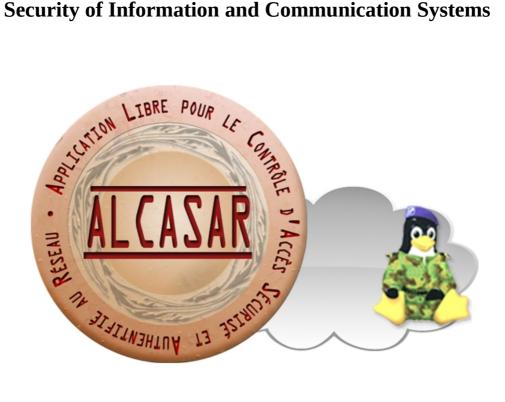


# **Security of Information and Communication Systems**





# **INSTALLATION**

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Project : ALCASAR	Author: Rexy with support of "Alcasar team". Thanks to translators.
Object: Installation	Version: 2.9
Keywords: captive portal, Network Access Control (NAC), accountability, traceability, authentication	Date: 2015, March

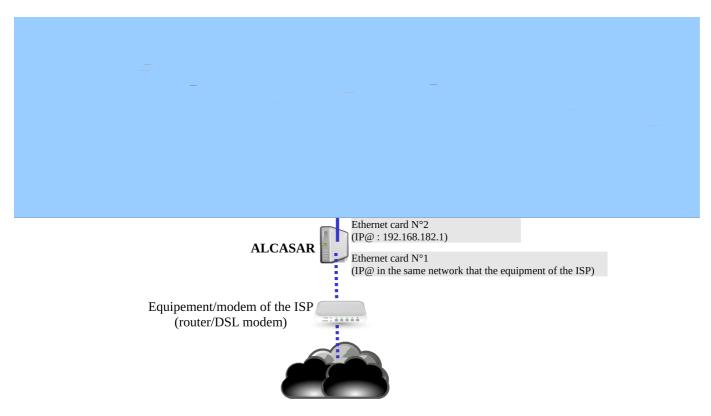
### 1. Introduction

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 equipments). 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 wifi access points).



#### Example with default class C network (254 equipments)

- IP address of ALCASAR: 192.168.182.1/24
- Maximum number of equipment on the consultation network: 253
- Network settings of equipment :
  - available IP addresses: from 192.168.182.2 to 192.168.182.254 (static or dynamic)
  - subnet mask: 255.255.255.0
  - IP address of the DNS server and of the default gateway: 192.168.182.1 (IP address of ALCASAR)
  - DNS suffix for equipment with static IP address: "localdomain"

#### Example with a class B network (65534 equipments)

- IP address of ALCASAR : 172.16.0.1/16
- Maximum number of equipment on the consultation network: 65533
- Network settings of equipment :
  - o available IP addresses: from 172.16.0.2 to 172.16.255.254 (static or dynamic)
  - subnet mask : 255.255.0.0
  - IP address of the DNS server and of the default gateway: 172.16.0.1 (IP address of ALCASAR)
  - DNS suffix for equipment with static IP address: "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 millions of IP addresses. The management of such volume of addresses would spend too much memory.

### 2. Installation

The installation of the portal consists of two steps. The first one is the installation of a minimalist Linux operating system based on Mageia 4.1. The second step installs and configures all the components of ALCASAR.

### 2.1. <u>Hardware requirement</u>

ALCASAR only requires one standard desktop 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. 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 8GB 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 less than 25G.

### 2.2. <u>Installation of the system</u>

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

- get the Mageia 4.1 ISO image file in double architectures (32 and 64 bits): « mageia-4.1-dual-DVD.iso » (1 GB). This ISO image is available on ALCASAR website as well as on several <u>mirror sites of Mageia</u>. For example:
  - http://www.mirrorservice.org/sites/mageia.org/pub/mageia/iso/4.1/
  - http://distrib-coffee.ipsl.jussieu.fr/pub/linux/Mageia/iso/4.1/
- burn this ISO image file on a DVDROM or create a bootable USB flash drive<sup>1</sup>. You can also use a external USB disk which simulate a bootable DVDROM (ex : zalman zm-ve300 ou 400).
- configure the BIOS settings to set the date and time and to boot from the CD or USB flash drive. Disable the floppy disk controller if no floppy drive is installed. 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 bellow:

Screen display	Comments	Actions to achieve
Boot from Hard Disk Install Magels 4 Rescue System Memory Test Hardware Detection Tool	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 2MB of shared memory for the graphics card.	Select "Install Mageia 4".
PLEASE CHOOSE A LANGUAGE TO USE  3 Asia 3 Africa 4 English (British) English (British) English (American) English (Canada) Español		Select your language.

