

PRODUCT REVIEWS

Sun's Bright Spots and More

By Jason Perlow, Jason Tower, and Jason Faulkner

Solaris on x86 has traditionally been the butt of a lot of bad jokes and criticism, and rightfully so. It was sluggish and unresponsive — earning it the nickname “Slowlaris” in the mid-to-late '90s; its support by Sun and third-parties paled in comparison to its sibling, *Solaris for SPARC*; and to add insult to injury, Sun eventually pulled Solaris on x86 off the shelf entirely, abandoning its die-hard user community in the process. With Solaris x86 out to pasture, the only providers of a commercial-grade *Unix* for Intel-based systems were SCO or any number of small commercial BSD vendors (such as BSDI), none of which exist today.

As *Linux* gained momentum in the last five years or so, displacing many *Unix* installations in its wake, including costly *SPARC* systems, Sun realized its colossal mistake relegating Solaris x86 to a second class citizen and decided to bring it back from the dead, in the form of *Solaris 9 x86*.

Now the release of *Solaris 10 on x86* represents a major sea change for Sun, because it's first version that has parity with the *SPARC* version in technical support and development effort and is first release to be sold and certified on Sun's latest Intel-compatible hardware on a large scale, as Sun has a technology partnership with AMD to develop 64-bit servers based on the *Opteron* platform. Solaris 10 supports all the 64-bit features of that CPU. And last but not least, all of Solaris 10 has been released under a new Open Source license, the CDDL, hopefully bringing about an entirely new prosperous age in community software development.

During the course of the last six months, I've looked at various beta builds of Solaris 10 as part of the *Solaris Express* program. For my tests, Sun provided me with an *Opteron*-based, dual-

processor Sun W2100z workstation.

The installation process is fairly straightforward: boot with the installation CD, choose either a graphical or text-based installer, answer some key questions about the hardware using a menu-driven guide, choose from a number of default installation sets or customize your software selection, and start feeding in all four CDs. While the interactive GUI installer is straightforward and easy to use, I felt it clearly lagged behind in development and stability from the text-based version and lacked the level of control in device configuration found in the text-based installer. Moreover, compared to other GUI-based installers

I've seen in various commercial versions of *Linux*, the Sun GUI installer was somewhat sluggish. Solaris die-hards tell me that the text installer is still the way to go.

Once Solaris 10 was installed, however, it was all smooth sailing, for the most part. The system was very responsive, particularly in filesystem and network performance. On the same hardware, I tested three different AMD64-based *Linux* distributions using recent 2.6.x kernels, and in various two-way file transfer tests of increasing size using *FTP*, *Samba 3.x*, and *Apache 1.3* and 2.0 *HTTP* servers, I found Solaris 10 to be anywhere from 20 to 50 percent faster than *Linux*, and these speed improvements persisted even when I brought the system RAM down from 4 GB, to 2GB, and even to 1 GB.

I also found considerable client-side speed advantages to using Solaris 10 as a workstation as well, provided one actually installs some useful client software on it. Solaris 10 comes pretty much bare bones with an aging *CDE GUI* that was at its best ten years ago. (Solaris 10 comes with a modern desktop environment called the *Java Desktop System*, which each user can choose at login. However, *CDE* is still the default desktop.) Those looking for modern *GNOME* and *KDE* desktops and end-user applications and tools found on common *Linux* distributions should look at <http://www.blastwave.org> rather than Sun (see the March 2005 “On the Desktop” column, online at http://www.linux-mag.com/2005-03/desktop_01.html).

Be advised however that many of the video drivers in Solaris 10's new Xorg-based *X11* system are in a beta state, and don't currently support some of the more advanced features found in *Linux's* Xorg/XFree86 drivers. My Sun W2100z's

SOLARIS 10 ON X86

<http://www.sun.com/software/solaris>

PRICE: Free for non-commercial use; security patches and other updates are also free. Additional services require a support contract, and prices begin at \$120 per physical CPU socket per year.

RATING: 

SYSTEM REQUIREMENTS: 128 MB system memory (512 MB recommended for GUI); 5-7 GB of disk space depending on configuration; Sun and third-party x64 platforms (AMD *Opteron*-based and Intel *EM64T*-based systems); Sun and third party 32-bit x86 platforms.

PROS: Rock solid, high performance, enterprise-class *Unix* operating system for the x86 architecture; fully exploits the 64-bit capabilities of the AMD64 platform. And it's finally Free.

