

# **Linux replaces Windows one desktop at a time: A case study**

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## ***Abstract***

Since its introduction in 1991, Linux has been primarily used as a server operating system (OS). Despite its many advances and movement towards a Windows look and feel, it has not gained wide acceptance as a replacement for Windows on the desktop.

This paper is a case study of a small company that made the decision to incorporate Linux into its core business offering as well as a replacement for Microsoft Windows based desktops used to run its business. In this paper, we explore the reasons and ask questions as to why a company might want to migrate to Linux. We also examine the cost, benefits, and challenges associated with such migration.

## ***Introduction***

Since its introduction, Linux has garnered attention as an economical server operating system (OS) solution to competing against products such as Windows NT server, Sun Solaris, HP-UX and IBM AIX. Despite its wide acceptance as a server OS, Information Technology (IT) executives have struggled over its use as a replacement on the desktop. Early versions of Linux based office software have had compatibility issues with documents created in desktop applications such as MS Word, Word Perfect and MS Excel. With the latest release of Open Office, a suite of applications developed by Sun Microsystems that compete against the Microsoft Office suite, many of the compatibility issues are no longer a problem although some do still exist. However, users who are familiar with the Windows versions of word processing and spreadsheets might struggle with the transition to a new desktop offering.

Although many of the technical challenges have been resolved, managers are still struggling with its use as a desktop replacement in a business environment. These issues include compatibility with in-house developed applications, lowering the total cost of

ownership (TCO), and licensing issues with currently owned applications. More importantly, IT managers struggle to balance and convince their organizations that it's more cost efficient and better to replace their current desktop OS's while simultaneously minimizing disruption to their business during the transition. .

### ***Application Compatibility***

The first step in deriving a strategy toward a Windows-to-Linux migration is conducting an application compatibility assessment. This could be a huge undertaking depending on the size of the organization and its application portfolio. Many organizations fail to clear this hurdle mainly because of the volume and nature of the applications. Many in-house developed applications would require some rework and redevelopment in order to run on a Linux desktop.

Even if you decided to re-write your in-house developed applications to run on Linux, you still have to deal with the myriad of artifacts already created. Artifacts created with commercial of-the-shelf (COTS) products like MS Office, could have compatibility issues with Open Office. These issues relate to document formatting, embedded objects, macros and the use of proprietary languages (i.e. VBA). Managers should ask themselves the following questions:

- Do any of my user's documents have embedded objects in them?
- Do my users tend to use a lot of macros?
- Do any of my users use VBA or any other embedded language?
- If so, how will I deal with any of these issues?

These are only a few issues that need to be worked out. Irrespective, if you convert all your embedded objects to separate files, reformat your documents, rework your macros and disallow the use of VBA, you still have to take into account the possibility that customers and outside vendors may employ these features into their documents and

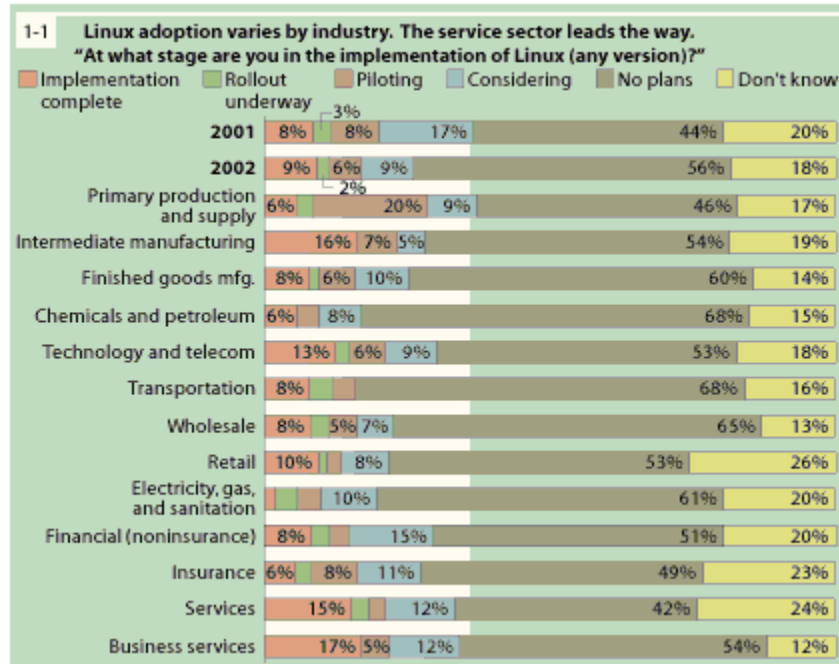
programs that are sent to your organization. Policy issues must be in place to accommodate this situation.

