

## Migrating to Linux at the Desktop A Practical IT Management View

### Contact:

Quocirca Ltd

Tel +44 1753 754 838  
[inquiries@quocirca.com](mailto:inquiries@quocirca.com)

### Executive Overview

With the continuing evolution of Desktop Linux and its associated tools and applications, many organisations are experimenting with this Open Source challenger to the mighty Microsoft Windows.

The top five motivations for considering a Windows alternative, as determined from the feedback of nearly 1,700 respondents in a recent online survey, are:

- Concerns about Windows security vulnerabilities
- The high cost burden of keeping windows secure
- A perception that Windows squanders the power of modern hardware
- Ongoing frustration with Windows stability and reliability
- Confusion and dissatisfaction with the cost and complexity of Windows licensing

Such concerns are felt by some to be the cause of increased IT operational costs and to represent an ongoing drain on valuable IT bandwidth.

It is against this background that Linux is considered as an alternative desktop operating system and the perception of its advocates is that it directly addresses all of these concerns.

Yet migrating to Desktop Linux is perceived in itself as a costly and labour intensive exercise, bringing with it a number of its own risks and concerns. The top 5 barriers to migrating to Linux are perceived to be:

- Software availability and compatibility issues
- Usability, End User acceptance and resistance to change
- The cost and challenge of End User training and support
- The cost and challenge of porting bespoke Windows applications
- A frequently encountered dependency on Microsoft Active Directory

There are ways of tackling a Windows to Desktop Linux migration that go some way towards working around these issues, and a series of tips and tricks to increase the chances of a successful migration is presented in this paper. So too is a six step approach to making an objective assessment of whether Desktop Linux is right for your organisation, and if so, where within the organisation it would make the most sense.

The conclusion from analysis of survey responses, however, is that Desktop Linux and associated applications still have a way to go before they can be thought of as a viable wholesale replacement for the Windows based desktop in most organisations.

In the meantime, it is a case of evaluating the cost/benefit equation for a Desktop Linux deployment in relation to different user scenarios and considering the use of this Open Source operating system on a selective case-by-case basis.

#### RESEARCH NOTE:

The information presented in this report was derived from 8,128 responses to an on-line survey carried out in February 2005. Approximately 1,700 of these were used as an "IT Pro" sample – those who provided free-form feedback on their experiences with Linux at the desktop.

# CONTENTS

- 1. INTRODUCTION..... 3**
- 2. FOUNDATION FOR ANALYSIS AND RECOMMENDATIONS ..... 3**
- 3. REASONS FOR CONSIDERING A WINDOWS ALTERNATIVE..... 4**
  - SECURITY VULNERABILITIES IN WINDOWS ..... 4
  - COST OF KEEPING WINDOWS SECURE..... 4
  - PERFORMANCE..... 4
  - STABILITY AND RELIABILITY ..... 5
  - WINDOWS LICENSING COST AND COMPLEXITY ..... 5
- 4. PERCEIVED BARRIERS TO DESKTOP LINUX ADOPTION ..... 5**
  - SOFTWARE AVAILABILITY AND COMPATIBILITY ..... 5
  - USABILITY, USER ACCEPTANCE AND RESISTANCE TO CHANGE ..... 6
  - COST AND CHALLENGE OF END USER TRAINING AND SUPPORT..... 7
  - COST AND CHALLENGE OF PORTING BESPOKE APPLICATIONS ..... 7
  - DEPENDENCY ON MICROSOFT ACTIVE DIRECTORY ..... 8
  - OTHER ISSUES ..... 8
- 5. TACTICS, TIPS AND TRICKS ..... 9**
  - EMPLOY A SELECTIVE, TARGETED APPROACH..... 9
  - WORK WITH AND MOTIVATE THE BUSINESS ..... 9
  - TECHNOLOGY SELECTION AND DISCIPLINE ..... 9
  - ROLLOUT TACTICS..... 9
  - PREPARE WELL ..... 10
- 6. QUALIFYING THE DESKTOP LINUX OPPORTUNITY..... 10**
  - BE CLEAR ON WHY YOU ARE CONSIDERING A WINDOWS ALTERNATIVE..... 10
  - MAKE SURE YOU UNDERSTAND YOUR CURRENT SITUATION ..... 10
  - IDENTIFY AND QUALIFY POTENTIAL TARGETS FOR DEPLOYMENT ..... 10
  - DETERMINE THE FEASIBLE SCOPE OF THE MIGRATION ..... 11
  - BUILD THE BUSINESS CASE AND SECURE EXEC LEVEL SPONSORSHIP ..... 11
- 7. DISCUSSION AND CONCLUSIONS..... 11**
- APPENDIX..... 13**
- ABOUT QUOCIRCA ..... 15**

## 1. Introduction

When the average consumer goes shopping for a desktop or laptop computer, they tend to have a Windows based PC in mind. It would never occur to most consumers to look at an alternative; the subconscious considerations being that all of their friends and family have Windows and when they look around the PC megastore at all of the games, utilities and other software displayed, the vast majority of it is Windows based. Nowadays, the chances are also that our shopper will be replacing an existing Windows PC or adding another machine to a household that already runs Windows. Windows is therefore the “obvious” choice for the new computer. Indeed “choice” is probably too strong a word in the majority of cases as no explicit selection will have taken place – Windows was a given from the start.

The picture is not that different for business buyers. When the average small business owner or IT manager goes shopping for another machine to support their business, they have in the back of their mind that they are already running Windows and Windows based software for document preparation, email, accounting and other functions. Furthermore, if they approach local dealers who focus on providing IT products and services to small businesses, they come across a community of people who talk reassuringly about having support staff with extensive Windows experience and the ability to offer good prices and availability on popular Windows based packages. Again, Windows is the default choice.

The considerations for larger organisations in the enterprise and public sectors bring things like internal support and development skills into play, but there is still a default view that in a world dominated by Windows you might as well just “go with the flow”.

It is against this background that we consider one of the alternatives to the Windows operating system for desktop and Laptop PCs – Linux. In doing this, we acknowledge that there are other desktop options such as systems based on Apple OS/X and various other forms of Unix, but Linux is interesting because it has already achieved mainstream acceptance as a server operating system and has the backing of some of Microsoft’s strategic competitors in the IT industry, and even some of its traditional partners.

