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## CHAPTER 1 – Installation of the Operating System

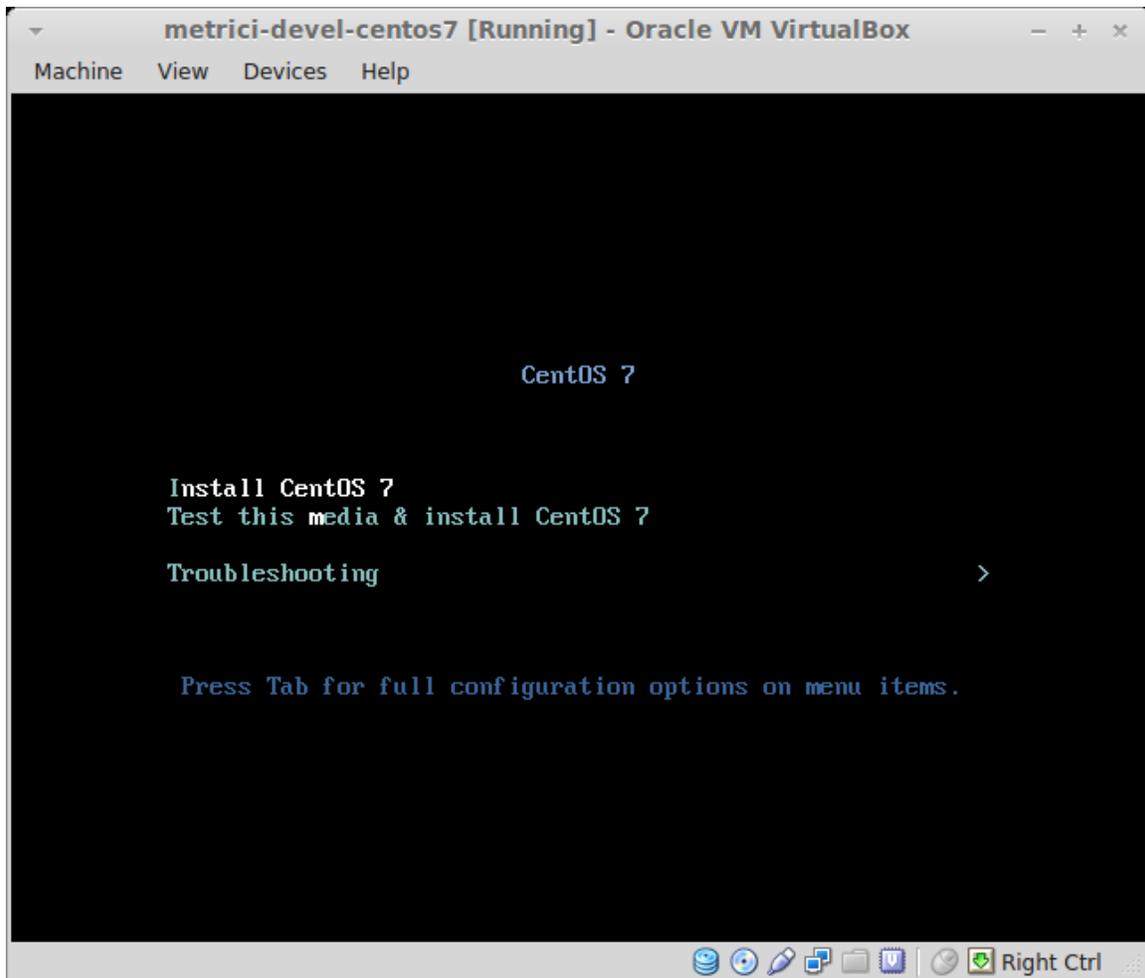
**Metrici LPR** is a software solution for the recognition of license plates mounted on vehicles, licensed and labelled in accordance with existing standards in each country.

In order to run, it requires a computer equipped with Linux 64 bit operating system. Next, we will describe the recommended installation procedure, using the CentOS 7 distribution.

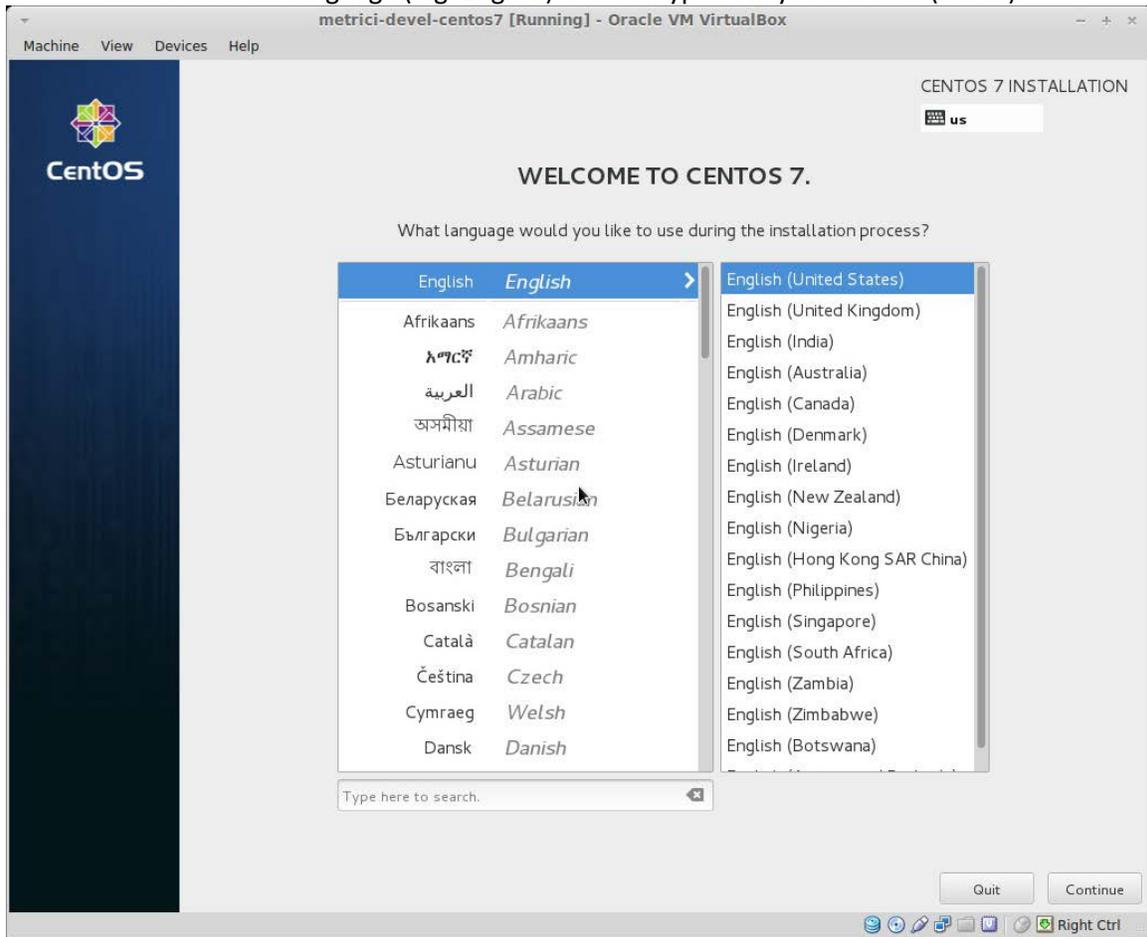
The installation DVD image can be downloaded at:

[http://support.metrici.ro/operating\\_systems/CentOS-7.0-1406-x86\\_64-DVD.iso](http://support.metrici.ro/operating_systems/CentOS-7.0-1406-x86_64-DVD.iso)

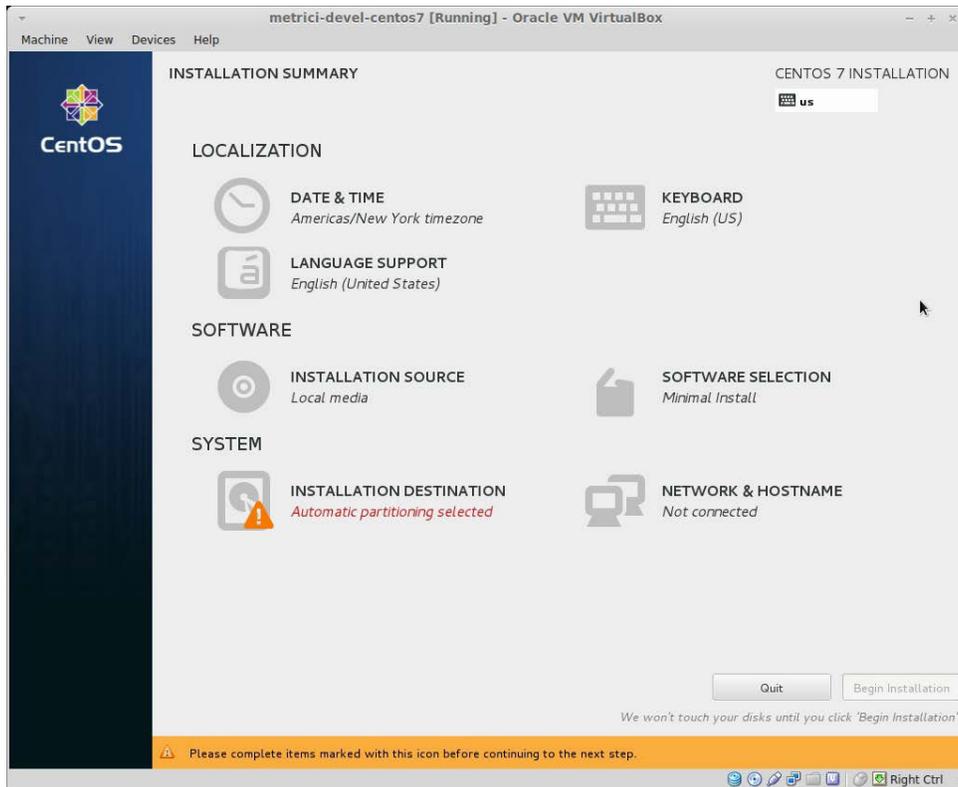
After booting, choose the option: **Install CentOS 7**.



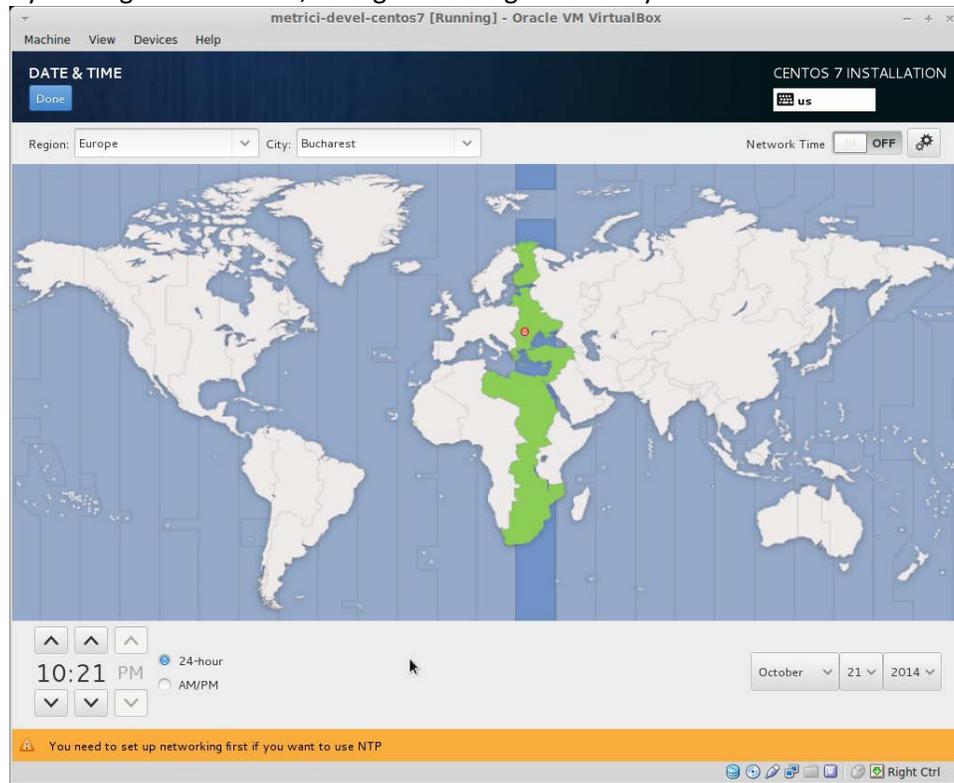
Then select the language (e.g. English) and the type of keyboard used (i.e. us).



Before starting the actual installation, change the default settings by pressing the appropriate keys, in sequence.

