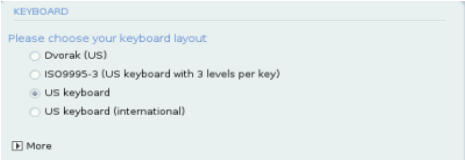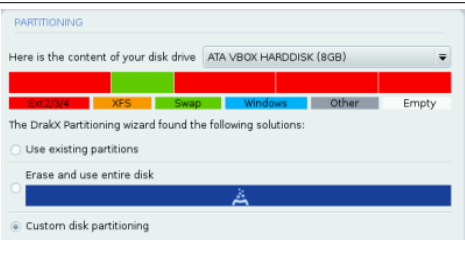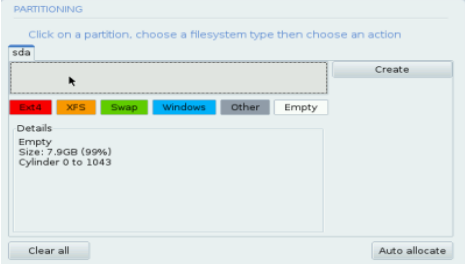
2.2. Installation of the system
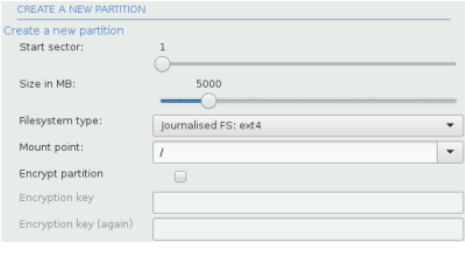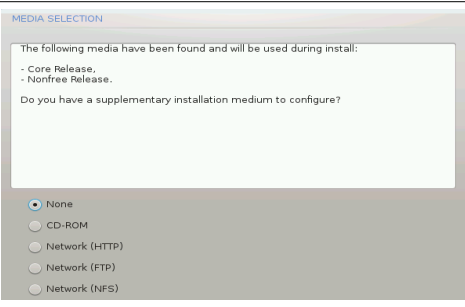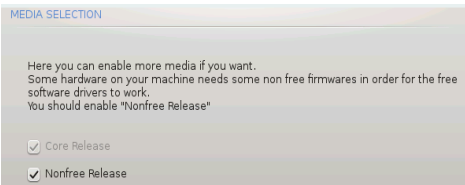
The installation procedure of the operating system is the following (estimated time : 6') :
- Retrieve the Mageia-6 ISO image file for 64b architecture (file : « mageia-6-x86_64-DVD.iso »). This ISO image is available on Mageia website as well as on several mirror sites of Mageia. For example :
  - http://www.mirrorservice.org/sites/mageia.org/pub/mageia/iso/6/
  - 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[1]. You can also use an external USB disk which simulates a bootable device (ex : zalman zm-ve300 or 400);
