Security of Information and Communication Systems

INSTALLATION

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| Projet : ALCASAR	Author : Rexy with support of « Alcasar team ». Thanks to translators.
Object : Installation	Version : 2.6
Keywords : captive portal, access control, imputability, traçability, authentication	Date : 2012, June

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.
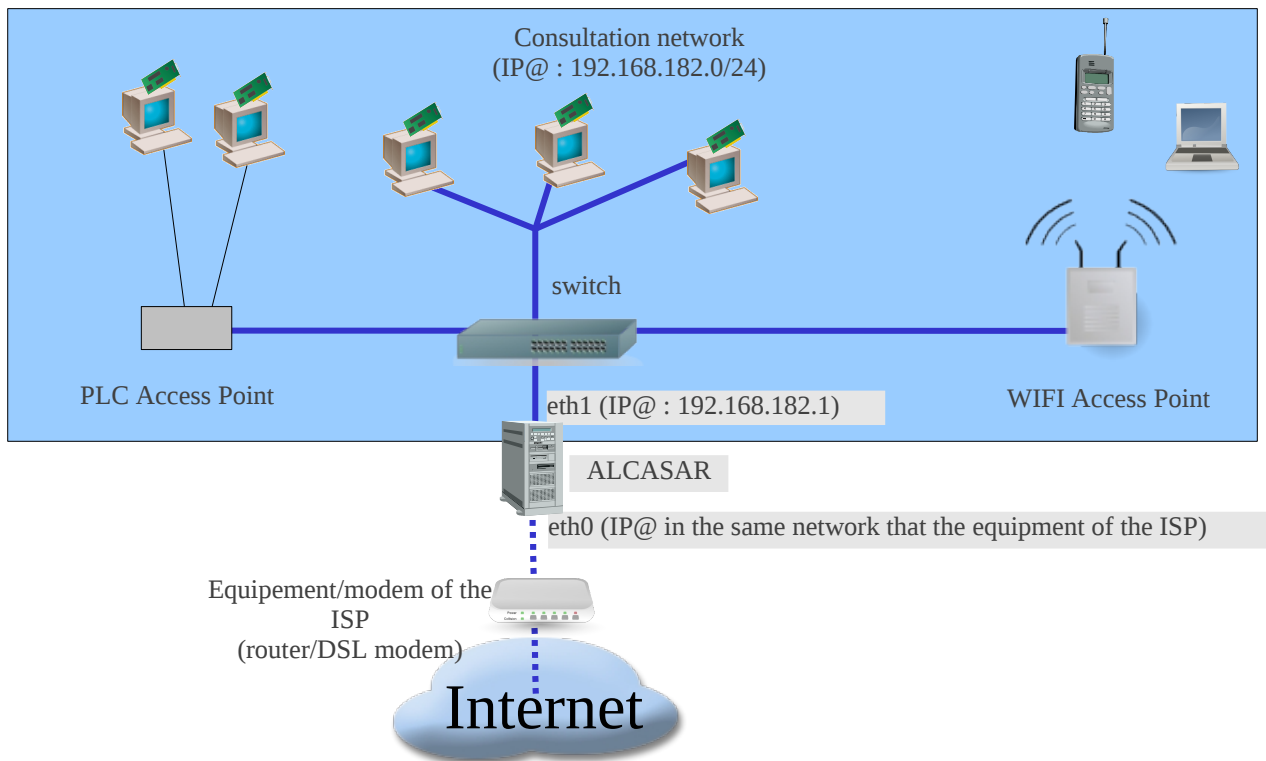
Example with default class C network (254 equipments)
* IP address of ALCASAR : 192.168.182.1/24
* Maximum number of equipments on the consultation network : 253
* Network settings of equipments :
  ○ available IP addresses : from 192.168.182.2 to 192.168.182.254 (static or dynamic)
  ○ subnet mask : 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 equipments on the consultation network : 65533
* Network settings of equipments :
  ○ 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 mémory.