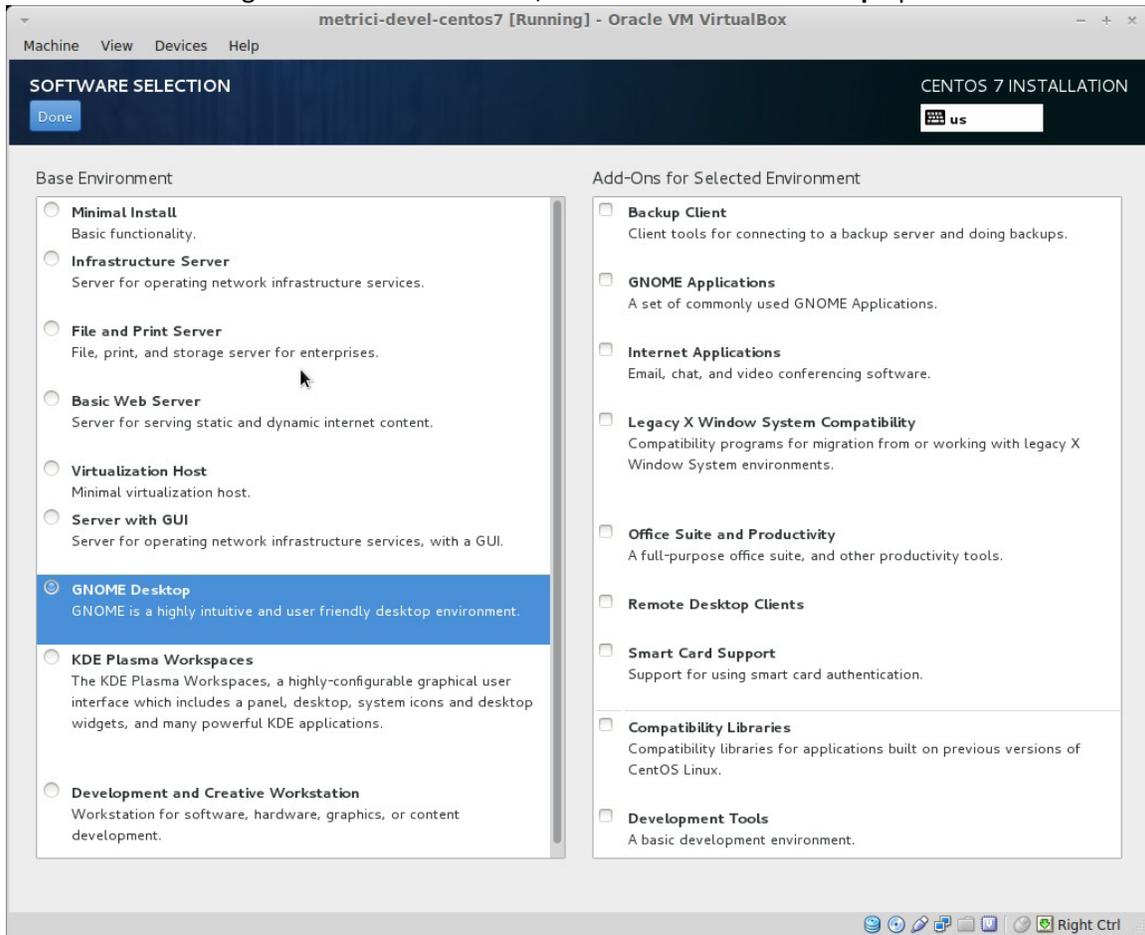


By clicking **DATE & TIME**, configure the region and city.

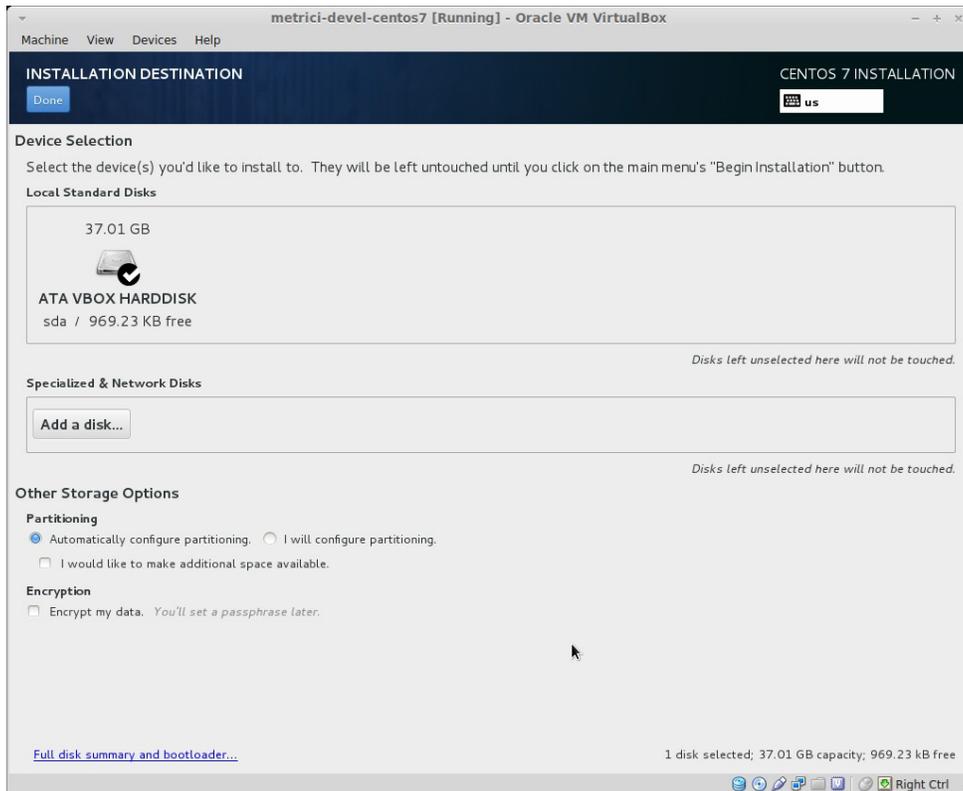


Return to the summary screen, by clicking **Done**, located on the upper left.

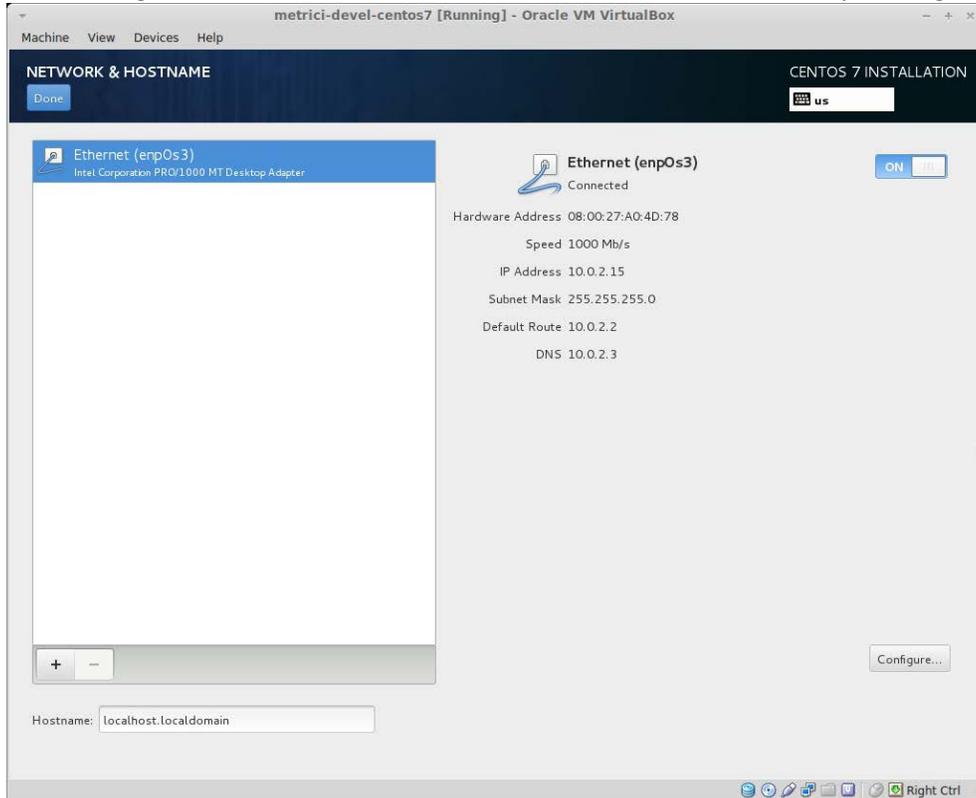
After clicking **SOFTWARE SELECTION**, select the **GNOME Desktop** option.



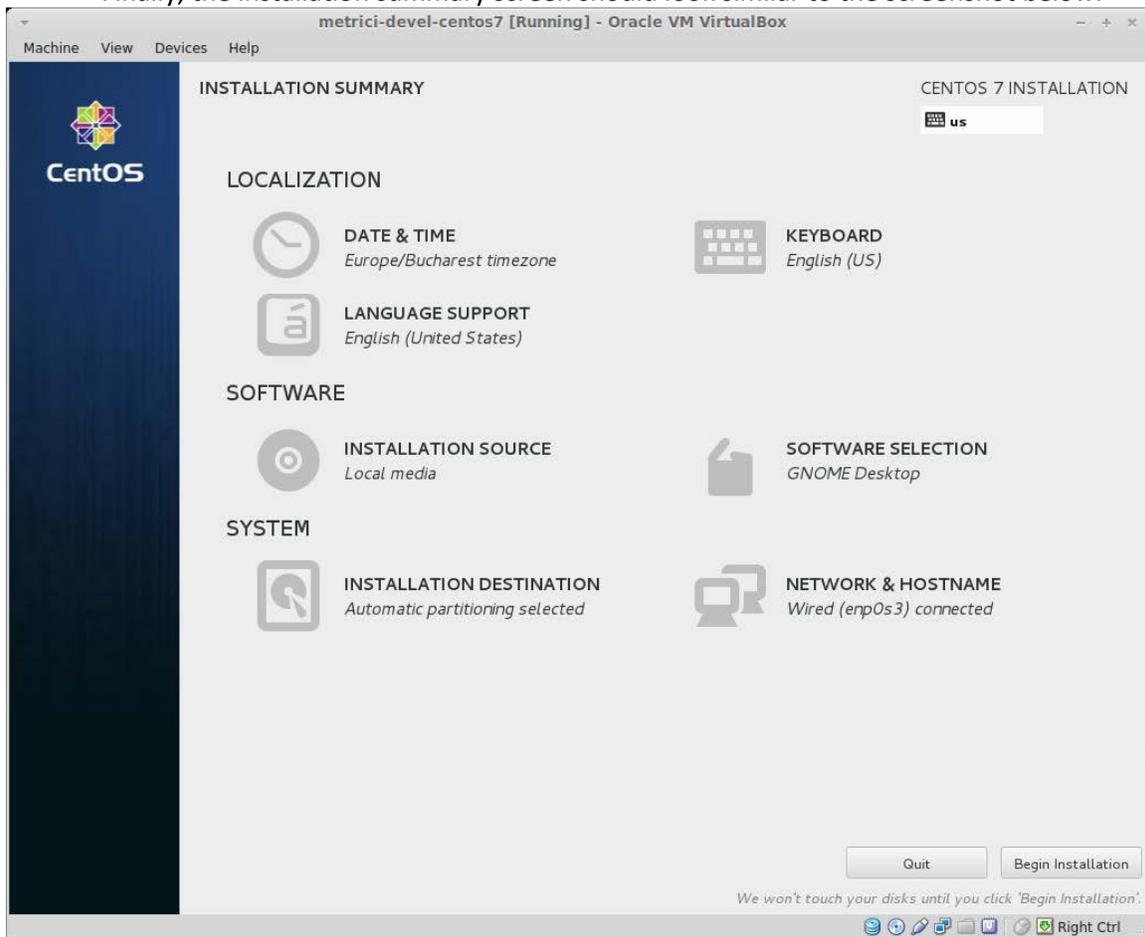
After clicking the **INSTALLATION DESTINATION**, select the local disk where you want to install the software and the partitioning type thereof (e.g. **Automatically configure partitioning**)



After clicking **NETWORK & HOSTNAME**, enable the network interface by clicking **ON**.

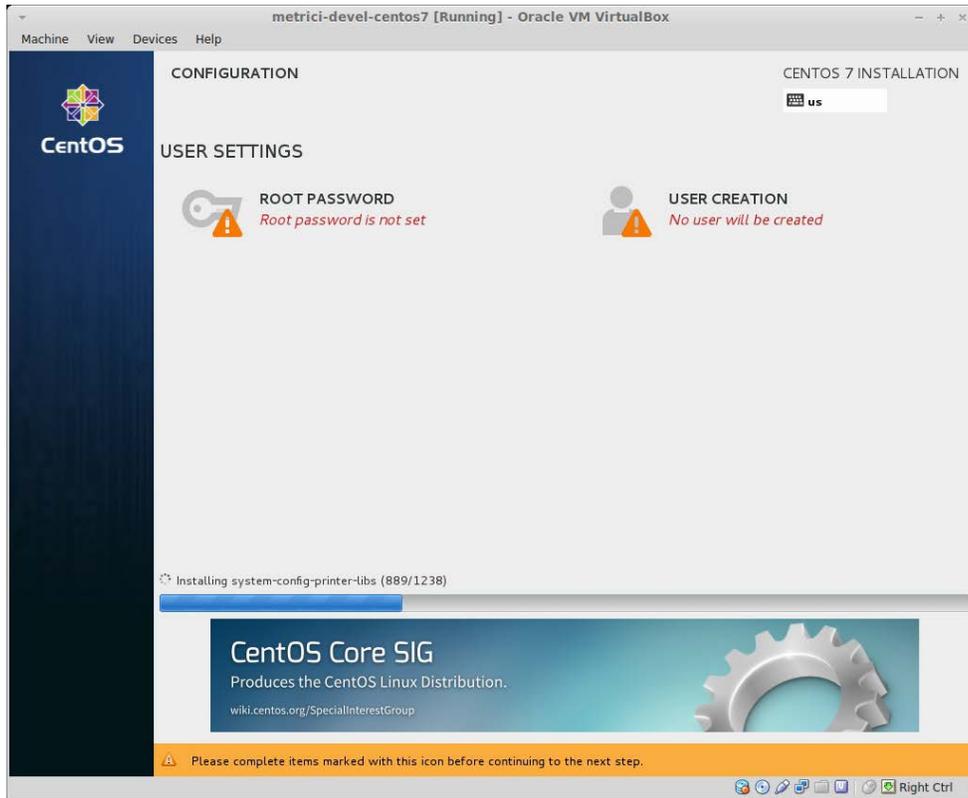


Finally, the installation summary screen should look similar to the screenshot below.

