

## Windows in the world of Linux

# LIVING WITH VISTA

Home and business users are starting to wonder how Windows Vista will work with Linux. In this month's cover story, we'll show you Vista from the eye of Linux. **BY RÜDIGER BERLICH, JOE CASAD, JAN KLEINERT, AND ANDREA MÜLLER**

**A**nother new version of Windows has arrived, and you are probably wondering if the new Windows will really be so different from the old Windows. The answer is that Windows Vista, like all previous Windows releases, comes with some significant new features and some insignificant new features pleasantly bundled in an over-hyped potpourri. Any way you look at it, though, the proliferation of Windows systems means that a new version really is worth noticing – even if you aren't a Windows fan.

Most networks with Linux are actually heterogeneous networks that may include a number of different Windows systems. The flawless functioning of your network is most likely the result of past troubleshooting efforts that you may not even remember, but as soon as a new version of Windows rolls out, you'll have to start that troubleshooting all over again. The recently reported problems with networking Vista and Samba are just the first step in a long process of keeping Windows and Linux connected, and if the present is anything like the past, the open source community will need to take the lead in the quest for Windows/Linux compatibility.

Another reason to learn about Vista is that Linux is now competitive in the desktop workstation market. If your company plans to put any new desktops

online, you'll need to know how the new generation of Windows measures up to the new generation of Linux.

In this month's cover story, we bring you some important details about Windows Vista in the Linux context. We'll start with a look at tools for accessing Linux partitions from Vista. Next we'll examine some techniques for sharing files between Vista and Linux systems. We'll describe the differences between Bash and the Vista command shell, and

we'll finish with a study of Vista and Linux dualboot.

## Vista vs. Linux

As a starting point for our study, our testing lab compared Windows Vista with some equivalent Linux systems and arranged the results in a handy tabular format. Their tests included the following popular Linux releases:

- Mandriva Powerpack Professional 2007



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- Red Hat Enterprise Linux Desktop 5 (Beta 2)
- Suse Linux Enterprise Desktop 10
- Xandros Desktop 4

Table 1 describes some helpful facts relevant to the installation process. For a general look at an array of important features, see Table 2. Table 3 provides a summary of security features.

The follow sections include some notes that could not fit easily into the tables. The real interplay of complex modern operating systems, however, is much too complicated for any brief summary. In later articles, we'll bring you more details on how Vista interacts with Linux, but ultimately, your own experience with Vista (or Linux, for that matter) will depend on your hardware, your software, and your situation.

## Updates

The Windows Vista update features are similar to the update features for Win-

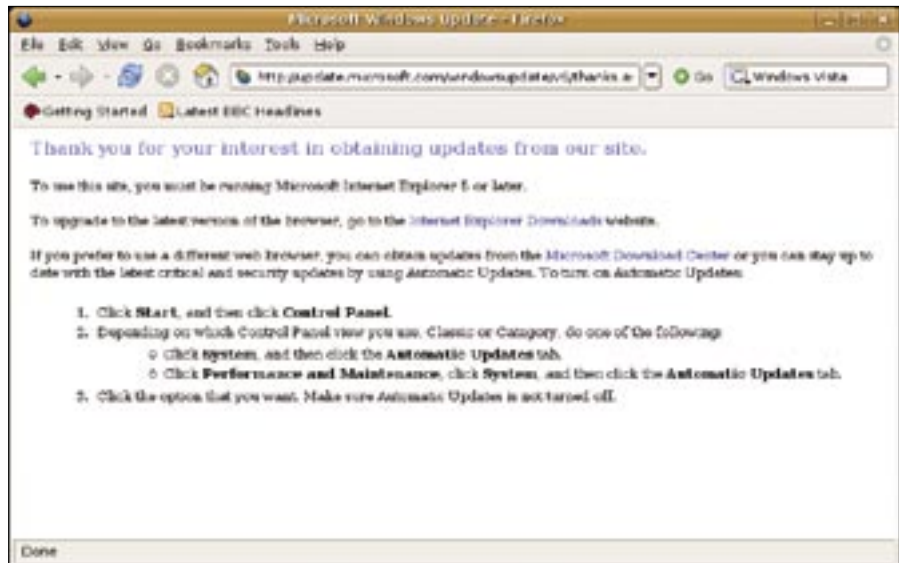


Figure 1: You'll need Internet Explorer to configure an automatic backup through the Windows Update website.

dows XP. Vista includes a tool for automatic update, however, you won't be able to use this auto-update tool unless

you're running Internet Explorer (Figure 1), so if you plan on running Vista with Firefox or some other alternative

## The Challengers

The corporate-grade Linux distros in our test also had a few quirks:

### Mandriva Powerpack Pro

Powerpack Pro is a more consumer-oriented product than the others in the test, although the vendor does recommend it for corporate users. Administrators who are not fazed by the decidedly non-business-like installation object to the fact that it is impossible to automatically propagate an identical setup to multiple clients. But apart from this drawback, the installation was quick and well designed.