<sup>1</sup> Two solutions are used to create a bootable USB flash drive:

in graphical mode you can use "unetbootin" (Windows/Linux) or "isodumper" (Linux)

<sup>•</sup> 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
Introduction system and the different components available in the Megale The operand system and the different components available in the Megale The operand system and the Software Products' hereafter. The Software Products include, but are not restricted to, the set of programs, methods, rules are components of the Megale distribution, and any applications distributed with these products provided by Megales's licensors or suppliers.  1. License Agreement Please read this document carefully. This document is license agreement Please read the document carefully. This document is license agreement Please read the document carefully. This document is license agreement please read the please of the Software Products in any manner, you explicitly aduption or using any of the Software Products, you are not allowed to install, diplication or use the Software Products, any attempts to install, diplication or use the Software Products and the Software of the Software Products in a presence of the Software Products in a stream of the Software Products in the Softwa		Accept the license agreement.  Info: this license agreement explains that the installed software are free (GPL).
REYBOARD  Please choose your keyboard layout  Overak (US)  ISO9995-3 (US keyboard with 3 levels per key)  US keyboard  US keyboard  I More		Choose your keyboard layout.
Here is the content of your disk drive ATA VBOX HARDDISK (8GB)  Estazaya XFS Siesp Windows Other Empty The DrakX Partitioning wizard found the following solutions:  Use existing partitions  Erase and use entire disk  Custom disk partitioning	The hard disk partitioning will be adapted to the needs of ALCASAR (see next step).	Select "Custom disk partitioning".
Click on a partition, choose a filesystem type then choose an action  sda  Create  Create  Details Empty Size: 7.9GB (99%) Cylinder 0 to 1043  Clear all  Auto allocate	After removing all the partitions, create the following 5 partitions:  • /: 4 GB  • swap: keep the default size  • /tmp: 4 GB  • /home: 4 GB  • /var: 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.  Info: except the partition of swap, all the filesystem (FS) type are "Journalized FS: ext4".
Créer une nouvelle partition Taile en Mio :  Type du système de fichiers : journaised FS: ext4  Port de montage :  Chiffrer une partition Clé de chifrerand Clé de chifrerand	At the end of this operation, and depending on the size of your hard drive, the partitioning should look like this:    Sda	- Create the root partition (/). Choose its size (4 Go) and its filesystem (ext4). Repeat this step for all the partitions Once the partitioning completed, click on "Done".
MEDIA SELECTION  The following media have been found and will be used during install:  - Core Release, - Norfree Release, - Norfree Release, - O you have a supplementary installation medium to configure?  • None  - CD-ROM - Network (HTTP) - Network (NFS)	For ALCASAR, it does not need any other media	Select "None" then click "Next"
MEDIA SELECTION  Here you can enable more media if you want. Some hardware on your machine needs some non free firmwares in order for the free software drivers to work, you should enable "Nonfree Release"  Core Release  Nonfree Release		Leave the "Nonfree Release" media enabled then click "Next"