CONS: While improved, driver support lags behind *Linux*, especially in the areas of video and desktop multimedia hardware; *Solaris 10 on x86* desktop environment is considerably behind that of modern *Linux* distros, unless you use Blastwave.

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nVidia *Quadro 3000* card, while able to display in its highest native resolution, was not fully accelerated and also lacked the improved font rendering features of its Linux cousins. However, newer drivers with better support for the more advanced features of graphics cards are reportedly on their way, and may even be ready by the time you read this.

System administrators will surely enjoy the *Solaris Management Console 2.x* (SMC), which allows you to graphically and easily manage many aspects of the system, including the display of critical resource information, managing user accounts, and configuring system devices and hardware. *Dtrace*, a powerful application performance monitoring command-line utility with its own *awk*-based scripting language, is able to isolate over 37,000 different test points in the Solaris kernel, and is new with Solaris 10. Another new feature, *Solaris Fault Management*, which includes *Dynamic Self Healing*, is able to monitor and report system abnormalities and isolates failing system components to prevent a complete system failure and catastrophic data loss.

But perhaps the most compelling new feature is *Solaris Containers*, a tool that allows you to virtualize and isolate many iterations of the Solaris environment (it can be upped to thousands) within a single, centralized server, a similar but more powerful implementation than User Mode Linux, and far less resource intensive than IBM's *LPAR* in *AIX 5L*. A *container* can have its own IP address, its own filesystem space, its own users and system administrators, its own applications, and can interact with other containers and servers through their own network services. *Solaris Containers* alone may cause Internet and application service providers to think twice before casting Solaris aside in favor of Linux distributions for certain applications.

As of Solaris 10's initial release, however, the tool for container creation and administration was command-line

based. I'd like to see something more graphical and easier to use, perhaps something along the lines of the web-based tools provided with *VMware ESX* server for virtual machine creation and management. (Sun says that a web-based tool is in the works.)

Other new features planned for Solaris 10 but not in the initial release include the *Zetabyte File System*, or *ZFS*, and the *Linux Application Environment* (LAE, formerly called *JANUS*).

ZFS is a completely new network file system internally developed at Sun that allows Solaris to pool storage resources among many distributed systems and dynamically provide file system services to the user. Need more disk space? Just ask *ZFS* to pull more space off a drive on another Solaris box. *ZFS* will likely be included in the first Solaris update in the second half of 2005.

LAE is technology that will allow Solaris to *execute* (as opposed to *emulate*) native Linux *ELF* binaries at native speeds with kernel-level ABI support, thus providing true Linux application compatibility. *LAE* will likely come with a suite of libraries that allow applications written for selected Linux distributions to run out of the box. If the feature works as promoted, it could mean a whole new life and user base for Solaris, and could give some of the Linux distributions a run for their money. The technology is nothing new — *SCO* provided a similar feature, the *Linux Kernel Personality* with *OpenUNIX 8* way back in 2000, but it never really took off, although it worked perfectly. With Solaris now becoming open source, I hope the Linux community and Solaris users take to this feature like flies on you-know-what.

Bottom Line: Buy

All in all, after putting Solaris 10 through its paces these last few months, I'm happy to say that Solaris is no longer a second class citizen anymore at Sun. And with its compelling feature set, the operating

system is well worthy of further attention by the Open Source community and the Linux faithful.

Solaris 10 on x86 has tremendous potential, but it's up to Sun to continue to support it to shake its legitimately-gained poor reputation and foster a thriving developer and end-user community.

— Jason Perlow

SUN JAVA WORKSTATION W2100Z



Sun and *workstation*. Back in the day, those two words really meant something, especially if you were a *Unix* geek. In the late 1980s and early 1990s, the legendary *SPARC 2*, *SPARC 10*, and any number of other *Unix*-based desktop systems from Sun (and Silicon Graphics) represented the pinnacle of graphical, compute-intensive workstations. Back when I was a consultant on Wall Street and the Twin Towers still stood proudly over the Manhattan skyline, I remember floor upon floor of stock traders and investment bankers with *SPARC* machines on their desks in those buildings, running mission critical market data and trading applications and mastering all that they surveyed. The Sun machines *never* went down, *ever* — 100 percent

SUN W2100Z WORKSTATION

<http://www.sun.com/desktop>

PRICE: \$ 4,695-\$ 8,695 (MSRP)

RATING:

PROS: Insanely fast performance when running a 64-bit Linux distribution and *Solaris 10*; machine is ideally suited for demanding mathematics, research and financial application. Price competitive with other high-end workstation offerings from other vendors.