### ***Total Cost of Ownership***

The initial entry price of Linux appeals to many technology managers. However, this appeal is quickly replaced by potentially higher services, support, application development and training costs. Research has shown that switching to any new OS will incur costs. The challenge of any conversion lies not simply with the hardware and software but mainly with developers and end-users. The proliferation of Windows and the abundance of Windows based COTS and in-house developed applications add to the complexity of encouraging end-users to convert. A typical user might begin a word document in the office and decide to finish the document at home. If the home system is not compatible with the office desktop, the ability to continue that work is negated. Early Apple Mac users faced the same dilemma. In spite of these issues, in the long run, TCO will drop due to licensing considerations, less overhead in administering virus policy due to low attacks on Linux systems, better GUI environments, and a wider availability of COTS software on the Linux environment. All of these factors will make the administration tasks easier and faster which translates into a lower TCO. Many IT managers agree that a migration to Linux will result in lower TCO but statistics are still premature.

## Industry acceptance

So who is using Linux today? Figure 1.0 shows who is adopting Linux by industry.



Source: Forrester Research

Figure 1.0

Figure 2.0 illustrates the adoption of Linux by use. As noted, Linux has not been widely adopted on the desktop. The conversion cost to re-write applications or replace applications with a Linux version and the lack of administration tools, are mitigating factors to faster conversions.