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 Linux-Mandriva. 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 1GB 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.
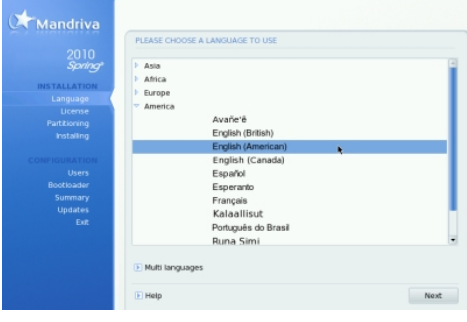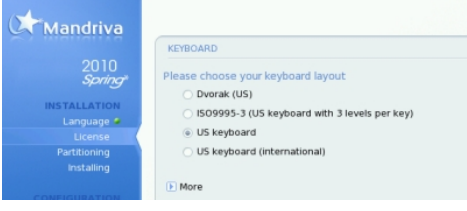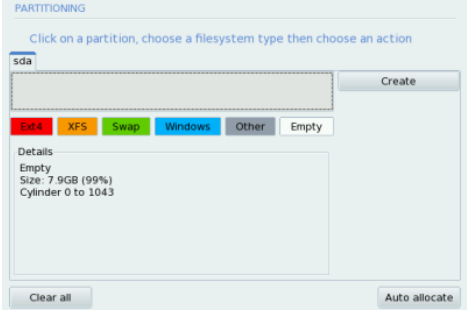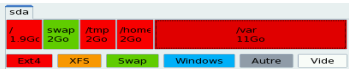
2.2. Installation of the system

The installation procedure of the operating system is the following (estimated time : 6') :
- get the Mandriva-Linux 2010.1-free ISO image file in double architectures (32 and 64 bits) : « mandriva-linux-free-2010-spring-dual.iso » (700MB). This ISO image is available on ALCASAR website as well as on several mirror sites of Mandriva. For example :
  - ftp://ftp.free.fr/mirrors/Distributions_Linux/MandrivaLinux/official/iso/2010.1/
  - ftp://ftp.lip6.fr/pub/linux/distributions/Mandrakelinux/official/iso/2010.1/
  - ftp://ftp.cru.fr/pub/linux/Mandrakelinux/official/iso/2010.1/
- 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. 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 :
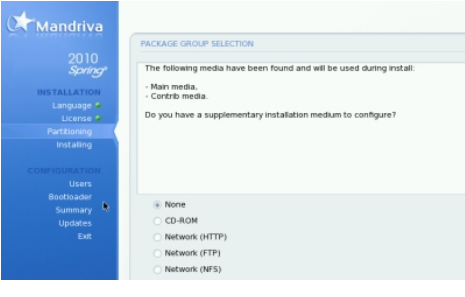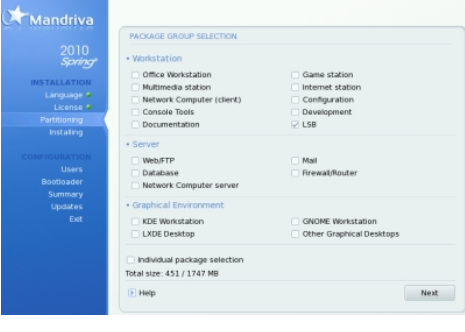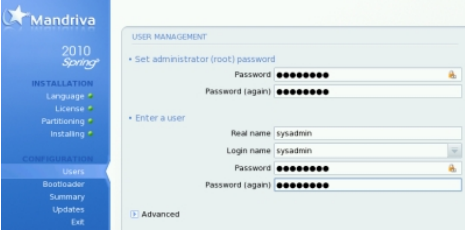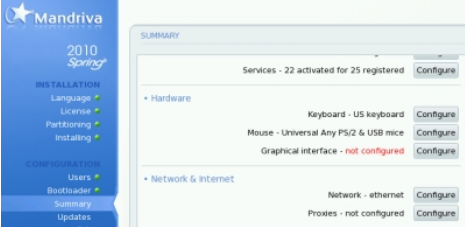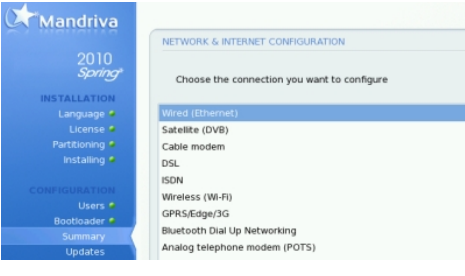
Screen display	Comments	Actions to achieve
	After starting the computer, this screen is displayed. * If the graphical mode doesn't work, you have to configure the BIOS settings to allocate more than 2MB of shares memory for the graphics card.	Select « Install Mandriva ».