CONS: Solaris 10 nVidia drivers are not totally baked; CD recorder and *FireWire* connections not fully compatible with Solaris 10 yet.

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uptime was not unusual for a Sun workstation-based trading floor.

But times have changed and the SPARC workstation that once was a fixture of the barons of The Street got displaced with less reliable but more cost effective *Windows NT* and *Windows 2000* boxes running on Intel chips. Now, many of those very same organizations are evaluating or adopting *Linux*, seeking further cost savings and better reliability using open standards and open source. Seeing the writing on the wall, Sun Microsystems began a new x64-based initiative in a highly publicized alliance with AMD, and now hopes to re-establish its leadership in the high performance workstation market.

The Sun W2100z represents a significant change in Sun's approach to workstation engineering, taking its cues from its two main competitors, IBM and HP, and eschewing the costly and proprietary *UltraSPARC* in favor of dual AMD *Opteron 250* series processors, up to 16 GB of system RAM, an nVidia *Quadro 3000* series graphics card, and *Ultra320* SCSI storage. And it comes standard with *Red Hat Enterprise Linux* or *Solaris 10*.

Red Hot Sun

There's not a single bad thing I can say about the hardware — it's one of the fastest workstations I've ever used, and it runs *Linux* like a dream, especially if you eschew the standard *Red Hat*

Enterprise Workstation 3 configuration and put on a 2.6 kernel-based *Linux* operating system for AMD64 processors, such as *SuSE 9.2* and *Fedora Core 3*. I benchmarked the CPUs using a multi-threaded, SMP-capable 64-bit *Distributed.net* client, and came up with a result of just over 19 million keys per second, which is an astounding number. High resolution *OpenGL* applications using the nVidia optimized video drivers for *Linux* blazed across the screen. (If the machine didn't cost over \$8,000, I'd seriously consider it as an *Unreal Tournament* box.) Java applications, especially when running on the very latest Sun *Java2 5.0 JVM* that could take advantage of the 64-bit features, were also extremely snappy. Where was this machine when we needed it for Java development years ago?

I also used the W2100z to test out *Solaris 10 on x86*, and I have to say, it's a hell of a combination — the 64-bit *Solaris 10* really flies on *Opteron* hardware, and in many cases, it actually outperformed *Linux*, particularly in network responsiveness and filesystem access. [See the review of *Solaris 10* on page 14.] However, unlike its *Linux* cousin, *Solaris 10* drivers for nVidia cards are nowhere near as feature rich and mature. Poor font rendering, as well as slow *OpenGL* performance, prevented me from wanting to use *Solaris 10* on this box on a full-time basis, I also had problems getting the built-in CD recorder and the integrated *Firewire* adapter to work in *Solaris 10* (although they worked just peachy in *Linux*).

Bottom Line: Must Buy

As it stands, and probably much to Sun's chagrin, the

W2100z is better overall as a *Linux* workstation than it is for running *Solaris*.

However, I have no doubt that Sun will want to have parity with its *Linux* offering on this machine and its successors, and the time may come where *Solaris* may become a compelling choice for power users that would otherwise look towards the Penguin.

— Jason Perlow

ARKEIA NETWORK BACKUP

Ask any experienced system administrator about his or her infrastructure and you'll likely hear proud tales of big RAID arrays, redundant networks, failover *this*, and hot swap *that* — all sorts of things that make a good geek smile. But ask specifically about *backups* and the conversation will die faster than `rm -rf/` trashes a system. Because despite all of the advances in hardware and software over the years, backups remain a sore spot for many sites — unreliable, tricky to set up, difficult to manage, and painful to restore from in the event of data loss. Worse, many of the big commercial backup vendors treat *Linux* like a rented stepchild, with poor (if any) server and client tools.

However, at least one company has been providing *Linux*-friendly backup software for many years: Arkeia (<http://www.arkeia.com>). In addition to their flagship product, *Arkeia Network Backup* (ANB), the company offers other solutions for *Linux*, such as *Server Backup* (for a single server), *Arkeia Light* (limited to one server and two clients), and *Disaster Recovery* and *Hot Backup* modules for various services.

