



Desktop Linux 2006: The Year in Review

Prepared by the OSDL Desktop Linux (DTL) Working Group

Executive Summary

Linux on the desktop grew and matured in 2006. While some analysts reported a slowing of Linux penetration on the desktop in 2006, a number of significant milestones were reached that promise to continue to move the Linux desktop ahead in 2007. As Gerry Riveros, Red Hat product marketing manager for client solutions put it, “What I think was most important [in 2006] were all of the ‘under the hood’ incremental improvements that took place around printing, plug-and-play support, laptop enablement and the arrival of the compositing manager that allows for modern graphics.”

These and other improvements are setting the next stage of growth for the Linux desktop. A number of projects and teams have moved beyond alpha positioning and ownership to focus on how their efforts contribute to overall desktop Linux objectives. “In 2006, it appeared that developers were aware of how each other’s projects help to accomplish the shared goals of all the projects,” said John Terpstra, Advanced Micro Devices (NYSE:AMD) Linux Evangelist. Over 70 of the key desktop architects have met three times this year to agree on focus areas that would make desktop Linux “just work.”

This report will spotlight several of the most important advances for the Linux desktop in 2006, including improved desktop functionality, new applications, standards and interoperability, Linux distribution activities and market growth.

Improved Desktop Functionality

Based on more than 2,600 responses to OSDL's 2006 Linux Client Survey, the need for additional open source drivers is the top priority for the growing Linux desktop community. Fortunately, 2006 saw significant gains in drivers and other functional areas of the Linux desktop.

New Drivers: A broad range of new drivers for Linux in 2006 have led to better connectivity, telecommunications support, plug and play support, network boot enablement and laptop enablement. According to Stephen E. Harris, vice president of communication at Xandros, “The delivery of high quality, reliable, easy-to-use Linux desktops at little or no cost has, in turn, fostered wider adoption and support from hardware and software vendors.”

Printing: Desktop printing summits organized by OSDL drew printing architects and developers from major hardware vendors, Linux distributors, consultants, and

standards organizations. The group identified printer driver development and a standardized method for installing printers as top priorities.

Graphics: Accelerated graphics, leveraging technology such as Xgl and Compiz, provided a new level of graphics on the desktop. This technology takes advantage of modern graphics cards via OpenGL drivers to deliver stunning 3D effects. As implemented on Novell, they provide window translucency, multiple desktops, improved window viewing, switching, animation and zoom.

In the summer of 2006, Intel released open source software drivers for the newest generation Intel graphics architecture, including support for 2D and 3D graphics features. Up until then graphic vendors had been reluctant to open source drivers that supported hardware acceleration for 3D graphics. A proprietary driver, even if it works, raises complications. "If you have an open-source kernel...and you add a binary module into the mix, it reduces your ability to provide the customer the same level of service," said Dirk Hohndel, Intel's director of Linux and open-source strategy.

Graphics development promises to continue to move forward via the collaboration of the Libre Graphics Meeting (LGM), where free software graphics developers and artists exchange ideas and tips, and map out the future of free graphics. LGM brings together developers and users of the best known free software graphics applications, including GIMP, Inkscape, Scribus, and Blender.

Wireless Enablement: Improved wireless support, which 46 percent of the respondents to the 2006 Linux Client Survey put at the top of their wish list, is also a key focus for the community. At OSDL's wireless summit, developers and chipset vendors agreed to focus efforts on a common software stack, called Devicescape, to drive consistency in wireless device support. They agreed to migrate to the common wireless stack within a year while supporting existing stacks in the short term. The transition will be transparent to wireless users and will result in the rapid support of a full range of wireless chipsets and capabilities.

Pre-installed Linux: The use of Linux on mobile desktops has emerged as a very attractive option. For example, Lenovo introduced its T60p mobile workstation preloaded with SUSE Linux Enterprise Desktop 10. This was the first personal computer offered by a Tier 1 manufacturer to be pre-installed with Linux.

Intel did its part by releasing the Intel Quick Start Kit v2.0 for Linux to its partners to make it easy for them to design, build and sell Intel-based desktops using the Linux operating system. This PC platform integration kit provides a collection of software drivers, documentation, and tools. "As the demand for the Linux operating system on the desktop increases, Intel is working with the industry to extend validation and tools to ensure that Intel processor-based PCs running the Linux OS can be built faster, saving your organization time and money," Dirk Hohndel added.

