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 : 2.7
Keywords : captive portal, access control, accountability, traceability, authentication	Date : 2012, August

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 equipments of consultation network, ALCASAR is the DNS server, the network time server and the default router (gateway). **Thus, on this network, there must be no other gateway**. ALCASAR can be the DHCP server of the consultation network. In this case, it should be alone in this role.
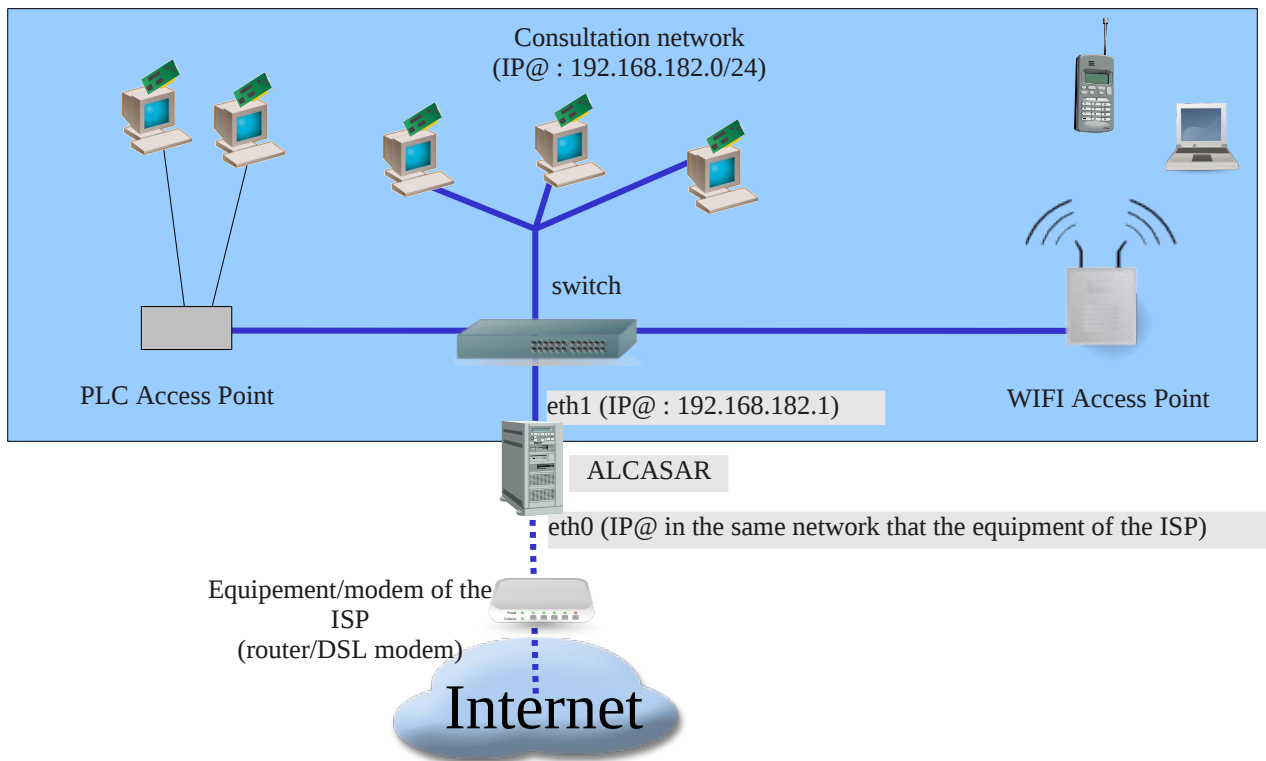
Example with default class C network (254 equipments)
- IP address of ALCASAR : 192.168.182.1/24
- Maximum number of equipment on the consultation network : 253
- Network settings of equipment :
    - available IP addresses : from 192.168.182.2 to 192.168.182.254 (static or dynamic)
    - subnet mask : 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 :
    - 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 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 spent 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 Mageia2. The second step installs and configures all the components of ALCASAR.
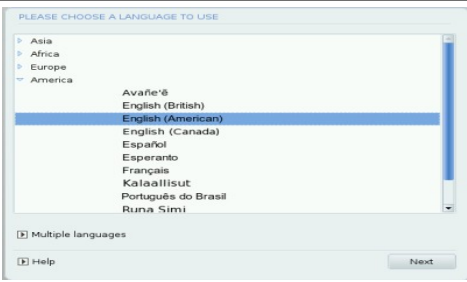
2.1. Hardware requirement