An interesting challenge with Linux, however, stems from its Open Source status. The alternative ideology associated with this often sparks heated and emotional debates about how software should be developed, distributed and paid for. The unfortunate consequence is that the practical considerations relevant to IT Managers simply trying to get their job done in the most effective and cost efficient manner tend to get obscured or confused.

One of the key objectives of this paper is therefore to put religion and emotion to one side and focus on those practical considerations, with the aim of providing objective information and guidance for anyone wishing to explore whether Desktop Linux is right for their business.

In doing this, we do not encourage or discourage the use or consideration of Linux as an alternative to Windows on the desktop. We do, however, acknowledge the Windows dominated position that most organisations will be starting from, as to ignore this would be to ignore reality.

## 2. Foundation for Analysis and Recommendations

Rather than deal with the topic of Desktop Linux from a laboratory bench-test or theoretical market development standpoint, we decided it would be useful to gain an understanding of the real world drivers and practicalities by asking IT Professionals for their views and experiences in this area.

With this in mind, Quocirca polled over 8,000 IT Pros in an online survey entitled “Windows and Linux on the Desktop” during February 2005. The essential details of this are outlined in the Appendix and full survey results are available on request. More pertinent to this paper, however, was the feedback contained in close to 1,700 free text comments entered by respondents towards the end of the survey questionnaire. Mining and analysing these has allowed us to gain a much deeper insight into specifics than could be obtained from the more structured responses to the multiple choice questions that formed the core of the questionnaire.

Throughout this paper, we provide representative examples of these comments to illustrate specific points as expressed in the words of IT professionals. These are presented in italicised text within quotation marks as in the following example:

*“The feedback I have given mostly reflects how I see my company’s attitude towards Windows versus Linux, rather than my own personal views”.*

We also frequently refer to “IT Pro feedback”, by which we mean the feedback derived from the same pool survey comments, but expressed at summary level in a more general manner.

It must be stressed, that when providing example comments or more generalised versions of feedback in the ways described, we are sometimes documenting individual perceptions that may not necessary reflect reality. This was a discussion point that came up when we interviewed a number of relevant IT vendors whilst preparing this paper, most notably Red Hat, Novell and Microsoft. These vendors can often provide counter arguments against the points raised, especially with regard to gaps and issues. Nevertheless, we feel that it is important to represent the views we heard from the survey faithfully and base this paper predominantly on that feedback, rather than presenting distinct messages from IT Industry players that have specific agendas.

Based on analysis of input, this paper lays out the perceived drivers for looking at alternatives to desktop Windows, the main perceived challenges when considering the Linux alternative, tips and tricks we heard for dealing with those challenges, and some of our own high level guidance on how to determine whether Desktop Linux is right for your business.

### 3. Reasons for Considering a Windows Alternative

When Desktop Linux adopters are asked why they use Linux in preference to Windows, we often hear rationale based on an ideological objection to Microsoft. The following comments illustrate this:

*"My general view on this area is that there are great advances with IT and information management despite the efforts of the monopolistic and anti-competitive Microsoft".*

*"Microsoft is essentially a marketing company [...] I will never give Microsoft a penny of my own money as long as there continues to be Open Source alternatives"*

*"Microsoft executives should all be jailed..."*

*"Avoid Microsoft like the plague".*

*"Microsoft sucks".*

*"Microsoft is evil".*

We mention such sentiments only so we can put them to one side as comments like these are actually in the minority in our IT Pro feedback. This illustrates that the messages propagated by hard core Linux advocates are not representative of the IT Pro community as a whole. Broader IT Pro feedback tends to focus on more practical drivers for considering an alternative to Windows. From analysis of the frequency with which different types of comment occur in this feedback, we can summarise the top five drivers as follows:

#### Security Vulnerabilities in Windows

Some of those considering or using Desktop Linux believe that there are inherent security vulnerabilities in the Windows operating system that represents a significant risk to their business. The belief is that Linux is inherently more secure and therefore represents a lower risk:

*"The number one concern with Windows is security".*

*"We are moving to Linux because we have concluded that it is impossible to be confident of running Windows securely. Not that it's impossible to do, but it is impossible to be confident enough you have done it".*

*"Windows works great, as long as it isn't connected to the Internet".*

*"Security concerns forced us away from Windows. We have never had a virus or a compromise since we turned off our last Windows box two years ago".*

Such comments were received mostly from Linux advocates (see Appendix for a definition of these).

#### Cost of Keeping Windows Secure

Even those that believe it is possible to secure Windows to a reasonable level often highlight the cost and overhead of continually having to apply security updates to keep the exposure to a minimum. The expense and overhead of needing to deploy and manage third party security solutions such as antivirus software is also perceived to be a burden:

*"I'm only using XP because I'm paid to use it. We're seeing several patches a week, company-wide, and it must be costing the budget of an entire small country just to do the patch testing and deployment".*

*"Anti-virus, firewall, and spyware programs, each needing separate licensing and yearly upgrades/purchases, make maintaining Microsoft powered systems a never-ending drain on IT labour and cash".*

*"Our big problem is that the auto-update 'security' feature of XP has to be switched off for our office (approx 25 units) as everyone has individual requirements. We then either spend all of our time going round adding patches/software upgrades or need to give users admin rights on their PC. Neither of these is desirable".*

The level of inconvenience and pain felt in this area appears to be widespread across both Windows and Linux advocates.

#### Performance

IT Pro feedback suggests that many question whether the Windows operating system makes efficient use of hardware resources and adopters of Desktop Linux tell us they achieve better performance:

*"Each new version of Windows is heavier on system resources and forces a hardware upgrade, which we cannot justify because the amount of useful work done on that hardware is the same we did on a non-MMX Pentium 100MHZ with Win95 on it".*

*"Linux gives you higher performance on equal hardware".*

Other feedback in this area suggests that the more efficient hardware utilisation perceived with Linux translates to a more responsive user experience on equivalent machines and an increase in the useful life of older machines, with the latter leading to a direct cost saving on hardware procurement.

