



## *Session E-LIN1*

The business case to add Linux to your skill set

*Whil Hentzen*

---

## **Contents**

As I begin to think about application development in 2004, it's no secret that the Fox on Windows market has been stagnant. Jobs are tough to find. Whatever the reason (or reasons), the net result is that in order to grow your business, you have to look outside the Visual FoxPro + Windows arena.

There are multiple areas of opportunity. Over the last few years, we've looked at components like Visual Studio, SQL Server, Automation, .NET, handhelds, and the Internet. It's time to add one more capability to your ever expanding skill set: Linux. In every area of the computer industry, Linux deployment is growing. You hear daily of former Microsoft shops converting to open source and Linux – but you never hear of open source shops going the other way.

Linux has always been a strong contender in the server market, with the Apache Web server commanding the largest market share for years. But recent releases of Linux, such as Red Hat 8.0, have made serious inroads on the desktop in 2003, including the conversion of the city of Munich from Windows to Linux this summer.

That means that there's going to a huge opportunity for business apps on Linux over the next couple of years. You have taken for granted skills most developers don't even know exist – database normalization, business application design, OOP, Design Patterns, UML, and so on.

You owe it to yourself to put yet another tool in your Visual FoxPro toolbox – so when that customer or potential customer calls up, asking you to connect your VFP app to a Linux-based back end database, you can offer them a solution, not a referral to someone else who had the foresight to prepare in advance and knows something you don't. Prepare to grow your business now.

This session will provide a broad, complete overview of where Linux fits into the current computing landscape from the perspective of a VFP developer, where VFP can be used with Linux, and a conceptual plan for how to approach the incorporation of Linux into your day to day work.

---

# Fox on Windows Opportunities are Dwindling

No one in their right mind would argue that opportunities for FoxPro developers are increasing. But let's look at exactly why this is so.

## ***Microsoft has never marketed Fox very well***

This point is so obvious that it feels silly to even bring it up. But given its position in the marketplace ten years ago - the leading database tool for personal computers - Microsoft has devoted minimal resources both technically and marketing-wise. And they continue to ignore it today, not advertising it or promoting it except within very narrow niches.

## ***A strategy of appeasement***

Microsoft's strategy has always been one of appeasement - doing just enough to keep the Fox community mildly discontented, but not doing anything to force a mass exodus from Fox, and, presumably, to other, non-Microsoft products. We've always been left wanting.

## ***People leave the community but they have to be replaced in order to keep the community static***

This strategy of appeasement has had its casualties. Every year we see more and more developers - in many cases, our friends and associates - leave the fold, because their companies don't believe that Fox has a future, because their customers don't believe that Fox has a future, or because they retire or die.

In order to keep the community vibrant, then, we need new members to replace those who have left. But that rarely happens.

## ***Microsoft doesn't market Fox outside of the Fox community***

When was the last time you saw a Visual FoxPro ad anywhere but a Fox publication? When was the last time you saw VFP evangelized by Microsoft anywhere but at a gathering where VFP developers were in attendance? It never happens. You see Microsoft push other products - .NET, SQL Server, Commerce Server, Exchange, and so on - at Visual FoxPro gatherings. Remember the full day of .NET training forced upon attendees at DevCon in Miami a couple of years ago? Do you think that attendees at TechEd or the PDC are going to see a half day of Visual FoxPro training jammed down their throat? They won't even provide sessions on VFP at these major Microsoft events. They say that it's because "We tried that but no one goes." Then why do they promote non-VFP sessions at VFP conferences? It's because "these are important technologies that VFP developers needs to know about." Thus, Microsoft has shown that it doesn't believe that VFP is important to other developers.

As a result, not only are the numbers in our community not growing, they're not even staying the same, because Microsoft won't market Fox outside of the Fox community, and thus those who are leaving aren't being replaced, except by happenstance.

## ***What are the numbers?***

Advisor DevCon attendance has dropped 20% every year since 1996 - from 3,000 to around 350 in 2003. It's now down to the size of 'regional conferences' they disparage.

Vendor participation at DevCon used to take up a whole room - 50 or more vendors. Now it's a half dozen booths lined up against a wall in the lunchroom.