ALCASAR only requires one standard desktop computer with two network cards and a hard drive with a capacity of at least 50 Go in order to be able to store logs related to connections tracing. ALCASAR includes several optional filtering systems (network protocols, URL, antivirus and web page content). If you decide to enable these filtering systems, it is recommended to install at least 2GB of RAM in order to ensure an acceptable processing speed. As an example, an organization has installed ALCASAR with more than 1000 accounts on a computer whose specifications are : Intel P4 3.2Ghz, 2GB RAM and a 80 GB hard drive. Both 32-bits and 64-bits architectures are supported.
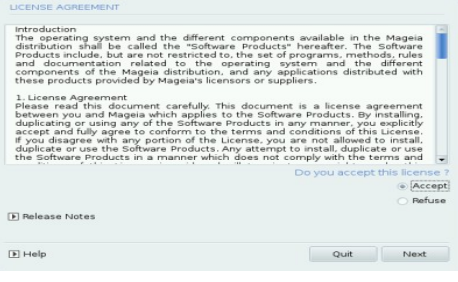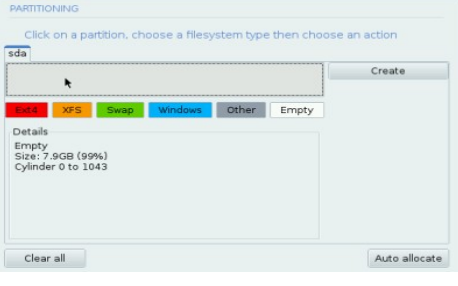
2.2. Installation of the system
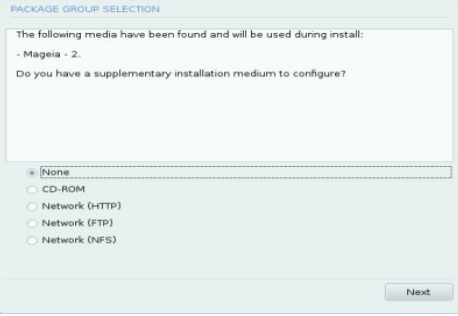
The installation procedure of the operating system is the following (estimated time : 6') :
- get the Mageia2 ISO image file in double architectures (32 and 64 bits) : « mageia2-dual-CD.iso » (700MB). This ISO image is available on ALCASAR website as well as on several [mirror sites of Mageia](). For example :
  - http://www.mirrorservice.org/sites/mageia.org/pub/mageia/iso/2/
  - http://distrib-coffee.ipsl.jussieu.fr/pub/linux/Mageia/iso/2/
- burn this ISO image file on a CDROM or create a bootable USB flash drive[1] ;
- configure the BIOS settings to set the date and time and to boot from the CD or USB flash drive. <u>Disable the floppy disk controller if no floppy drive is installed</u>. 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 :
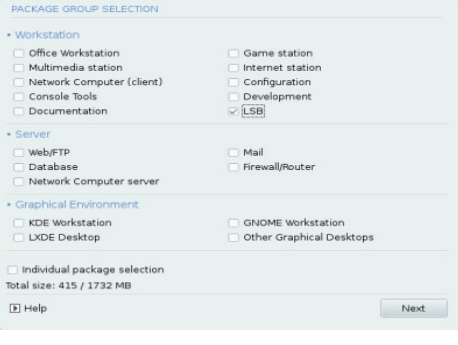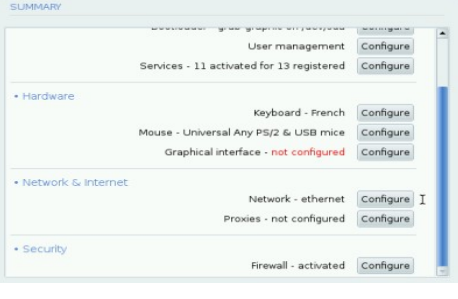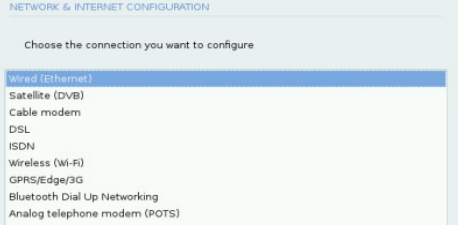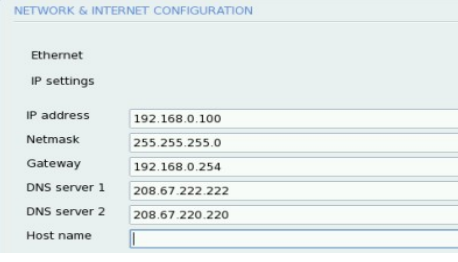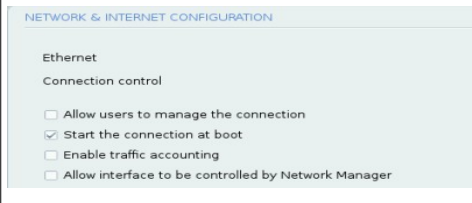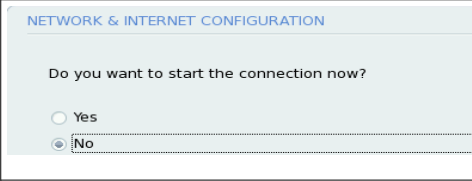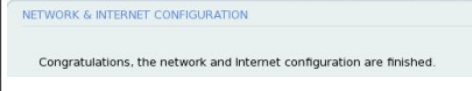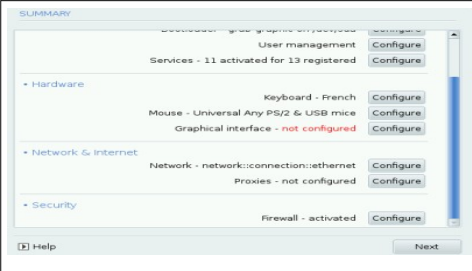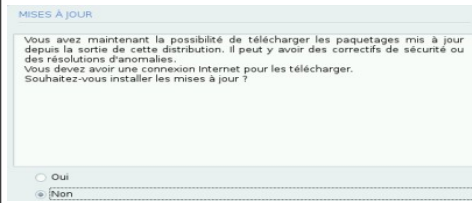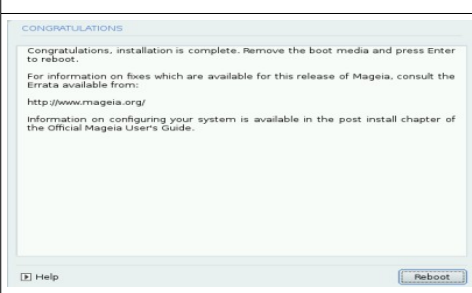
Screen display	Comments	Actions to achieve
	After starting the computer, this screen is displayed. * If the graphical mode doesn't work, you have to configure the BIOS settings to allocate more than 2MB of shares memory for the graphics card.	Select « Install Mageia 2 ».
		Select your language.