- 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 the CD-ROM or the USB flash drive, reboot the computer and follow the instructions below :
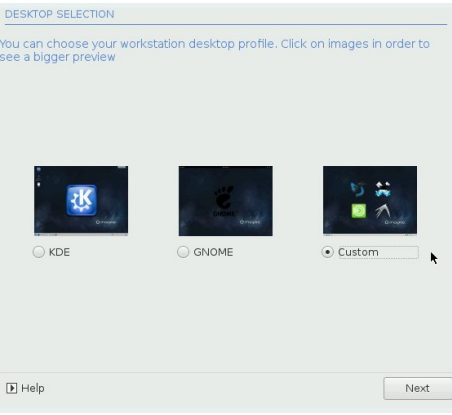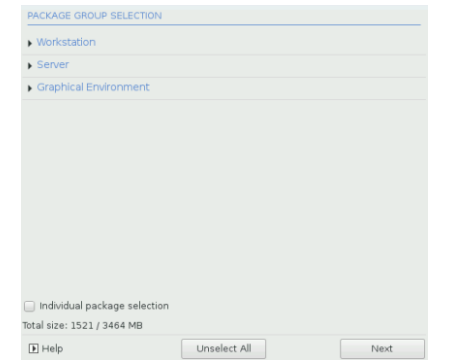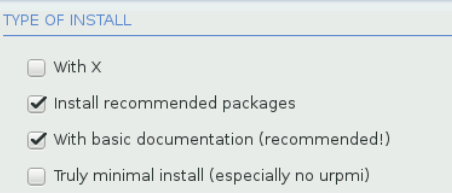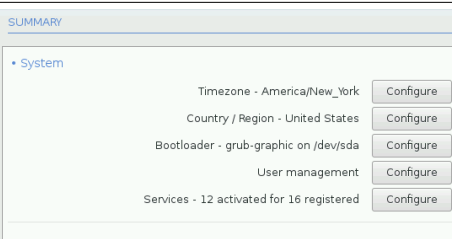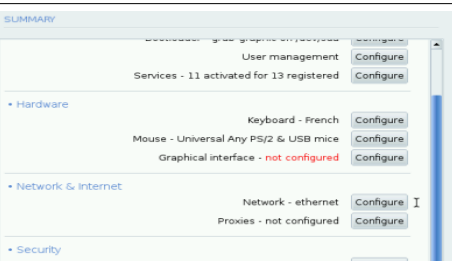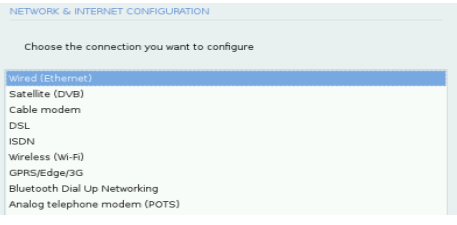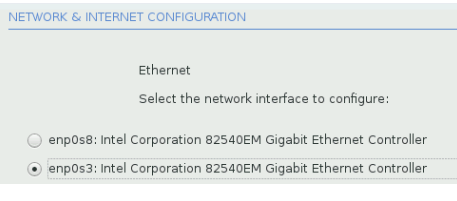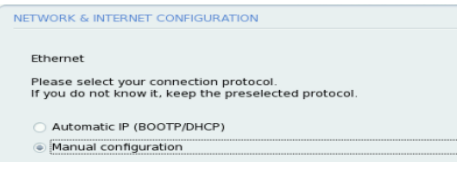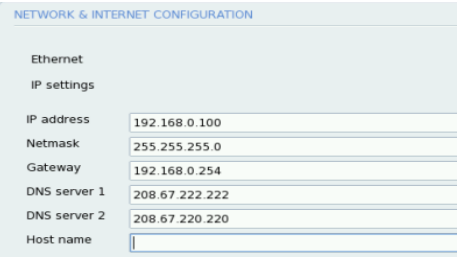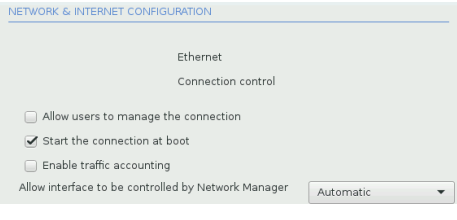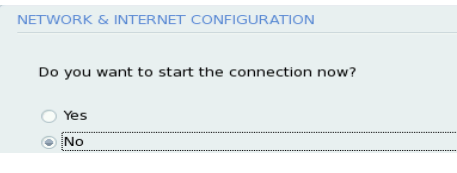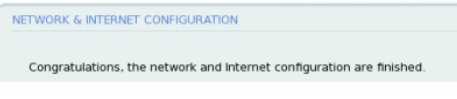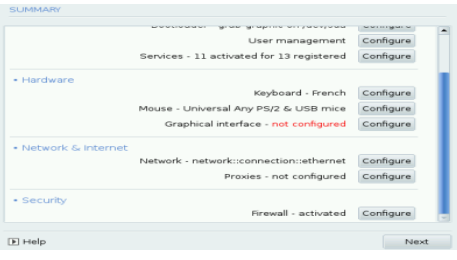
Screen display	Comments	Actions to achieve
	After starting the computer, this screen is displayed. * If the graphical mode doesn't work, you have to configure the BIOS settings to allocate more than 2 MB of shared memory for the graphics card.	Select "Install Mageia 6".
		Select your language.

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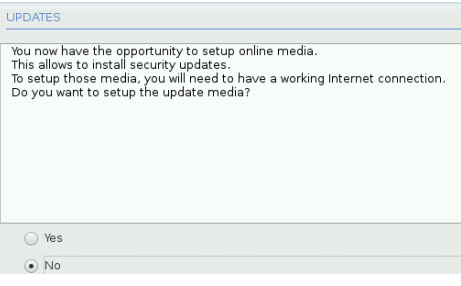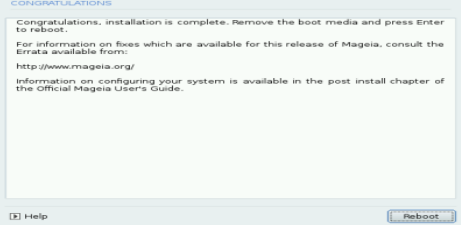
1 Two solutions are used to create a bootable USB flash drive :
- in graphical mode you can use "rufus" or "win32 disk image" (Windows) or "isodumper" (Linux)
- in console mode on Linux, plug the USB flash drive and get the name of the device with the "*fdisk -l*" command (an USB flash drive is usually "/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
LICENSE AGREEMENT		Accept the license agreement. Info : this license agreement explains that the installed software is free (GPL).
KEYBOARD Please choose your keyboard layout		Choose your keyboard layout.
PARTITIONING Here is the content of your disk drive ATA VBOX HARDDISK (8GB)	The hard disk partitioning will be adapted to the needs of ALCASAR (see next step).	Select "Custom disk partitioning".
PARTITIONING Click on a partition, choose a filesystem type then choose an action	After removing all the partitions, create the following 5 or 6 partitions : ! Create the 1st "/boot/efi" partition only on UEFI BIOS. • /boot/EFI/ : 300MB (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.
CREATE A NEW PARTITION Create a new partition	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".
MEDIA SELECTION	For ALCASAR, it does not need any other media.	Select "None" then click "Next"
MEDIA SELECTION		Leave the "Nonfree Release" media enabled then click "Next"
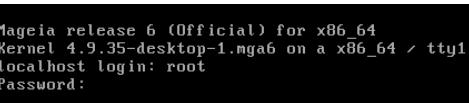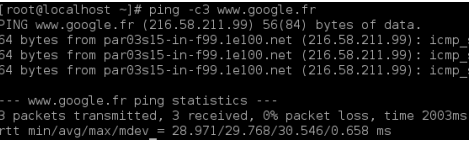
Screen display	Comments	Actions to achieve
DESKTOP SELECTION You can choose your workstation desktop profile. Click on images in order to see a bigger preview ○ KDE ○ GNOME ● Custom ▶ Help Next	ALCASAR doesn't need a graphical environment (it is controlled from a WEB browser)	Select "Custom" then click "Next"
PACKAGE GROUP SELECTION ▶ Workstation ▶ Server ▶ Graphical Environment ☐ Individual package selection Total size: 1521 / 3464 MB ▶ Help Unselect All Next	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.).
TYPE OF INSTALL ☐ With X ☑ Install recommended packages ☑ With basic documentation (recommended!) ☐ Truly minimal install (especially no urpmi)		Select only "Install recommended packages" and the basic documentation, then click "Next". The copy of the packages is launched. Estimated time : 2'
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.
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 timezone and your country	In the group "System", click on "Configure" in "timezone" section then in "Country" section. Select your timezone and your country.
SUMMARY Bootloader - grub-graphic on /dev/sda Configure 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.

Screen display	Comments	Actions to achieve
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)". Info : 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. Tips : Choose the interface with the smallest index. **Write the name of this interface on a paper.** Info : 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" Info : While it is possible to let this interface in "bootp/dhcp" mode, we recommended configuring it manually in 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 subnet 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).