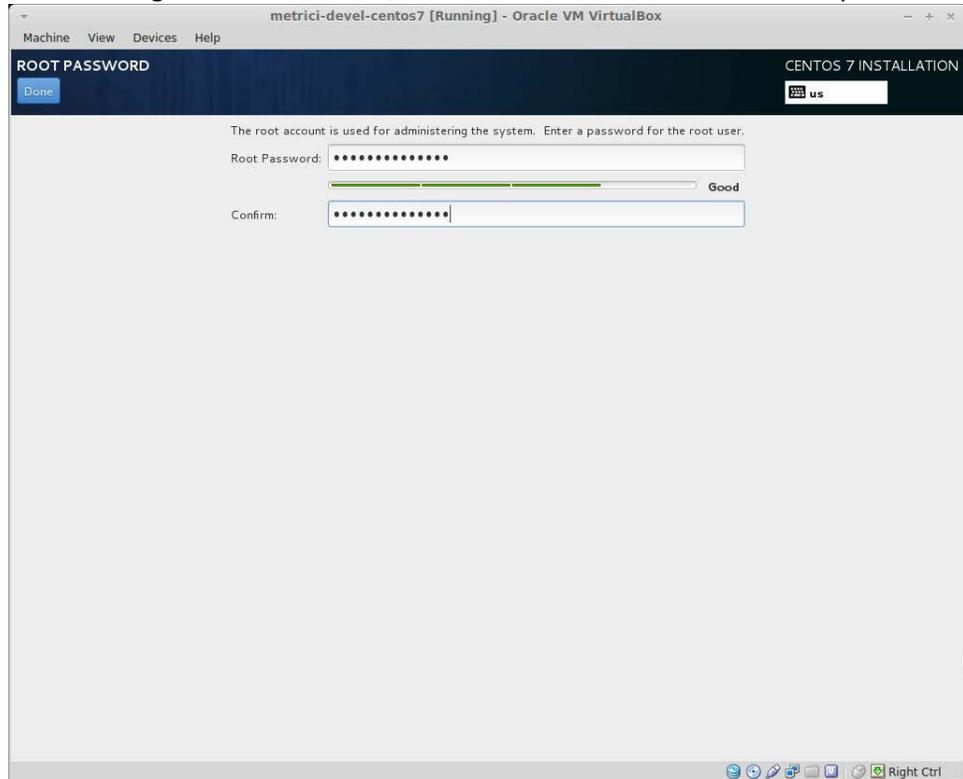


Start the installation by clicking **Begin installation**.

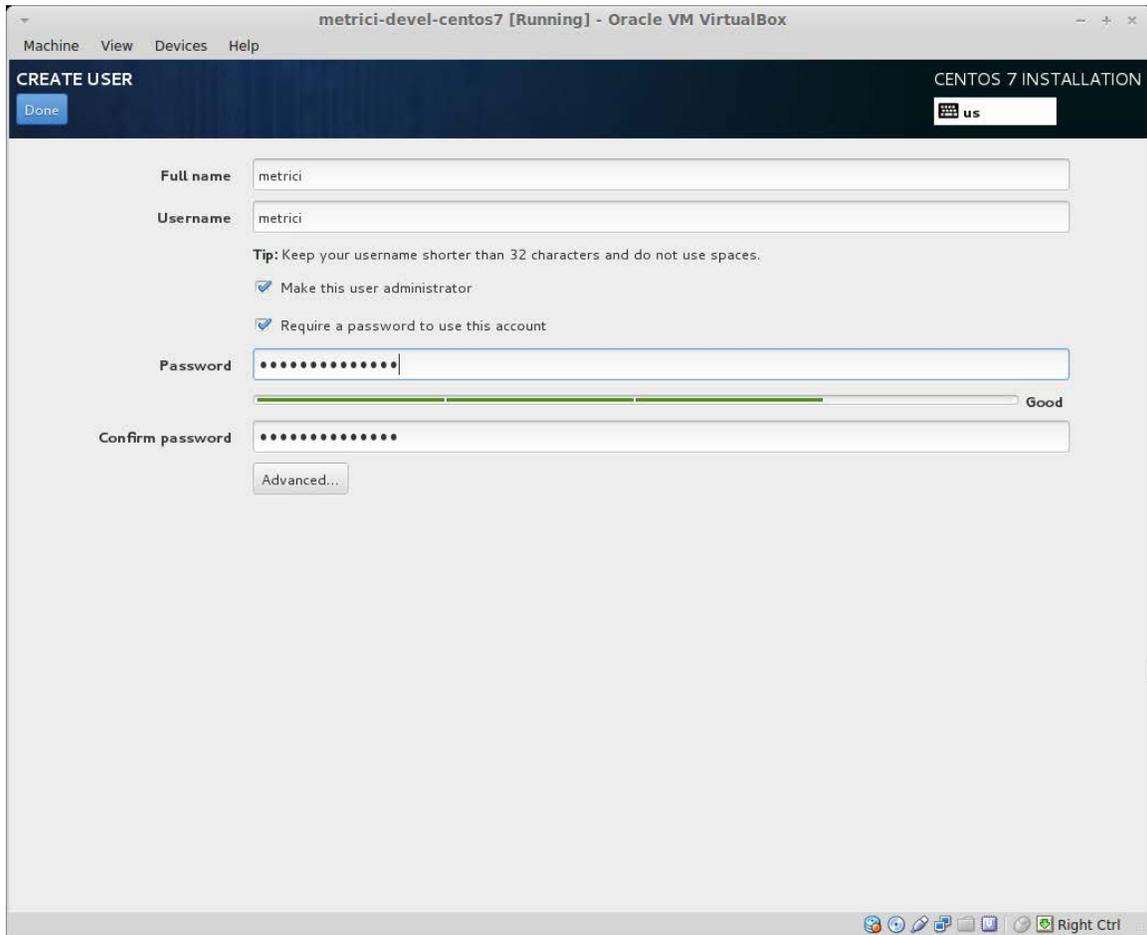
While the installation is running, you can configure the root password (administrator) and you can add a system user account.



After clicking **ROOT PASSWORD**, enter and confirm the administrator password.



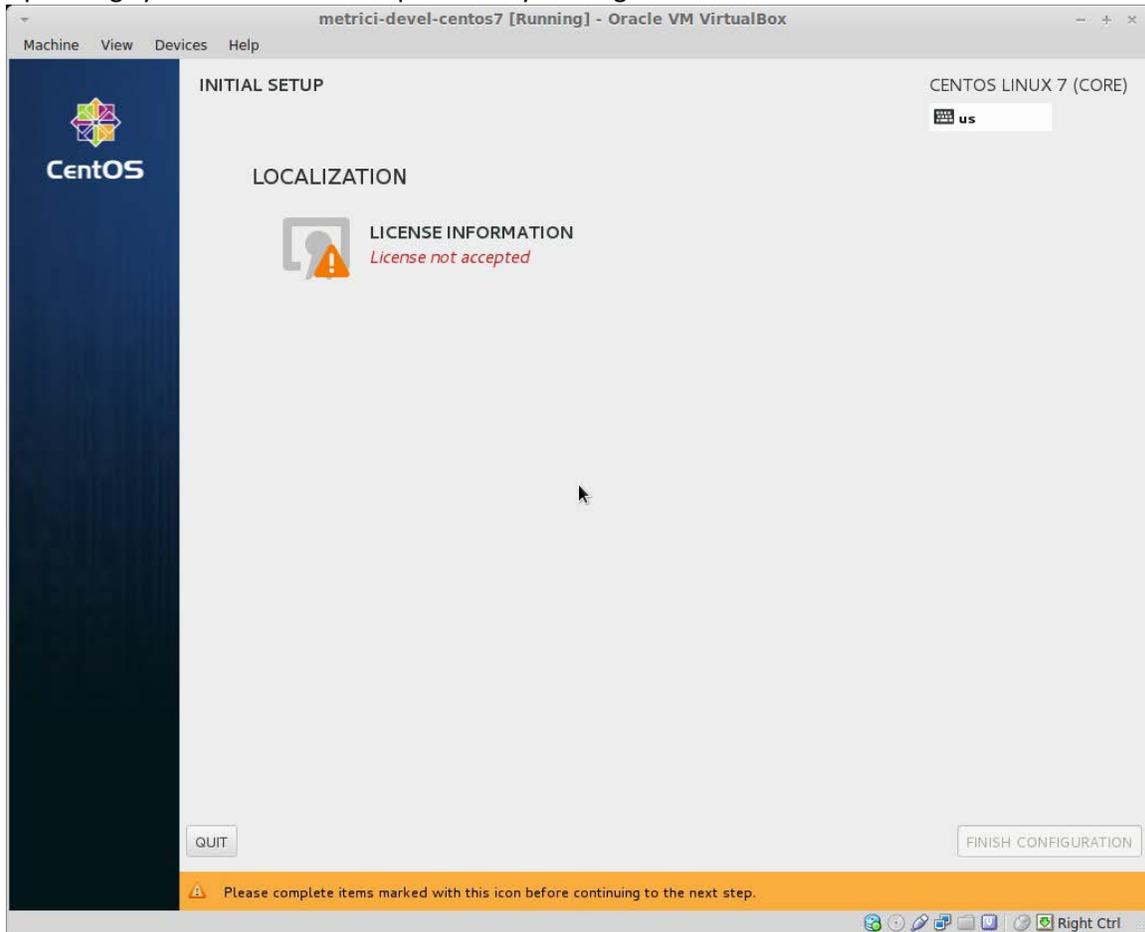
After clicking **CREATE USER**, add a new user account. **Do not forget to check the option Make this user administrator.**



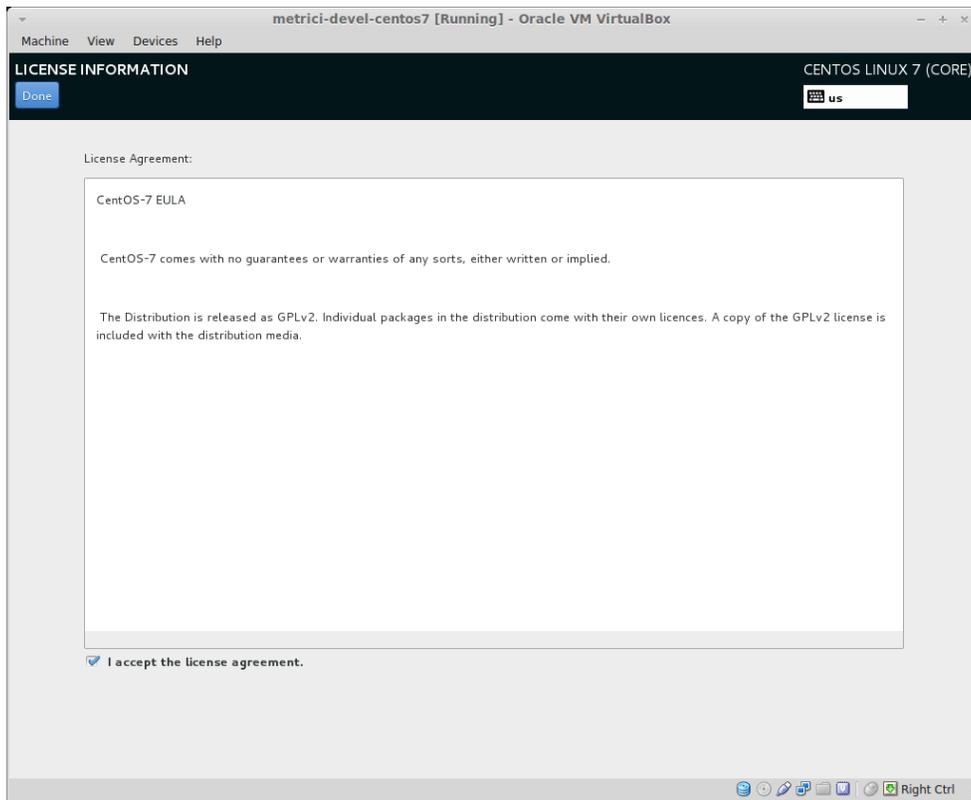
After completing the installation, reboot the system by clicking **Reboot**.

## CHAPTER 2 - Configuration after First Boot

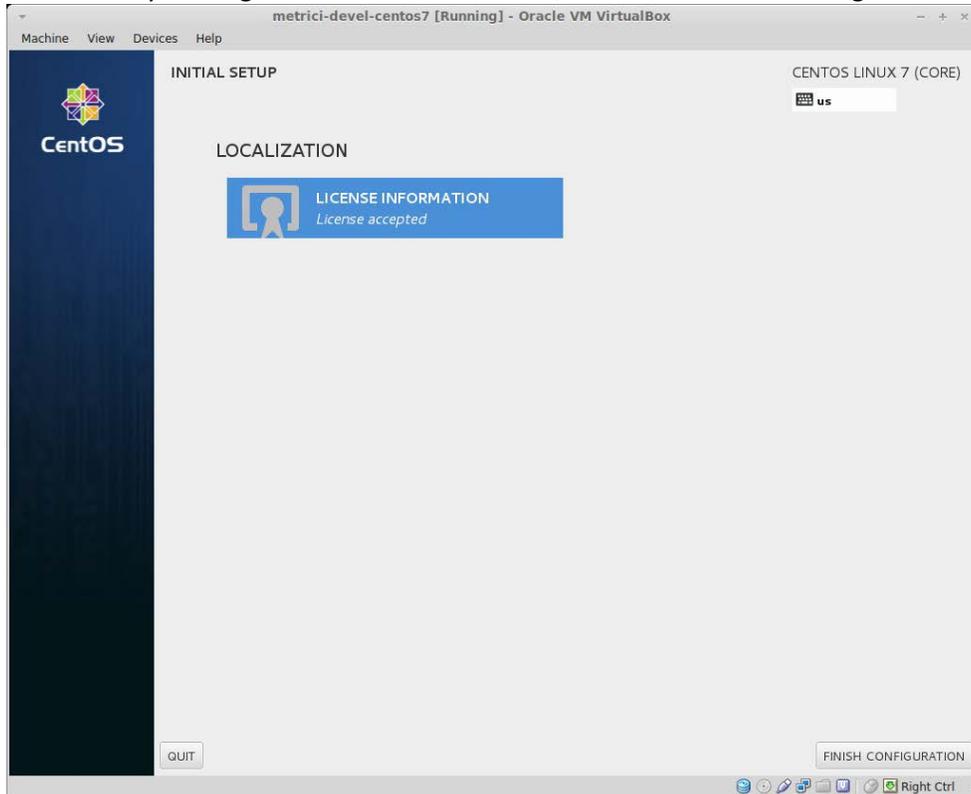
After the first boot of the computer, the system will ask you to read the license of the operating system. Perform this operation by clicking **LICENSE INFORMATION**.