Sound and Multimedia: Desktop architects at the third Desktop Architects Meeting (DAM) in December identified audio on Linux to be a critical focus area and the community is organizing to help application vendors understand which audio interfaces

to use. While audio can be made to work on a Linux desktop, problems with proprietary CODECs, audio configuration, and multiple applications accessing a single audio device are being addressed by the desktop community. In a related development, Fluendo recently announced that they are making available plug-ins to handle Windows Media Audio, Video, and MMS streaming protocol, MPEG-2 video decoding, MPEG-4 Part 2 video decoding, ASF container format demuxing, MPEG-2 Program and Transport Stream container format demuxing, MPEG-4 ISO container format demuxing and MP3 audio. Further CODECs are planned for release by Fluendo over the course of 2007.

BIOS Compatibility: Hardware OEMs have worked to ensure that their hardware works properly with Linux. Major manufacturers are going to great lengths to certify that their system BIOSes work across the board with Linux. For example, AMD expanded their LinuxBIOS work to include additional systems. “This year’s activities to improve BIOS compatibility are a great leap forward in the firmware area of support of Linux on client machines,” said Marc Miller, Open Source Developer Outreach Engineer at AMD.

New Open Source and Commercial Applications

A major factor in the adoption of Linux on the desktop is the availability of applications. In 2006, several significant commercial and open source applications were realized for the Linux desktop.

Beagle: The Beagle desktop tool to index and search personal information developed significantly in the past year. With the release of version 0.2.14 in December, Beagle can now search in many different domains, including documents, email, Web history, instant messaging, source code, music files and images.

Firefox: Version 2.0 of the popular Web browser was released in October, with the first update ready in December. By the end of the year, Firefox had more than 10 percent of the browser market, according to the market research firm WebSideStory.

Flash 9: Adobe released a final version of Flash 9 for Linux and it is working with the Linux Standards Base to ensure that all the necessary pieces are in place for the Linux client. The general availability of Flash 9 for Linux is considered to be a major step forward for desktop Linux and the development of Flash-oriented Web sites.

RealPlayer & Helix Banshee: In August, RealNetworks announced it would deliver state-of-the-art multimedia capabilities on the Linux desktop. Novell will distribute Real's upgraded RealPlayer, which will support Windows Media formats and Helix Banshee music player, as part of its SUSE Linux Enterprise Desktop 10.

Lotus Notes: In July, IBM announced a fully supported IBM Lotus Notes client for Linux, available for download to anyone with a current Lotus Notes entitlement. IBM also said it will provide support to companies running the new Lotus Notes client on Red Hat Enterprise Linux v4 update 3 or SUSE Linux Enterprise Desktop 10. The

availability of a Linux version of Lotus Notes demonstrates the penetration desktop Linux is making among larger enterprises.

LTSP: Thin clients account for a significant number of the Linux desktops that are currently deployed. With the integration of the Linux Terminal Server Project (LTSP) into more Linux distributions, these deployments will become even easier.

Finally, with the release of **Mono 1.2**, which implements the .NET framework on Linux, many companies have engaged in cross-platform application development, including Medsphere, Codice Software, Mindtouch Technologies, Otee, Versora, Splendid CRM and Mainsoft. “Mono has been an important factor in attracting these companies,” said Bruce Lowry, a Novell spokesperson.

Standards Developments and Interoperability

The emergence of standards plays a key role in the open source development model. Standards ensure that open source technology consistently works as expected. Last year, several key standards and related initiatives emerged within the community to ensure desktop Linux interoperability, consistency and uniformity.

Portland Project: Facilitated by OSDL, The “Portland Project,” delivers a common set of Linux desktop interfaces and tools to allow applications to easily integrate with the free desktop configuration with which the end-user has chosen to work. Version 1.0 was released in October. One of the goals is for the project technology to be incorporated into the Linux Standards Base. “The Portland Project promises to make it more cost effective for ISVs to port applications to Linux without the risk of selecting the ‘wrong’ desktop environment,” said Laurent Gharda, CEO of Open Country.