### Stability and Reliability

Interestingly, the issue of stability and reliability of Windows is not mentioned as frequently as the old clichés would suggest. Desktop Linux users mention it the most, but it is nowhere near as prominent as the security related issue.

Nevertheless, despite Microsoft's efforts with XP, stability and reliability of Windows is still perceived to be a problem by a significant number of IT professionals, as illustrated by comments such as these:

*"We can no longer carry the risk of mission critical Windows based machines crashing abruptly".*

*"Linux is a more stable, robust and deployable system; cheaper end to end, more reliable and controllable from an IT perspective".*

*"Users don't care [that they are running Linux] but they do appreciate the fact that their PCs and applications don't crash nearly as much, or need IT support intervention as often".*

### Windows Licensing Cost and Complexity

Whilst Microsoft and many analysts tell us that the operating system licence element is a relatively minor part of the overall cost of desktop computing, most (83% in our survey) still say it is a cost worth managing. There is a perception, however, especially amongst those in smaller businesses, that the complexity of Microsoft pricing, with the interplay between OEM agreements, "boxed" product bought through resellers/retail and corporate licensing agreements, makes this management difficult.

*"Microsoft licensing is a nightmare! We use MS partner versions of XP on all systems and it gets really complicated".*

*"When a legally licensed copy of Windows bundled with a machine and supplied with 'Recovery Disks' goes wrong, we have to run an IT department copy of Windows to get the machine working again. That machine is then no longer legal as far as Microsoft is concerned and yet we have paid for both licences".*

*"The price point of small volume Windows upgrades affects the economics of system ownership so much that we have ended up replacing systems before they ceased to be useful, simply because we didn't want to spend that much money on a machine with only one more good year left in it".*

*"The cost of Microsoft Windows is obscured in our organisation through complex site licence deals".*

Linux adopters simply point to the fact that switching can dramatically simplify, reduce or even remove licence cost related issues.

In addition to these five areas, IT Pros occasionally mention Linux being more compliant with open standards, but such comments are relatively rare - possibly because Windows is generally acknowledged to have achieved the status of a *de facto* standard for desktop computing. Whether this is regarded as a good or a bad thing is not the concern of this paper, but we have to acknowledge it as a reality, which brings us on to the topic of barriers to Desktop Linux adoption.

## 4. Perceived Barriers to Desktop Linux Adoption

Whilst many acknowledge the merits of Desktop Linux and perceive it has advantages over Windows, both Linux and Windows advocates also perceive there to be some significant challenges when considering its adoption.

From analysis of the IT Pro feedback, we can summarise the top 5 perceived practical challenges to be:

- Software availability and compatibility
- Usability, user acceptance and resistance to change
- Cost and challenge of end user training and support
- Cost and challenge of porting bespoke applications
- Dependency on Microsoft Active Directory

Each of these is discussed in the following sections, again with IT pro comments:

### Software Availability and Compatibility

This is by far the most significant challenge to Desktop Linux adoption if we take as a measure the frequency with which it is highlighted by both Desktop Linux advocates and sceptics. As an aside, it is also acknowledged as the number one challenge by Desktop Linux vendors based on recent interviews conducted with Novell and Red Hat. Both of these vendors regard investing time and effort in working with important independent software vendors (ISVs) to encourage Linux ports as a high priority activity. IT Pros generally agree with this prioritisation, as summed up in this comment:

*"The most important thing is the business task, so applications are where it's at; the OS is secondary. The key to Linux on the desktop is application quality and quantity".*

One of the most obvious considerations with regard to compatibility is the availability of "office suites". This is important because the *de facto* standard in this space, Microsoft Office, does not run natively on Linux.

*"Office is a critical app that Linux needs to enable it to take off".*

Desktop Linux advocates point out that OpenOffice, the most commonly cited Open Source alternative to Microsoft Office, is, on the whole, functionally equivalent to the Microsoft product. Some OpenOffice users, however, allude to its limitations in more advanced areas of Office use, particularly support for macros.

*"We'd love to throw Windows out, but we need the mature programming and automation facilities that Microsoft Office has. OpenOffice is OK but it's not there yet".*

It is also generally acknowledged that users of OpenOffice should expect the occasional document exchange problem with Microsoft Office users and that full interoperability with Microsoft Exchange and Lotus Notes (e.g. in the area of shared calendaring) relies on introducing separate solutions into the mix.

*"It's possible to transfer pretty much everything Microsoft Office can do to OpenOffice fairly easily. The problem lies in all the other businesses that still use Office and insist on sending out MS Word files, MS Excel files, etc that you can't read".*

*"OpenOffice needs to be 100% MS compatible to make it a serious option".*

*"It's not just MS Office that's the major blocker [to us moving to Linux]. We cannot operate without full Lotus Notes support".*

*"Another issue in switching to Linux is the lack of support for connecting to a Microsoft Exchange Server and having access to most of the normal Outlook functionality - including public folders, shared calendar, etc".*

There is an alternative approach which is to run Microsoft Office in a Linux environment. Whilst it will not run natively, utilities such as CodeWeaver's CrossOver Office, which provides a Windows runtime environment layered on Linux, may be used. IT Pro feedback suggests, however, that (at the time of writing) this only supports older versions of the Microsoft Office suite.

*"You can run MS Office under Linux using CodeWeaver's Crossover Office, but perhaps not the newest version. Office 2000 runs fine, and I believe XP will run pretty well too".*

But despite these limitations, it is not office suites that are the main challenge; it is that in many organisations, there are tens, sometimes hundreds of Windows-based applications in use that will not run on Linux either natively or with the help of the previously mentioned utilities. Examples frequently cited range from creative applications such as those from Adobe and Macromedia, though core small business applications such as QuickBooks and Sage, to higher-end solutions such as the full "thick" Siebel client.

*"It's the creative elements such as Adobe Creative Suite, Macromedia Suite, 3D applications (CAD/CAM, 3D renders etc) that need to be ported to Linux, as there isn't anything on that OS that comes near to supporting the level of features these offer".*

*"A show stopper mentioned by some senior and project management staff is that there appears to be no open source application that is compatible with Microsoft Project on Linux".*

*"The hold-up isn't MS-Office, it's QuickBooks and most other small business accounting software".*

*"We have to use Windows for machines that run our preferred accounting software, Sage, because Sage doesn't support Linux".*

From speaking with the Linux vendors themselves, it is clear that there is activity in both the commercial software and Open Source worlds to produce either Linux ports of existing Windows applications or viable alternatives that run on Linux alone or, ideally, both operating systems.