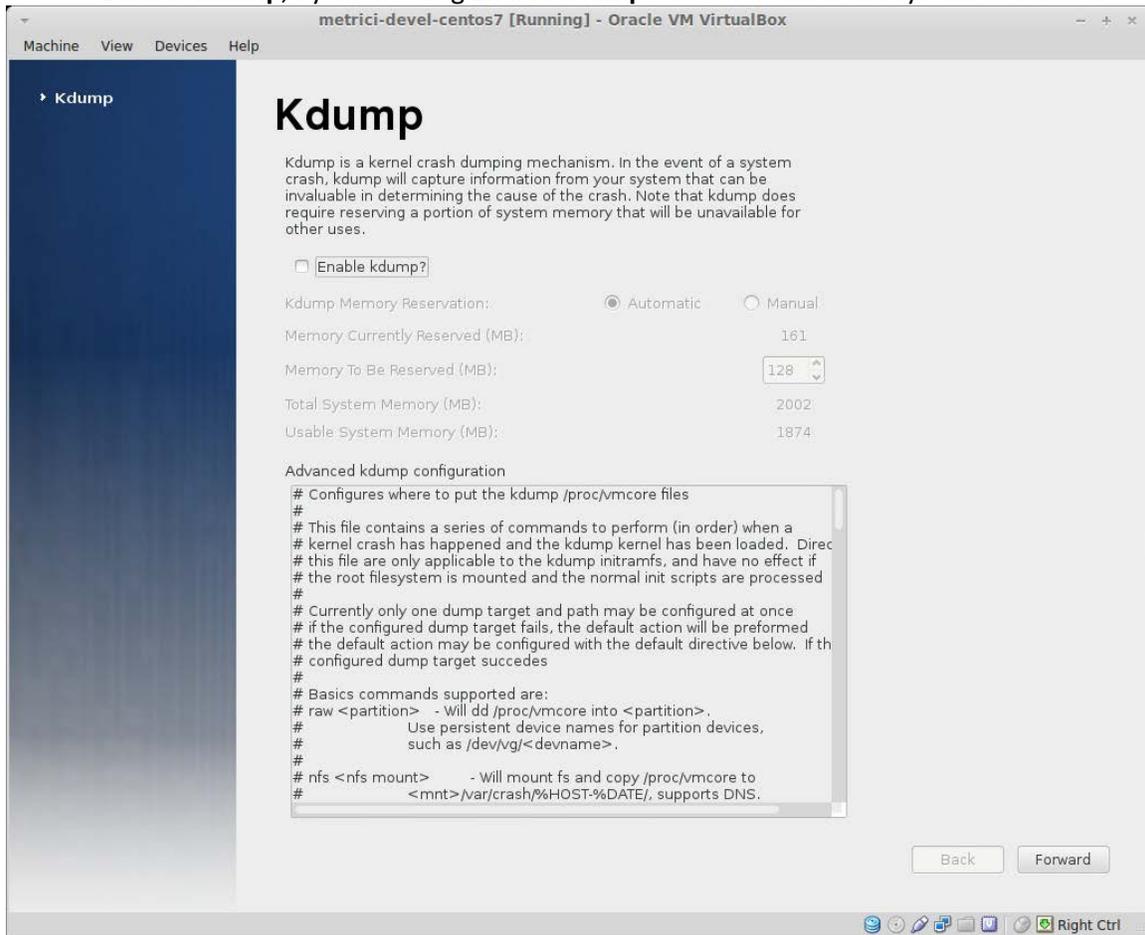
If you agree with the terms mentioned, confirm by checking **I accept the license agreement**.



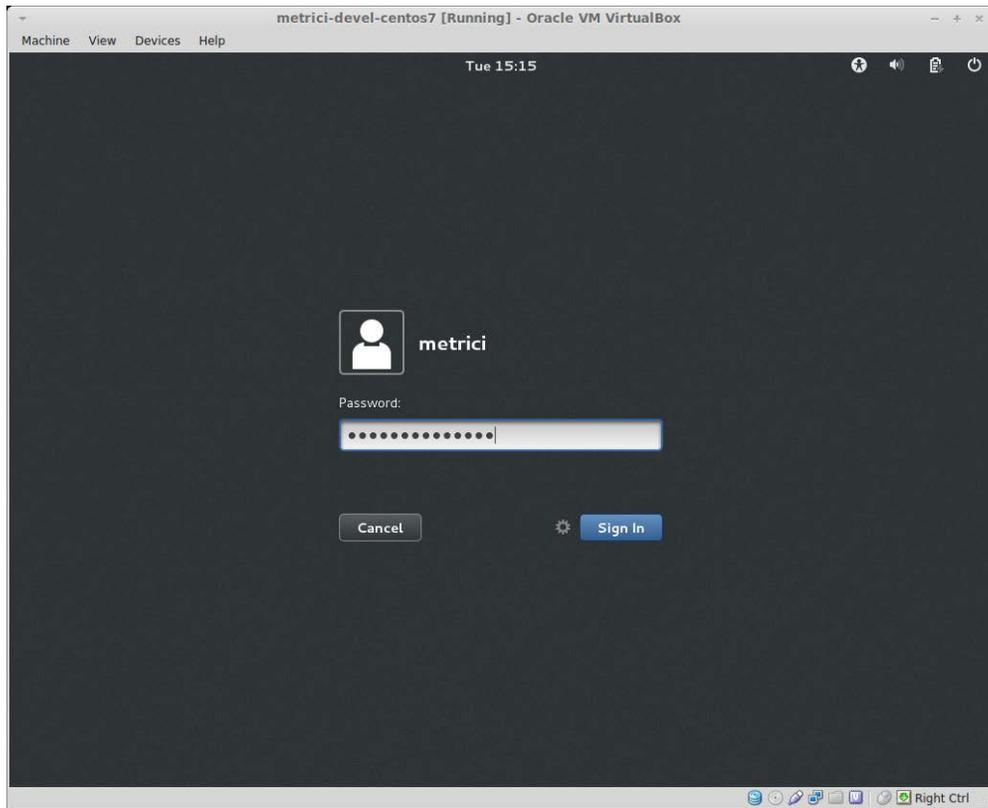
Continue by clicking **FINISH CONFIGURATION**, located in the bottom right.



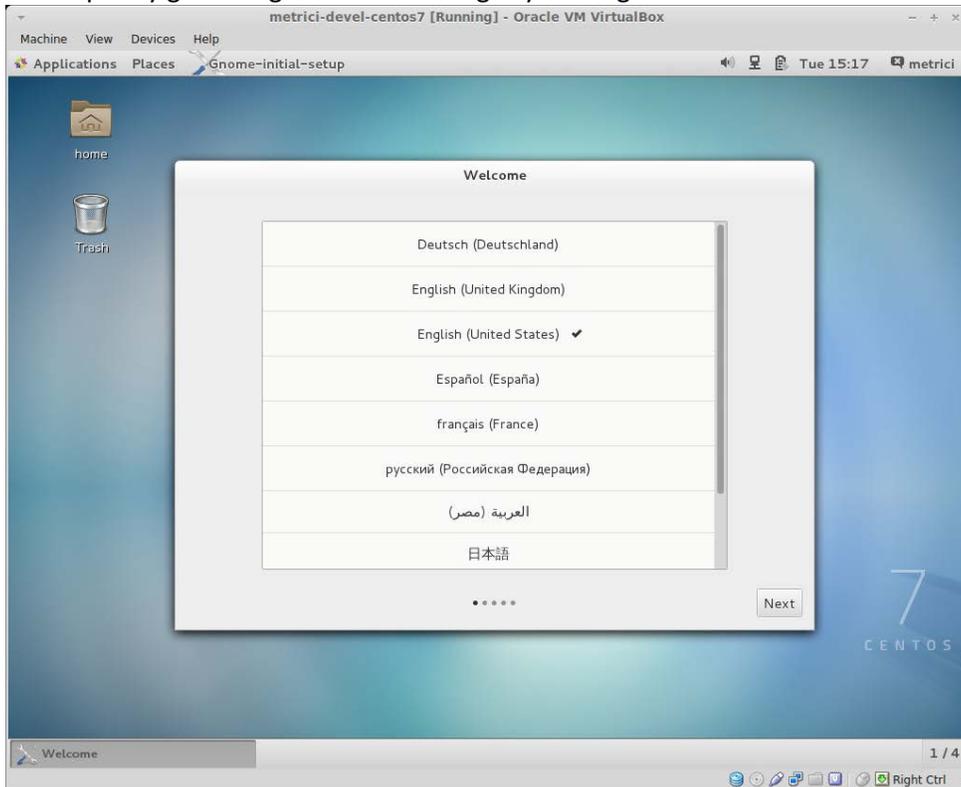
Disable **Kdump**, by unchecking **Enable kdump?** and then allow the system to reboot.

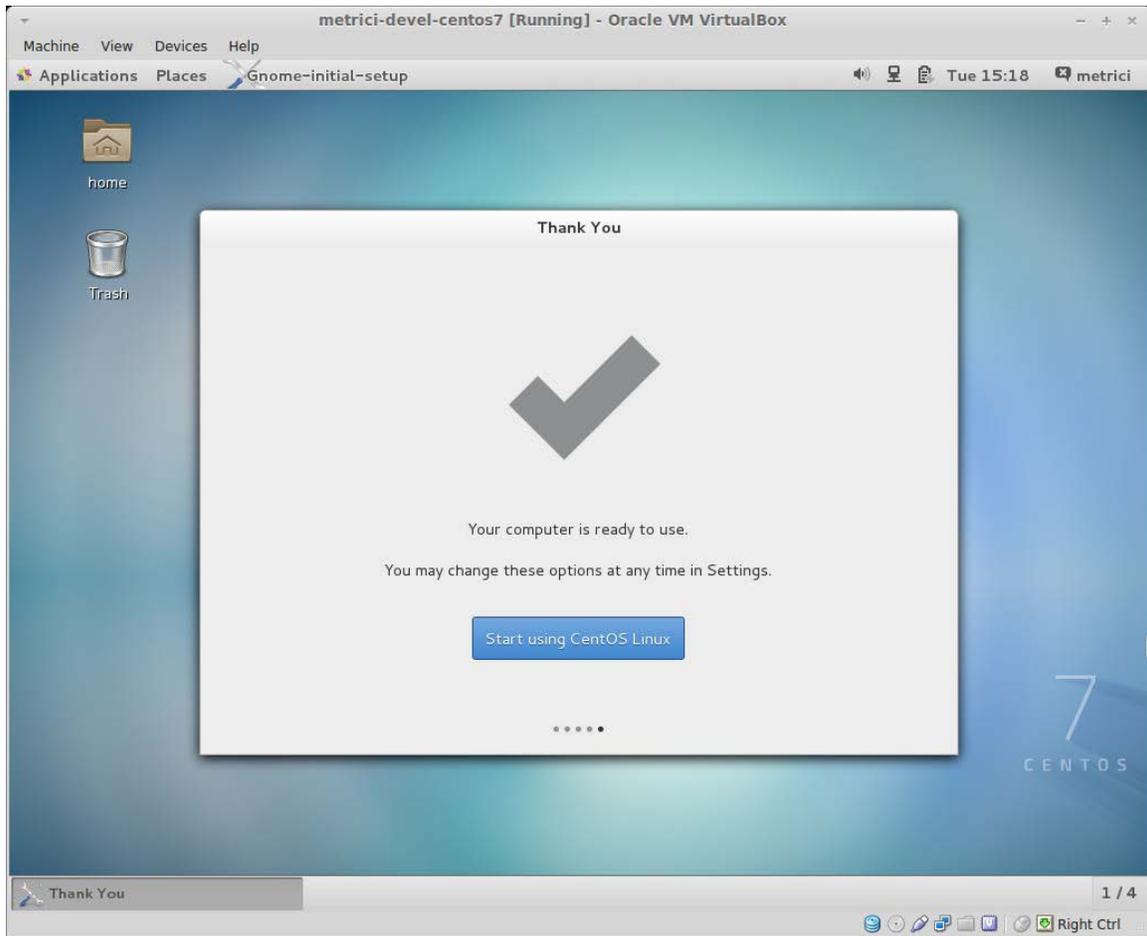


After reboot, login by using the password defined during installation.