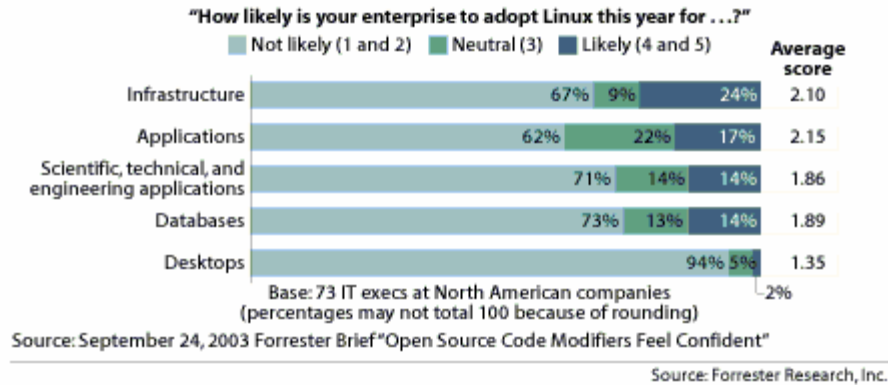


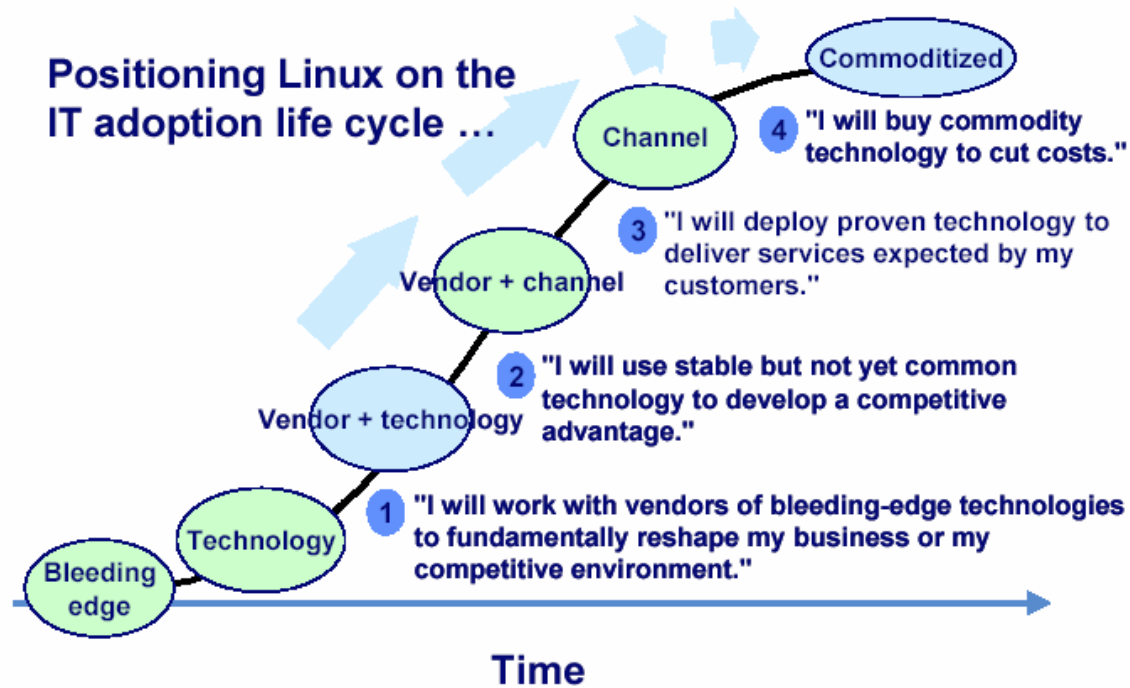
Figure 2.0

### ***Building a business case***

The most important factors in making a project successful are gaining the trust and commitment of your business partners. This includes sharing the risks, costs, failures and rewards. Without total buy-in from your partners, the project is doomed. Understanding the benefits and risks of converting to Linux is paramount to ensuring a successful engagement. First, business people want to be assured that your project will not impact their business process. You must pass the application compatibility test. Secondly, you must demonstrate that there are some cost savings or opportunities by changing software. Finally, it would be beneficial to show your partner that other companies in your industry have embraced this technology and are gaining a competitive advantage. Success stories go a long way in selling technology.

Questions to ask:

- What impact will this have on my business partner?
- How will my business partner be more competitive with this technology?
- Are there cost savings substantial enough to warrant switching technologies?



Source: Frank Lynn & Associates and IDC, 2003

Figure 3.0  
Where are you on the curve?

### ***Implementation strategy***

Experience has shown that wide scale rollout over a short period of time of an application that has a major impact on an organization, is a recipe for disaster. The best plans cannot account for every variation.

Questions to ask:

- Will this be able to be backed out easily if I run into a problem?
- Are all the end-users and support people trained on this product?
- Was this product tested with every application?
- Were the end-users involved in testing?
- Will there be interoperability issues as this product gets rolled out?

- What group is best to roll this out to first?

A migration policy that uses the following steps is a much better strategy:

1. Beta in a lab
2. Regression/functional testing
3. End user testing
4. Pilot with a group that wants to embrace the technology
5. Rollout to small groups or departments
6. Rollout to the rest of the organization

### ***Training***

Once you have decided to migrate, training could be the single most important factor as to whether your project succeeds or not. This is not something to wait until the end of the project to think about. Since your business partner has been in step with you all along the process, training should have been thought out early in the planning stage.

Your users would benefit more if the training was conducted in-house. You could either hire a computer training company to come to your facility or send trainers out for train-the-trainer sessions.