But how well does Arkeia's ANB software work? And even if it supports *Linux*, how well does ANB support heterogeneous networks? Let's take a test drive and find out.

Backup to the Future

To test ANB, I created a test network of



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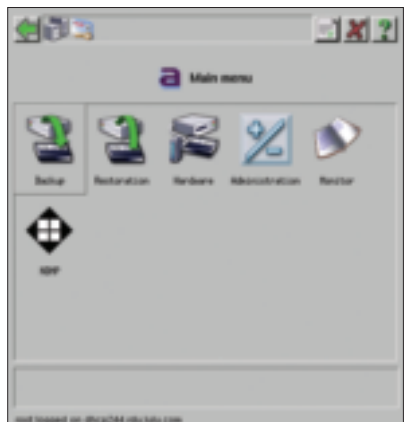


FIGURE ONE: The main menu of Arkeia's Network Backup software



FIGURE TWO: Adding tapes to slots

several disparate machines. The backup server was a 500 MHz *Pentium III* with 256 MB RAM and an 80 GB hard drive, running *SuSE Professional 9.2*. To capture backups, the server was connected to an Adaptec 29160 SCSI card, which was cabled to a SpectraLogic *T120* tape library, with two *LTO-2 Ultrium* drives. The client machines were an IBM *Thinkpad T20* running *Mandrake Linux 10.1*, an Apple *Powerbook* running *Mac OS X 10.3*, and a late-model Dell *Windows XP* box. All were connected via a switched, 100 MB network.

I started by downloading the ANB RPM file for the backup server. Arkeia's ANB download page lists nearly fifty different platforms, including *AIX*, *HP-UX*, *Solaris*, all *BSD* variants,

Debian, and various flavors of *Red Hat*, *Mandrake*, and 32- and 64-bit *SuSE*. But despite the plethora of options, the list wasn't terribly current: the latest RPM for *SuSE* was for *SuSE 9.0*, which is nearly eighteen months old. (Several other distros were similarly outdated.) However, the RPM for *SuSE 9.0* installed just fine on my backup server. The install deposited software in */opt/*, two binaries in */usr/bin/*, and a handful of entries in */etc/init.d/* to start the daemon. The RPM also ran the *init* script to kick-off the daemon.

Since reading documentation would irreparably damage my geek credibility, I jumped right in by logging into the backup server and running *xarkeia*. The GUI tool started right up and presented me with a login screen with entries for hostname, user, and password. ANB uses its own set of user definitions, which can be a bit confusing. For example, ANB's *root* is not the same as the system's *root*.

Getting Started

At the login screen, type *root* for the user name and click enter (the default password for ANB's *root* account is null). The first screen is ANB's main menu (shown in *Figure One*).

The first thing to do is change ANB's *root* password. You should also enter any licenses that you've purchased. Each piece of Arkeia software (like the Disaster Recovery and Hot Backup modules) requires a license to function.

Navigating Arkeia's interface is elegantly simple: every menu and sub-menu is shown in a linear bar along the top of the window. You can either hit the *Back* button to retrace your steps, or click directly on a previous menu item to go directly there. Within minutes, I found myself able to navigate anywhere in the interface with just a few rapid clicks — no menus to drag down, no combo boxes to select, just big fat icons.

And while the look of the GUI is

ARKEIA NETWORK BACKUP

<http://www.arkeia.com>

PRICE: \$1,280, which includes the Linux server software and licenses for up to five *Mac OS X*, *Linux*, or *Windows* clients

SYSTEM REQUIREMENTS: 0-350 GB (small office): single processor, 512 MB RAM, single tape drive or autoloader, *DAT*, *VXA*, *DLT7/8*, *AIT2*; 350-750 GB (departmental): dual or quad processors, 1 GB+ memory, two or more tape drives in a tape library, *LTO*, *DLT8000*, *AIT3*, *SDLT*; 1 TB+ (enterprise): quad processor or more; 2 GB+ RAM, four or more tape drives in a tape library, *LTO2*, *SDLT600*.

RATING: 

PROS: Outstanding user interface, exceptionally easy to construct backup sets and schedules; works on virtually any modern operating system; very good performance.

CONS: Documentation out of synch with current release of the software; glitches in install made an otherwise easy deployment among heterogeneous systems problematic.

decidedly old-school (think *Motif* or *GTK1*), it's also snappy and responsive.