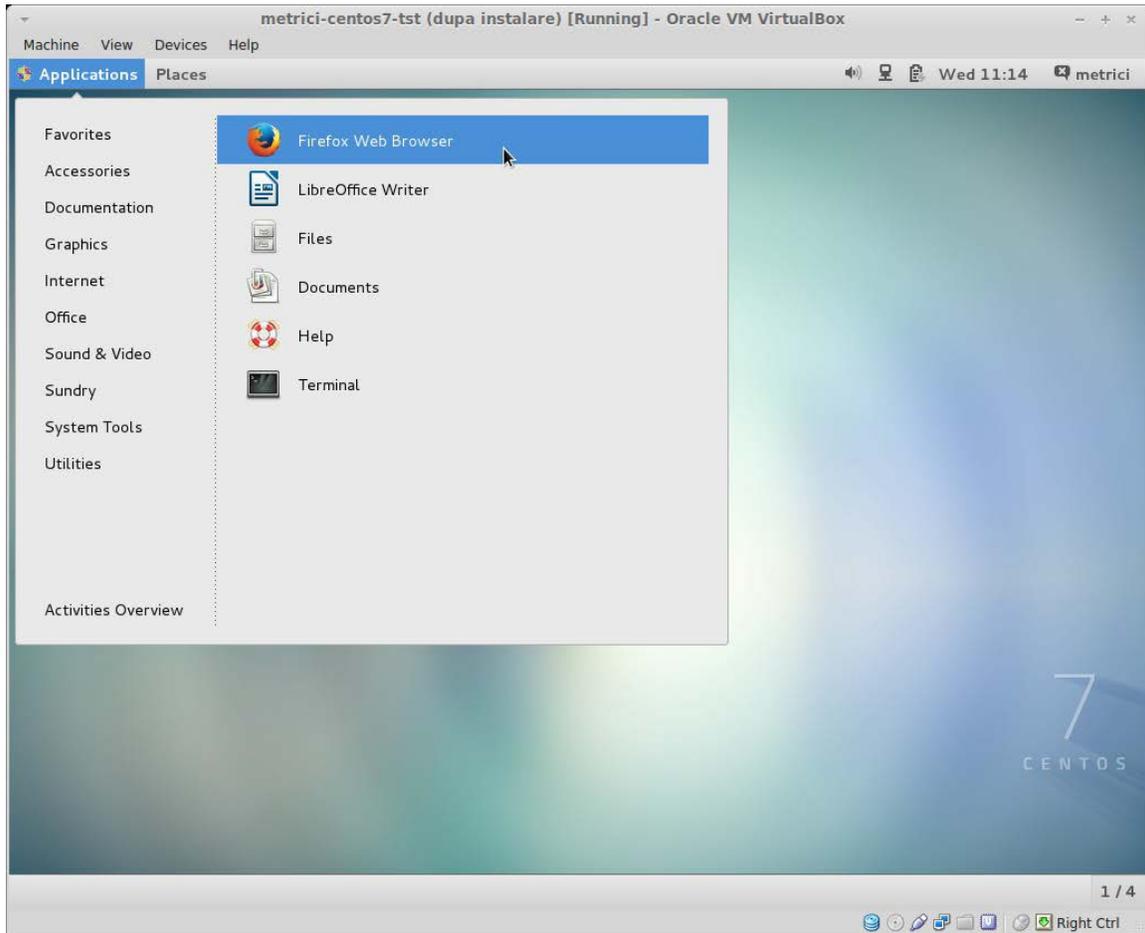
Then quickly go through the final settings by clicking Next.



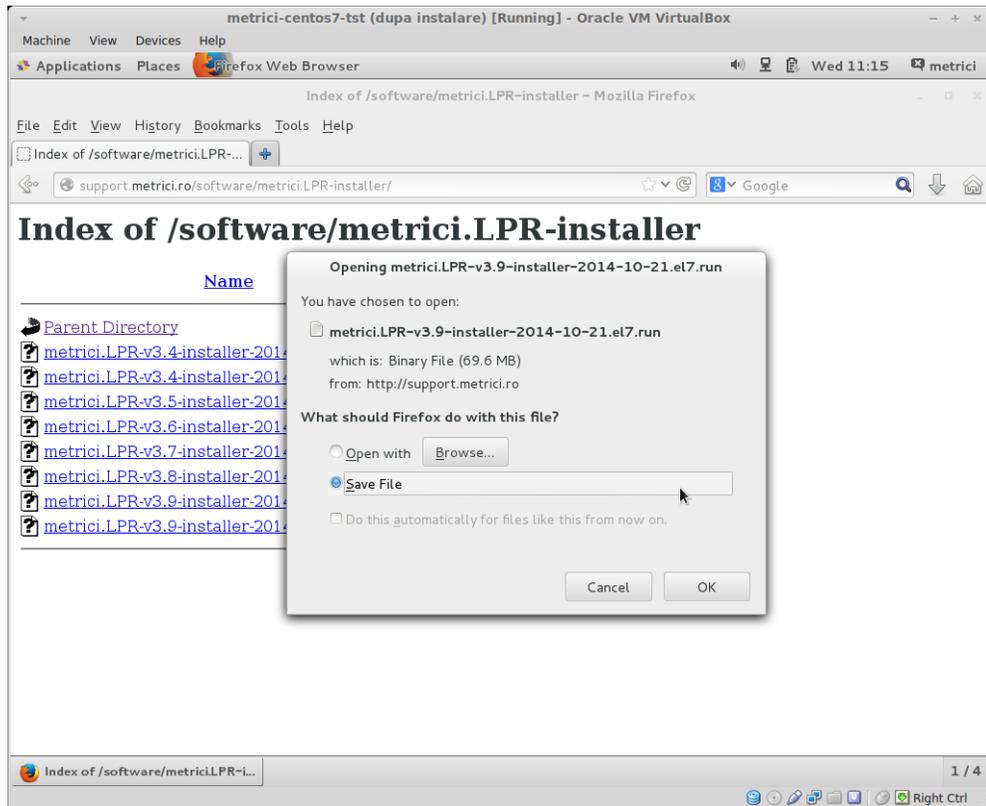


## CHAPTER 3 - Download and Install Metrici LPR

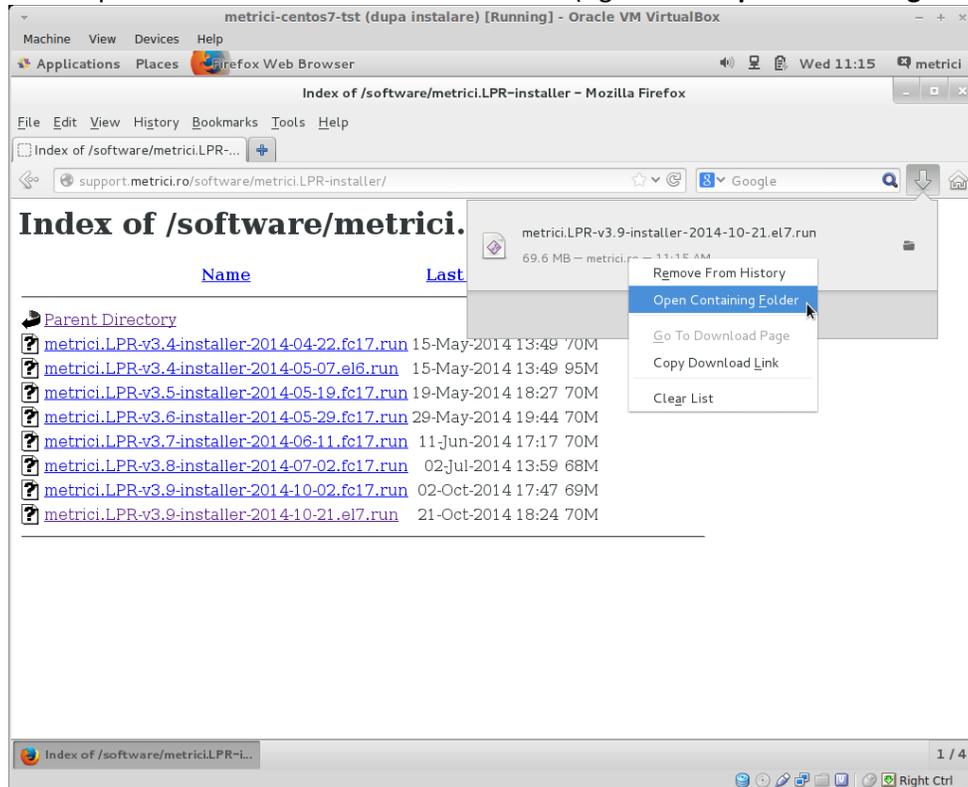
To download the Metrici LPR installation kit, open Mozilla Firefox browser by clicking on the **Applications** menu in the top left.



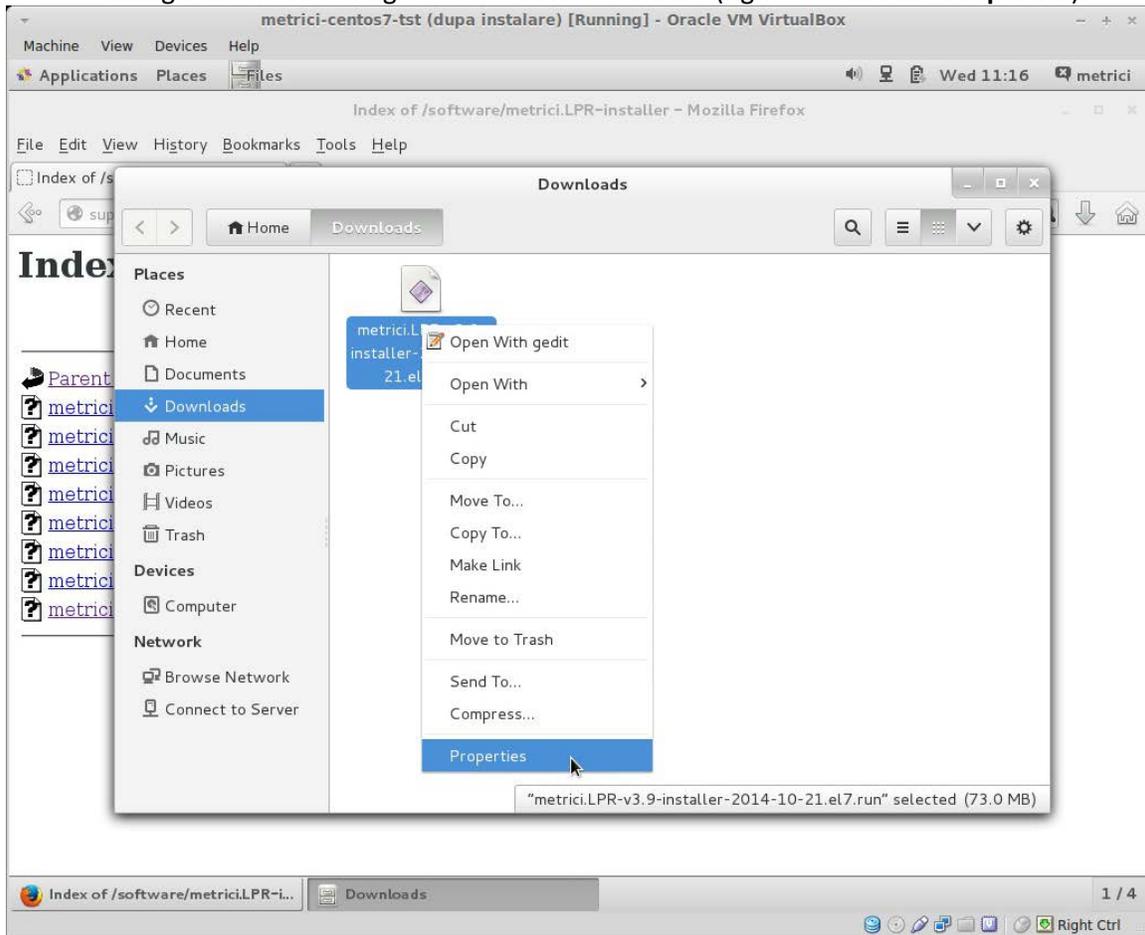
Then access the address <http://support.metrici.ro>. In the section **Software / Metrici.LPR-installer**, you will find the latest version of the installation kit, containing the suffix **el7.run**. Download it and save it on your hard drive.



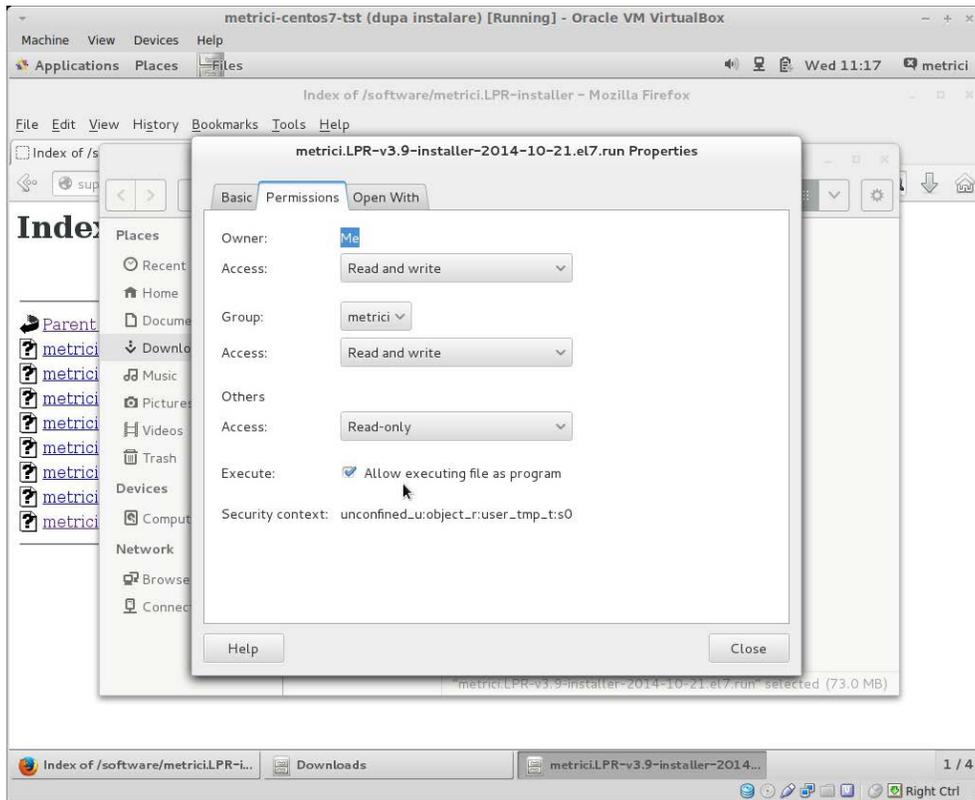
Then open the folder where the file was saved (right click - **Open Containing Folder**).