Screen display	Comments	Actions to achieve
PACKAGE CROUP SELECTION  * Workstation Internet station Configuration Development Decumentation Development  * Server    WebmTP	Package group selection : ALCASAR only requires a very minimal install.	Select "Unselect All" then click "Next". <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.).
TYPE OF INSTALL  With X  ✓ Install suggested packages  With basic documentation (recommended!)  Truly minimal install (especially no urpmi)		Select only "Install suggested packages", then click "Next". The copy of the packages is launched. Estimated time: 2'
USER MANAGEMENT  Set administrator (root) password Password (again)  Password (again)  Enter a user  Icon Real name   sysadmin Login name   sysadmin Password (again)  Password (again)		Assign a password to the "root" account, then, create the "sysadmin" account and assign it a password.
SubMARY  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 Proxies - not configure Configure  * Security  Firewall - activated Configure	Configuration of Internet access	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 modern DSL ISDN Wireless (Wi-Fi)		Select the type of Internet connection. In the case of use of an ISP broadband modem, choose "Wired (Ethernet)".
GPRS/Edge/3G Bluetooth Dial Up Networking Analog telephone modern (POTS)		<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  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	For the moment, only the interface connected to the broadband modem of the ISP will 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 of the printscreen.  Select "Manual configuration"  Info: While it is possible to let this interface in "bootp/dhcp" mode, we recommended to configure it manually in static mode.
NETWORK & INTERNET CONFIGURATION	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 this field 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"
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 Cenfigure Services - 11 activated for 13 registered Configure  - Hardware  Keyboard - French Mouse - Universal Any PS/2 & USB mice Graphical interface - not configured Cenfigure  - Network & Internet Network - network::connection::ethernet Proxies - not configured Cenfigure  - Security  Firewall - activated Configure		Click on "Next"
MISES À JOUR  Vous avez maintenant la possibilité de télécharger les paquetages mis à jour depuis la sortie de cette distribution. Il peut y avoir des correctifs de sécurité ou des résolutions d'anormalies.  Vous devez avoir une connexion internet pour les télécharger.  Souhatez-vous installer les mises à jour ?  Oul	Security updates will be managed during the installation of ALCASAR.	Select "No" and click on "Next"
CONOMENLATIONS  Compatulations, installation is complete. Permove the boot media and press Enter to rebook.  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 Quide.  [] Help	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. <u>Installation of ALCASAR</u>

# Configuration of the network cards

Screen display	Comments	Actions to achieve
Mageia release 4 (Official) for x86_64 Kernel 3.12.8-desktop-2.mga4 on a x86_64 / tty2 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.	ethtool -p enp0s3  On this blinking interface, connect the cable linked to the ISP broadband modem (Internet access).
	Stop the blinking	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

Screen display	Comments	Actions to achieve
		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    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 <a href="#">Ctrl&gt; + c</a> 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 network's 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.
	Internet connectivity test	ping 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) :  $\frac{1}{2}$ 

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
[root@localhost -]# fdisk -1  Disque /dev/sda: 80.0 60. 88832838912 octets  255 heads, 30 sectors/track, 9736 cylinders  Distance of the sector of the secto	Insert the USB flash drive.  Display informations on mass media storage to get the name of your USB flash drive. In this example, "/dev/sdb1" is a 1GB USB flash drive.	fdisk -l  Info: You also can display the system log to get this name (journalctrl -f).
<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> <li>Create a directory and mount the USB flash drive on it.</li> <li>Copy the archive of ALCASAR to the directory "/root".</li> <li>Unmount the USB flash drive.</li> <li>Unplug it.</li> </ul>	mkdir -p /media/usb mount /dev/sdb1 /media/usb/ cp /media/usb/alcasar-* /root/ umount /media/usb 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
Proot@localhost "]#   Iftp ftp.alcasar.net/pub   od ok. cud~pub     Iftp ftp.alcasar.net/pub> od stable   od ok. cud~pub/stable     Iftp ftp.alcasar.net/spub> od stable   od ok. cud~pub/stable     Iftp ftp.alcasar.net/pub/stable> ls   ruy-r-r-	<ul> <li>Connect to the FTP server with the "lftp" command</li> <li>download the archive file</li> <li>quit</li> </ul>	lftp ftp.alcasar.net/pub cd stable ls get alcasar-x.y.tar.gz bye

