

Small Enterprise Server

Open Source Linux Based SES

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Abstract

In this short paper, we will explain the differences between the different small enterprise server solutions available, email, collaboration, document management, customer management. Many features that are included in an out-of-the-box in proprietary systems, that can be very easily implemented in an open source environment, based on CentOS Enterprise Linux, Zarafa Email Server, Alfresco eCSM/DM, SugarCRM. The advantage of the system is that all products in the bundle are available in a supported version by their respective upstream manufacturers. The use of the bundle system makes integration towards multiple client systems possible. Each product will be discussed and their integration into one bundle, keeping account with scalability and security. Both the business value and practical value will be discussed for small and medium enterprises based on previous knowledge as a consultant.

1 Introduction

The Small Enterprise Server is a complete server solution based on open source software. The main difference between proprietary software and open source software from a business perspective is the fact that proprietary software vendors provide a complete package that the end-user can buy. With open source software the story is different, because the choice of which package is left up to the end-user, nevertheless this requires a high in depth knowledge on how to integrate these packages together into one integrated platform. The experience can be frustrating, long and confusing.

In this short extract, we will only look at the software level, as it the hardware would be the same in both cases. It can be suggested that an open source based server requires a less powerful machine and therefore a cheaper server. However this discussion is beyond the scope of this paper. Nevertheless a minimum hardware

requirement will be set in this paper.

1.1 Business case

In this extract, we will use the company Demo, a small business with 20 people in the service of providing custom marketing material. The company has an internet connection with a fixed IP and owns the domain *demo.be* and the registrar runs the DNS server. The company want to integrate files, email and contact details into one complete solution. The end-users currently already use Microsoft Outlook for their email and calendaring, Some users work from outside the office, this requires them to be able to login into the system from outside.

2 Technical Setup

In this section we will discuss the setup on how to build the Small Enterprise Server. A

wide variety of software is available to build this type of solution. We will point out which software there is and how they compare to each other. Per section one component will be chosen to do an economic analysis as to compare it with the competition.

2.1 Operating System

For business purposes, the most convenient open source operating system is a Linux distribution, as many business applications are available and supported on Linux. As it is for business use, stability and security are paramount, so an enterprise Linux distribution needs to be considered. There are two major players, RedHat Enterprise Linux (derivatives like CentOS and Scientific Linux) and Ubuntu LTS. In this example we will be using CentOS, which is the free open-source binary compliant version of RedHat Enterprise Linux. By using CentOS we can reduce costs. Nevertheless adding RedHat support is very cheap and transformation paths exist between CentOS and RedHat Enterprise Linux.

2.2 User Management

As to centralise user information an directory system is setup, these systems are based upon the LDAP X.500 standard. Microsoft Active Directory, OpenLDAP, Novell eDirectory, RedHat Directory Server, Sun Directory Server Enterprise Edition, Apache Directory Server are the most commonly used products. It is even possible to have them connect to each other as to exchange user information. In the open source world, OpenLDAP is the standard, which enjoys a lot of attention and has a lot of documentation. In this extract we will use OpenLDAP, as it is standard available in most Linux distributions. CentOS has the OpenLDAP server as an installable package. The OpenLDAP server will provide all other software packages with the necessary information on user details and user authentication.

2.3 File & Print server

In a networked IT environment, there is a need to centralise information. This makes it easier to share information and to backup this information. In a multi operating system environment, the Samba server provides an easy way to share information and centralise user information. The Samba server also provides a way to centralise printing, even though most printers are network printers and therefore can be used as a direct printing solution, if the company requires an oversight of what is printed or wants to keep track of who is printing what and how much, CUPS and Samba will be able to provide a method of centralising and control all printing functions.

2.4 Web hosting

Today all companies require a website, this requires the necessary content and a web server to provide that content to the world wide web. The most commonly used open source web server is the Apache HTTP server. Other more specialised or lightweight versions include lighttpd, Cherokee, nginx. As Apache is packaged by default in all enterprise distributions and has extensive documentation, it required no separate installation and is easy to support by yourself. In this paper, we will use the Apache HTTP server as the web server.