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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=<nom_de_l'image_iso> of=<nom_du_périphérique_usb> bs=8M* ».

Screen display	Comments	Actions to achieve
		Select your language.
		Accept the license agreement. Info : this license agreement explain that most of software installed are free software.
		Choose your keyboard layout.
	The hard disk partitioning will be adapted to the needs of ALCASAR (see next step).	Select « Custom disk partitioning ».
	The next 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 grey area of the disk (sda) to create each new partition. Info : except the swap, all the filesystems (FS) are « Journalized FS : ext4 ».
	At the end of this operation, ans depending of the size of your hard drive, the partitioning should look like this :	- 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 ».

Screen display	Comments	Actions to achieve
	For ALCASAR, it does not need any other media	Select « None »
	Package group selection : ALCASAR only requires a minimum install of Mandriva-Linux.	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).
		Assign a password to the "root" account, then, create the "sysadmin" account and assign it a password.
	Configuration of Internet access	Click on "Configure" in "Network-Ethernet" in the "Network and Internet" section.
		Select the type of Internet connection. In the case of a broadband modem, choose "Wired (Ethernet)". Info : no test has yet been made on other types of Internet access.
	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.
		Select "Manual configuration" Info : While this is possible, it is not recommended to configure this interface in dynamic mode (bootp/DHCP) because the equipment is not intended to be mobile.
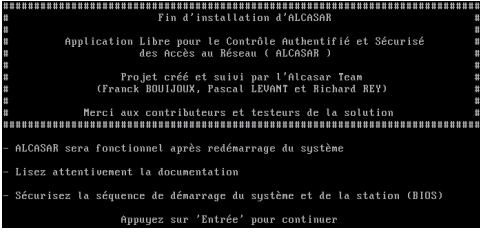
Screen display	Comments	Actions to achieve
NETWORK & INTERNET CONFIGURATION Ethernet IP settings IP address 192.168.0.100 Netmask 255.255.255.0 Gateway 192.168.0.254 DNS server 1 208.67.222.222 DNS server 2 208.67.220.220 Host name	Example : • IP address : this address must be in the same subnet as the 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 the DNS servers of the project "OpenDNS" (DNS1=208.67.222.222, DNS2=208.67.220.220) or the public DNS servers of 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		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"
Mandriva 2010 Spring — SUMMARY (Services - 22 activated for 25 registered / Hardware / Keyboard - US keyboard / Mouse - Universal Any PS/2 & USB mice / Graphical interface - not configured / Network & Internet / Network - network::connection::ethernet / Proxies - not configured / Security / Security Level - Standard / Firewall - activated)		Click on "Next"
Mandriva 2010 Spring — UPDATES (You now have the opportunity to download updated packages. These packages have been updated after the distribution was released. They may contain security or bug fixes. To download these packages, you will need to have a working Internet connection. Do you want to install the updates? ○ Yes ◉ No)	Security updates will be managed during the installation of ALCASAR.	Select "No" and click on "Next"
Mandriva 2010 Spring — 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 Mandriva Linux, consult the Errata available from: http://www.mandriva.com/en/security/advisories Information on configuring your system is available in the post install chapter of the Official Mandriva Linux User's Guide.)	The installaton is finished	Click on "Reboot" Remove the CDROM or the USB flash drive Reconfigure the BIOS to : • only boot from the hard drive ; • lock the access with a password.