On some machines the drivers for ATI graphics adapters on ATI refused to work until the administrator disabled the composite extension via the control center or in *xorg.conf*. The fact that Mandriva Linux claims to support the XFS filesystem but uses a kernel version known to cause data loss on XFS partitions could be a serious issue for XFS users.

### Red Hat Enterprise Linux Desktop 5, Beta 2

In contrast to Mandriva, Suse, and Xandros, RHEL Desktop 5 Beta 2 is incapable of resizing NTFS partitions; in fact, it can't even use them as mount targets. This said, we had no trouble installing RHEL in the free disk space parallel to an existing Windows installation. The installation routine is easy and intuitive, and it offers some interesting conveniences. For instance, you can access a console

by pressing [Ctrl]+[Alt]+[F1], which lets you run a utility such as GNU parted if problems occur.

The fact that Red Hat supports i-SCSI as an installation target is a feature quite obviously aimed at professional use. By default, Red Hat relies on the Logical Volume Manager for allocating disk space, and LVM sets up an Ext-3 partition along with the swap partition. After completing the install, you will discover a file titled */root/anaconda-ks.cfg*, which you can then use as a template for an automatic kickstart install.

### Suse Enterprise Desktop

The SLED 10 installation is very similar to that of openSUSE, however, the DVD lacked a 64-bit version. The license agreement displayed at the start of the install is a surprise, and it imposes fairly strict restrictions on users, prohibiting "disassembly" of the software. The license defines "software" as the whole distribution, including the accompanying documentation. This clause appears quite nebulous in light of the distro's many open source components, however, our testing team did not include an attorney.

The search function in the package selection was very useful, as was the simple firewall setup during the installation. One proxy configuration failed at first for lack of an IP address. We soon fixed the

problem by entering *rcnetwork restart* at the console.

The online update took about half an hour – longer than the installation itself. The reason for this is that SLED 10 has been on the market for a couple of months, and the vendor is very conscientious about removing security bugs.

What we really liked was the fact that SLED offer to clone the installed system for Auto-YaST at the end of the install. But make sure you have enough licenses – in contrast to the Linux typical approach of "Buy once, install many," you will need multiple licenses for SLED 10.

### Xandros Desktop Professional

Xandros also starts off with a lengthy license agreement that allows you to use the product on an unrestricted number of machines for non-commercial use, and a single machine for commercial use. In our lab, the Express install turned out working desktops with a minimum of user interaction on machines with a variety of CPUs and graphics adapters. There was no need to interact with the X configuration, and although the details may differ depending on your hardware, you can always access the Expert mode for advanced configuration options.

Xandros is the only distribution that uses logical Reiser partitions for the whole filesystem. We were unable to find a tool to automate the installation.

browser, you'll need to apply the updates manually. This closed-source practice of punishing users for exercising choice seems infuriatingly anachronistic to the open source community, and it is easy to believe that this ploy will ultimately fail, but in fact, Microsoft does this kind of thing all the time, and the courts, as well as the worldwide Windows user community, keeps letting them get away with it.

As for the Linux alternatives, Mandriva will automatically install any updates without needing user interaction. However, you do not have the option of specifying which packages you do not want to update.

Suse admins who would like to install software off the network can enter the installation source in YaST, and then run the YaST Installer. Like all the other test candidates, SLED displays an icon in the

panel to notify the user when new updates are available.

On Red Hat Enterprise Linux, you can use the graphical package manager, Pirut, to search for a specific set of packages, such as packages that contain the *X11* string. The required package is then downloaded. Membership of the Red Hat Network, where every single purchased system is registered, helps keep your packages up to date.