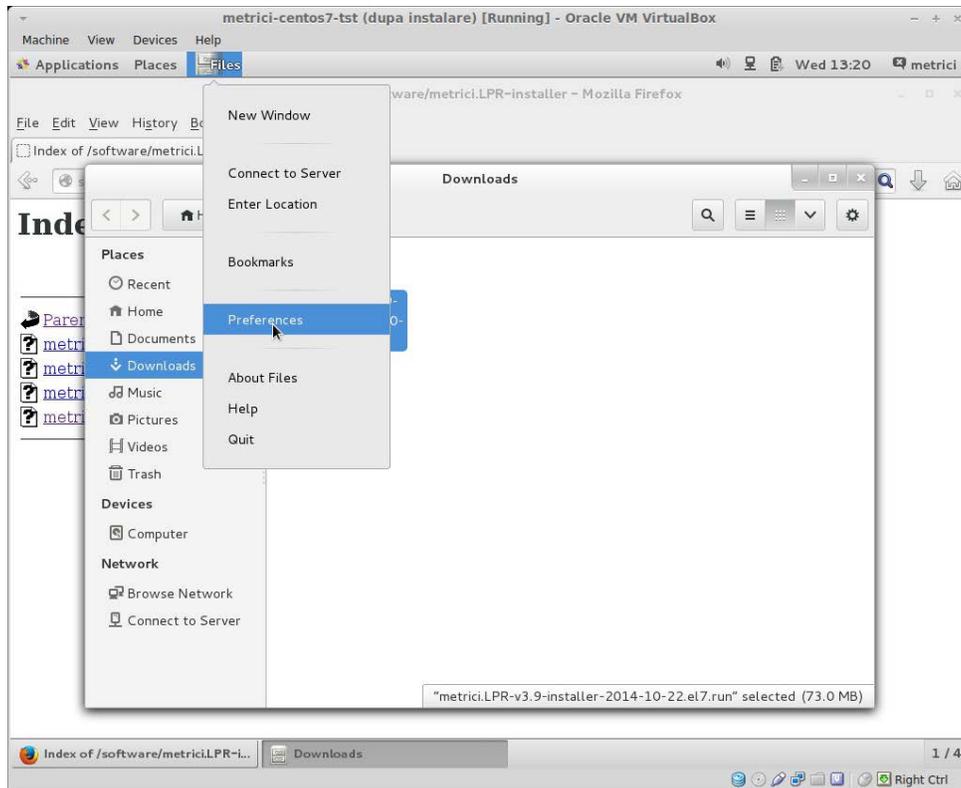
Change the execution rights of the downloaded file (right click on File - **Properties**).



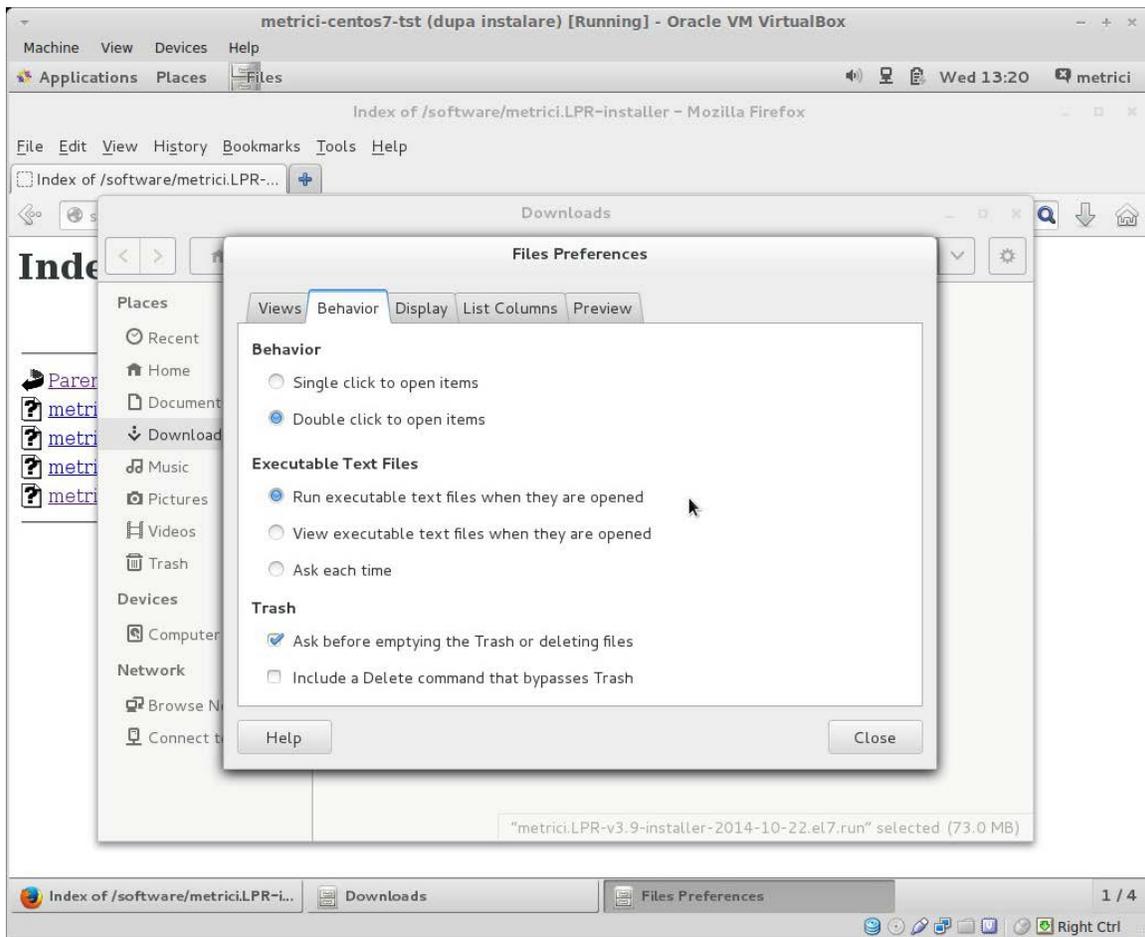
In the **Permissions** tab, check the option **Allow executing file as program**.



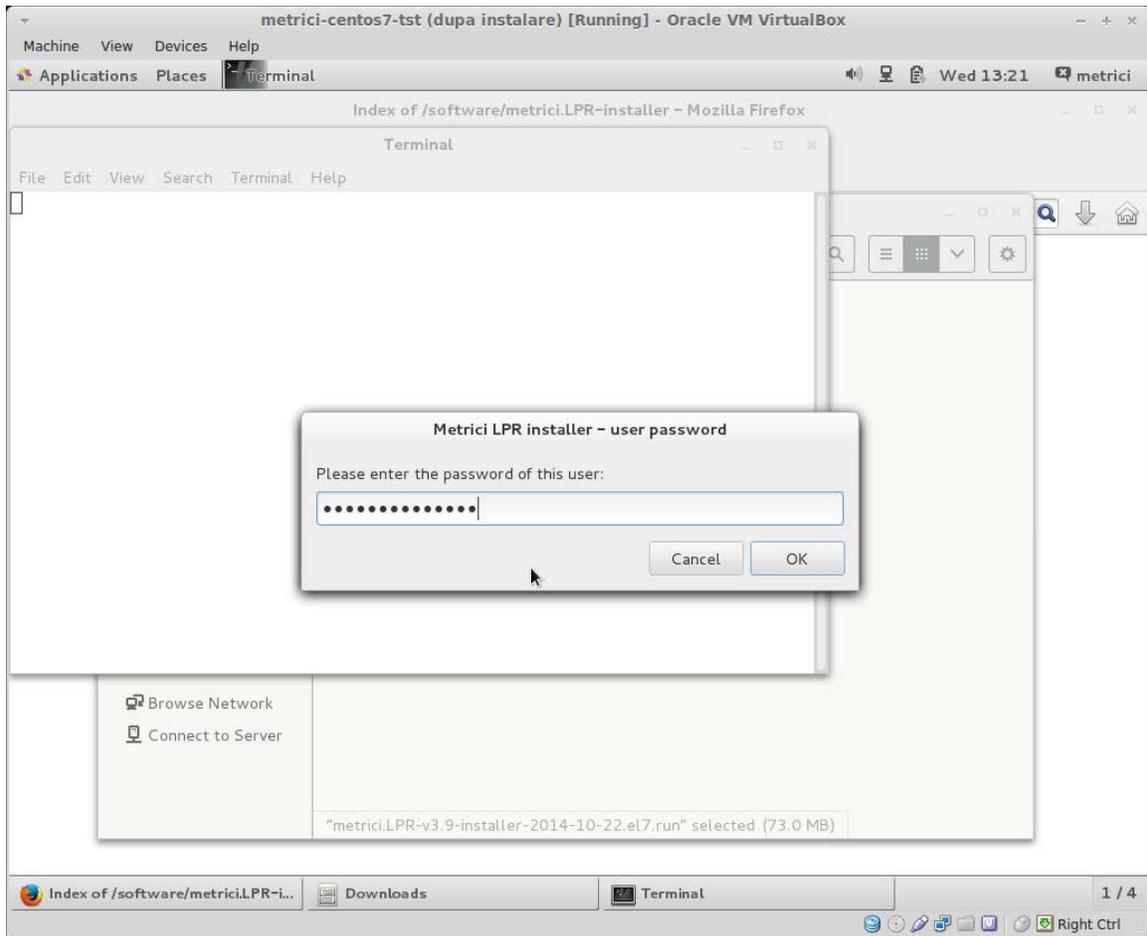
Access the **Preferences** submenu from the **Files** menu on the status bar above.



Check the option **Run executable text files when they are opened** in the **Behavior** tab.



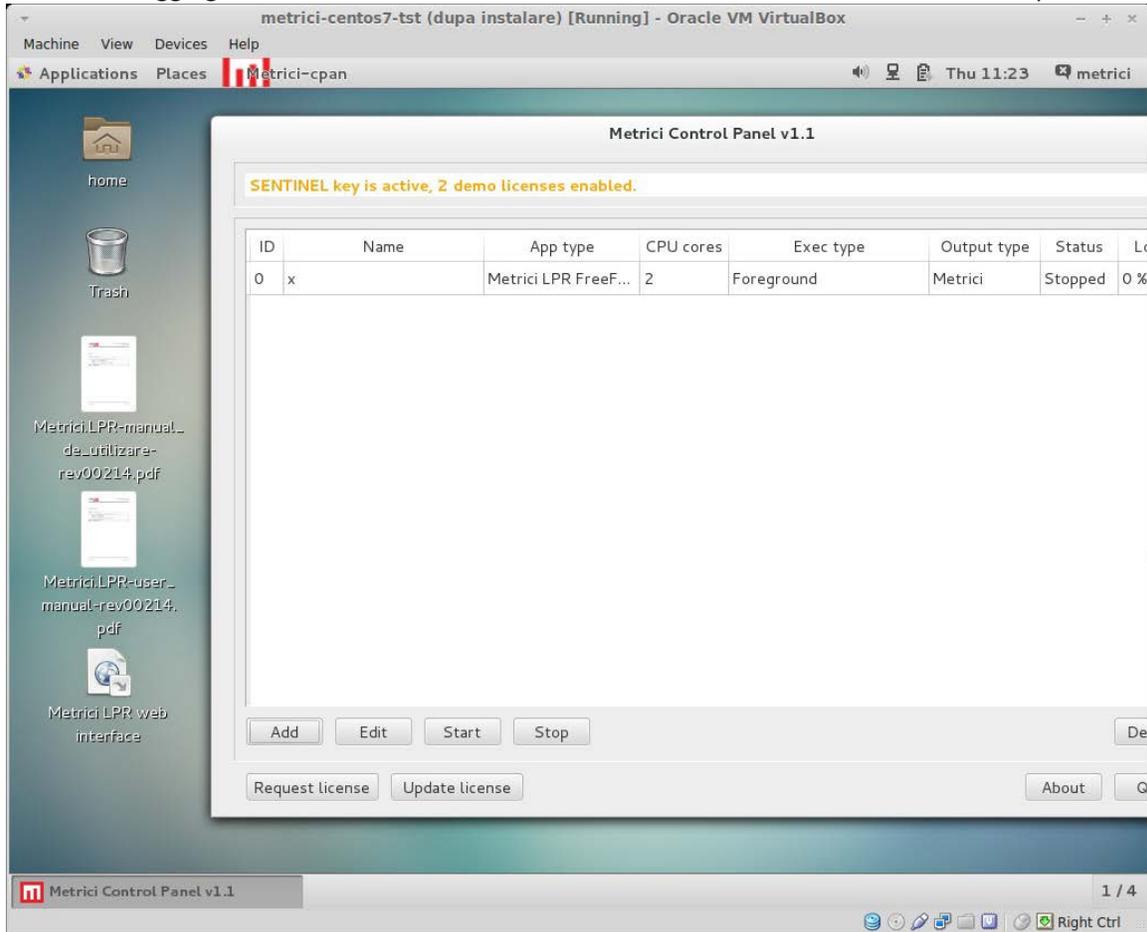
Then launch the installation kit (double click). When required, enter the system password of the user you are logged in with.