### ***The case study***

#### ***About the company***

Mirwin Consulting is located in the suburbs of Philadelphia, PA. They provide computer consulting services to other small companies. The company has four employees and has been in business for five years. Their 2003 income is estimated at \$200,000.

### *Business model*

The main service that Mirwin Consulting provides is the documentation of systems. Mirwin will document Networks, Applications, Data Bases and System Architectures. They can send people onsite or provide the service remotely. Most of their work today is being done in a Windows environment. They want to expand their revenue opportunities by providing their services on both the Windows and Linux platforms. In conjunction with their new business opportunities, Mirwin would also like to migrate a number of their office PC's to Linux.

### *Current applications*

Mirwin primarily uses Microsoft's Visio to document their customers systems. They use the MS Office Suite as an office productivity tool and Internet Explorer as a client for web E-mail.

### *Replacement applications*

Several applications were examined as candidates to replace Mirwin's current software suite. NMAP (NetWork Mapper) was chosen to replace Visio because of its flexibility, network exploration capability and security auditing. Open Office was chosen to replace the MS Office Suite because it has all the functionality of the Microsoft Office Suite (i.e. Word processing, Spreadsheets, Presentations and Drawing), it's based on an open standard, and it has a familiar interface and a myriad of tools. Netscape was chosen to replace Internet Explorer (IE) as a browser because IE is not available on Linux.

### *TCO*

Total Cost of Ownership (TCO) takes into consideration, initial, current and extended costs which include acquisition, training, direct related and consequential costs.