FPA used to have a eight or ten technical articles a month. Now it's one or two articles plus a couple of columns - because the advertising revenues aren't there to support the editorial pages.

User group attendance has plummeted. Ten years ago, it was common to see 100-150 attendees at a regular monthly meeting of the Chicago Fox Users/Developers Group. Now the entire meeting can fit around a conference table. This pattern is repeated throughout the country – for those groups that are still in existence.

VFP jobs are hard to find. Period.

Microsoft sales team continues to ignore VFP, after ten years, you still get "Do we sell that?" or, from the more knowledgeable: "Do we **still** sell that?"

Suppose you proposed a new app that was custom designed for Visual FoxPro. Let's say - a dozen workstations, 20 users, one physical building, 4,000 transactions a day, a small Web component for price lookups and order entry. And then suppose you asked 100 Microsoft sales reps what Microsoft product to use for this app. How many of them would recommend VFP, and how many would try to shoehorn this app into .NET?

All this means that the opportunities for Visual FoxPro on Windows development continue to dwindle.

Given that Microsoft won't support Fox on Windows, I predict Fox on Windows development will be, for all practical purposes, dead by end of 2004. I predict that two mainstays of FoxPro on Windows - Advisor DevCon and FoxPro Advisor - will both be gone. If someone else was running FoxTalk and GLGDW, I'd predict that they would be too. In order to keep them alive, I'm taking them into new directions.

### ***So we have to look for new business opportunities elsewhere.***

The first, obvious choice is .NET. But there are millions of VB and C++ developers moving to .NET, and .NET acceptance is not a done deal. There are still some major questions about whether it will be a success, or if it will go the way of Microsoft Bob and Hailstorm. And even if it does work, do you really want to compete with ten million other developers who are coming from VB and C++ backgrounds, and thus, in the eyes of their customers, ahead of the game when compared to these Visual FoxPro guys who have never been in the mainstream Microsoft camp?

The other choice is to look for other places that we can use Fox. And I believe that there is a huge opportunity in the making by using Fox in concert with Linux.

---

## **Linux App Dev Opportunities are growing**

### **What is Linux?**

Linux is an operating system that was initially created as a hobby by a young student, Linus Torvalds, at the University of Helsinki in Finland. Linus had an interest in Minix, a small UNIX system, and decided to develop a system that exceeded the Minix standards. He began his work in 1991 when he released version 0.02 and worked steadily until 1994 when version 1.0 of the Linux Kernel was released. The current full-featured version is 2.4 (released January 2001) and development continues.

Linux, strictly speaking, refers to just the operating system kernel. This kernel supports multi-tasking, multi-user and server capabilities. However, when people talk about "Linux", they often refer to more than just the kernel, but to the ancillary components, such as GUIs, utilities, installation routines, and other components.

Linux is developed under the GNU General Public License and its source code is freely available to everyone. That means that anyone can package the source code together with whatever else they desire - one or more GUIs, applications like OpenOffice.org or Koffice, utilities like the Mozilla browser and The GIMP graphical editing tool, and literally thousands more software applications of all kinds and sorts.

These collections are called 'distributions' and there are well over 100 different distributions available - some for popular, mainstream use, like RedHat, SuSE and Mandrake, others for hardcore users, like Debian, and still others that are more specialized.

This however, doesn't mean that Linux and its assorted distributions are free -- companies and developers may charge money for it as long as the source code remains available. Some distributions are free for download, but support comes at a price, while others are produced by consortiums of volunteers, and support is available only online. Linux may be used for a wide variety of purposes including networking, software

development, and as an end-user platform. Linux is often considered an excellent, low-cost alternative to other more expensive operating systems.

Due to the very nature of Linux's functionality and availability, it has become quite popular worldwide and a vast number of software programmers have taken Linux's source code and adapted it to meet their individual needs. At this time, there are dozens of ongoing projects for porting Linux to various hardware configurations and purposes.

Linux has an official mascot, the Linux Penguin, which was selected by Linus Torvalds to represent the image he associates with the operating system he created. Although many variations of the word Linux exist, it is most often pronounced with a short "i" and with the first syllable stressed, as in LIH-nucks.