Wait for the installation to complete, and then reboot the system.

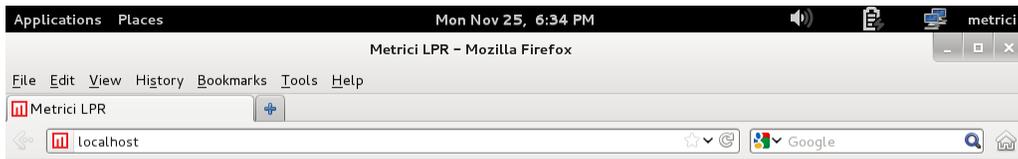
## CHAPTER 4 - First Steps

The **Metrici LPR** installation software modifies the default configuration of the Fedora desktop, by improving the user experience of users unfamiliar with Linux. The automatic logging is thus enabled and a few useful shortcuts are created on the desktop.



The **Metrici LPR Web interface** allows the access to the reporting interface where you can view the recognised license plates.

**Metrici LPR** allows the configuration of locations, within which you can define detection cameras. It is necessary to define at least one location and one camera. To do this, click on the shortcut **Metrici LPR web interface**. You can log in by using the following information: e-mail: [metrici@metrici.ro](mailto:metrici@metrici.ro) and password: **metriciadmin**. Please change this password after login.



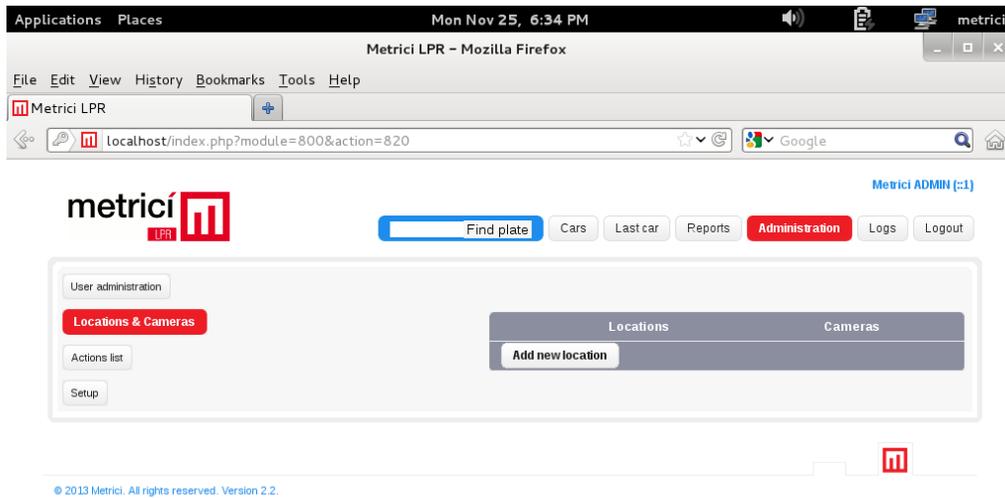


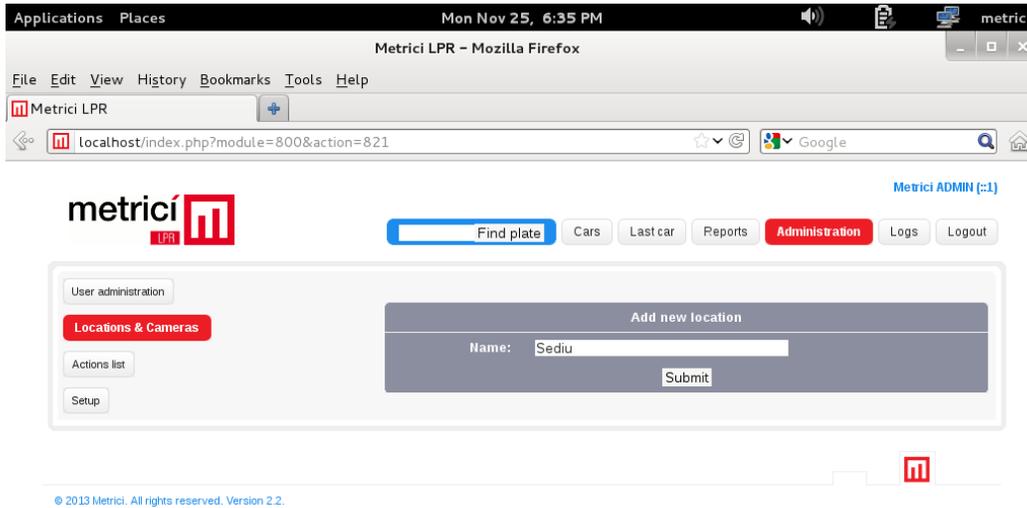
E-mail:

Password:

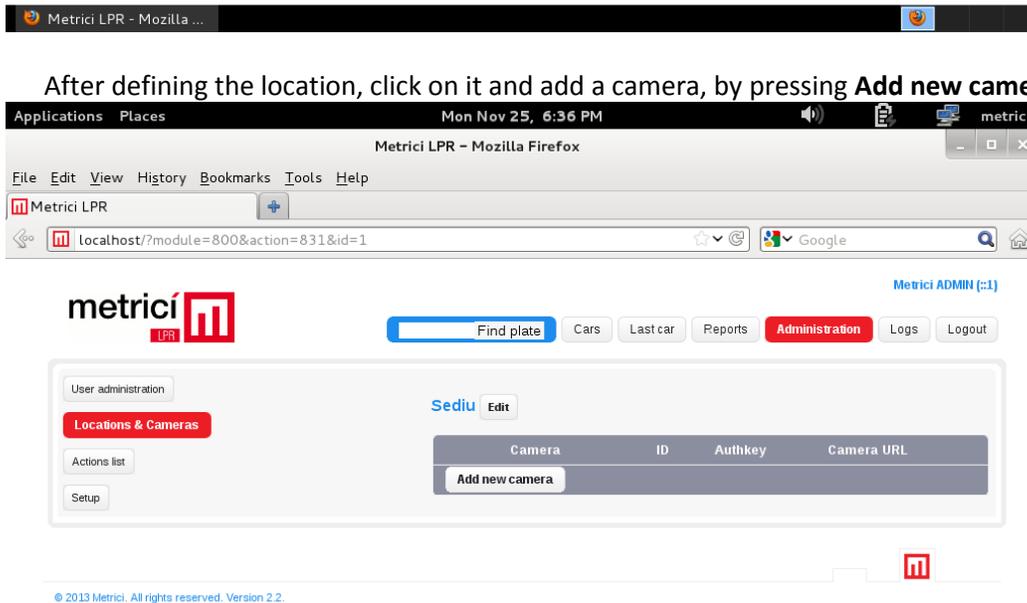


Then select the **Administration / Locations & Cameras** menus and click on **Add new location**.

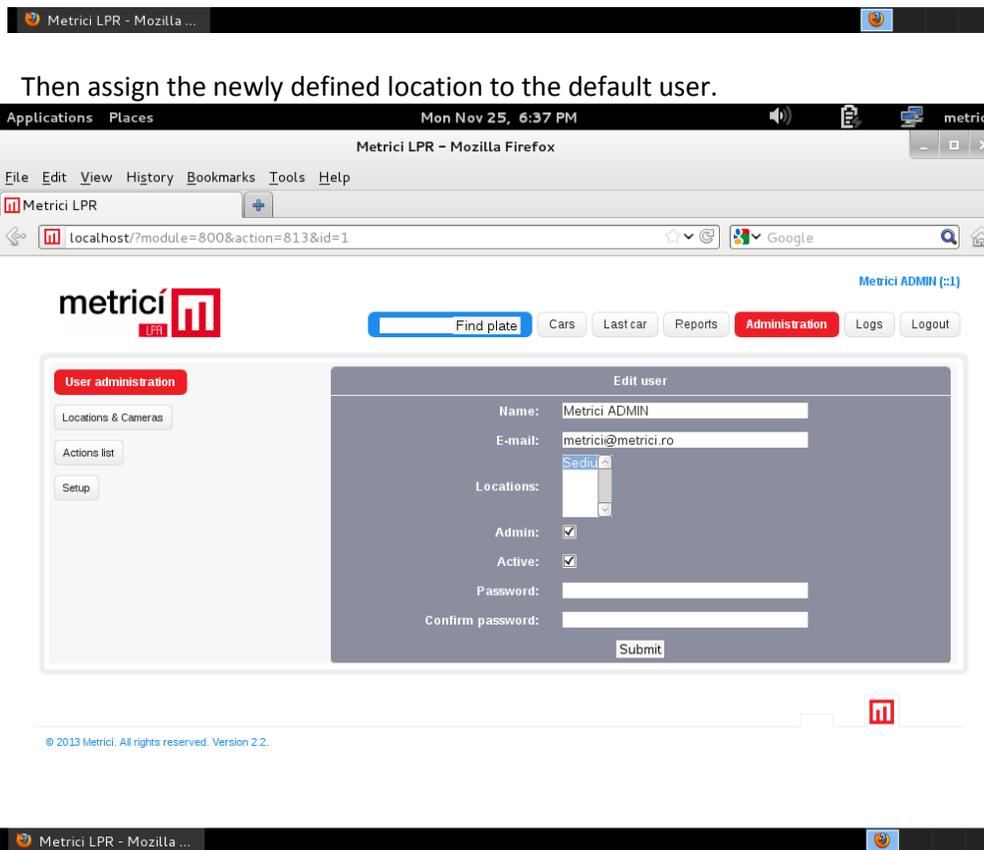
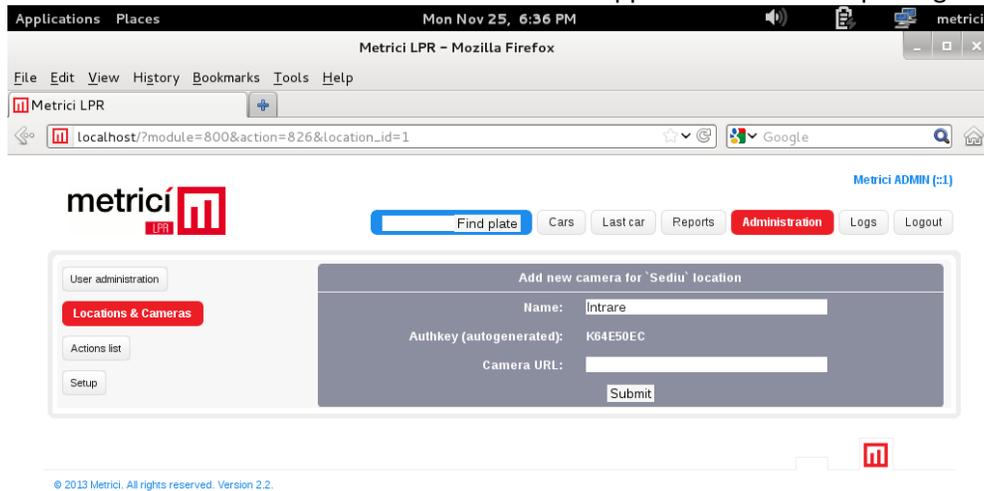




After defining the location, click on it and add a camera, by pressing **Add new camera**.

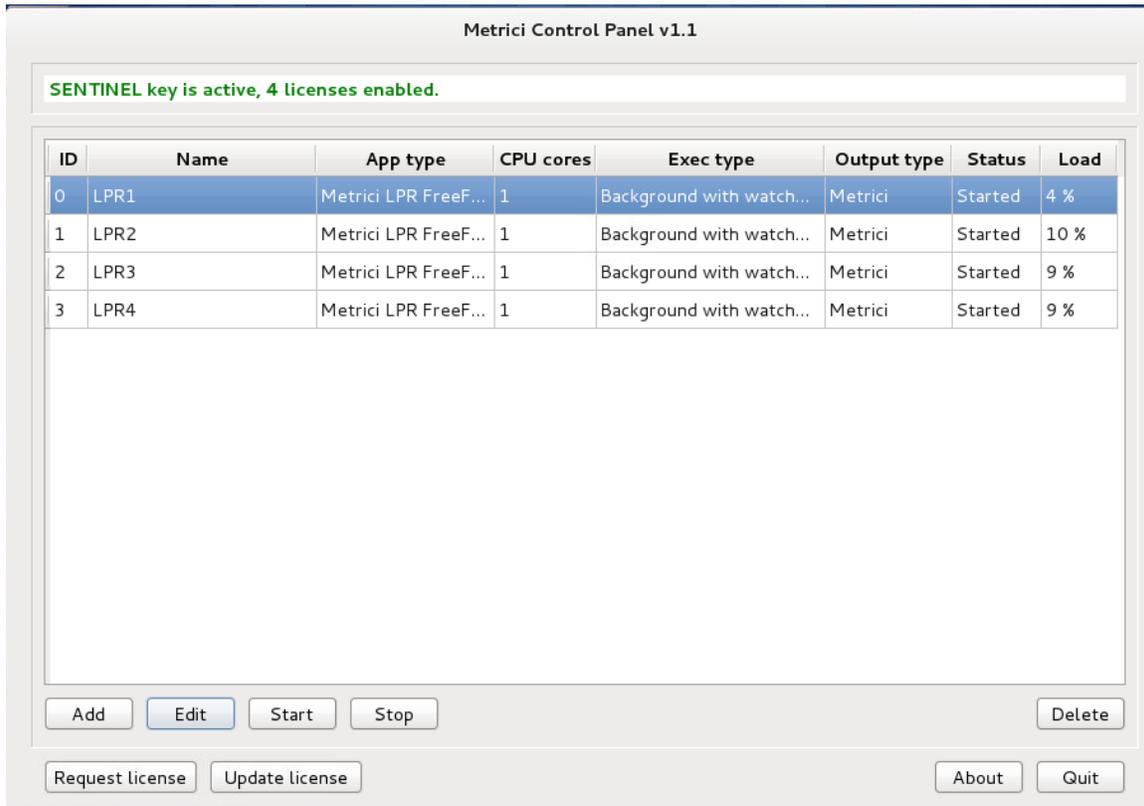


The system will generate an authentication key, which will be used to automatically authenticate the communication between the detection application and the reporting interface.