At the time of writing, however, the general conclusion from IT Pro feedback is that a degree of application switching and in some cases, compromise on application functionality, is an unavoidable consequence of migrating to Desktop Linux. Whilst strong advocates of Linux might dispute this, and even claim that the Linux environment is richer, the evidence from 1,700 respondents, two thirds of which have Desktop Linux experience, brings this limitation into sharp focus.

### **Usability, User Acceptance and Resistance to Change**

Usability of Desktop Linux is frequently called into question, but trying to assess inherent usability is very difficult as most of the feedback we receive in this area tends to be quite subjective. Many Linux advocates make reference to the significant user interface improvements that have been made in recent times, but it is also common for Linux users to acknowledge that things are still not perfect

*"The main reason I don't use Linux on my desktop (as opposed to on the server) is that the KDE and Gnome user interfaces are maddening compared to Windows".*

*"I have used both FreeBSD as SuSE Linux with KDE as a desktop environment, but the X(org/free) applications take too much of my time and create too much friction between each other. There is no standard look and feel and, for example, there is no standard for cut & paste, which is one of the tiny things that can drive someone completely nuts".*

Perhaps a more important consideration, if we make the assumption for a minute that both Windows and Linux can be configured to deliver acceptable inherent usability, is the fact they are different and that the vast majority of End Users are currently familiar with the Windows user interface. Even if the Linux user interface was proven in a laboratory to be superior, unfamiliarity with it could easily translate to a practical usability issue and therefore problems with user acceptance.

*"Why not switch to Linux? We want to, but getting all of our users to leave their trusted Windows applications and teaching them a new interface is THE main problem."*

*"OpenOffice and StarOffice remove the MS Office stumbling block for Linux adoption. The biggest block now is the user's acceptance of Linux as a workable desktop".*

*"We can barely get some of our folks to learn basic Windows procedures. Many users would flat out refuse to learn a brand new OS".*

If we put this together with concerns over application availability, it is common to hear of IT led Desktop Linux initiatives running into the brick wall of resistance to change, as business managers see the move as representing a period of disruption, a disjoint with the wider world (including their domestic computing environment) and a future constraint in terms of application choice. This can potentially kill a Linux initiative, even before it is properly scoped and evaluated.

### **Cost and Challenge of End User Training and Support**

Of course a way of avoiding some of the usability and user acceptance issues is to make sure users are properly trained and supported, both during and after a move. The cost and logistical challenges of doing this, however, are potentially significant.

*"Training is the death knell for Linux right now in the business".*

*"I would love us to move to Linux for the licence cost savings. But the user factor and support factor weigh very heavily against this. The cost, time, energy and fallout from the users would not be worth it."*

*"We use Windows basically because it does a good job right out of the box. While I can function with Linux, my users don't stand a chance. It would be a training support nightmare for me to switch them over [...] Contrary to what I hear from Linux people quite a lot, we simply just don't have very many problems with Windows 2000/XP."*

*"Linux is presently a good operating system for server platforms and we use it and FreeBSD fairly extensively. We develop software and fully support both of these as Tier 1 operating systems for our products, as we do with Windows. However, Linux is not presently a convenient or workable solution for the majority of typical desktop (read: non-technical) users. It's just too messy, and too difficult to support in that role".*

There is also a particular problem in larger environments with formal support infrastructures populated with staff geared up to providing help on Windows. These personnel need to be cross-trained as part of the migration process, but even if this is done well, they will still have little actual real-world experience under their belt. The level of service they will be able to offer to users without this experience will therefore be significantly less in the early days of a migration, which is exactly the time that most demands will be placed on them.

An alternative to cross training support staff is to hire them in, but some of the IT Pro feedback suggests this is not always that easy.

*The other blocker is resources. I have found it difficult to find support personnel that are familiar and capable with Linux".*

A number of those who have looked closely at the practicalities of implementing Desktop Linux also warn against under-estimating the importance of peer level support.

*"Would love to use a Linux platform but we'd be cutting out much of the 'co-worker' support that goes on."*

With a decade or two of experience with Windows scattered around the average office, a user running into a problem naturally shouts across the office for help as a first port of call. Help is often immediate without burdening the support desk. For a period of time after a migration, this ability for teams and departments to support themselves is no longer available, and if the IT support staff are still learning too, there is the risk of a backlash.

### **Cost and Challenge of Porting Bespoke Applications**

The next most frequently cited issue concerned with Desktop Linux is in relation to bespoke Windows applications.

*"Another roadblock to migration is porting our 190 desktop applications to Linux".*

Since the advent of SQL Server, Microsoft Access and Visual Basic, armies of developers, both professionals and gifted amateurs, have been developing applications that assume Windows as the front end environment. Many of these applications are a formally supported part of an organisation's IT landscape, but a similar number if not more were

developed informally at departmental, workgroup or even individual user level. Regardless of their origin, a large proportion of the plethora of home grown Windows applications is likely to be important or even critical to the business.

*“You should know that many large corporations have made very large investments in custom programmed applications, forms, document management, etc. based on MS-Office, and have huge amounts of vital business information in MS-Office format documents. There would be a huge cost in dollars, labour and lost time in making the conversion and this is a huge barrier to migration from MS-Office to anything else”.*

*“The big problem with Linux on the desktop in a mature environment is replacing or removing the huge number of 2nd tier applications (including hundreds of home brew Access databases) that are 'business critical'. In addition, many departments (particularly finance) have built up elaborate suites of Excel spreadsheets whose development costs over 10 years run to millions of pounds. Someone, sometime will do a big Excel to OpenOffice Calc migration and subtly (or not so subtly) screw up their financial management because nobody tests spreadsheets, do they?”*

Migrating bespoke Windows applications is an expensive and challenging prospect, but when we consider that identifying all of the Windows applications that matter is in itself difficult to do in the first place, the chance of overlooking something critical also introduces an element of business risk. Personal or team level Access databases, Excels driven by macros and VBA scripts, etc, written independently of the IT department by power users are a particular risk.