Having used several other backup applications in the past, I decided that configuring hardware was the logical next step. The detection utility immediately recognized the two *LTO* drives and the library's robotic hardware. Double-clicking on each item brought up a configuration window with all of the necessary information already filled in, so all I had to do was click *OK*. The library required some additional configuration like adding drives and adding tapes to slots (see *Figure Two*). It was here that I started to get a bit confused by things, so I headed back to Arkeia's web site to download both the *Quickstart Guide* and *User Manual*.

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Unfortunately, the *Quickstart Guide* was dated Jan 13, 2004. My brief perusal found pictures and explanations that were clearly not in synch with the current release of the software.

Many of the step-by-step procedures were unusable without some creative interpretation. The *User's Manual* was dated Jan 17, 2005, but wasn't much better. Pictures of the GUI were out of date, and much of the text didn't match the software I'd just installed. I expected much more from a commercial product.

Still, with some prior backup software experience under my belt and a couple of lucky guesses, I managed to get the library more or less configured. One thing I never got working to my satisfaction was setting up tapes. The library I was using held upwards of eighty tapes, yet Arkeia seemed to offer no way of defining tapes except manually, one by one. After creating four tape definitions and assigning them to slots (see *Figure Two*), I gave up.

Putting the Network in Network Backup

Running a backup is relatively simple once setup has been completed. The most important object definition is the *savepack*, where you select what you want to backup. Arkeia offers a graphical method for selecting assets: you can select an entire host, individual files and/or directories, specific mount points, and so on. Once the *savepack* is defined, a monitoring screen indicates backup speed and total. ANB communicated flawlessly with the tape library, loading tapes quickly and efficiently.

When the job was completed, the tape was unloaded from the drive and placed back into its slot.

Next, I put the "network" in Arkeia Network Backup to work. Going back to the download page I grabbed the RPM for *Mandrake 10* and installed it on my T20 laptop. As before, the RPM installed without difficulty.

To add the T20 to the *drivepack*, Arkeia's notion for a collection of drives, I edited the file */opt/arkeia/sarkeiad/admin.cfg* on the T20 and specified the hostname of the backup server. After adding several large directories from the T20, I ran another backup. This time two tapes were loaded, and data from each host was streamed simultaneously to the individual drive, making full use of the hardware automatically. Very slick, indeed.

Preparing and configuring the Mac OS X and Windows clients was quick to perform (albeit with unique quirks on each platform). Adding the two new machines to the *savepack* required nothing more than a few clicks of the mouse.

Naturally, no backup software is useful unless it can be scheduled to run automatically. Arkeia lets you create multiple jobs with different levels of backup. I was impressed with the simplicity with which scheduled jobs could be set up. And all the backups in the world are useless unless they can be restored. Arkeia's restore feature is effective, although not particularly intuitive. Since I was testing with working systems, I elected to "restore" backups to an alternate location to avoid overwriting existing data. It took a couple of iterations via trial-and-error before I was 100% successful, but overall, the restores were quick and effective.

Bottom Line: Buy

All in all, there's a lot to like about Arkeia. The client and server software run on just about anything, making it ideal for heterogeneous environments. Performance was very good. If you don't like the look of the Arkeia interface or prefer the shell, there are command-line tools for nearly every function.

Arkeia isn't perfect: a couple of client installation bugs marred an otherwise easy deployment. And because the accompanying documentation is inaccurate, the learning curve is a little

steep. The company needs to update its manuals immediately.

Overall, Arkeia is a solid performer that treats Linux like the champion it is, rather than a second rate operating system supported only as an afterthought. Now that's something to smile about.

— Jason Tower

LINSPIRE FIVE-O

With a fresh name and a new look, *Linspire* (formerly *Lindows*) recently released *Linspire Linux Version Five-O*. Five-O is based on kernel 2.6.10 and KDE, and is designed for new desktop users looking for a low-cost alternative to *Windows*.

At \$99.95 for the Linspire software and its subscriptions service, the price certainly beats the best prices offered by Redmond. Installation is a snap, and Linspire closely resembles *Windows* — two features that are perfect for the software's primary audience. However, experienced Linux users will likely not be inspired by Linspire. There are cheaper and better distributions for the power hungry — and budget-challenged.