**Table 1: Installation**

	<b>Mandriva Powerpack Professional 2007</b>	<b>Red Hat Enterprise Linux Desktop 5 (Beta 2)</b>	<b>Suse Linux Enterprise Desktop 10</b>	<b>Xandros Desktop 4</b>	<b>Windows Vista Business</b>
Impression	clear-cut and intuitive; cosmetic errors on printer setup without network	some cosmetic errors in beta version	some cosmetic errors	error free	error free
Navigation	serial; some settings can be corrected at end of setup	serial/reverse serial	serial/reverse serial	serial/reverse serial	serial
Media	1 DVD (32 or 64 bit)	6 CDs, 1 supplementary CD	1 DVD	1 DVD	1 DVD
Automatic partitioning	yes; resizing of FAT and NTFS	yes; no NTFS resizing, but parted via console	yes; resizing of NTFS	yes; resizing of NTFS	yes
Logical Volume Manager	support	yes; standard	support	no; existing LVM usable	no
Other FS support	Reiser-FS, Ext 2, JFS, XFS <sup>(1)</sup>	Ext 3, Ext 2, Software Raid	Reiser, Ext 2, Ext 3, XFS, FS encryption	Reiser-FS, Reiser, Ext 2, Ext 3	no
Number of standard profiles/package groups	19 package groups in 3 categories	3 standard profiles, 39 package groups in 5 categories	10 schemes, 6 main groups with 149 sub- and sub-sub groups	3 profiles, 15 package groups; no Gnome	none
Package manager	hierarchically or alphabetic, with search function	hierarchical; no searching during package selection	hierarchical, with search function	hierarchical; no searching during package selection	no
PnP/USB	yes	yes	yes	yes	yes
Sound	Alsa or Kernel OSS	Alsa 1.0.12	Alsa 1.0.11	Alsa 1.0.11	driver, PnP
Graphics card and monitor correctly detected	yes; automatic installation of Nvidia driver	yes	yes	yes	yes
X11 screen refresh	optimum	optimum; problems on second computer	optimum; problems on second computer	optimum	optimum
X11 screen geometry	optimum	optimum; problems on second computer	optimum; problems on second computer	optimum	optimum
Mouse	yes	yes	yes	yes	yes
Printer database	yes	yes	yes	yes	yes
Network printer	supported	supported	supported	supported; IPP printer located in »Others«	manual after installation
Boot manager	Lilo 22.6.1, Grub 0.97, Windows detected	Grub 0.97, Windows detected	Grub 0.9.7, Windows detected	Lilo 22.7.1, Windows detected	Vista proprietary
Hard disk space	3.2 GB	2.8 GB	3.5 GB	max. 2.3 GB	7.8 GB
Comments	proprietary drivers by Nvidia, ATI and AVM, driver for Winmodems, Madwifi driver, 3D desktops (AIGLX and XGL)	reboot after installation, then configuration; update proxy configurable during installation; Gnome is standard	complex update after installation; Gnome is standard	warning in case of over-length computer name (Windows compatibility); KDE is standard	registration required after 30 days

<sup>(1)</sup>XFS not recommended due to kernel bug that can lead to total loss of data.

Updating via the Xandros Networks system works in a similar way. Clicking on the Xandros Networks icon takes you to the network, where you first need to register. Just like with Red Hat and Suse, you need to make sure that the proxy is set up correctly to avoid waiting for a timeout. Registering during the Xandros install might be a better option. The Xandros Network is a user-friendly tool for updating software, but a wider selection would be preferable.

## Multimedia

Although multimedia plays a secondary role in corporate environments, multimedia functions can positively influence a user's attitude to an operating system. Because Microsoft is in a stronger position to work directly with hardware vendors and commercial software companies, they started from a stronger vantage point when it comes to certain multimedia features. Linux, however, has closed the gap considerably in recent years. The Linux candidates had no real issues with audio CDs (Table 2); playing