### Dependency on Microsoft Active Directory

Many organisations complained when Active Directory was originally “forced” on them as a mandatory part of various server upgrades over the past several years. Today, however, it is often deeply embedded into the systems infrastructures, policies and procedures. IT Pro feedback suggests that Active Directory is now regarded as key to the management of large scale Windows deployments in a significant number of organisations and this is perceived to be a hurdle to Desktop Linux adoption.

*“The only reason we do not recommend Linux on the desktop to clients is because there is nothing comparable to the management features available through Active Directory. With Linux, we do not have the same level of granular control over the user experience as we do with Windows.”*

*“The Main reason for not wanting Linux is deployment. Windows has its woes and costs, but Active Directory is really very good.”*

*“Linux simply lacks anything close to the level of scalable central management that can be achieved with Active Directory / Windows XP. The overall cost of a full-scale Linux roll out would be enormous - even after taking into account the minor savings on OS purchase price.”*

*“Linux is lacking a viable management solution, such as Active Directory/Group Policy or Netware/ZEN.”*

This issue was, not surprisingly, highlighted mostly by those in larger organisations.

### Other issues

There were a couple of other interesting issues that were mentioned, albeit not as frequently as the above top 5. The first is supplier management. We know from other studies that Microsoft is considered to be a key supplier by the majority of Enterprises. We also know that many CIOs have been trying to drive rationalisation of suppliers as a top down initiative. These trends can hinder the acceptance of Desktop Linux as illustrated by the following comments:

*“At the very top level, supplier management matters almost as much as the product. Our CIO would love to deal with Microsoft for all software and IBM for all hardware. The thought is that by using Linux we would be stuck with a gazillion suppliers for everything else.”*

*“Most of our PCs could easily be replaced with Linux boxes running OpenOffice, with critical Windows applications such as Lotus Notes running seamlessly as published applications via Citrix. But our management is scared of Unix/Linux; they don't understand it. The biggest obstacle is therefore not technical, it is management awareness. There is nobody out there marketing Linux to management the way Microsoft markets Windows.”*

With reference to this last point, we have seen some powerful Microsoft competitors such as IBM and Oracle come out in support of Linux on the server, but their level of proactivity with regard to Desktop Linux is still very limited. Also, as the comment suggests, Red Hat and Novell cannot compete with the Microsoft marketing machine at senior management level.

Again, we must stress that the potential barriers to Desktop Linux adoption we have been discussing here are based on analysis of IT Pro feedback. Whether any one of these is a showstopper, challenge, minor irritation or simply a non-issue in practice is dependent on your organisation's specific situation. Understanding your situation, particularly your level of dependence on Windows applications, is an important part of qualifying the Desktop Linux opportunity in the context of your business. This is something we pick up in more detail in section 6.

Before getting onto that, however, it is worth considering some of the tips and tricks those with Desktop Linux deployment experience have used to overcome or minimise the impact of the common challenges.

## 5. Tactics, Tips and Tricks

Experiences of those who have already successfully rolled out Desktop Linux suggest that there are some effective tactics that may be employed at a detailed level to mitigate some of the application compatibility and availability issues, increase the chances of user acceptance and smooth out some of the challenges from a training and support perspective.

We will describe some of these now so we can have them in mind when we look at how to qualify the Desktop Linux opportunity in section 6.

### Employ a selective, targeted approach

Perhaps the first and most important tip is to recognise that the question of Windows versus Desktop Linux does not necessarily have to be an “all or nothing” one. Whilst some of the IT Pro feedback was from smaller organisations who had replaced Linux completely across the organisation, comments like the following were more common:

*“I work for my city’s government. We have a huge spectrum of applications, so we could never be 100% Windows or Linux or whatever. In areas where we predominantly build our own applications, Linux is being seriously considered, but in areas that need flexibility, agility and ease of use, we are going to stay with Windows for the foreseeable future.”*

*“The line between whether to use Windows or Linux is not that clear cut. For example, in some sections of our business we use Linux more than Windows (especially in the more technical departments), whilst in others (general admin and so on) Windows still predominates.”*

*“We have some Linux desktop for experimentation and test and for use by transient employees. I estimate that eventually, 50%+ of desktops can be Linux with OpenOffice, with 50% Windows to run required windows applications like Autocad, our accounting system and other specialised telecommunication engineering programs.”*

Even if total migration is the objective, it still makes sense to work towards it in a stepwise manner, targeting discrete roles, workgroups or departments as sub-initiatives under the broader migration umbrella. Guidance is provided in section 6 to help qualify and prioritise target groups for either selective deployment or as a phase of a larger programme.

### Work with and motivate the business

The second big tip is to work through the detail itself with the business managers responsible for the areas of the business that represent the initial targets. This ensures they buy into the whole migration concept and increases the chances of them encouraging and motivating their staff appropriately.

*“Unless it is a more technical area that is already receptive to Linux, it is important to have managers and key users in each target department on board. They need to think of it as ‘our’ initiative, not ‘yours’ and buy into the rationale before you migrate even the first machine.”*

If the initiative is fairly broad ranging, it is worth considering an internal marketing/PR campaign to publicise what’s going on and make sure employees know what’s in it for them. This clearly implies the need to work out the value proposition to the business, typically in terms of increased service from the IT department or cost savings that may be used to free up cash and people and other resources to bring forward key projects or other investments.

When introducing the new desktop into a particular area, deploy to a small number of cooperatively minded and enthusiastic individuals that others already turn to for peer support with Windows. This creates “champions” who can help to drive interest and lays the foundation for replacing the peer level support that exists with Windows.

### Technology selection and discipline

Make sure that all important components sourced externally are fully supported and acquired under a robust maintenance and support agreement. This will typically mean sourcing Linux and other Open Source components from a recognised supplier rather than working with free distributions downloaded from the Web.

Apply all of the same disciplines that you would normally apply to managing and controlling a production IT environment. Just because you can enhance or optimise the operating system with your own closely coupled code, doesn’t necessarily make this a good idea.

