IT infrastructures have labored for decades under the tyranny of a one-party system: proprietary software. But while proprietary software reigned as the de facto operating system, an underground hobbyist faction slowly fomented rebellion, and their ideas began infiltrating government agencies. If you haven't heard about the movement, listen up. Open source has the floor.

Barry West
CIO, The National Weather Service

TAKING THE
OPEN SOURCE PLUNGE:

THE PUBLIC SECTOR VIEWS LINUX AS ONE CANDIDATE WITH NOTHING TO HIDE

THE NATIONAL WEATHER SERVICE (NWS) checked its IT forecast several years ago, and predicted that utilizing open source software was on the horizon.

The agency first tested the open source waters in 1995, when developers ported its quantitative precipitation forecasting system to Linux. That complex system analyzes weather patterns and air mass rates capable of producing heavy rainfall. The number-crunching application—which processes model data of troughs, surface boundaries, fronts and convergence zones—required constant maintenance. And NWS developers found Linux much easier to tweak than its proprietary counterparts.

Still, the National Weather Service felt that the open-source software—though popular with its development staff, wasn't quite ready for primetime.

The question NWS faced was trusting open source software for the nation's mission-critical weather forecasting applications. Indeed, open source initially met with deep skepticism. It's owned by no one, yet owned by everyone. Everyone has free access to change the code. Who are these people supporting open source? What motivates them to debug and improve software that they don't even own? How can you trust them? Who provides open source training? How could a government agency base its IT operations on a free operating environment, the development of which is controlled by a worldwide community of strangers?

D A V I D   S P A R K

Viewed as a hobbyist's programming platform, rather than a viable business option, open source's lack of credibility left it largely ignored. That perception quickly changed when Linux, the major open source operating system, received more than a tip of the hat from vendors like IBM, Sun and Hewlett-Packard.

"We found that many of the questions that were unanswered before, such as support issues, industrial strength, the training, those issues had pretty much been answered," says Barry West, CIO for the NWS. Top proprietary software vendors invested millions in development and support resources into Linux. As a result, both the private and public sectors began taking notice of open source's greatest benefit: software licensing control.

Two years ago, NWS determined that software licensing expenses and maintenance costs across 150+ locations nationwide would account for a significant part of its IT budget. NWS needed to cut costs, and its Office of Atmospheric Research had successfully tested the Linux platform for the quantitative precipitation forecasting application. That experience, combined with Linux's portability, advanced security features and cost, factored into the decision to switch from Hewlett-Packard's HP-UX operating system to Linux.

Currently, the Advanced Weather Interactive Processing System (AWIPS)—the core application at NWS—runs on Linux. By the end of 2003, the NWS hopes to migrate all of its server-based computing to Linux. This includes over 2,000 systems in its 150+ weather and river forecasting offices and four national environmental prediction centers nationwide. In terms of costs relating to training, support and licensing, West estimates that the agency saw a 3-to-1 cost savings by switching to Linux as compared to staying with HP-UX.

"[HP's] huge maintenance costs forced us to take a step back. Are we really thinking strategically here from an IT standpoint? Are we really exploring all our options," says West, "[AWIPS] had the attributes of being at the right place at the right time. And the Forecast Systems Lab was able to test and help us through this transition."

Changing platforms on a mission critical application like AWIPS could be extremely perilous and nerve racking. As

Jim Willis
Director of e-government and information technology, Rhode Island's Secretary of State

such, those interested in Linux should consider first moving a smaller, non-critical application. Linux's modular design allows interested parties to test the open source waters within an existing infrastructure for small, basic, non-critical applications like a web server, print server or inventory database.

One Step at a Time

Jim Willis, director of e-government and information technology for Rhode Island's Secretary of State, started out as a social activist. Back then, Willis volunteered his time to set up community centers where the homeless and mentally disabled could use the Internet. To cut licensing costs and save money, Willis deployed open source software on the center's servers.

When Willis went to work for Rhode Island, his first assignment was to put the state's rules and regulations database online under a tight budget and four-month deadline.

"The tools that I had in my [technology] toolbox at the time were all

open source tools," explains Willis, who adds that negotiating and maintaining proprietary software licenses is time consuming. "Development time for me is cut dramatically using open source software."

Willis completed the project on-schedule, and at a modest cost of $40,000, of which $6,000 was for hardware. With the project complete, Rhode Island joined the handful of states pioneering public open source implementations.

The Cost of Open Source

Downloading open source software may be free, but that doesn't necessarily mean its implementation is. Administration, installation, operations, development, support and training typically accounts for up to 70 percent of the total deployment cost of a new operating environment. Hardware and software combined are typically only 30 percent of the total cost.