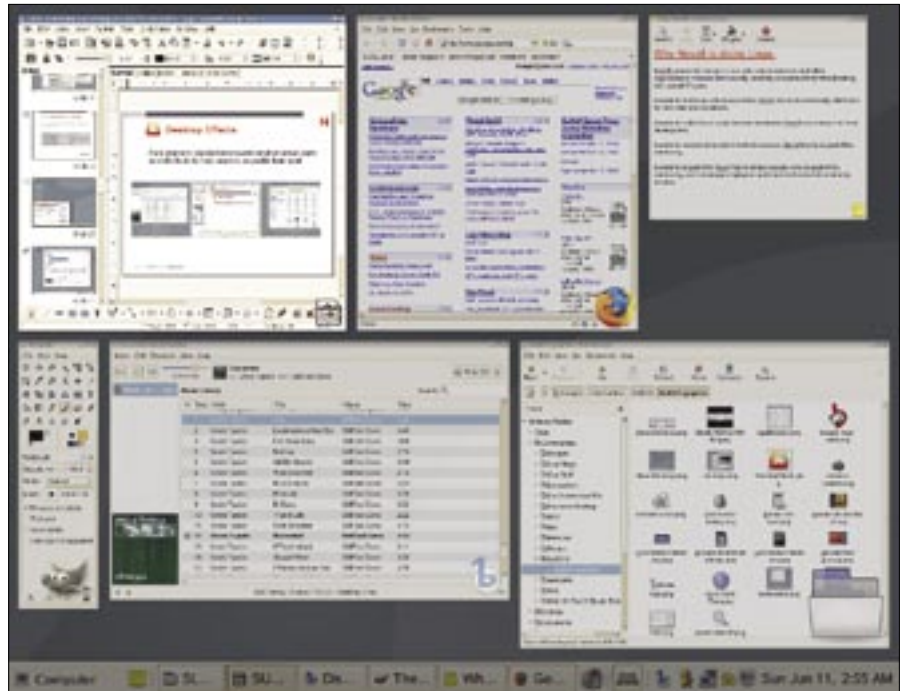


Figure 1: SLED is Novell's candidate for the enterprise desktop market.

protected media is a matter of the copy protection, player software, and drive involved. For some of the CDs in our test,

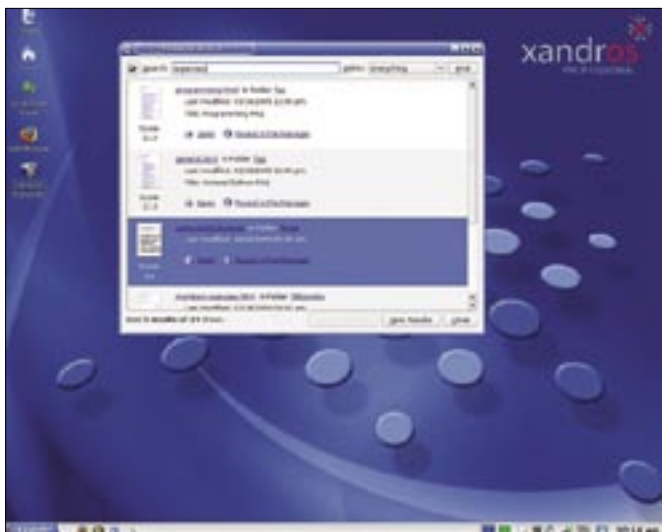
Xandros launched the CrossOver Installation Wizard to install the Windows "trojan" from the CD. CodeWeavers