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.
Use the following procedure : (estimated time : 5')

Screen display	Comments	Actions to achieve
```Mandriva Linux release 2007.0 (Official) for i586``` ```Kernel 2.6.17-5mdv on a Dual-processor i686 / 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 broadband modem, into the first card.	Wait until the link is up. Otherwise, plug 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 from 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 ~]# md5sum alcasar-2.5.tar.gz``` ```311f0884be511e8205d22e04d0d1528d alcasar-2.5.tar.gz``` alcasar-2.5.tar.gz Download Description: Cette archive contient les fichier permettant d'installer ALCASAR en version 2.5. La documentation est disponible sur ce site et dans la page de gestion graphique du portail. MD5 : 311f0884be511e8205d22e04d0d1528d Submitted On: 01 Mar 2012 Submitted By: rexy (alcasar)	- 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 MD5 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* *md5sum 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*
```ALCASAR V2.2 Installation``` ```Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau``` ```Tests des paramètres réseau :....```	- 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-5.1.6-1mdv2007.0.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 V2.2 Installation``` ```Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau``` ```Entrez le nom de votre organisme :```	- Enter the name of your organization (without spaces)	Exemple : rasacla Info : This name is mandatory. The only characters allowed are : [a-z] [A-Z] [0-9] [-]
```ALCASAR V2.2 Installation``` ```Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau``` ```Par défaut, l'adresse IP d'ALCASAR sur le réseau de consultation est : 192.168.182.1/24``` ```Voulez-vous utiliser cette adresse et ce plan d'adressage (recommandé) (O/n)? :```	You can change the IP address and the default network addressing plan of the consultation network.	Enter « Y » or « N » Info : If you type "N", the script will ask you the IP address of ALCASAR and the subnet mask in CIDR

Screen display	Comments	Actions to achieve
		notation (ex: 172.16.0.1/16)
ALCASAR V2.2 Installation / Application Libre pour le Contrôle d'Accès Sécurisé et Authentifié au Réseau / Définissez un premier compte d'administration du portail : / Nom : _	- Enter the username and password for a first ALCASAR administrative account.	Info : This account is used to administer ALCASAR by using the GUI located at http://alcasar. This is not a user account. You cannot use it to connect to the Internet.
Fin d'installation d'ALCASAR / Application Libre pour le Contrôle Authentifié et Sécurisé des Accès au Réseau (ALCASAR) / Projet créé et suivi par l'Alcasar Team / (Franck BOUIJOUX, Pascal LEVANT et Richard REY) / Merci aux contributeurs et testeurs de la solution / - ALCASAR sera fonctionnel après redémarrage du système / - Lisez attentivement la documentation / - Sécurisez la séquence de démarrage du système et de la station (BIOS) / Appuyez sur 'Entrée' pour continuer	The installation is complete. The system will be restarted to synchronize all components of ALCASAR.	Once the system is restarted, start an equipment and log on to the portal to create the first users (http://alcasar). Read the operating instructions carefully ("alcasar-Operating instructions")

3. Uninstall, reinstallation and update of ALCASAR

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. 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* ».

Organization name :	
Users authentication page	This page is displayed when a browser tries to access a website.
Portal page enabling : - access to the ALCASAR control center. - authenticated user to log out - user to change his password - installation of the certificate of the Certification Authority (C.A.) in the browsers.	http://alcasar Info : The possibilities of the ALCASAR control center are described in the "ALCASAR-Operating instructions" document.
Linux accounts	root password : .... sysadmin password : ....
1st ALCASAR WEB administrative account	.... 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 :____.____.____.____ • ____.____.____.____/___ • ____.____.____.____/___