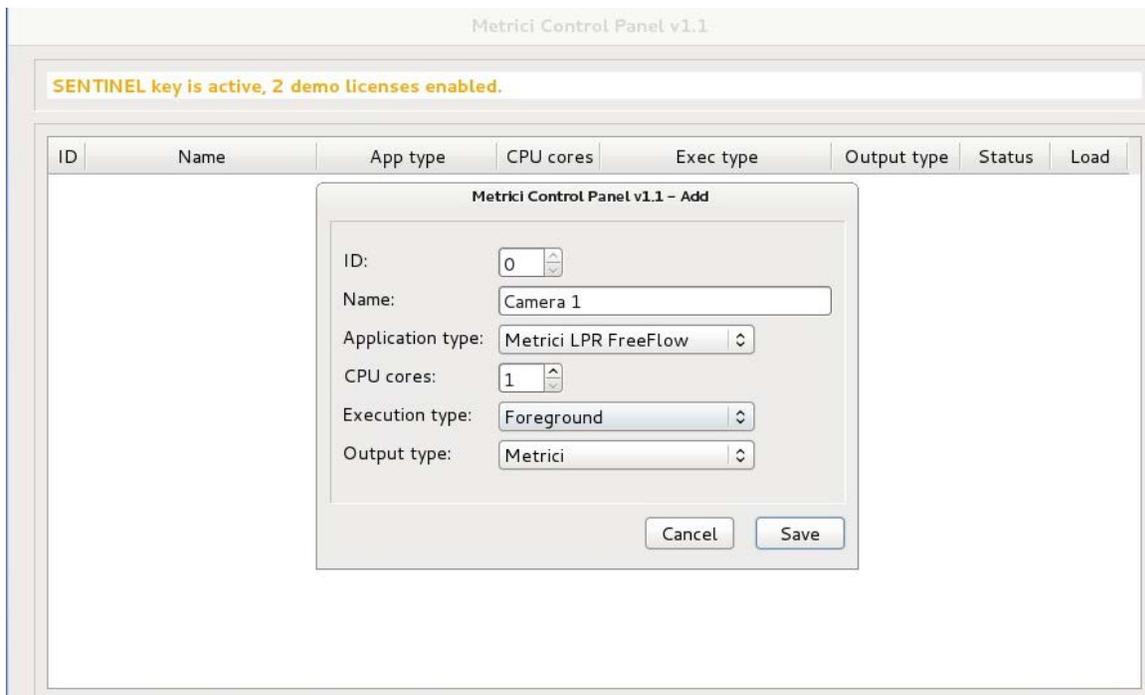
You can check one or more locations by holding down the Ctrl key while clicking on several options from the **Locations** list.

Using the application **Metrici Control Panel**, you can manage the licenses and detection applications.



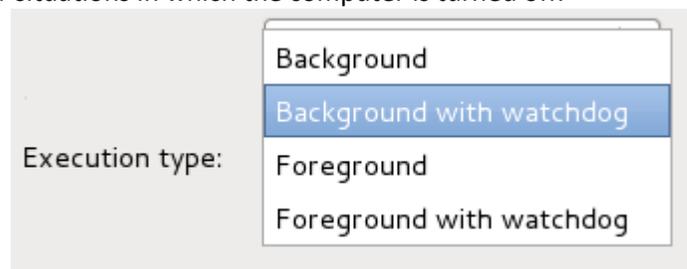
Add a new detection application in the system, by clicking **Add**.

In adding the application, configure in the field **CPU cores** the number of processing cores you want to allocate to each camera. The more processing power you allocate, the better the detection will be, and the application will be able to analyze in real time a greater number of image frames coming from the camera. For example, an Intel i5 processor is equipped with 4 CPU cores and if you want to connect a 3 megapixel camera and another 1 megapixel camera to the same system, it is recommended to allocate three CPU cores to the first one and 1 CPU core to the second one.

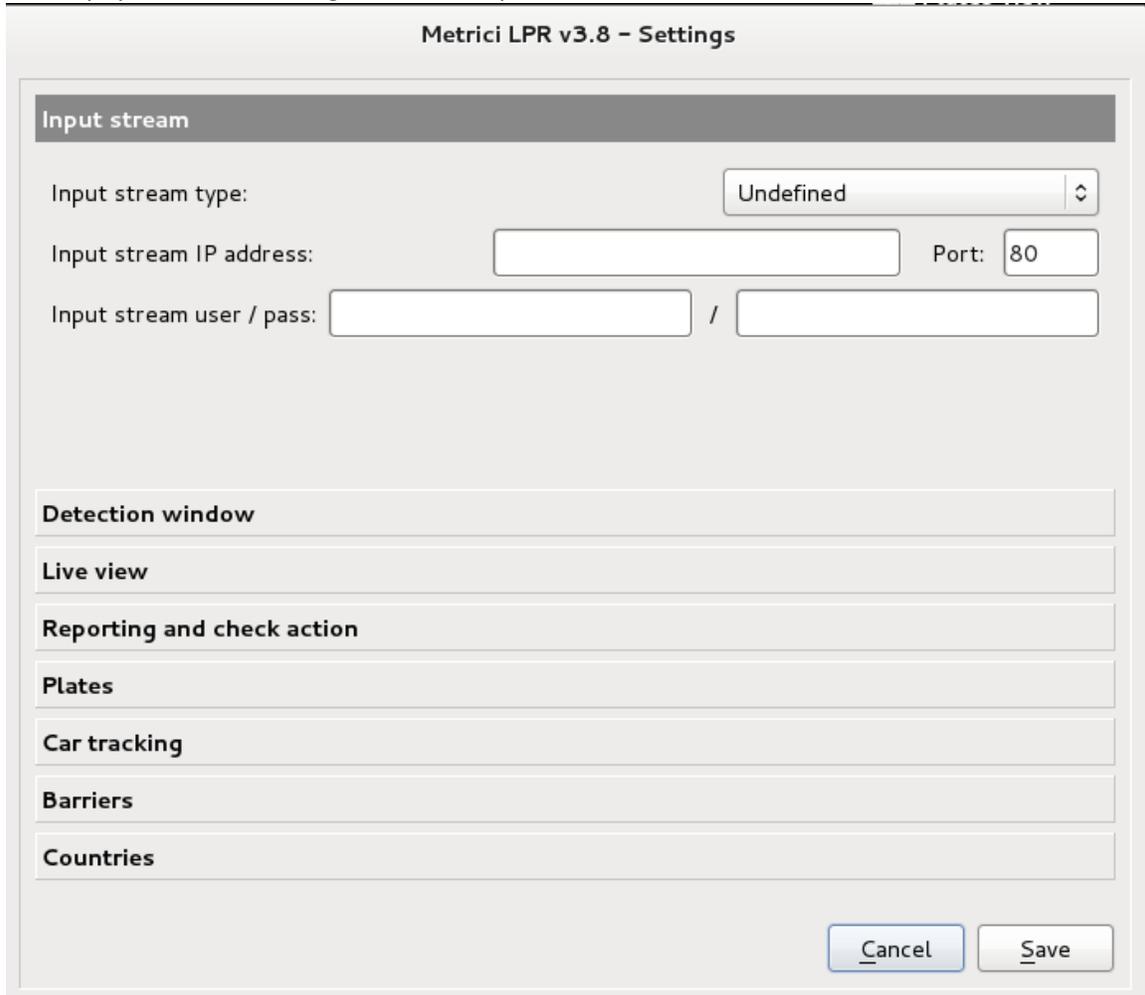


**Execution type** configures how the application will run:

1. **Background:** The application will run without displaying detection results on the screen, but only in the reporting interface. This mode saves processing power.
2. **Background with watchdog:** Same as Background, but the application will autostart on reboot or in other situations in which the computer is turned off.
3. **Foreground:** The detection application is visible. This mode is used mainly in mounting the system in order to check the camera position, settings, etc.
3. **Foreground with watchdog:** Same as Foreground, but the application will autostart on reboot or in other situations in which the computer is turned off.



After adding the detection application, select it from the list and click **Start** to configure the operating parameters, such as data for connection to the camera, checking the country syntax for the recognized license plates, etc.



**Metrici LPR v3.8 - Settings**

**Input stream**

Input stream type:

Input stream IP address:  Port:

Input stream user / pass:  /

**Detection window**

**Live view**

**Reporting and check action**

**Plates**

**Car tracking**

**Barriers**

**Countries**

After clicking on **Settings**, enter the connection data to the IP camera in the **Input stream**. Also, fill in the authentication data of the camera previously defined in the web interface, in the fields **Reporting / Check action - authkey / id**.

Setting the optimal values of the **Plate min. length** and **Plate max. length** fields is made after positioning the camera and choosing the appropriate resolution depending on the results. You can start with **Plate min. length = 120** and **Plate max. length = 1000**.

## CHAPTER 5 - Important Recommendations

To have a good rate of detection and recognition of license plates:

- Place the IP camera, choose a resolution of the video stream and a frame rate, so that each license number may appear in at least two consecutive frames; its width must be at least 200 pixels, and the axis inclination to the horizontal shall not exceed +/- 20 degrees.
- Use the Infrared spectrum lighting both during daytime and night time, combined with the use of a low-pass optical filter for the video camera. Contact the Metrici LPR distributors for obtaining it, depending on the model of the camera used.
- Use an IR illuminated reflector at an angle similar to the angle of the camera;
- Do not place the IR reflector at a distance of more than 30 cm from the IP camera; generally, the optimal position is just below the camera.
- Set the camera so that the shutter time be consistent with the relative travelling speed of vehicles towards the camera (e.g. 1/1000 s for speeds of up to 60 ~ 70 km / h).
- Choose a camera with high sensitivity sensor and set it to night mode for daytime operation as well.
- To minimize the image noise caused by reducing the exposure time, lower the gain of the camera. Do not use camera software corrections (e.g. noise reduction) for this purpose.
- Disable or lower: WDR, noise reduction, edge enhancement.
- Perform the adjustment of the camera / IR reflector ensemble, both during daytime and night time. Do the same on sunny weather and make sure that there are no irregular shadows in the area of detection, resulting from access stepladders, footbridges, poles, etc. Try to estimate the most unfavourable position of the sun and position the camera so as not to be blinded by it.
- Change the scene so that the movement of vehicles is consistent with the performance of the camera (e.g. installation of speed bumps, barriers, etc.).
- Use one or more computers to detect and recognize, properly dimensioned in terms of CPU / RAM, according to the required number of cameras, their resolutions and frame rate. Metrici LPR works in parallel on multiple threads and the scaling depends on the number of threads available in the system.
- Reduce the processing power needs by defining the detection windows only in areas of interest.

- Do not use the same system for LPR or as NVR, file server, or other uses.
- Read the user manual.
- Contact the Metrici support engineers or of the authorized distributors for advice on the right equipment for difficult installations.

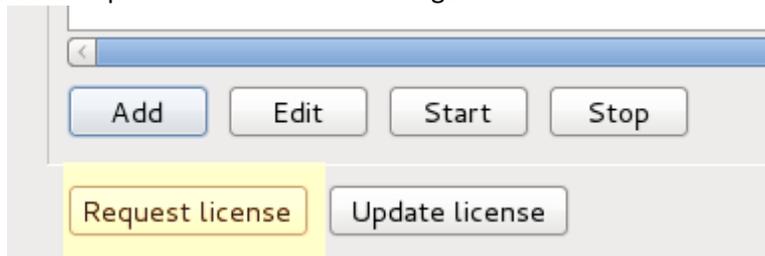
## CHAPTER 6 - Activating the Software License

Metrici LPR is protected by a system that prevents unauthorized copying of software. The initial installation is “Demo”, with the following limitations: it can be used for 30 days only, a maximum of 2 cameras can be connected, and the first character of the number detected is replaced with “\_”

After purchasing a license from one of the authorized distributors or integrators, you will receive a certificate of authenticity including the “product key” required for the activation.

```
Product key: 9656cf15-1123-4uc7-6970-777cd20117024
Number of licenses: 8
Features: Car direction: YES
Open/close barrier: NO
Date of purchase: May 21, 2014
Will receive upgrades until: May 20, 2016
```

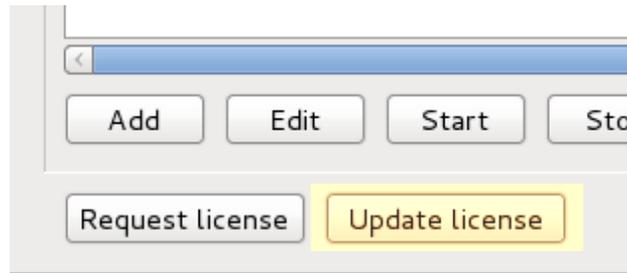
**Step 1.** Click on “Request license” in **Metrici Control Panel** and enter your product key. A file containing the data required for activation will be generated and saved on the desktop.



**Step two.** Open the web browser and access <http://support.metrici.ro/activate/>. Fill in the e-mail address field and attach the file generated in step 1.

The support team will receive the activation request and will send you at the indicated e-mail address a file required for activation. Copy the file to your detection computer.

**Step 3.** By using again the **Metrici Control Panel**, click on **Update License** and load the file received in step 2.



If the activation is successful, **Metrici Control Panel** will restart and then it will display the new number of licenses available in the system and their type.