(parts from Linux Online, at [www.linux.org](http://www.linux.org))

## Where is Linux used?

The primary use of Linux as of the beginning of 2003 was still in the back room - file and Web servers. There were also a wide variety of customized versions of Linux for specialized applications, such as machine controllers or vertical market hardware applications like watches and PDAs.

Over the course of 2002 and 2003, Linux has seen continued progress as a desktop operating system or as the foundation for a workstation.

## Growth curves

Not a week goes by that you don't see news about Linux and related open source projects. Business Week, Fortune, and the Wall Street Journal all have had cover or front page stories about Linux in the first few months of 2003. The March 15, 2003 issue of CIO magazine had a survey that indicated that over 60% of CIOs in Fortune 500 companies are evaluating Linux for use in their operations. Will they all move to Linux? No, undoubtedly not. But it's now on their radar screen as a serious contender for their attention.

Schools and governments are switching to Linux in droves - again, you can find new stories about this district or that entity making the switch every week. Conversely, you don't see stories about entities who had been Linux-based and who are switching to Microsoft. The trend is clearly in one direction.

RedHat, SuSE and Mandrake's latest distributions have made to leap to being usable on the desktop for a significant number of users. Typically, these are the 'power user' or 'early adopter' who was first to try out VisiCalc, the first to write macros in Lotus 1-2-3, the first to try Windows 3.0, the first to get an email account and start surfing the Web.

Linux is no longer strictly in the domain of highly technical computer wizards. Each of these distributions can be installed by your average power user who can click on the Enter key a dozen times. Hardware detection, network card installation, setting up a connection to the Internet - these are all transparent to the user in these distributions.

OpenOffice.org, a competitor to Microsoft Office, contains a word processor, a spreadsheet, and a presentation manager (and a number of other tools). It, like Linux, is open source and thus available for download for free. It also runs on Linux, Windows and the Mac - and files are compatible across all three platforms. It contains 90% or more of the functionality of Microsoft Office, which is to say 70% more functionality than most people will ever use.

How good is OpenOffice.org? Since summer of 2002, I've used OOo to edit FoxTalk articles from authors, and then to produce my half of FoxTalk. Authors and Pinnacle use various incarnations of Microsoft Office, from 97 to XP, and there's never been a complaint - indeed, until I told them in February, no one ever knew. And we use OpenOffice.org for all of our Hentzenwerke Publishing work.

Evolution is an email client that functions very similarly to Microsoft Outlook, except without the security holes and flawed architecture.

OpenOffice.org and Evolution are included with many mainstream distributions, including RedHat 8.0 and later. OpenOffice.org and Evolution are making great headway into all sorts of organizations who can't

afford the cost of Microsoft Office or are worried about keeping up to date with the draconian licensing requirements of Microsoft Office.

## Why are people moving to Linux?

### ***Inexpensive***

Open source software, such as Linux, OpenOffice.org and Evolution can be downloaded for free.

### ***Licensing***

Licensing for Microsoft products is becoming more and more strict, and Microsoft is becoming more and more aggressive about enforcing possible lapses.

Even VFP's licensing has changed. If you have bought an upgrade to VFP 8.0, you are not able to use earlier versions of VFP anymore. Period. Even I went out and bought a brand new copy of VFP 8.0 because I didn't want to take the chance that I would be in violation of the fine print.

The penalties are severe, and people don't want to take the chance that they have an unknown liability at their company. Thus, they're looking at open source products which don't have the same issues. A single set of CDs can be used to install open source software on any number of machines.

### ***Security***

I set up a Linux Web server at the beginning of 2003 and hooked it to the Web, using the default Red Hat configuration. I didn't announce the server to anyone, nor is there any content on the server whatsoever past a dummy index.html page. The server log has had over a thousand hits a month - every one of them an attempt to hack into the server using Windows exploits. Not a single attempt was a Linux-based exploit. Clearly, Windows is where the hackers are targeting, while Linux is being ignored.

It's stories like this that make people perceive that Linux is more secure than Windows. Whether it is or not doesn't matter - it's the perception. Everyone "knows" that Linux is more secure. And thus they're looking at Linux as a more secure alternative.

### ***Open source code, proprietary data***

Microsoft recently announced that a critical security flaw in Windows NT Server 4.0 will not be fixed, even though they have promised to support the product through 2004. They offered a workaround but claim that "it's too hard to fix." There are still millions of NT4 installations around the world, yet a company with \$50 billion in the bank says it doesn't have the resources to support their product. Some companies agree with their position, that an eight year old operating system should be put to pasture. Others feel that their proposed solution of upgrading to a new version is disingenuous, particularly since they promised to support it through a given date. With open source products, companies can make evaluate whether or not a fix is too hard or not, and, if necessary, make the modifications themselves as they need to.

Many companies feel it's bad business to entrust their own data to a closed, proprietary format that's under the control of another company. They don't want to be locked to a particular vendor because their data is being held hostage. They would rather have their data stored in an open format that can be accessed by a variety of products, if they have the choice and opportunity. Thus the push to XML - which can be read by many products. It's an open standard.

### ***Trust***

Microsoft has been tried and convicted of breaking the law in a variety of cases. Some companies do not want to do business with such a company if they have the choice to go with an alternative.

## **Dependability**

Microsoft continues to have problems maintaining their own house in order. A couple of years ago, Microsoft's DNS servers went down because they had ALL of their servers on a single computer. When that computer had problems, their entire website was unavailable for over a day.

More recently, part of their customer database was hacked into. Their entire MVP database was compromised. And everyone knows about how the SQL Slammer worm brought many of Microsoft's own servers to their knees because they hadn't been patched in over a half year.

Redundancy, fault tolerance, data security, and security updates are entry level concepts, yet they're not daily practices at the largest independent software manufacturer in the world.

Some companies are uncomfortable with this inability for Microsoft to manage their own affairs properly, and thus don't feel comfortable depending on them for mission critical applications, processes and services.

## **Maturity of desktop**

Two years ago, it was widely held that Linux was never going to be used on the desktop. Office suites were held up as a prime example. About OpenOffice.org (StarOffice back then): "It's junk. Totally unusable."

A year and a half ago, the same office suites had moved to "It's only useful if you're desperate and you need something for free." A year ago, that view had changed to, "Yeah, OpenOffice.org is OK. But it's definitely nowhere near as good as Microsoft Office."

Six months ago, people started saying, "We can definitely use OpenOffice.org in some places in our organization."

And in 2003, companies are saying "We're seriously looking at replacing Microsoft Office with OpenOffice.org, and just keeping Microsoft Office in a few places where we need specific functionality that isn't available in OOo yet."

In just two years, people have seen an open source competitor to the cash cow of the largest software company in the world make serious inroads. They're interested and taking note. And they're now taking open source seriously themselves.

## **About Open Source**

Linux is open source software, as is OpenOffice.org and many other software applications that run on Linux. What does open source really mean?

### **Start of Open Source**

Richard Stallman, one of the original hackers at MIT over two decades ago, had his office closest to the workgroup laser printer. It kept jamming. He wanted to modify a printer driver so that it wouldn't jam, but the manufacturer refused to let him. He was incensed. Imagine if Ford or Chevy refused to allow you to put dual carbs or turbo charge your 58 coupe? Stallman felt that the manufacturer's action was tantamount to the same thing.

After some noodling, he came up with the GPL that made the source code available for anyone to look at, use, and modify, with the single restriction that modifications to GPL source code also had to carry the GPL license.

See "Free as in Freedom", but Richard Stallman. Required reading.

### **How Open Source Works**

Two words: GENSCRNX. GENMENUMX.

All volunteers, although some companies allow or ask their employees to work on open source projects. Sun Microsoft systems, for example, has paid employees who work on StarOffice/OpenOffice.org.

One person is head of the project. Depending on the size of the project, there may be a hierarchy, where a second level in the chain of command runs parts of the project. With Linux, for example, there are leads for the kernel, for drivers, etc. With OpenOffice.org, there are leads for development, marketing, documentation, and so on.

Developers grab a chunk of code that interests them and work on bugs, enhancements. Hopefully they'll work on pieces that are ranked as important, but, since it's a volunteer effort, they may not.

## **Why Open Source Works**

There are two primary reasons why open source works.

First of all, the open source community is just that - a community. People participate because they are fulfilling a basic human need - the need to belong. And since many of us didn't belong to the football team or the cheer leading squad in high school, we jump at the chance to belong to a group that will not only 'allow' us to join, but will welcome us with open arms.

Second, developers get 'karma points' for doing good things. The better the things, the more points. Fix a major bug that other people have wrestled with for a long time? Create a new feature that's been on the list for a while? Figure out a way to speed up a nauseatingly slow operation? You become "way cool". The rock stars in the open source world are those who do the best things - who write the best code - and with the fewest bugs. There isn't any (well, not much, at least) politicking and back-stabbing like that which characterizes many other volunteer groups - you don't rise to the top by talking - you rise to the top by doing. Darwin at work. It's pretty fun.

See "The Cathedral and the Bazaar" by Eric S. Raymond. The other book that is required reading in this part of the business.

## **About Open Source - Common Questions**

As I've made this presentation to group after group, I run into the same questions.

### ***What if all the open source developers get married, have kids, and stop programming?***

First of all, contrary to popular myth, not all of the open source developers are unkempt long hairs downing Mountain Dew and Doritos at 3 am and listening to Eminem while banging away in their C editor. A surprising number have day jobs that they use to support their families - the average open source developer more looks like a grey beard you'd see at a Neil Young or Rolling Stones concert.

Sure, there's always some turnover. But people are into open source development because it's part of their self-image, part of how they belong to "their" community.

### ***How can I make any money if Linux is free?***

People aren't going to pay you for Linux. They're going to pay you to deliver value via custom software. Just because they're not paying huge amounts for licenses doesn't necessarily mean that they don't want to pay for anything. They're paying for hardware, for support, for telephone service and Internet connections. If they want you to do custom software that they're going to find value in, they'll have no problem paying.

True, given the philosophy of open source, they may try to find an open source application that fits their needs. If they can find one, more power to them!

### ***There are too many choices. How do you decide?***

Gosh, what a terrible thing to have happen. You're suddenly faced with **choices** again. You do the same with software as you do with toothpaste, automobiles, and movies. Pick one. Or ask a friend. Try it out. If it doesn't work the way you wanted it to, try another. That's the beauty of having choices - you can decide for yourself - not have someone else choose for you.

## Why NOT Linux?

Linux and open source are not a panacea. They're not for everyone.

### ***Fit and Finish***

There are still a substantial number of "fit and finish" items in Linux and other open source projects - and they are much more noticeable than the few in Windows. For some people, they'll try out Linux or OpenOffice.org, and decide it's not for them.

### ***Jerks in the Community***

The Linux community has its roots in the core hacker ethics, and, as such, have all the attendant cultural issues. There are the technical snobs - those who openly show their disdain anyone who doesn't know hundreds of terminal window commands, and their dozens of parameters, by heart, and think that GUIs are for sissies. These folks are a little hard to deal with.

Worse are the zealots - those who blindly proclaim their allegiance to Linux - and who blindly hate Microsoft - without being able to reason or accept rational but differing points of view. These folks are just too much to take. I've twit filtered more of these folks in the last two years than I have in the Windows world in a decade.

And then there are those with their own agenda - for example, those who are pushing something for their own interest. I might be accused of being one of these, and the accusers would be partially right. I believe that Fox and Linux is the right way to go, and I'm going to promote it in order to promote Fox and keep my consulting and publishing businesses alive.

## Your First Look at Linux

Let's stop this "powerpoint" show for a minute.... and see that we've been running OpenOffice.org's Impress presentation software on Linux the whole time. And that this white paper was written with OpenOffice.org's Writer.

## Ramifications

So what does all this mean?

### ***Linux deployment is growing***

As we've seen, Linux deployment in the mainstream world is growing - in business, on desktops. And that means...

### ***Demand for custom application development will grow***

When people have Linux on their desktop because they're using OpenOffice.org and Evolution and a whole host of open source software, they're eventually going to run into a business situation where they need custom software. Just as Windows 3.0 produced the need for GUI applications (remember the learning curve we all went through then?), Linux will produce a need for apps as well.

### ***Available tools***

Unfortunately, there aren't many tools out there like Visual FoxPro, or even Visual Basic. The big three - Perl, Python, and PHP - really aren't 4GL languages. Kylix (Delphi on Linux) is probably the closest, but it's still not the same as Fox, and it hasn't achieved a critical mass like, say Visual Basic did with Windows 3.0 development.



## **Available developers**

Even worse, the majority of Linux users are operating system geeks, not application developers. That spells opportunity for us - we know databases, user interfaces, OOP, design patterns, normalization cold - they're still a long way from being competent.

---

## **Fox is Great. Fox + Linux = Opportunity**

Theoretically, there are three general areas of opportunity.

### **Fox apps on Windows talking to Linux back ends**

The first opportunity is to connect your Fox apps to Linux back ends - MySQL or PostgreSQL databases on Linux. Or, if you're looking for proprietary solutions, Oracle or DB2.

### **Fox apps on Linux talking to Linux back ends**

The second potential opportunity is building FoxPro applications that run on Linux workstations, and connect to Linux back ends.

### **Fox apps on Linux talking to Windows back ends**

And the third opportunity is building FoxPro apps that run on Linux workstations, but that connect to Windows back ends, like SQL Server. Or Access. Heh heh heh.

## **Fox won't run on Linux. Or will it?**

Hmmm.... Of course it won't. Visual FoxPro is a Windows tool, that connects to the operating system via the Windows API, right?

Except that there's an open source project called WINE that serves as a layer between Linux and Windows applications running on Linux. It takes calls from the Windows application and translates those to Linux. Examples of Windows applications running on Linux via WINE include Acrobat Reader, FTP Commander, and WS-FTP receiving "Gold" status, and many others under development, including Visual FoxPro, Dreamweaver, Photoshop and Quicken.

As of the writing of this paper, I've been using Visual FoxPro 8.0 running on an alpha release of WINE, and have had good success. There are still some issues, but day by day, these are taken care of. The Visual FoxPro WINE subproject is the number one WINE project. See WINE and get involved at [www.winehq.com](http://www.winehq.com).

And there are others who have been using VFP 7.0 on Linux via WINE to develop and deploy production applications. It's only a matter of time before we get 8.0 running just as well.

---

## **Conclusion**

As we've seen, Visual FoxPro is not a growth market, while application development on Linux is a huge growth opportunity. People ask me what my plans are and what they should be doing if they want to prepare for the growth opportunities with Linux.

## What I'm doing now - infrastructure

I'm methodically migrating my Windows infrastructure to Linux. I have one Web server and one file server each converted to Linux as of this writing, and will have another server converted by the end of 2003.

My primary desktop machine is running Red Hat, and all but one of the other desktops on our network are also running various versions of Linux. My one remaining Windows machine is running Windows 2000 and will stay that way until it dies.

## What I'm doing now - products

As of the writing of this paper, we have 10 books in the works. 2 cover Visual FoxPro and the rest are on various open source technologies. Of our last six books, four were on Visual FoxPro and two were on non-Microsoft subjects; those two have outsold the other four significantly. Our book on OpenOffice.org is already our number four seller despite only being out for a couple of months.

## What you should be doing

I expect that many Visual FoxPro developers will be using VFP for the next ten years. Just as there are plenty of developers still maintaining FoxBase and FoxPro 1.0 and 2.x applications ten years after those products were released, I think that Fox developers will be maintaining VFP applications well past 2010.

However, that doesn't mean that Visual FoxPro developers should ignore other avenues for new business. In order to take advantage of Linux, there are three things that a VFP developer should do.

First, install Linux on a test machine. Popular distributions like Red Hat and Mandrake can be downloaded from their respective Web sites for free. Another distribution, Knoppix, is even easier to use – it runs off of a CD, so you can boot it and experiment, but without making any changes to your hard disk.

Second, practice with Linux on desktop. Use it for Web browsing, for creating documents via OpenOffice.org, for managing mailing lists with one of the many email clients, and so on. Get comfortable with the user interface and the tools available.

Third, learn to connect to a Linux back end, such as VFP interfacing with a MySQL database that's running on a Linux server. That way, when that customer or potential customer calls up, asking you to connect your VFP app to a Linux-based back end database, you can offer them a solution, not a referral to someone else who had the foresight to prepare in advance and knows something you don't. Prepare to grow your business now.

---

## Resources

[www.linuxtransfer.com](http://www.linuxtransfer.com)  
[www.openfox.org](http://www.openfox.org)  
[www.leafe.com](http://www.leafe.com)

## End