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1 Two solutions are used to create a bootable USB flash drive (1Gb USB flash drive formated in FAT or VFAT) :
- in graphical mode you can use « unetbootin ». On Linux, install it via "urpmi" or "apt-get". On Windows, download it here : « http://unetbootin.sourceforge.net/ »
- in console mode on Linux, plug the USB flash drive and get the name of the device with the « *fdisk -l* » command. (a 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=8M* ».

Screen display	Comments	Actions to achieve
LICENSE AGREEMENT Introduction The operating system and the different components available in the Mageia distribution shall be called the "Software Products" hereafter. The Software Products include, but are not restricted to, the set of programs, methods, rules and documentation related to the operating system and the different components of the Mageia distribution, and any applications distributed with these products provided by Mageia's licensors or suppliers. 1. License Agreement Please read this document carefully. This document is a license agreement between you and Mageia which applies to the Software Products. By installing, duplicating or using any of the Software Products in any manner, you explicitly accept and fully agree to conform to the terms and conditions of this License. If you disagree with any portion of the License, you are not allowed to install, duplicate or use the Software Products. Any attempt to install, duplicate or use the Software Products in a manner which does not comply with the terms and Do you accept this license ? ⊙ Accept ○ Refuse ▶ Release Notes ▶ Help Quit Next		Accept the license agreement. Info : this license agreement explain that the software installed are free software.
KEYBOARD Please choose your keyboard layout ○ Dvorak (US) ○ ISO9995-3 (US keyboard with 3 levels per key) ⊙ US keyboard ○ US keyboard (international) ▶ More		Choose your keyboard layout.
PARTITIONING Here is the content of your disk drive ATA VBOX HARDDISK (8GB) [Ext2/3/4	XFS	Swap	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 ».
PARTITIONING Click on a partition, choose a filesystem type then choose an action sda Create [Ext4	XFS	Swap	Windows	Other	Empty] Details Empty Size: 7.9GB (99%) Cylinder 0 to 1043 Clear all Auto allocate	After clearing the partition table, the following 5 partitions must be created : • / : 2 GB • swap : keep the default size (or twice the size of the RAM) • /tmp : 2 GB • /home : 2 GB • /var : the rest of the hard drive	Click on « Clear all ». Then click on the area of the disk (sda) to create each new partition. Info : except the swap, all the filesystems (FS) are « Journalized FS : ext4 ».
CREATE A NEW PARTITION Create a new partition Start sector: 1 Size in MB: 2000 Filesystem type: Journalised FS: ext4 Mount point: / Encrypt partition ☐	At the end of this operation, and depending of the size of your hard drive, the partitioning should look like this : sda [1.9Go	swap 2Go	/tmp 2Go	/home 2Go	/var 11Go] [Ext4	XFS	Swap	Windows	Autre	Vide]	- Create the root partition (/). Choose its size (2 Go) and its filesystem (ext4). Repeat this step for all the partitions. - One the partitioning is complete, click on « Done ».
PACKAGE GROUP SELECTION The following media have been found and will be used during install: - Mageia - 2. Do you have a supplementary installation medium to configure? ⊙ None ○ CD-ROM ○ Network (HTTP) ○ Network (FTP) ○ Network (NFS) Next	For ALCASAR, it does not need any other media	Select « None »
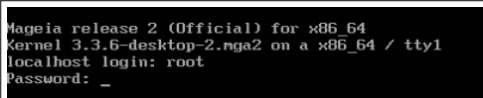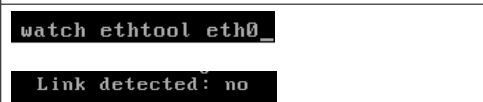
Screen display	Comments	Actions to achieve
PACKAGE GROUP SELECTION • Workstation □ Office Workstation · □ Game station □ Multimedia station · □ Internet station □ Network Computer (client) · □ Configuration □ Console Tools · □ Development □ Documentation · ☑ LSB • Server □ Web/FTP · □ Mail □ Database · □ Firewall/Router □ Network Computer server • Graphical Environment □ KDE Workstation · □ GNOME Workstation □ LXDE Desktop · □ Other Graphical Desktops □ Individual package selection Total size: 415 / 1732 MB ▶ Help · Next	Package group selection : ALCASAR only requires a very minimal install.	Select only the "LSB" (Linux Standard Base) package group. Uncheck all other package group and click on "Next". The copy of the packages is launched. Estimated time : 4' Info : On Linux, a package is an archive file containing all the components of a software (binary, help file, configuration file, etc.).
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 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	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 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 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: ○ eth1: Intel Corporation 82540EM Gigabit Ethernet Controller ◉ eth0: Intel Corporation 82540EM Gigabit Ethernet Controller	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 "eth0" interface Info : if the interfaces are not identified (eth0, eth1, etc), select the first interface.
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 this is possible, it is not recommended to configure this interface in dynamic mode (bootp/DHCP).
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 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. Example for those of the project "OpenDNS" (DNS1=208.67.222.222, DNS2=208.67.220.220) or those of google (DNS1=8.8.8.8, DNS2=8.8.4.4).