Time to Test

My test system was an AMD *Athlon XP 2500+* with 896 MB of RAM, a Silicon Image SATA controller, and an NVIDIA *GeForce 5600 Ultra* graphics card. All hardware was detected by the install CD without a hitch.

Linspire's installation routine is very slick and easy to use. Installing the operating system on a fresh hard drive is simple, and when you boot the system for the first time, the *Linspire Setup Wizard* guides you through basic Linux setup tasks, such as setting your date and time. Next, an "Advanced Settings" screen lets you set an administrative password and create new users.

After setup is complete, the Linspire desktop, with KDE 3.4 and XOrg 6.8.1, is launched. The desktop bears a

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striking resemblance to Windows, including a “Launch” menu with access to all of the pre-installed applications. The desktop is also populated with icons — lots of icons — most of which are trying to upsell Linspire products and services. Linspire offers the *VirusSafe* virus scanner, which stops you from forwarding Windows viruses to your friends; the *SurfSafe* Internet filter, designed to filter out “bad” websites; and the *Click-and-Run* (CnR) package manager.

While the former two packages are unnecessary costs for most Linspire users, CnR, which costs \$50 per year after your 15-day trial expires, is a necessity to get the most out of the distribution. CnR is the only supported way to install more applications on a Linspire system.

And because an out-of-the-box Linspire install doesn't include a graphics editor, an *FTP* client, or a DVD player, you will need more applications. A CnR subscription is also



required for software updates, including security fixes.

In its favor, CnR has an excellent front end, and makes it simple to install new applications. And Linspire offers a number of unique software suites. *Linspire Internet Suite* is an Internet browser and email client based on *Mozilla 1.6* that includes several new features, such as spell check in web forms and “HotWords,” which highlights certain words for easy web search.

PhoneGaim is a modified version of the *Gaim* instant messenger with *Voice over IP* (VoIP) technology embedded. (While the added features are nice, every time the application is loaded, a nag screen pops up until you create a SIPphone account — a major annoyance to a user who doesn't want VoIP.) Linspire also includes a few of its own creations: *Nvu* is a web publishing application based on *Mozilla Composer*; *LSongs* is a music player with an interface similar to *iTunes*; and *LPhoto* is a photo organizer similar to *iPhoto*. *LSongs*, *LPhoto*, and *Nvu* are all open source applications, available for use on other Linux distributions in addition to Linspire.

Click and Run to the Bank

However, CnR doesn't include all available Linux applications, and you must pay a surcharge for some specific

applications, such as *StarOffice* and *Win4Lin*. In fact, if you insert certain program CDs into a Linspire system, a popup appears, suggesting that you install the Linspire-branded version of the application instead of the version you already own.

And while CnR does include a large library of software, its lack of organization a good search tool can make it daunting to find a specific application. Also, CnR is mainly a repository of free software, making the \$50 per year price tag seem a bit steep.

There are other shortcomings in Linspire. One glaring omission in the installer is the option to repartition your system. You must already have free space partitioned before you begin the install or wipe out your hard drive. It is also odd that creating non-*root* accounts are left to an “Advanced Settings” screen; instead, the Setup Wizard should require you to create at least one account with common user privileges.

Bottom Line: Shop Around

Although Linspire has given back quite a bit to the desktop Linux community and is a strong distribution, it may not be a good value for your money. At a cost of \$99 for the operating system and a one year Click-and-Run subscription, the cost of owning Linspire is quite high — especially when compared to a distribution like *Debian*, which is free and has a trove of tools and applications available via *APT*.

Linspire does have its place, though. If you are looking for a new Linux laptop or desktop, you'll likely find Linspire pre-installed, as the company has partnered with several white box computer makers to provide Linspire on new systems.

Is Linspire ready for the average home user? Yes. Are other distributions just as capable and far less costly? Definitely.

—Jason Faulkner

LINSPIRE “FIVE-O” CNR EDITION

<http://www.linspire.com>

PRICE: \$99.95 (which includes CDs and a one-year subscription to the Click-and-Run service, an absolute necessity for *Linspire*)

RATING: 

PROS: Similarity to *Windows* great for new users; *Click-and-Run* software repository offers more than 2,000 applications; installation on a fresh system is a snap.

CONS: The \$50 per year Click-and-Run subscription is the only way to expand and update the system; additional surcharges for some software increase the cost of Linspire; Click-and-Run is so expansive, it's hard to find packages.

BOTTOM LINE: Shop Around