"Totally free software could be the most expensive choice if it requires retraining," argues Dan Kusnetzky, vice president of Systems Software Research for IDC, a market-intelligence firm. "What appears to be very low cost software may be the high cost option for people who are in an environment where there's little or no expertise in this type software." For Windows-focused organizations, Linux's learning curve can be very painful and costly.

Open source proponents agree that user training may present additional costs, but say that the long-term benefits of application sharing and portability

Signs That You're Ready to **Implement** Open Source

- ■ Have in-house Linux or open source software expertise.
- ■ Don't want to be locked into a proprietary format.
- ■ Are concerned about ongoing licensing fees.
- ■ Have non-mission critical applications to test with open source.
- ■ Have an operating budget and paid for equipment.
- ■ Want to convert a computer into a single function server, such as a print server or mail server.
- ■ Want to reuse developed applications without having to pay additional license fees.

Signs That You're **Not** Ready for Open Source

- ■ Training costs associated with the transition from an existing, proprietary system outweigh open source benefits.
- ■ No in-house Linux or open source expertise.
- ■ Don't have time to develop or manage an application in-house, or the funds to hire outside consultants.

outweigh any training hurdles.

"With [the rules and regulations database], because it's state government, it's taxpayers' money. I can take what I've written and hand it off to the Department of Taxation," says Willis. "Develop it once and you can use it wherever you want to use it." You're not required to pay additional license fees.

Another benefit of Linux is that it runs very smoothly on older computers, helping organizations extend the PC life cycle in tight budgetary times. In situations where there's no budget for additional equipment, Kusnetzky suggests giving an old desktop machine a field promotion to server. Running Linux, the PC can be turned into a single purpose unit like a mail server, proxy server or print server. In Rhode Island, Willis reincarnated a Pentium-233 MHz machine to act as a log server.

Who Can You Call for Help?

"There is this perception about a lack of support," says Stacey Quandt, industry analyst for Forrester Research, "People have a perception that open source is not commercial software." That's a misperception Quandt says, citing to the examples of many large vendors using open source software as a loss leader for the support and consulting that they offer. IBM, for example, offers the same support agreements for Linux as it does for its proprietary operating environments.

Adventuresome users often turn to the open source community for help. Kusnetzky warns that developers may not get the same hand-holding from an open source volunteer as from a paid support vendor. But open source support is available 24 hours a day, and answers can come from knowledgeable sources all over the world. Indeed, West reports that his developers often received responses back from "goodwill" Linux developers faster than from technical support lines of proprietary software vendors.

Open Source and Open Standards

Open source software is based on open standards. That's not to say they're synonymous. Open standards, which advocate vendor neutrality and do not lock customers into any particular group or vendor, can also be found in proprietary software like Sun's Java.

Phil Barnhart
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Most agencies have had the experience of buying software, only to change to some other, incompatible software some years later. To ensure operations continue smoothly, agencies must often hire expensive consultants to convert data from the legacy system to the new system. With open standards, transitioning from one platform to another tends to be relatively seamless. As such, state and local agencies gain more control over their systems and vendor independence. Don't like the support you're receiving from one vendor? Switch, or do the work yourself.

Rep. Phil Barnhart (D-Ore.) wants to "future-proof" his state's technology by moving toward the adoption of open systems. Barnhart began his campaign with the introduction of the Open Source Software for Oregon Act. Originally, the bill required state agencies to consider open source software for any infrastructure purchase decision. Barnhart has since amended the bill to clarify the desire for open systems, which is more than just open standards. Open systems mean you have more control with regards to upgrading, interoperability and communications.

Barnhart wants to base Oregon's purchase decisions on "best value," which not only encompasses total cost, but also non-cost considerations, such as whether an application is easy to modify, maintain and upgrade.

"[We're] trying to avoid getting locked into a set of proprietary systems which would then dictate who we have to buy materials from," Barnhart says, "and would require us to obligate future legislations and future administrations to a set of licensing fees which we can't predict now."

Get Your Feet Wet

NWS and Rhode Island had some in-house expertise to initiate the move toward open source systems. And that's usually what it takes—an internal champion and expert to act as the driving force for adoption. NWS, for instance, had Barry West, a former UNIX professor with ten years experience. If your organization lacks such knowledge, look to a local university for a course, Kusnetzky suggests.

For your first foray into open source, Willis recommends a simple, non-critical, in-house application, such as an inventory database that tracks your laptops.

"Those internal projects are great, because you can show it to people higher up and say look what we did in-house. It didn't cost us any money. We spent time, yes, but that's learning time," says Willis, "Recoup that investment down the road when you develop your next project." ◆