There are many web programming languages which have modules or plugins for Apache, some even have their own application server such as Java with Apache Tomcat or RedHat JBoss as the application server. For web scripting language, the distribution provides modules to add to Apache, so that it can execute the code : php, python, perl, . . .

One more advantage of having the web server locally, is that it can be linked to local applications such as your stock program, an ERP software or other business applications.

2.5 Email

The two most commonly used Mail Transfer Agent (MTA) are Sendmail and Postfix. Both can be used in combination with OpenLDAP to have a central user administration. The mails are received and send by the MTA. The MTA places incoming mails into the specified mail location and format and outgoing mails are relayed through the MTA to the destination. In this paper we will be using Sendmail as the MTA.

On the other hand a Mail Delivery Agent (MDA) which uses POP3, IMAP or MAPI protocol to process the pickup of received mails. The two main protocols are : IMAP and MAPI. IMAP is a fully open standard and is provided by many MDA's like Dovecot, Zarafa, Zimbra, Kerio, Scalix, On the other hand there is MAPI, this is a proprietary protocol which is not only used for email, but also for contacts and calendars, making it a groupware protocol. In this paper we will be using Zarafa as the MDA. The Zarafa Outlook connector is not open source and requires a commercial license, but this also applies to Zimbra, Scalix and Kerio, however the Zarafa Webaccess is made similar to the Outlook Webaccess, thus providing a similar end user experience.

Z-Push provides an synchronisation method to the Groupware functions of Zarafa. It implements the ActiveSync protocol, which enables synchronisation with smart mobile devices. Z-Push synchronisation uses the IMAP protocol for e-mail synchronisation, the vCard backend for contact synchronisation and the CalDav protocol for calendar synchronisation.

2.6 Document management

There are many document management software vendors, the three main players are Microsoft SharePoint, IBM Lotus Quickr and Alfresco ECM. The only open source software is Alfresco. There are other open source vendors, like Knowledge Tree, Nuxeo, O3Spaces, . . . , but they have all their advantages and disad-

vantages. Alfresco does have an easy integration with Zarafa and has a native addon for Sharepoint support. Thus making it the best choice for use with Zarafa. If the collaboration/MDA module would be Zimbra then the best choice would be O3Spaces, as it is easier to integrate because it has a prebuild connector to Zimbra and a similar feature set as Sharepoint.

The Alfresco application requires Java, MySQL or PostgreSQL and Tomcat, because the precompiled version provided by Alfresco is defined for Java JDK1.6.0u6, will function with other versions, but it runs most stable with this version. CentOS provides an OpenJDK, but this version does not run very stable with Alfresco, nevertheless setting up JDK1.6.0u6 is very easy.

2.7 Customer Relationship Management

Customer Relationship Management is normally not included into most proprietary systems like Microsoft Windows Small Business Server and IBM Lotus Foundation, however it is becoming an important factor in business. There are many CRM packages, whereof SugarCRM is the most known and the easiest to integrate into the Zarafa setup as it links with Zarafa through Z-Merge. It requires a web server, Apache HTTPD, a database, MySQL and Z-Merge to communicate with Zarafa, to allow full integration.

2.8 External connections

In a global economy and a more mobile world, users need to connect from anywhere at any time to the server to do their work, this connection requires to be secure because of the many threads on the internet. OpenVPN allows you to create a VPN tunnel between the client and the server allowing the user to access the local network securely. The user can then work as if he or she would be in the office.

This connections requires a good firewall solution, like iptables or a more specialised version like the Cisco Firewalls.

If you chose to use the same server as the firewall, iptables is the default Linux enterprise server firewall. It allows you to define many rules and conditions as to whom, when and how users can access the internet, but also how the internet can connect to the server. It does however require minimum two networking cards in your server and maybe some other devices depending on your internet service provider. If you do not want to use your server as a firewall, but require a cheap solution, two very powerful solutions are : DD-WRT on a Cisco Linksys WRT router or a Soekris device with OpenBSD with pf.

2.9 Virtualization

Enterprise Linux distributions, come with a wide variety of choice, from builtin to the kernel to external modules or even separate hypervisors.