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Table 2: Features

	Mandriva Powerpack Professional 2007	Red Hat Enterprise Linux Desktop 5 (Beta 2)	Suse Linux Enterprise Desktop 10	Xandros Desktop 4	Windows Vista Business
Box content/online	2 DVDs (32 and 64 bit), CD with games, Cedega and demos, manual, Mandriva keyring	Trial version; download CDs from Red Hat Network (Beta 2)	DVD without printed manual; "Quickstart Tour" on desktop	DVD without printed manual; "Getting Started" guide on desktop	1 DVD
Packages	2,500	2,200 plus Suppl. CD	1,800	1,000	no box
Menu/desktop	good, focused	focused, clear-cut start menu	good, focused	good, 3D desktop	design good, 3D desktop
Language support	good	good	good	good	single language only
Anti-aliased fonts	yes	yes	yes	yes	yes
Euro symbol	on GUI yes, console no	Shell entry possible	Shell entry possible	Shell entry possible	on GUI yes, console no
Office packages	OpenOffice 2.0.3, KOffice 1.5.91	OpenOffice 2.0.4	OpenOffice 2.02	OpenOffice 2.03, CrossOver Office	no
Browsers	Firefox 1.5.0.7, Konqueror, Opera 9.01, Epiphany 2.16	Firefox 1.5.0.8	Firefox 1.5.0.9	Firefox 2.0, Konqueror	Internet Explorer 7
Exotic languages rendered in browser	good	good, incorrect rendering of Chinese characters	good	good	good
Mail and groupware clients	Thunderbird 1.5.0.7, Kontact, Evolution 2.8.0	Evolution 2.8.0	Evolution 2.6.0	Evolution 2.6.3	Windows Mail
Graphics programs	GIMP 2.3.10, Inkscape 0.44	GIMP 2.2.13	GIMP 2.2.10	various KDE programs renamed	Paint
Sources	kernel only	CDs available on RHN	few sources on DVD, no SLED 10 directory below <a href="ftp://ftp.suse.com/pub/suse/i386">ftp://ftp.suse.com/pub/suse/i386</a>	not on DVD or on Xandros Network	no
<b>Multimedia</b>					
Realplayer link opens	Realplayer	Totem 2.16.1, no connection, hangs	Realplayer 10.0.8.805 (gold), proxy must be configured separately	Realplayer 10.0.8.805, proxy must be configured separately	none
MP3 link opens	Amarok	Rythmbox 0.95, manual entry of target failed	Realplayer 10.0.8.805 (gold), proxy must be configured separately	Realplayer 10.0.8.805, proxy must be configured separately	Windows Mediaplayer
YouTube with penguin video	embedded Flashplayer in Firefox or Konqueror	Flash error message in Firefox, complex post-install installation of Flash 9 plugin, then okay	embedded Flashplayer 7.0.69 in Firefox	embedded Flashplayer 7.0.25 in Firefox	embedded Flashplayer in IE
Inserting standard audio CD opens	Kscd	Totem 2.16.1	Helix Banshee 0.10.19	Musik Manager (actually, Amarok)	Windows Mediaplayer
Inserting DVD opens	LinDVD 1.2.6	no reaction	no reaction; starting with Totem returns plugin error message	Xandros file manager; manual launch of Xine returns error message	Windows Mediaplayer; error message due to missing decoder
Games	CrackAttack, FreeCol, BZFlag, LBreakout, FlightGear, PlaneShift; Cedega 3 months updates	various from board or Nibbles type; more on CDs or online	various from board or Nibbles type; more on CDs or online	Patience, Minesweeper, more via Xandros Network (for example, Battle for Wesnoth)	Game Explorer (empty)
<b>Configuration</b>					
Integration of configuration tools	clear-cut via DrakConf	pull-down menu in system integrated in control center	integrated or via YaST	integrated in KDE	clear-cut integrated in GUI
Network configuration	good	good	good	good	good
Detection of computers on network	displayed NFS and CIFS resources	did not display NFS shares; displayed CIFS resources	did not display NFS and CIFS-resources	displayed NFS and CIFS resources	displayed CIFS resources
Automount	dialog that prompts for required action	icon appears on desktop	icon appears on desktop	file manager opens	dialog that prompts for required action
Trouble-free change from Gnome/KDE	yes	KDE not installed by default	KDE not installed by default	no	-



**Figure 2: Xandros tunes in on business users with their Desktop Professional product.**

CrossOver Office, which is included with this Xandros version, lets you run various Windows programs on Linux. Three of the Linux versions (like most other

distributions) were unable to play DVDs, mainly for legal reasons. Red Hat's philosophy has always been to rely on open source tools wherever possible. And true to this philosophy, the Red Hat desktop did not install a Flash plugin or the Realplayer, opting for Rythmbox and Totem instead. Of course there is nothing to prevent you from installing Flash, Realplayer, or Adobe Reader either from the Supplements CD or from the Red Hat Network. Suse and Xandros install these tools by default, al-

though the Flash player version is slightly ancient.

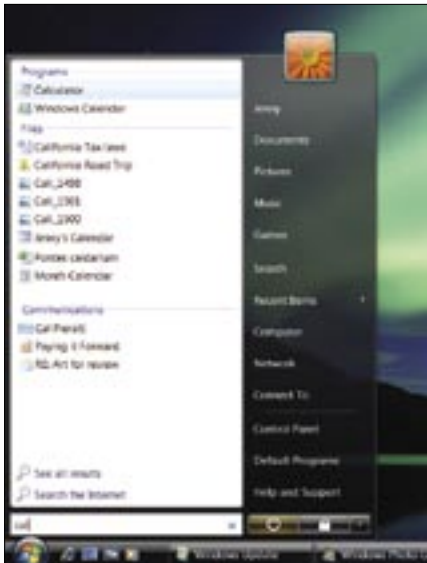
Vista marks an evolution in Microsoft's continuing effort to integrate the PC with consumer electronic devices. If you have a TV tuner and you're willing to spend the significant extra money for the Vista Home Premium or Vista Ultimate edition, you can manage TV, movies, music, and pictures through the Windows Media Center (Figure 3). (Similar tools for the open source environment have appeared in previous issues of *Linux Magazine*. For instance, see the article on MythTV in the October 2006 issue.)