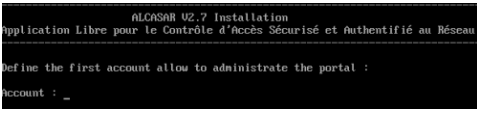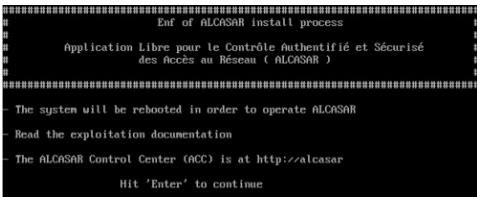| Screen display	Comments	Actions to achieve
NETWORK & INTERNET CONFIGURATION Ethernet Connection control ☐ Allow users to manage the connection ☑ Start the connection at boot ☐ Enable traffic accounting ☐ Allow interface to be controlled by Network Manager		Select only "Start the connection at boot"
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"
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'anomalies. Vous devez avoir une connexion Internet pour les télécharger. Souhaitez-vous installer les mises à jour ? ○ Oui ◉ Non	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

ALCASAR consists of a compressed archive (alcasar-x.y.tar.gz) and additional packages that are automatically downloaded from the Internet during the installation phase.
Get the latest version of the compressed archive on the ALCASAR website and copy it on an USB flash drive.
Then, use the following procedure : (estimated time : 5')

Screen display	Comments	Actions to achieve
Mageia release 2 (Official) for x86_64 Kernel 3.3.6-desktop-2.mga2 on a x86_64 / tty1 localhost login: root Password: _		Login as root
watch ethtool eth0_ Link detected: no	Disconnect the cables from the two network cards and display the status of the fist one (eth0).	*watch ethtool eth0* *Info : the last line displayed show the state of the link (Link detected <yes/no>)*
Link detected: yes	Plug the cable connected to the ISP	Wait until the link is up. Otherwise, plug

Screen display	Comments	Actions to achieve
	broadband modem, into the first card (Internet access).	the cable into the other network card. When the link is detected on eth0, 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 eth1` 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.
```[root@localhost ~]# fdisk -l``` Disque /dev/sda: 80.0 Go, 80032038912 octets 255 heads, 63 sectors/track, 9730 cylinders Units = cylindres de 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 de 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. 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` Info1 : For PC with PATA standard (old generation), the flash drive will be named hd(a-b-c...)(1-2-3...). For PC with SATA standard, it will be named sd(a-b-c...)(1-2-3...). Info2 : You also can display the system log to get this name (tailf /var/log/messages).

```[root@localhost ~]# mkdir /media/usb```
 ```[root@localhost ~]# mount /dev/sdb1 /media/usb/```
 ```[root@localhost ~]# cp /media/usb/alcasar-* .```
 ```[root@localhost ~]# umount /media/usb/```
 ```[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
	• Create a directory and mount the USB flash drive on it.
	• Copy the archive of ALCASAR to the directory "/root".
	• Unmount the USB flash drive.
	• Unplug it.
	• Compute the SHA256 digital footprint of this archive and compare it with that of the website.
		`mkdir -p /media/usb`
		`mount /dev/sdb1 /media/usb/`
		`cp /media/usb/alcasar-* /root/`
		`umount /media/usb`
		`sha256sum alcasar-x.y.tar.gz`
		
		Info1 : Replace "sdb1" with the device name retrieved in the previous step (sdc1, hda1, etc...).
		
		Info 2 : 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```
	• Uncompress 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`

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ALCASAR V2.7 Installation Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau Network parameters tests : .... : ok	The network configuration is tested.	Info : In some cases, the script changes network cards configuration. It is then necessary to run the script again.

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 of software (packages) is done from Internet. Estimated time : 2'	

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)

Screen display	Comments	Actions to achieve
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 Linux account is used to administer ALCASAR from the consultation network via the graphical control center (http://alcasar). This is not a consultation user account.
End 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 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 login on the portal (http://alcasar). Create the first users. Read the operating instructions carefully ("alcasar-exploitation-en.pdf").

3. <u>Uninstall, reinstallation and update of ALCASAR</u>

Move to the directory of ALCASAR archive. You can uninstall the portal with the command « *sh alcasar.sh --uninstall* ». This command only uninstalls ALCASAR, the operating system (Linux Mandriva) is still installed. You can reinstall or update the portal with the same command as before (« *sh alcasar.sh --install* »). The script will ask you if you want to save the settings of the existing version.

4. <u>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 (« GRUB »). It can be consulted via the command « *cat /root/ALCASAR-passwords.txt* ».

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 are described in the "ALCASAR-exploitation" document.

Linux accounts	root password : .... sysadmin password : ....
1st 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 :____.____.____.____ • ____.____.____.____/___ • ____.____.____.____/___