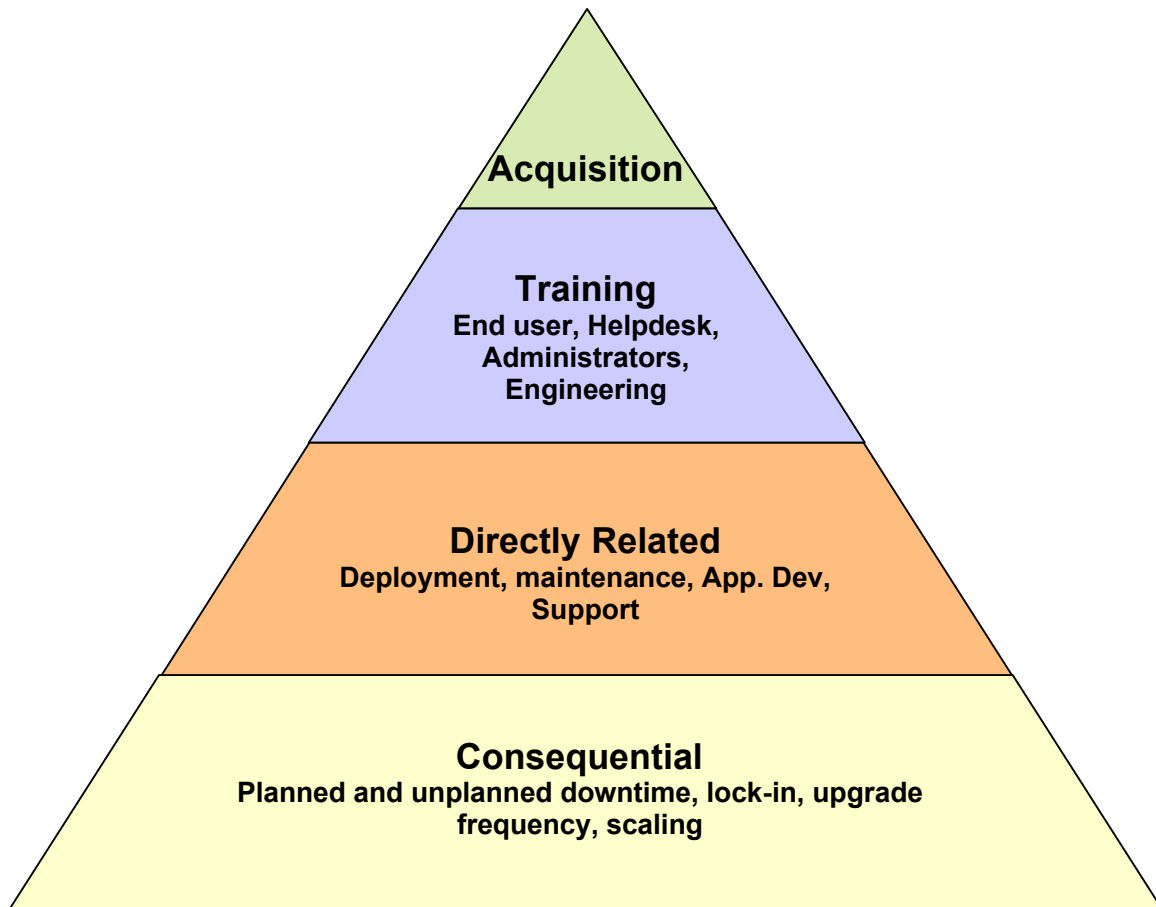


Figure 4.0  
TCO pyramid

As we can see in Figure 4.0, the initial acquisition costs are small compared to the direct, training and consequential costs which can extend into multiple years.

#### *Industry acceptance*

Mirwin felt that many of its competitors are benefiting from supporting multiple operating systems. The lack of Linux support resulted last year in a lost of a contract to the competition. With Linux gaining greater industry acceptance, they felt that they must keep in pace with industry trends or lose business.

### *Business case*

Since Mirwin Consulting lost a \$20,000 opportunity last year and the company is a sole proprietorship, the owner decided to migrate to Linux in order to expand his business offerings and lessen the likelihood of future loss business. However, we still asked the questions as outlined above to see if they would work for a small company and if they were thought through.

### *Implementation*

The first systems to be migrated took place over a weekend. Mirwin has a total of six desktop PC's and three laptop computers. One laptop and one desktop were targeted for the migration. The plan was to migrate two systems every weekend. Actual migration time was three hours per system plus time to restore data. System information was collected off the PC's using Belarc Advisor. Advisor builds a detailed report of a system's hardware and software.

### *Training*

Since the employees were technical by profession, no formal training plan was put in place. All four employees were familiar with Linux and the Open Office suite but not proficient or savvy in the operating system's or Open Office suite's nuances. Management knew there would be a gradual ramp-up time and was willing to accept the risks of not providing formal training.

## ***Conclusion***

The prospect of no or low cost software has caused technology managers to at least look at including Linux into their IT strategies. If this lure is the only reason a company has decided to include Linux in their application portfolio, they have made a grave mistake. As we have discussed, the initial TCO of Linux versus Windows is slightly higher. Applications might have to be re-written and a migration plan for existing documents created.

Why then would a company want to migrate from Windows to Linux? First, many corporations have grown weary of being dominated by a pure Microsoft solution. As with any monopoly, they felt that Microsoft has a strangle hold on the technology and is stifling innovation. Second, companies have a growing concern over recent cases where the Business Software Alliance (BSA) has brought companies to court over invalid software licenses. Finally, the software is open. This means that companies are free to modify the code to fix errors and enhance the system.

In our case study of Mirwin Consulting, a small company that wanted to branch out and offer additional services, migrating to Linux was a good strategic move. However, the decision to migrate their office productivity suite was not entirely successful. Mirwin's goal was to give up all their licenses on their Microsoft products. In reality, they had so many artifacts with embedded data that did not translate properly into Open Office that they had to keep a few of their Windows Office licenses. While Mirwin was not able to capitalize on any immediate cost savings, they are now able to expand their business offering into the Linux world. Over time as new applications are developed under Linux, legacy applications running under Windows can be retired. The lesson learned from this case study is that replacing the Microsoft family of products is hard but to move one step away from the dominance of Microsoft is not as hard as one might expect. Linux will continue to mature and grow not only as a server OS but it will slowly replace Windows one desktop at a time where and when it makes sense.