Windows Media Player 11, which offers an interface for streaming, downloading, and managing music files, presents the usual proprietary annoyances that will confound open source devotees, but in terms of connectivity and flexibility, it is arguably less annoying than Apple iTunes.

**Table 3: Security and Updates**

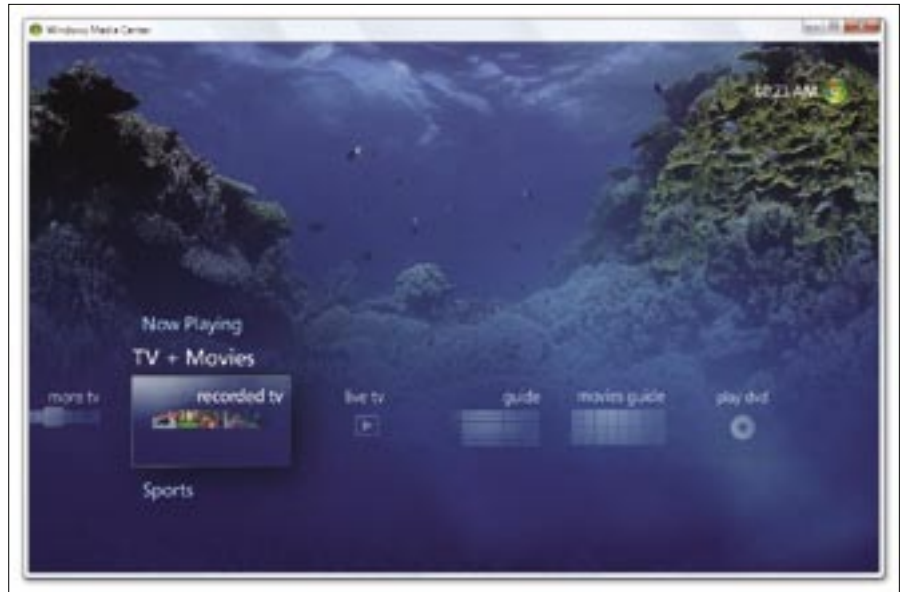
	Mandriva Powerpack Professional 2007	Red Hat Enterprise Linux Desktop 5 (Beta 2)	Suse Linux Enterprise Desktop 10	Xandros Desktop 4	Windows Vista Business
<b>Up-to-date?</b>					
Auto update	yes, no interaction possible	yes <sup>(1)</sup>	yes	yes <sup>(1)</sup>	yes, restricted interaction
Basis: kernel	2.6.17	2.6.18	2.6.16	2.6.18	proprietary
Basis: glibc	2.4	2.5.4	2.4.31	2.3.2	proprietary
X11	X.org 7.1	X.org 7.1	X.org 6.9	X.org 7.1.0	proprietary
KDE	3.5.4	-	-	3.4.2	-
Gnome	2.16	2.16	2.12	-	-
Java	1.5.0	Sun Java 1.4.2, IBM Java 1.5.0, Gij 4.1.1	Sun Java 1.4.2	Sun Java 1.5.0.06	-
SSH	OpenSSH 4.3	OpenSSH 4.3	OpenSSH 4.2p1	OpenSSH 3.8.1p1	-
Samba client	3.0.23b	3.0.23c	3.0.22	3.0.21b	CIFS integrated
<b>Secure configuration</b>					
Security profiles	Standard/High/Higher/Paranoid	no, but profiles for SELinux	Home workstation/networked workstation/network server	no	group profiles
Unneeded daemons	no	no	no	no	various services and drivers
Shadow password	yes	yes	yes	yes	yes
<b>Security Tools</b>					
Firewall with GUI	yes	yes	yes	yes	yes
Intrusion Detection System	no	no	no	no; regular check for rootkits and viruses via panel applet, configurable	no
SSL/TLS	OpenSSL 0.9.8b, Gnutls 1.4.0	OpenSSL 0.9.8b	OpenSSL 0.9.8a	OpenSSL 0.9.7e	yes/yes
IPsec, VPN	OpenVPN 2.0.7, tool for Cisco VPN Concentrator and OpenVPN	IPsec-Tools 0.6.5	OpenVPN 2.0.5	unknown	PPTP, L2TP
Special features	Kaspersky Antivirus with 6-month update eligibility	SELinux	Novell App-Armor	-	-

<sup>(1)</sup>Could not be checked because there were no updates in the test period.