- XenSource Xen kernel (provided by distribution)
- KVM integrated into kernel (provided by distribution)
- OpenVZ addition possible
- VMware ESX(i)
- VirtualBox

In most cases Xen or KVM would be your choice, however all products mentioned in the previous list are free, some are supported by the distribution. These use of virtualization enables you to run desktop applications, to retain full control on the application, to an extra server which runs on a different virtual machine, due to the use of proprietary systems or due to external availability.

3 Business Logic

In this part of the paper, we will look at the business aspect of the Small Enterprise Server. The meaning is to prove that it is cheaper, better and more manageable. As already stated, we will presume that the hardware in both cases would be the same, this enables us to focus on the software. The two main competitors are the Microsoft Small Business Server and IBM Lotus Foundation, we will compare them the Small Enterprise Server.

There are many factors you are required to look at, for the higher management, their interest is bottom line, the total cost, on the other hand there are the users, whom are interested in the experience. We will discuss both perspectives and how the vendors make package deals to sometimes confuse you into choosing the easy solution.

3.1 License

In the Small Enterprise Server, you can chose the Operating System, in case of RHEL, you are required to take an entitlement, this costs 279 euro (excl vat) for a basic version 1 year entitlement or 711 euro (excl vat) for a basic version 3 years entitlement. If you chose CentOS, you pay no fees, as this a free open source operating system. By the Microsoft solution and the IBM solution, the operating system is incorporated into the package, buying it separate outprices the solutions by far. The list price of a Microsoft Windows Server 2008 starts from 425 euro (excl vat), for IBM the story is completely different as their operating systems are far beyond the price and the scope of this paper.

The mail server, this includes the MDA and the MTA are combined by Microsoft in the Exchange server, which has a built-in SMTP server, this is also the case for the IBM Lotus Domino server included in the IBM Lotus Foundation server. In the open source version you do require two separate programs, Send-

mail or Postfix, which are free, and Zarafa or Zimbra which are semi free. In our case we chose Zarafa server, which is free, except for the Microsoft Outlook connector, you basically pay for each native Microsoft Outlook connection. So if we apply these rules to our business case you would need 20 users. In the case of Microsoft you would get 5 users with the base package, thus requiring you to purchase 15 user CALs extra. For IBM you are required to buy 21 user licenses, as your setup user¹ also requires a license. For Zarafa you would need to buy 20 user license with the Microsoft Outlook connectors. The Zarafa server professional edition for 20 users costs 560 euro (excl vat). A Microsoft Windows Server 15 user CAL would amount to 1 x 550 euro (excl vat) for the standard server license with 5 user CALs and 3 x 450 euro = 1350 euro (excl vat) for the remaining 15 user CALs. For the IBM Lotus Foundation the price would be 221 euro (excl vat) for the server and 21 x 144 euro = 3024 euro (excl vat).

On the client side a license for Microsoft Outlook is required, this is mostly included with the Microsoft Office package that is bought when buying the computer. Again this part will be assumed to be out of scope, because mostly it is already bought and would not make any difference. On the other hand, there is Mozilla Thunderbird with Mozilla Sunbird that can connect to a Zarafa server and Lotus Foundation comes with Lotus Notes.

In the document management solution, Microsoft offers their Microsoft Sharepoint, the open source world offers many products, whereof Alfresco with the VTI connector emulates a Sharepoint and offers much more possibilities. IBM Lotus Foundation does not offer their Lotus Quickr, however a third party connector can be integrated into Lotus Foundation, at this moment there is no ready made solution and building a custom solution would be far out of budget and beyond the scope of

this paper. As all solutions mentioned are or free or integrated, no extra costs are required for license, however support is not included and can be taken as an option, this will be discussed later in this paper.

The CRM solution is normally option, however in the open source server setup, it is recommended to integrate the CRM into the global system, as to not be unreasonable we will not include this calculation into the rest of our paper, nevertheless it is obvious that the cost would increase tremendously. Microsoft CRM solution starts from 2000 euro (excl vat), without installation and configuration and in IBM Foundation, you are required to add a third-party solution as to integrate the CRM functions.

The other functionalities are integrated into the operating system and do not require any extra costs, just the configuration and installation.