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"
NETWORK & INTERNET CONFIGURATION Do you want to start the connection now? ○ Yes ◉ No	It is not necessary to start the connection now.	Select "No"
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 on "Next"

Screen display	Comments	Actions to achieve
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	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	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 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) :
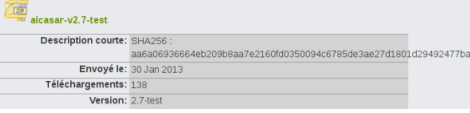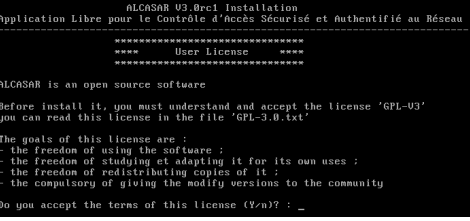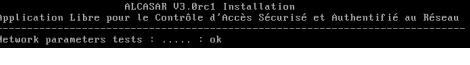
- <u>via an USB flash drive :</u> Download the latest version available on the ALCASAR website and copy it on an USB flash drive. Then, use the following procedure to copy it on ALCASAR computer :

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. |
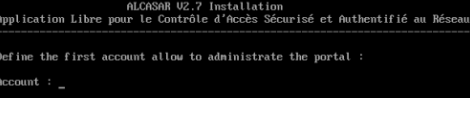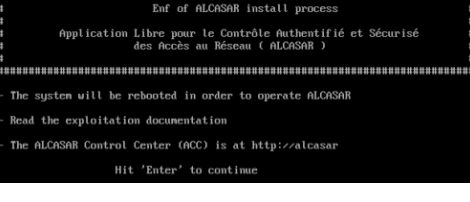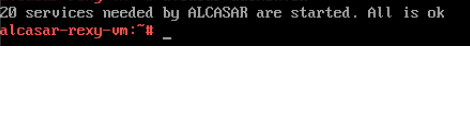
- <u>via FTP :</u> directly from the ALCASAR computer, download the archive file from the FTP server :

Screen display	Comments	Actions to achieve
| ```
[root@localhost ~]# lftp ftp.alcasar.net/pub
cd ok, cwd=/pub
lftp ftp.alcasar.net:/pub> cd stable
cd ok, cwd=/pub/stable
lftp ftp.alcasar.net:/pub/stable> ls
-rw-r--r--   1 root    root    87551026 Oct 16 05:35 alcasar-2.0.1.tar.gz
-rw-r--r--   1 root    root    87547182 Jan 27 2014 alcasar-2.0.tar.gz
lftp ftp.alcasar.net:/pub/stable> get alcasar-2.0.tar.gz
87547182 octets transférés en 90 secondes (950.4Ko/s)
lftp ftp.alcasar.net:/pub/stable> bye
[root@localhost ~]# _
``` | • Connect to the FTP server with the "lftp" command<br>• change to the directory "pub" then "stable" and list its content<br>• download the archive file<br>• quit | *lftp  ftp.alcasar.net*<br>*cd  pub*<br>*cd stable*<br>*ls*<br>*get  alcasar-x.y.tar.gz*<br>*bye* |

Screen display	Comments	Actions to achieve
[root@localhost ~]# sha256sum alcasar-2.7-test.tar.gz aa6a06936664eb209b8aa7e2160fd0350094c6785de3ae27d1801d29492477ba alcasar-v2.7-test Description courte: SHA256 : aa6a06936664eb209b8aa7e2160fd0350094c6785de3ae27d1801d29492477ba Envoyé le: 30 Jan 2013 Téléchargements: 138 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* 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]# _	• Decompress and extract this archive. • Move to the directory of ALCASAR and run the installation script.	*tar -xvf alcasar-x.y.tar.gz* *cd alcasar-x.y* *sh alcasar.sh -i*
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'	

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 : This name is mandatory. 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. Connexion 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 – P9 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 :____.____.____.____ • ____.____.____.____/___ • ____.____.____.____/___