Cuban GNU/Linux Nova Distribution for Server Computers

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Abstract. This article presents the novelties offered by the new version of
GNU / Linux Nova distribution in its server edition, exposing the new features
such as network attached storage, distributed files system, charge balance for
PostgreSQL database servers and thin clients, as well as the basic features of a
standard server. All these developments are obtained from the integration with
the server management platform Zentyal designed to facilitate the work of the
end users of the variant of this Cuban distribution.

1   Introduction

After Informatics Havana 2009 event, Revolution Commandant Ramiro Valdés
decided to implement an edition of the GNU/Linux Nova Cuban Distribution to
migrate the country servers. A server oriented operating system must maximize the
conditions of ICTs use in State Central Management Organisms (OACE) under
technological sovereignty, security, socio-adaptability y sustainability principles [1].
For this reason, Nova development team releases that same year the first Cuban
Server Distribution. This first version didn't count with a graphic interface to allow
the administrator to easily and efficiently configure the system, so it was hard to
manage the different services.

Besides, the fact that the administrator had to write directly in the configuration
files might bring services errors, which often become fatal.

According to this situation, Nova team members wanted to facilitate servers
management through a comfortable graphic interface, which could be also intuitive
and highly reduce the occurrence of services errors on its next version.

Therefore, are proposed as objectives for this work:
- Integrate to Cuban Server Distribution a graphic interface for services
  management.
- Provide and develop a group of services as modules to the administration
  interface.

2   Development Methodology

OpenUP was used as software development methodology, because embraces a pragmatic and agile philosophy that centers on software development collaborative nature and allows more freedom because the model can be extended with part of other models, to face a wide variety of project types. It is a condensed process but is quite complete, with easy application to small and medium projects and easier to learn for smaller development teams. It is applied with an iterative and incremental focus inside a structured live cycle.

Management platform: As a centralized management platform was used Zentyal, a unified open source network server created for small and medium enterprises (SMBs). It can act managing network infrastructure, as gateway to Internet, managing security threats, as office server, as unified communications server or a combination of them [2]. Besides, Zentyal includes a development framework to facilitate the development of new UNIX based services [3]. Even with all its options Zentyal does not have some services that are necessary in new informatics environments in the country, as SAN[1]/NAS[2] infrastructure and thin clients or no-disk machines. Fundamentally to these modules has been guided the work of the product developers.

Network attached storage module: NAS is the name given to a storage technology dedicated to share the storage capacity of a computer (server) with personal computers or client servers through a network, using an optimized operating system to give access with *Microsoft Common Internet File System* (CIFS), NFS, FTP or TFTP protocols. NAS communications protocols are based in files, so the client requests the entire file to the server and handles it locally, that´s why they are oriented to information stored in small size and huge amount files. Using NAS provides some advantages as: capacity of sharing units, less cost, using the same network infrastructure with a simpler management. A plugin was implemented to Zentyal for adding support for implementing storage services on network via NAS, using ZFS[3], which is a file system developed by Sun Microsystems for their operating system Solaris. It has a 128 bits capacity (2^{64} times a 64 bits file system capacity) [4]. For its implementation was necessary to add native support to Nova kernel.

Distributed files system module: Another product oriented to storage servers is the files systems cluster module, that allows to have multiple disks, even computers together in a cluster that is accessed through the network by client computers as a

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[1]   *Acronym of Storage Attached Network*

[2]   *Acronym of Network Attached Storage*

[3]   *Acronym of Zettabyte File System*

simple shared resource [5]. This method is even cheaper than NAS as thus can be implemented with outdated hardware already present in the country's institutions.

PostgreSQL charge balance module: PostgreSQL is one of the free databases managers most used generally in the world and particularly in Cuba. It's common for a poor network infrastructure not to have powerful machines on which to mount this manager to be robust and reliable at all times. Nova Server provides an interface for PostgreSQL charge balancing that interacts directly with pgpool-II tool [6] and allows reducing the connection overcharge, and improve overall system performance; managing multiple PostgreSQL servers and reducing charge on them.

Thin clients suite module: Nova has several ways of configuring thin clients, from the tedious manual configuration of all necessary services, to Osplugger: a native development that allows administration and configuration of most of this service related components. This tool, integrated with Zentyal, using LTSP module will allow Nova Server to gradually become the ideal suite for thin clients environments in the country, allowing Cuban operating system to be inserted gradually on network environments dominated nowadays by Windows Server or even other GNU / Linux distributions.

Antivirus module: Zentyal by default uses ClamAV[4] antivirus, which is an anti-virus toolkit specifically designed to scan e-mail attachments in a MTA[5]. It has been said by MIC that "For virus protection, antivirus programs produced in the country will be used, or other officially approved for its use in the country, up to date." According to this, it has been developed a module for managing files and email through SavUnix[6].

Known Results: Once made and analyzed the proposed solution, GNU / Linux Nova Cuban Server Distribution was developed, and its integration with Zentyal, has made a GUI for telematic services management and to get a native product capable of deciding on it. It will be helpful for Cuban SMBs in the free software migration process that takes place in the country, as for an advanced alternative for network managers for convenient, simple and intuitive work. Being developed in Cuba contributes to its technological sovereignty, because it was possible to incorporate Nova Server's team as members and contributors of Zentyal development international community. It has also been established a direct and effective communication with the developers of the Cuban company Segurmatica Antivirus, managing to incorporate to the solution, a Cuban anti-virus, maintaining a constant and effective collaboration between both parties. This way not only has been

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[4]   *Clam Antivirus: http://www.clamav.net/*

[5]   *Acronym of Mail Transport Agent.*

[6]   *Cuban antivirus solution.*

possible to maintain a close relationship of collaborative development, but to give visibility to the project in the international framework. It has been possible to deploy thin clients on a smaller scale (10) in the University of Informatics Sciences (UCI) library and on a larger scale (64), in the MIC, working properly. Below is a table that reflect aspects that give validity to using Zentyal in Nova.

Table 1. Tool comparison

	Windows	**Webmin**	**YaST**	**Zentyal**
Operating system	Windows	GNU/Linux	openSUSE	Nova
License	CAL	BSD	GPL	GPL
Usage easiness	High	Low	Medium	High
Executionmode	Local	Local	Local	Local
Security	Low	Medium	High	High

3   Conclusions

Nova Server is a project that has been gaining strength and is destined to be one of the products with more acceptance from Nova family, given its high levels of adaptation to the requirements of the Cuban enterprise informatization.

The development of new modules for its management system not only allows new features, but after reviewing the knowledge gained in its development, people can think of a sovereign software where decisional capacity and response times to errors are minimized, including compensation of this knowledge to the international community that can gain merits and recognition for Nova.

4   References

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