### Rollout tactics

Roll out key applications that run on both Windows and Linux on the existing Windows platform first. Once users are comfortable with OpenOffice and the chosen Open Source browser on Windows, for example, switching Windows out for Linux becomes much less of a change.

Where there is a real confidence problem, provide users with a dual boot facility so they can fall back to Windows as a safety net if necessary. However, monitor such activity and question users that are consistently falling back to Windows to find out why this is the case. It is important to distinguish between natural nervousness of the unfamiliar and genuine difficulties, e.g. caused by an important application not working for the user in the Linux environment.

Consider the use of a thin-client architecture to serve up business critical Windows applications to the desktop that cannot be run natively in the Linux environment and do not have an acceptable Linux compatible alternative. IT Pro feedback suggests that Citrix and Open Source alternatives can bridge the gap until key software applications are ported to run natively in a Linux environment.

### **Prepare well**

It should go without saying that the IT department must make sure it prepares itself well in advance of the actual migration commencing. Application mixes and utilities must be verified as being able to work together without conflict. Ports or rewrites of bespoke applications need to be completed, fully tested, and so on.

In addition, all relevant IT staff and third party personnel must be fully trained and comfortable with the new desktop environment, particularly those working in the end user support function. To augment this, it is also worth considering the creation of an area on the company intranet to provide support information along with tips and tricks for how to get the most from the new environment.

## **6. Qualifying the Desktop Linux Opportunity**

Having looked at drivers, challenges and ways of managing those challenges, we can now pull everything together and look at how to assess the opportunity for Desktop Linux in your environment. The five steps outlined below do not form a complete methodology, they are intended simply as a guide for how to approach answering the question “Is Desktop Linux right for us?”

### **Be clear on why you are considering a Windows alternative**

Migrating to Desktop Linux will involve time, effort, money, and a degree of disruption. In this respect, it is no different in principle to the replacement or upgrade of any other part of the IT infrastructure, apart, perhaps in that the move will have a more direct and obvious impact on what is often a large number of individual users. This creates an added level of sensitivity.

Given this, suggesting that Windows should be replaced because of an ideological objection to Microsoft or the IT department’s enthusiasm for the Open Source model is unlikely to stand up as an acceptable rationale to senior management and the business user community. It is therefore necessary to make sure you can articulate the reasons for considering a migration in clear and precise business terms. The likely candidates in this respect are as follows:

- Reduction of security related business risk
- Reduction in the cost of achieving acceptable security  
*(Note that these two are different)*
- Reduction in other IT operations costs
- Reduction in software licence and upgrade fees
- Better service to users from improved performance and stability

It is not necessary for the benefits to be defined in great detail at this stage, but it is important to have a crisp idea of where the potential payback is going to come from. If it is not possible to articulate the rationale for considering Desktop Linux clearly in business terms at the outset, there is little chance of being able to build an objective business case once all of the costs and risks have been defined.

### **Make sure you understand your current situation**

Determining the current level of dependency on Windows is not easy but is critical to qualifying the feasibility of a Desktop Linux Deployment in cost/benefit terms.

As part of this process, it is necessary to look at the applications currently in use on a departmental, workgroup and role basis. At one extreme, there will be power users dependent on a range of desktop applications whose features are used extensively. In the middle, there are employees who make frequent but relatively shallow use of Microsoft Office and perhaps one or two other applications. At the other extreme, we have those users whose only requirement is to access a selected number of forms in a selected number of applications – e.g. in the warehouse or on the shop floor.

It is important whilst carrying out these investigations to identify business critical bespoke solutions as well as packaged software. This includes all of the home grown Access databases and Excel macro based applications out there as well those developed by the IT department.

### **Identify and qualify potential targets for deployment**

Having understood the dependencies in each potential area for deployment, the process of identifying and qualifying target groups of users for migration may begin. The ease with which a particular group may be migrated can be assessed by considering the following questions:

- How many Windows applications do they depend on?
- How many of these will also run on Desktop Linux?
- For those that won’t run on Linux, is there a Linux compatible alternative?

- Failing that, would it be feasible to run the application in thin client mode?
- Are there applications the user could benefit from that only run on Linux?

Having analysed dependencies and opportunities in this way, the degree of cost (in terms of time, effort, money and disruption) and benefit of migrating each target group may be determined. At this stage, an approximate cost/benefit assessment is the desirable outcome rather than a detailed cost analysis.

### **Determine the feasible scope of the migration**

From the high level cost benefit analysis, it should be possible to determine the feasible scope of a migration project.

Some organisations might conclude at this point that the opportunity is not significant enough to migrate at all, as the overhead of managing a second desktop environment cannot be justified by the number of users to which it could feasibly be deployed. Others might conclude that a wholesale replacement of Windows with Desktop Linux across all or most of the business is possible, in which case, the previous analysis may be used to determine phasing of the migration project. It will usually make sense to migrate the easiest targets first.

In between, there will be organisations that can identify enough target users to make the migration worthwhile, e.g. a large base of ERP users, but who exclude other groups for whom the migration would either be prohibitively costly or have a negative impact on user efficiency or effectiveness. Professional users who make heavy use of advanced Microsoft Office functionality or have a need for specialised Windows only applications are likely to fall into this category.

As part of the due diligence for including a group of users within the migration scope, it is clearly necessary to look very closely at the way they use critical applications to make sure that key features are available in Linux based alternatives or acceptable workarounds are possible.

### **Build the business case and secure exec level sponsorship**

Once the likely scope of the migration is determined and the nature of the target users is known, a business case may be constructed, taking into account:

- Acquisition and maintenance fees for the new OS and associated tools
- Acquisition and maintenance fees for alternatives to key applications
- Cost of IT time and effort to port or rewrite bespoke applications
- Cost of any additional infrastructure to allow thin client access where needed
- Cost of IT time and effort to effect the physical migration
- Cost of time and effort to cross train IT staff and users
- Cost of any professional services required to support the migration
- Savings from the areas highlighted previously in section 6.1
- Additional value that may be delivered as a result of the cost savings

This last point is an important part of selling the migration to business management and users. It could, as we said previously, be that the cost and time savings resulting from the migration may be used to free up resources to bring forward other projects and initiatives that the business has been waiting on for some time.