#### **Installation**

Screen display	Comments	Actions to achieve
Troot@localhost "1# sha256sum alcasar=2.7-test.tar.gz	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 -zxvf alcasar.1-5RC4.tar.gz _ [root@localhost "]# cd alcasar-1.8a [root@localhost alcasar-1.8a]# sh alcasar.sh -i	<ul> <li>Uncompress and extract this archive.</li> <li>Move to the directory of ALCASAR and run the installation script.</li> </ul>	tar -xvf alcasar-x.y.tar.gz cd alcasar-x.y sh alcasar.sh -i
ORN GENERAL FUBLIC LICENSE  Wersion 3, 29 June 2007  Copyright (C) 2007 Free Software Poundation, Inc. chttp://fsf.org/> Energone is permitted to copy and distribute werbait copies of this license deciment, but changing it is not allowed.  The GNU General Public License is a free, copyleft license for software and other kinds of works.  The licenses for mest software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to quarantee your freedom to share and change all versions of a program—to make sure it remains free Software for all its works.  Pree Software Foundation, use the any other work released this way by its authors. You can apply it to your programs, too.	The space bar is used to go at the end of the text of the GPLV3 license. At the end, just press "Enter"	ALCASAR is a free software (open source) developed under the GPLV3 license.
ALCASAR UZ.7 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-lndv2007.0.1586.rpm Préparation 75/100: php-ctype Installation de php-ty-5.1.6-1.1ndv2007.0.1586.rpm Préparation Préparation php-ty-5.1.6-1.1ndv2007.0.1586.rpm Installation de php-ty-5.1.6-1.1ndv2007.0.1586.rpm Installation de php-ty-5.1.6-1.1ndv2007.0.1586.rpm Installation de php-ettext-5.1.6-1ndv2007.0.1586.rpm Préparation	The installation of about a hundred of software (packages) is done from Internet. Estimated time : 3'	
ALCASAR UZ.7 Installation Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau Enter the mane 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] [-]
#ALONSAR UZ. 7 Installation  Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau  The default #ALONSAR IP Address on consultation network is: 192.166.182.1224  The default #ALONSAR IP Address and this IP Addressing plan (recommended) (Yzn)?: n  Catter #ALONSAR IP address in CIDR format (a.b.c.dzxx): 172.16.8.1224	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 VZ.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 Linux account is used to administer ALCASAR from the consultation network via the graphical control center ( <a href="http://alcasar">http://alcasar</a> ). This is not a consultation user account.
ENDOWN HEREBURNESS AND A CONTINUE  End of ALCASAR install process  Application Libre pour le Contrôle Authentifié et Sécurisé  Application Libre pour le Contrôle Authentifié et Sécurisé  Acs Rocès au Méseau (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 will be restarted to synchronize all components of ALCASAR.	Once the system is restarted, connect an equipment on the consultation network and use it for log in on the portal ( <a href="http://alcasar">http://alcasar</a> ). Create the first users. Read the operating instructions carefully ("alcasar-exploitation-en.pdf").

# 3. Uninstall, re-install or update ALCASAR

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

If you launch the installation again or if you launch the installation of a newer version on a running version of ALCASAR, the script will ask you if you want to perform an update.

### 4. Preparation of an off-line installation

This procedure allow you to install ALCASAR in offline mode. This can be usefull when you manage to install ALCASAR in a place with a lack of Internet bandwith. In this case, it's interesting to create an archive file of all the packages (RPMS) needed. This file will be used instead of the Internet downloading. Use the following procedure:

- <u>Creation of the RPM archive file</u>: on a new PC, install "Mageia Linux" as describe in §2.2. Then, retrieve and uncompress the last ALCASAR archive. Go to the scripts directory « <u>cd alcasar-x.y/scripts/sbin</u> » and run the script « <u>./alcasar-rpm-download.sh</u> ». This script will create the RPM archive file of your PC architecture (32 or 64 bits). Retrieve this archive file on a USB key.
- Offline installation: after installing the system, retrieve the RPM archive file. Uncompress it and go in its directory. Install all the RPM (*urpmi –no-verify-rpm*\*). Then, follow the installation process describe in chapter §2.3.

### 5. 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 (« GRUB »). 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.

Organization name :	
Users authentication page	This page is displayed when a browser tries to access a website.
Portal page allowing:  • the administrator to access the control center.  • The users to  • log them out  • change their password  • install the certificate of the Certification Authority (C.A.) in their browsers.	http://alcasar  Info: The possibilities of the ALCASAR Control Center (ACC) are described in the "ALCASAR-exploitation" document.
Linux accounts	root password :sysadmin password :
First ALCASAR WEB administrative account	Login: password:
Network parameters	• • DNS1: • DNS2: