

## Educanix: a Linux live educational distribution for kiosks

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In this work we present a GNU/Linux live distribution: Educanix. Also, we have adapt it to the IBM Anyplace Kiosk, a powerful machine that combines certain characteristics that make useful in many surroundings, among them, the one of education to small children as they don't have the same mobility nor facility that an adult to use a mouse or a keyboard of a computer.

### 1. Introduction

Educanix [1] (the name Educanix comes from a wordsgame between “education” and “canijos” that in spanish is a friendly way of calling to the most little kids) is a free GNU/Linux live distribution specially developed for kids between 3 and 8 years old. It is based on a Debian and metadistros (the most important project oriented to create a system and framework to make distros for an specific group of users) [2]. This distribution has been implemented by Centro de Referencia Linux (CRL, UAM-IBM) [3].

A live distribution (live-CD) is the one that is executed only in main memory (RAM), with no need of a hard disk, allowing the user to learn how to use this operative system without the danger of damaging the system. By simply restarting the computer all the configurations and programs will return to the default values, as they were before the execution of this live-CD. The main advantage of these distributions is that it doesn't take much time to boot, having in account that everything is decompressed in RAM; in approximately 3 minutes you will have a completely working linux on your machine, with maybe 1Gb of applications, libraries, multimedia... For these distributions is not compulsory needed to be executed in only in RAM as a live; many of them give the possibility of being installed in hard disk, coexisting simultaneously with another operative system already installed in the computer. This kind of distributions have some programs that allow to autodetect hardware devices at startup, so it can be executed in any computer with a minimum of requirements.

### 2. Applications

Educanix has been created as a child oriented distribution for people between 3 and 8 years old. It has many packages including different knowledge areas as mathematics science, language or geography. All of them are complemented with games for learning how to use the computer, kid's entertainment, logic structures, etc.

At this moment, there is are some others educative distribution in spanish [4-7], oriented more to educators instead to kids, because in those distributions, kids may execute any system or network tool, configurations, control panels or terminals. These are not available for them in Educanix. Another advantage in comparison with others distributions, is that the software included is totally free and

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gratuitous, with no need of using special modules to execute applications of another OS as could be Microsoft Windows.

The applications included in Educenix are the following ones:

- GCompris [8]: game designed for children of ages between the 3 and 8 years old. It contains 49 applications to learn counting, reading, identification of letters and numbers, colours, countries in the world, mouse movements... Everything integrated in a fullscreen graphic environment, with sounds and manuals in spanish, for every application. Every game describes a problem to the kid, who will have to solve it, using the mouse or the keyboard, depending on the game and the difficulty level, and finally verifying the solution to the problem. The voices of the game have been recorded by children of approximately those ages, so it is like other kids aiding and congratulating the child playing with the game. The main menu allows to filter the applications that appear in the graphic menu, according to its difficulty.
- Kturbeling [9]: Educenix includes three different version of this game. Consists on creating an scene with different objects (represented as icons) on a background. The backgrounds included are an aquarium, which can be filled with fishes and different marine animals, as well as objects that can be found at the sea. The other two backgrounds are a penguin and one of Mr. Potato. Those consists on creating different faces by adding eyes, hair... and different complements. In this two kturbeling games the icons have a sound associated for identified them. For example, if you add a hat to the penguin, the word "hat" will be heard. This tool originally had a toolbar that allows to select the language, to save images... but in Educenix it has been removed, so the execution is much more safe and simple for kids.
- Tuxpaint [10]: this game consist on making pictures and painting them. It has different tools like brushes of different ends, rubbers, stamps with numbers, letters, symbols, traffic signals, foods... Sound effects are included in this game, and an animation of a penguin encouraging to continue painting and filling the picture with multiple colours. This game is also executed in fullscreen mode.

### 3. Features

Educenix is a distribution that may be used by very little children, so it has been adapted to their needs and capabilities. Thus, the main features of the environment, non existent in other distributions, are the following ones:

- The wallpaper changes according to the system time, showing if it is day or night, even if is getting late or dawning. At certain hours of the day, when the wallpaper changes a sound can be listened, for example a cock in the dawn or a girl making notice of the dusk.
- The applications icons are big enough, so children who can not handle the mouse properly can run the games. In order to simplify the mouse movements, and the selection of the applications, the mouse pointers are bigger than the usual in other standard distributions. Also the colour of the mouse pointer has been chosen to stand out the background, so it can be easily located at the desktop.
- The icons are followed by a sound that can be listened when the kid clicks it to execute the game. These sounds will help to identify the program. The applications can be ran with a simple click or multiple clicks, avoiding the case of executing them many times, when the mouse is clicked more than one time.
- On the other hand, the icons are also in certain positions of the desktop creating a scene, even if the screen resolution is changed. It does not prevent that the kid can play with the icons

- changing their positions to create new scenes. It is important that the icons can not be removed, so they are always accessible.
- In order to make the booting sequence more amusing, we have added in Educunix, a melody that could be heard while the session is started.
  - As in most operative system, when the computer has been sometime without executing anything, a screensaver is executed, to avoid damage on the screen. In Educunix the screensavers has been selected not to scare small children. There has been included didactic screensavers that familiarize the child with very basic principles of mechanics, logic or space vision.
  - The distribution's capabilities have been limited, so it can not be executed a terminal, or have access to commands, configurations, toolbars or panels, in any moment. Every external terminal or console, have been disabled, only the F1 terminal will be used, and it will be showed when the computer turns off. Pressing the keys combination that turn the computer off, will not be easy for kids of these ages, but will be accessible for the adult who take care of the kid when he plays with the computer.
  - Every error message at the screen, that could be generated on any exceptional situation, has been omitted. It is not necessary to modify any configurations while the distribution is being used, everything has been configured and programmed beforehand, so every application is accessible at any time. On the other hand, it is necessary to emphasize that the startup is made in graphics mode, without text messages. In only 3 minutes (depending on the computer) we will have ready a totally safe linux educative distribution. The shutdown is also made in graphics mode.
  - The kernel version of Educunix is 2.4.25 and desktop environment GNOME 2.6.10

All these characteristics have been implemented either modifying some precise characteristics of Nautilus or using complex scripts in bash with calls to cron and using and setting values to the gconf parameters.

In order to facilitate the use of the machine by the children we decided to create a new version of Educunix able to be executed in a kiosk. The most important characteristic that this machine contributes to Educunix project is the advanced infrared flat-panel touchscreen display that allows not to have to use neither a keyboard nor a mouse. We have made diverse tests on the adaptation of the different applications in Educunix having solely changed certain booting parameters of these applications and some others system configurations. The touchscreen is perfectly integrated with Xfree and Xorg servers using the ELOTouch [11] Open Source drivers. This allows us to use the touchscreen as the core pointer device of the system.

This new version of Educunix is now based on a GNOME 2.6.12 desktop environment with a 2.6.11 kernel to manage this device.

#### 4. Results

Having into account that this distribution is only one and a half year old, the obtained results are very satisfactory in regards to the statistics of use, the places where people is using it and the feedback obtained from its creation:

- From the point of view of the statistics we had, in this period of time, more than 7500 web links and press notes in the google search engine. Also we have more than 4500 downloads of the ISO image from our webserver and more than 2000 from one of the most important servers in Spain, RedIris. It is impossible to know the total number of downloads from all the internet download servers.

- Due to the possibility of executing Educenix in a multilanguage mode, this GNU/Linux live distribution is being used in many places and in many educational environments. Educenix is now in Spain and in many countries in Southamerica as in Argentine, Chile, Colombia, Mejico, Paraguay, Peru or Uruguay. Also is present in some other countries in Europe, as Poland or Czech republic with their own repository.
- Some others countries are customizing this distribution to adapt it to their necessities. There are two others projects in Southamerica that ask us for collaboration and feedback knowledge.

These are the reasons why we think that this project can coexist with others business software contributing with new ideas and evolving towards a software with more users day at day

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