Open Document Format: The open document format (ODF) was accepted as a standard by the International Standards Organization. “This is a major milestone and a tremendous accomplishment of the open source community and the companies supporting the OpenOffice.org effort as part of the OpenDocument initiative,” said Bruce Lowry, a spokesperson for Novell. ODF is an XML-based API to office productivity applications. Microsoft has responded to the acceptance of ODF with OpenXML, its own XML-based API, which the company has offered to the community for free. Novell has announced that it will support OpenXML in its Linux desktop as well as ODF.

Accessibility: Accessibility has advanced dramatically in the GNOME desktop for Linux. Two new full function assistive technologies, the Orca and LSR screen readers, have been open source released by Sun Microsystems and IBM. These screen readers provide customized interfaces for blind and low vision desktop users. Using the GNOME accessibility infrastructure, Red Hat and Novell have both developed automated testing harnesses for GUI applications. In the standardization arena, the LSB has included GNOME's Accessible Toolkit (ATK) in their desktop standard. The availability of these technologies is making it possible to accelerate the proper accessible enablement of complex applications such as Firefox and OpenOffice.org.

IBM has also open sourced the IAccessible2 specification for Windows to the FSG. This will facilitate multi-platform accessible enablement for applications like Firefox, Flash, Acrobat, Google Earth, Skype, and OpenOffice.org. Both IAccessible2 and the UNIX Accessibility API support the upcoming W3C Accessible Rich Internet Applications (ARIA) specifications which will allow multi-platform browsers to support Web 2.0 applications. Firefox 3 is now being enhanced to support both efforts on Windows and Linux.

Samba 23.0.22: “This allows desktop Linux users to authenticate properly with Microsoft Active Directory and Novell Evolution 2.6, which offers email and calendaring capabilities while seamlessly interoperating with Microsoft Exchange, to facilitate a peaceful coexistence of Windows and Linux in the corporate network,” said Novell’s Lowry. In addition, Lowry added, “Novell created and licensed a large number of fonts, allowing Microsoft Office and OpenOffice.org to interoperate even more seamlessly for users.”

Significant Activity by the Linux Distributions

Even as standards are developed to ensure consistency and uniformity across desktop Linux distributions, the Linux desktop community remains very vibrant, and offers a wide range of alternatives. All of the major Linux desktop distributions made major advances in 2006.

Linspire: Linspire’s Freespire brought a free, easy-to-use Linux desktop environment to the mass consumer market and released Linspire, its commercial desktop Linux, in several different languages. “The open source community is helping lift roadblocks to desktop Linux adoption by working together to bring Linspire's ease of use to computer users all over the world in their native language," said Kevin Carmony, president and CEO of Linspire.

Mandriva: In October, Mandriva unveiled Mandriva Linux 2007. The key innovation, according to the company, was AIGLX and Xgl 3D-accelerated desktop. It also included innovations in office suite applications, Internet, multimedia and virtualization.

Novell: With the release of Novell SUSE Linux Enterprise Desktop 10, Novell delivered significantly improved capabilities in productivity, usability, interoperability, hardware and software support, and mobility. The release reflected the results of more than 1,500 hours of usability testing with hundreds of regular PC users. Noteworthy new features in SLED 10 include integrated search, a more seamless plug-and-play capability, accelerated 3D graphics and desktop effects, and the Novell edition of OpenOffice.org 2.0. At the LinuxWorld Conference & Expo SLED 10 was named “Best of Show” and "Best Desktop Solution," and its AppArmor product earned "Best Security Solution" honors.

Red Hat: Red Hat is readying the release of Red Hat Enterprise Linux Desktop 5 for February 2007. According to reports, the new release will offer enhanced graphics, OpenOffice.org 2.0, support for the ODF, improved wireless support and improved

compatibility with Microsoft Office. RHEL 5 Desktop, the first major upgrade of the corporate desktop since version 4 shipped in January of 2005, is based on the Fedora 5 code.

Ubuntu: Ubuntu is a free, open source Linux-based operating system based on the Debian core. The Ubuntu team releases a fresh Ubuntu every six months, and each release is supported with security updates for 18 months. During 2006, Ubuntu was at the top of the page hit ranking at Distrowatch.com.