Assuming you get to this stage and the business case looks positive, this becomes the primary tool for securing the all important executive level sponsorship and funding for moving forward.

The alternative to the above is to drive a Windows to Desktop Linux migration as a unilateral IT initiative on the shaky foundation of technical interest or a subjective wish to move away from Microsoft and/or Windows. Whilst either or both of these motivations might be the starting point for the discussion, a firm business level foundation and sound tactical approach are required to ensure success.

## **7. Discussion and Conclusions**

No one can deny the pain and cost organisations have had to deal with through the use of Microsoft Windows over the years. It seems that Windows has always been behind the curve in the area of security in particular. It is therefore not surprising that businesses and public sector organisations have been looking at alternatives such as Linux, Apple OS/X, other forms of Unix, and, indeed, total thin-client computing replacements at the desktop.

The reality, however, is that Windows is firmly embedded into the fabric of so many organisations and switching it out for any alternative, however good, is not a trivial task. The question of whether Desktop Linux is an appropriate solution for a particular organisation is therefore down to the cost/benefit equation associated with the migration, which is in turn determined by the starting point and the application requirements of end users.

With this in mind, the cost/benefit ratio is likely to rule against wholesale Desktop Linux adoption for most organisations at this point in time, especially the larger ones. Application availability and compatibility, along with the cost of cross training and supporting users, are likely to be the main blockers. Many will also have an issue with bespoke applications.

But it is not just the cost and risk that is likely to block activity. A migration of this nature is a labour intensive exercise and the average IT department is already overstretched trying to cope with project backlogs. The business case therefore doesn't just need to be positive, it needs to be compelling for the project to compete successfully with others for funding.

However, many organisations could probably identify selective targets to which Linux could be deployed safely and cost effectively with the minimum of disruption. Users whose requirements largely revolve around transaction processing systems such as ERP, for example, could fall into this category, especially if their application access is predominantly browser based. Having said this, it is precisely this type of user that is often targeted with thin client solutions such as Citrix, which works around many of the perceived issues with full Windows desktops using a different approach.

The question of whether Linux makes sense for the average Microsoft Office user who doesn't stress or push the boundaries of the office suite too much is not that cut and dried either. Even though OpenOffice is a capable and robust product, full support for Microsoft Exchange and Lotus Notes requires additional components and anyone routinely exchanging documents with Microsoft Office users, either internally or externally to their organisation, still runs the risk of data compatibility issues for the time being. This will change over time as Open Source solutions evolve, which is likely to tip the balance in favour of migrating in more cases. It will always, however, be necessary to fully understand the user requirements before a decision is made.

In terms of other user types, one of the myths surrounding Linux is that you need to be a power user to cope with it and therefore it is only suitable for this audience. From what we have heard, the reality is exactly the opposite. The consensus amongst early adopters is that Windows power users are the most difficult group to migrate to Linux because of the breadth of applications they rely on and the advanced features they use within them. Replacing this richness with Linux compatible alternatives, and at the same time dealing with their legacy data and home grown applications, is extremely difficult.

Finally, we must not forget that Microsoft has invested significantly in dealing with the problems so often highlighted with Windows. The emergence of Windows XP and, more recently, Service Pack 2, has led to significant improvements in both stability and security. Microsoft tools for managing large scale Windows deployments have also matured, as we saw in some of the IT Pro feedback. As the Open Source alternatives become stronger and more complete, so too do the incumbent Microsoft solutions, so the likelihood of a tipping point towards Linux being reached in the foreseeable future is far from certain.

In the meantime, we encourage organisations to keep experimenting with alternatives as there will always be cases where they make sense.

## Appendix

### Survey Background and Details

The primary research intelligence upon which this paper is based was derived from an online survey executed in February 2005. The title of the survey was “Linux and Windows on the Desktop” and it was publicised via a popular online news site and via an email invitation sent to a panel of pre-registered respondents.

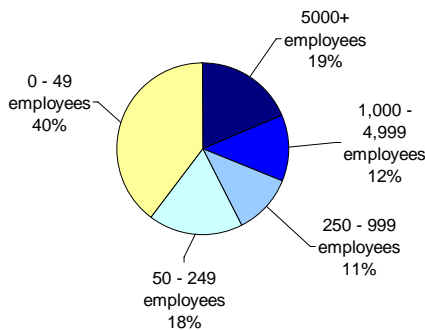
The questionnaire used in this study was designed by Quocirca Ltd. The Quocirca primary research team also analysed and interpreted the results and all work was conducted on a completely independent basis.

In total, 8,128 responses were received, approximately 1,700 of which had associated free text comments that formed the source of the quotes and the more generalised “IT Pro feedback” used as the foundation for this paper.

The sample covered a broad cross section of organisation sizes (Figure 1) but, due to the channels used for respondent recruitment, was skewed geographically towards English speaking countries (Figure 2).

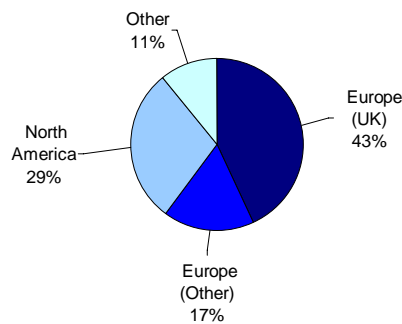
**Figure 1**

**Respondents by Organisation Size**



**Figure 2**

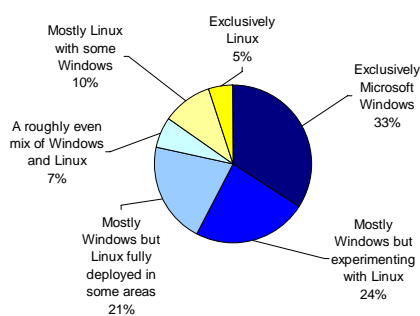
**Respondents by Geography**



The distribution of the sample by desktop operating system usage demonstrates that we had a good amount of both Windows and Linux experience behind the comments we received (Figures 3 and 4).