**Figure 2: The Beagle-like Windows Instant Search tool turns up matches in user files, programs, and email.**

Many of the multimedia technologies included with Vista have had open source equivalents for years, however, it is worth noting that the huge mass of business and marketing attention



**Figure 3: Users of the high-end Vista variants can manage their movies, music, and pictures with Windows Media Center.**

associated with a new Windows release may have an effect on the electronics market that could ultimately benefit all computer users – at least if the vendors are willing to place the interests of their

customers ahead of their backdoor business arrangements with Microsoft. For instance, the fact that Vista provides integration with wireless digital media receivers could help stimulate further

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Figure 4: Our test lab took a liking to Vista's transparent window frames.

development in the field of wireless media players.

## Where Are the Tools?

The collection of software that Microsoft supplies with Vista is fairly meager compared to the tools provided with a standard Linux distro. For instance, Vista lacks a full-featured office suite and is missing many of the capabilities for design, development, and system administration that Linux users have come to expect.

What's more critical right now is the fact that practically no low-level, third-party Windows XP software will run on Vista: virus scanners, firewalls, crypto tools, and user filesystems, partitioning tools, and so on. Users will just have to wait until third-party vendors have dis-

covered the secrets of the new system and can produce Vista-ready programs. Of course, this will mean upgrade costs for customers.

## Keeping Safe

The security issues associated with Microsoft Windows are well known to most Linux users. Many of the persistent problems with viruses and other forms of malware stem from a primitive access control system, in which the system and its applications all too often operate under a *root* or administrative security context.

Microsoft has made an attempt to address this security problem in Vista, which offers a new User Account Control (UAC) system, in which applications can run without administrative privileges and the user still has some limited power to configure the system. If the application needs to undertake a task that requires administrative control, the user is then prompted to provide an administrative password.

It is still too early to tell whether this User Account Control feature will truly solve the perennial Windows problems of virus propagation, remote intrusion, and adware secretly playing around in the registry. If so, the change will certainly be welcome, however, the other question is whether this change will have an effect on stability or interoperability of the system.

Vista also provides other security improvements, such as alert dialogs, driver

## Thanks!

The authors would like to say thank you to the Institute for Scientific Calculations at the Karlsruhe Research Center for its support in this test.

certification, and many other features. The new Security Center tool is another indication that Microsoft is taking the security issue seriously, however, when it comes to security, Windows is the one that needs to play catchup. Linux and Unix users are understandably skeptical about whether another round of incremental changes, fixes, patches, and workarounds will truly resolve the fundamental problems with the Windows security architecture.

## Conclusions

Almost any Linux system on a mixed network must have some means for interacting with Windows, and the complications of coexistence mean that you'd better be ready for Vista. But even if you don't want to access or interact with Microsoft Windows systems, you are living in a world where Windows is quite difficult to avoid.

Readers who are professional developers or system administrators will certainly need to know what's new in Windows Vista, and even Linux end users may need some understanding of what is coming in the next generation of Windows, so they can work around compatibility issues and manage home network connections.

Whether you plan to work with Vista once in your life or ever day, we hope you enjoy this month's Vista with Linux cover story. ■

## Alternatives

In our test, we compared Vista with 4 Linux versions. Why not just opt for some other Linux? The main difference between the distributions we investigated and other distros is the availability of updates, support, and roll-out tools.

A possible alternative might be the Ubuntu LTR (Long Term) Version combined with commercial support by vendor Canonical or a local partner. It is hard to say at this point whether Ubuntu really is suitable for long-term, large-scale installations. Although it is not usually considered an end-user desktop system, Debian may also be a good choice for this context, since the package format is suitable for both fast and slow update schedules.

## INFO

- [1] Windows Vista: <http://www.microsoft.com/windows/products/windowsvista/>
- [2] SLED: <http://www.novell.com/products/desktop/>
- [3] Red Hat Enterprise Linux: <http://www.redhat.com/rhel/>
- [4] Xandros Desktop Professional: [http://www.xandros.com/products/business/dsk\\_professional.html](http://www.xandros.com/products/business/dsk_professional.html)
- [5] Mandriva Powerpack: <http://www.mandriva.com/en/linux/2007/powerpack>