To summarise the costs we will add all costs up :

- Microsoft Windows Small Business Server Standard Edition
 - Server license with 5 user CALs
 - * 550 euro (excl vat)
 - 3 packs of 5 user CALs : 3 x 450
 - * 1350 euro (excl vat)
 - Total
 - * 1850 euro (excl vat)
- IBM Lotus Foundation
 - Server license :
 - * 221 euro (excl vat)
 - 1 admin user CAL : 1 x 144
 - * 144 euro (excl vat)
 - 20 user CALs : 20 x 144
 - * 2880 euro (excl vat)
 - Total
 - * Total : 3245 euro (excl vat)

¹root, Administrator, supervisor as per your operating system

- RHEL with Zarafa Professional
 - OS Server license :
 - * 279 euro (excl vat)
 - Zarafa server support with 20 user CAL :
 - * 560 euro (excl vat)
 - Total
 - * 838 euro (excl vat)
- CentOS with Zarafa Professional
 - Zarafa server support with 20 user CAL :
 - * 560 euro (excl vat)
 - Total
 - * 560 euro (excl vat)

After making this small and quick calculation, we can already conclude that the Zarafa server combined with RHEL or with CentOS is the cheapest solution. As both distributions are Enterprise Linux a lifespan of 5 to 7 years is provided. The Zarafa server includes 1 year of updates, but can remain on being used for a long period, be it without support.

3.2 Setup

The main part Microsoft tries to advertise is the fact that Linux consultants are more expensive than Microsoft consultant. In general this is true, a Linux consultant is more expensive starting from 100 euro (excl vat) per hour compared to a Windows consultant starting from 50 euro (excl vat) per hour, then again Lotus consultants are the most expensive starting from 150 euro (excl vat) per hour. Now if we take into account that a Linux based license is roughly half to one fourth of the cost of a Windows based license and that a Linux consultant mostly has a working knowledge of Windows, however Windows consultants have no or very little knowledge of Linux.

The setup costs may be more, but taking into account that an average Linux server

with CentOS or RHEL requires about 30 minutes to install and another 30 minutes to install Zarafa, running updates, configuring the base install, the total installation costs would take upto 2 hours. Then the configuration of 20 users with a central identity server and file&printing, email, document management should take another 3 hours we would amount to 5 hours total work with installation and configuration, thus costing minimum 500 euro (excl vat). If we look at the Windows consultant, the installation requires at least 2 hours, the configuration of the base system another 1 hour, after that you can start configuring, this process for 20 users would take upto 3 hours, making the total come to 6 hours costing 300 euro (excl vat). For the IBM Lotus Foundation the installation only requires 2 hours with configuration as it is a prebuild appliance and will therefor amount to 300 euro (excl vat).

We see that Linux comes out the most expensive in setup and if we combine this with the low license fee, RHEL version : $838 + 500 = 1338$ euro (excl vat) or CentOS version $560 + 500 = 1060$ euro (excl vat). Now if we do the same for Windows we come to $1850 + 300 = 2150$ euro (excl vat) and for IBM Lotus Foundation it is $3245 + 300 = 3545$ euro (excl vat). At the moment Linux still comes out cheaper than any other solution.

3.3 Maintenance

In maintenance costs there is a very big difference between supported and unsupported. Enterprise Linux allows a support of 5-7 years, Microsoft gives an average of 3-5 years and IBM gives support based upon the customer. Again the same applies as by the setup, a Linux consultant is more expensive, but on average interventions are far less and shorter. A Windows consultant will need to do more intervention and take longer, not only does a windows consultant require to do Windows maintains more often, but is required to do more extra maintains such as antivirus, defragmentation,

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A Linux server has on average 0.5% more uptime, relating this to time this amount to about 50 minutes per week, or 216 minutes per month. Taking the fees as previously defined, this amounts to an extra cost of 42 euro (excl vat) per week or 180 euro (excl vat) per month more for Windows than Linux, and this does not take into account the fact that downtime not only costs in intervention, but in lost revenue and loss of image.

4 Conclusion

In conclusion, we summarise both the technical aspects and the economical aspects. From a technical point of view, Linux provides more choices and more possibilities, to many people this can be a daunting task as to chose the right software, external consultants normally have more experience and more knowledge about the differences and which may suit your needs the best. From an economical point of view Linux comes out cheaper in license and in maintenance, so in total the total cost is still the lowest with Linux. Nevertheless there are many other aspects that are taken into consideration when choosing software.