Xandros: In November, Xandros, announced “Xandros Desktop - Professional,” featuring advanced 3D desktop graphics effects, Bluetooth wireless support, desktop search and ISV support. The version 4 desktop for the enterprise has seamless compatibility with Windows, Linux and Unix networks, plus support for log-on scripts, group policy profiles and Microsoft Exchange.

Market Growth

The development of desktop Linux in 2006 has set the stage for new market growth in 2007. Most observers believe that much of the growth will take place outside of the United States. “It will be in the BRIC (Brazil, Russia, India and China) countries,” said Gerry Riveros, Red Hat, “because of the price and because they aren’t locked in yet.”

“For corporate, there will be increased uptake in North America and Europe and particularly in Latin America,” added John Terpstra, AMD Linux Evangelist.

The “One Laptop Per Child” project is one of the most intriguing initiatives helping to nurture the desktop Linux market. One Laptop per Child (OLPC) is a non-profit organization created by Nicholas Negroponte and other faculty members from the MIT Media Lab to design, manufacture and distribute laptops inexpensive enough to provide every child in the world access. The laptops will be sold to governments and issued to children by schools on a basis of one laptop per child. The machines will be rugged, open source, and energy-efficient so that a child can power them manually. The pricing goal will start near \$100 and then steadily decrease. In November, the first 1,000 XO laptops rolled off the Shanghai assembly line of Quanta Computer, the world's largest manufacturer of notebook computers. The next units, to be manufactured by Quanta in early 2007, will go to school children in Argentina, Brazil, Libya, Nigeria and Thailand for testing in real world conditions. Mass production is scheduled to begin in the summer of 2007. The global OLPC project will put millions of Linux desktops into the hands of children and will create a new collaborative development environment.

In addition to geographic areas, desktop Linux should continue to be accepted into specific market sectors. “Financial services, government, the educational market -- anyplace that the Linux desktop can meet clearly defined user requirements -- are ripe for picking,” said Stephen E. Harris, a spokesperson for Xandros. “Larger accounts will be won over with the help of advanced deployment, support and integration tools.”

Governments, especially in developing countries, want to provide cost-effective educational tools to the teachers and students. Linux and open source technologies help to make such capabilities available to the educational community. After talking to educators and vendors in emerging markets, Intel in 2006 developed the Intel Integrated Solution Kit for Education (Intel ISKE). The Intel ISKE is a solution "stack" consisting of hardware and a collection of open source software applications, middleware components, software drivers and documentation. The solution kit provides educational tools for teachers, students, school administrators and parents. It is built on open interfaces and standards that enable the open source community and third party vendors to build upon the core solution "stack" and contribute components to address local and regional education market requirements.

There continues to be solid Linux traction in the thin client market. Neoware, which sells more than 40 percent of all Linux-based thin client devices, continues to see faster-than-market growth rates for Linux devices. "Our customers are embracing the opportunity to integrate the security, manageability and cost benefits of Linux thin clients more broadly into their IT environments." said Neoware's Matt Wrabley, Executive Vice President.

Mark Shuttleworth, founder of the Ubuntu Project says, "A key thing to look for in 2007 is evidence of innovation in desktop technology on the free software desktop accelerating faster than the pace of innovation on the proprietary platforms. We've already seen the free software browser platform, Firefox, become a locus of creative development effort, and I think this year we'll see the same happening with the core desktop environments on both Gnome and KDE. New must-have features will drive the desktop adoption of Linux."

Conclusion

The past year was a year of steady growth and development for desktop Linux. Important new functionality was added to the operating system. Significant standards and technologies that enable interoperability both within the community and with other desktop technologies have been put in place. The community continues to release new versions of desktop Linux. In short, 2006 has set a strong foundation for desktop Linux to grow as a serious desktop option in 2007.

About Open Source Development Labs (OSDL)

OSDL - sponsor of Linus Torvalds, the creator of the Linux kernel and other key Linux developers - is dedicated to accelerating the growth and adoption of Linux-based operating systems in the enterprise. Founded in 2000 and supported by a global consortium of major Linux customers and IT industry leaders, OSDL is a nonprofit organization that provides state-of-the-art computing and test facilities available to developers around the world. With offices in China, Japan and the United States, OSDL sponsors legal and development projects to advance open source software as well as

initiatives for Linux systems in telecommunications, in the data center and on enterprise desktops. Visit OSDL on the Web at www.osdl.org.