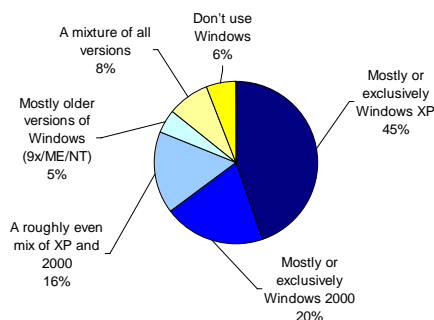
**Figure 3**

**Which of the following best describes the usage of desktop and laptop PC operating systems in your organisation?**



**Figure 4**

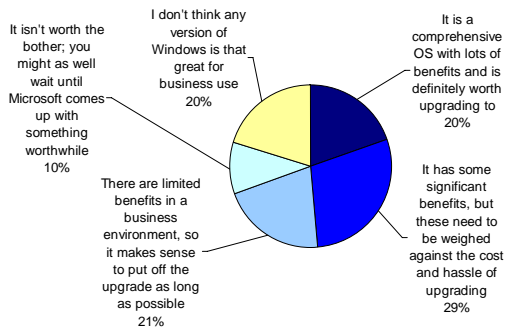
**If you are using Windows, which of the following best describes your current deployment in terms of versions?**



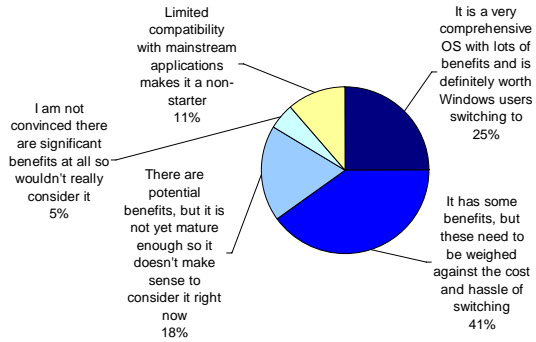
When looking at these two figures, we must bear in mind that this study was based on what’s known in research circles as a “self selecting sample”. This essentially means that respondents chose whether or not to participate based on their level of interest in the topic. As a result of self selection, we can assume a natural skew towards extremes of feeling in this highly emotive area. Those with a strong advocacy for Linux or, to a lesser degree, Windows XP, are more likely to have responded and will therefore be over-represented. It is therefore important not to regard the percentages given as representative of the world as a whole.

The same caution applies to the following, which illustrates how the respondents in our sample rated Windows XP and Desktop Linux (Figures 5 and 6).

**Figure 5**  
What is your attitude to Windows XP?

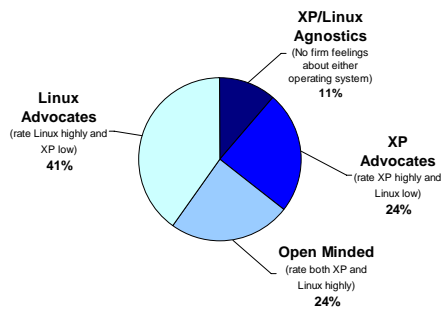


**Figure 6**  
What is your attitude to Linux on the desktop/laptop?

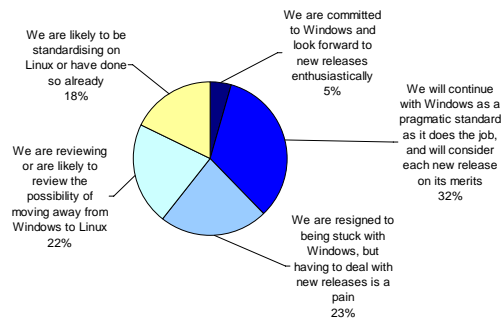


Nevertheless, by segmenting the respondents based on whether they rated one, both or neither operating system highly, we can form a view of operating system advocacy (Figure 7). Along with future plans (Figure 8), this gives us a feel for the range of different viewpoints and mindsets from which feedback was gathered.

**Figure 7**  
Respondents by Operating System Advocacy



**Figure 8**  
Looking forward, how do you see your use of desktop and laptop PC operating systems evolving?



An annotated PowerPoint outlining the results of the quantitative elements of the questionnaire may be requested at [www.quocirca.com/report\\_winlinuxppt.htm](http://www.quocirca.com/report_winlinuxppt.htm).

## About Quocirca

Quocirca is a perceptual research and analysis company with a world-wide capability and a focus on the European market for information technology and communications (ITC). Its analyst team is made up of real-world practitioners with first hand experience of ITC delivery who continuously research and track the industry in the following key areas:

- Business Process Evolution and Enablement
- Enterprise Applications and Integration
- Communications, Collaboration and Mobility
- Infrastructure and IT Systems Management
- Utility Computing and Delivery of IT as a Service
- IT Delivery Channels and Practices
- IT Investment Activity, Behaviour and Planning

Quocirca research is always pragmatic, business orientated and conducted in the context of the bigger picture. ITC has the ability to transform businesses and the processes that drive them, but often fails to do so. Quocirca's mission is to help its customers improve their success rate.

Quocirca has a pro-active primary research programme, regularly polling users, purchasers and resellers of ITC products and services on the issues of the day. Over time, Quocirca has built a picture of long term investment trends, providing invaluable information for the whole of the ITC community.

Quocirca works with global and local providers of ITC products and services to help them deliver on the promise that ITC holds for business. Quocirca's clients include Morgan Stanley, Oracle, Microsoft, IBM, CA, Vodafone, O2, EMC and Cisco. Sponsorship of specific studies by such organisations allows much of Quocirca's research to be placed into the public domain. Quocirca's independent culture and the real-world experience of Quocirca's analysts, however, ensures that our research and analysis is always objective, accurate, actionable and challenging.

Many Quocirca reports are freely available and may be requested via registration at [www.quocirca.com](http://www.quocirca.com).

**Contact:**

Quocirca Ltd  
Mountbatten House  
Fairacres  
Windsor  
Berkshire  
SL4 4LE

United Kingdom

Tel +44 1753 754 838

Email [info@quocirca.com](mailto:info@quocirca.com)

The logo for Quocirca, featuring the word "quocirca" in a lowercase, sans-serif font. The letters "qu" are blue, "o" is red, "c" is blue, "i" is red, "r" is blue, and "ca" are black.