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Pete's all things Sun (PATS): the future of Sun



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HI, AND WELCOME TO A NEW COLUMN in ;login:. Thanks are owed to USENIX for giving me the opportunity to write about “All Things Sun” in this lovely journal. I previously wrote a column for *Sys Admin* magazine (<http://www.samag.com>), may it rest in peace. Before that I wrote for *SunWorld*, may it also rest in peace. Hopefully this tragic cycle will be broken at ;login:! If you've seen my previous writings, you'll know I like to cover the gamut of topics around Sun, Solaris, and sometimes more general information technology issues. Experience is the best teacher, and the best source of topics to write about, so I'll draw on my work and play experiences to try to save the reader's time (and sometimes money)—pointing out the good, the bad, and the ugly of all things Sun. Feedback is always welcome, so feel free to let me know what you think about the column and/or suggest topics to write about.

This month I thought it would be nice to cover something near and dear to those who use or are thinking about using Sun products: the future of Sun.

The Future of Sun

History is full of inflection points. And only history can tell the long-term results of those inflections. Consider Sun a few years ago. If one were to create a checklist of vendors and their advantages and features, there were many rows in which Sun lacked the all-important checkmark. Solaris 9 was a strong Sun asset, but it ran only on SPARC. Sun made only SPARC systems, and SPARC was not the best choice in many circumstances. Sun was seemingly “closed” and “proprietary.” This fact was not lost on IT managers, who were consistently choosing other solutions to their post-dot-com boom infrastructure.

Fast forward to the Sun of today and one sees that the company has certainly closed the “checkmark gap.” One inflection point was the open sourcing of Solaris (and many other Sun software assets). Of course, as with most things Sun does, that move was not without controversy. Sun chose to create a

new license—the CDDL—rather than use an existing one. Another inflection was the release of Solaris 10, arguably the most advanced and feature-rich operating system in history. A third was the purchase of Andy Bechtolsheim's company Kealia. Andy, when he is not being a world-class venture capitalist [1], is designing world-class x86 systems for Sun.

In November 2007 Sun inflected again. This time the area was Solaris, specifically OpenSolaris. OpenSolaris has been the tagline for the open sourcing of Solaris. And although there are several OpenSolaris distributions, there was no official “OpenSolaris distribution.” Project Indiana, headed by former Debian founder Ian Murdock, has morphed into “the” OpenSolaris distribution. The OpenSolaris distribution is a brave, new Sun. For one thing, it is not 100% backward-compatible with Solaris 10. Sun prides itself on the backward compatibility of its operating systems. (In fact it was rumored to be a firing offense for a Sun engineer to break that compatibility.) But when ZFS is the root file system, and a new package system is the cornerstone of a distribution, backward compatibility apparently has to go. By combining those two aspects, OpenSolaris is able to have a liveCD format to “try before you install” (and also can be booted from a USB stick!). It also becomes more, well, Linux-like in its ease of adding new software packages from the network and having those packages manage themselves (with versioning, seamless upgrades, and dependency management).

Eggs are clearly being broken, but whether the result is an omelet or something far less tasty won't be known for a while. A preview release (with very limited functionality) of OpenSolaris (a.k.a. Project Indiana) was made available in November and is expected to be production-ready in a few months. You can find it on the OpenSolaris Web site [2]. Just what “production-ready” means is a bit of an open issue, but Sun is saying that it will support OpenSolaris for those with support contracts. A crucial question for Sun (and its customers) is how ISVs will respond to the new release. Applications make or break a distribution. Where does that leave Solaris and its next releases? Clearly those will continue for quite a while, but one version of future history has those tapering off and OpenSolaris continuing as, for all intents and purposes, *the* Solaris. This preview release is one view of the OpenSolaris future. There is considerable internal and external debate about it, so before it sees production there could be more radical changes (and less backward compatibility) or a rollback on some features to create more compatibility. The problem statement of Project Indiana is also available from the OpenSolaris Web site [3].

In the meantime, Sun engineers continue to do work on new operating system components and continue checking them in (performing a “putback”) at opensolaris.org. Those projects are then cherry-picked for inclusion in Solaris releases as well as use in other distributions. There are many interesting and useful changes taking place. These are worth tracking, and trying in OpenSolaris, because they can be tested for stability and functionality well before you need to plan their use in production. Some of the most interesting projects include:

- CIFS: including CIFS as a kernel-level server
- Caiman: a redo of the Solaris installer
- Clearview, which unifies the feature set provided by network devices
- Crossbow: deep network virtualization for resource control, performance, and security
- DTrace providers, which enable DTrace to probe more languages and system aspects such as NFS V4
- ZFS on-disk encryption
- ZFS boot-ability

The full list and access points to each project's Web pages and discussion groups are online [4].

Perhaps the most major recent opensolaris.org putback was the inclusion of the "xvm" project. This project is based on the XenSource virtualization code. Once this project is ripe, Solaris will be the "Dom0," or host, operating system and Solaris will support many "DomU" guests, including Windows, Linux, BSD, Solaris x86, and pretty much anything that runs on x86 hardware. This feature will only work on x86 hardware (of course), so a new inflection will be Solaris x86 having different features from Solaris SPARC. Solaris SPARC on UltraSPARC T1 and T2 CPUs has its own hypervisor-like virtualization called LDOMs (covered in the August and October 2007 issues of *login.*). Add to that the CPU-independent Solaris Containers and there is a wealth (overabundance?) of virtualization choices for Sun, which would be a good topic for a future column.

The OpenSolaris Web site [5] is a great portal into Sun. The discussion forums there are lively and populated by interested users and Sun employees. Sun frequently seeks feedback there about how a specific feature should work, and about the relative priorities of specific features. Gone are the days when Sun was a black box, emitting an occasional product, with users complaining that Sun didn't listen. At least Sun is now listening (and, even more important, discussing). How this evinces itself in products is an open subject, but clearly progress is being made. Of course the OpenSolaris source code is available there as well, along with some source code tours. The ZFS tour is a thing of beauty, as is the DTrace source code itself.

Not all code is available on opensolaris.org before it ships. Recently Sun created the "Solaris 8 Migration Assistant" (S8MA, née project Etude) and launched it as a production-ready unbundled package without (yet) putting it on opensolaris.org. By the way, S8MA is a very interesting solution to the problem of having lots of Solaris 8 (on SPARC) systems and not wanting to do a full migration of the applications to Solaris 10. S8MA will do a physical-to-virtual capture of a Solaris 8 system and install it in a special Solaris 8-compatible container on Solaris 10. Several Solaris 8 environments could fit on modern Solaris 10 hardware, allowing consolidation as well as reducing rack space and power and cooling needs as those Solaris 8 systems are retired. Those Solaris 8 applications can continue running in that S8MA container until the end of life of Solaris 8 or until you make the move to run them natively on Solaris 10. As this is a new feature, my recommendation is to test it thoroughly and then plan on deploying old development and QA environments on it before attempting production conversions.

Another project that has my attention is "xvm ops center." This project ships in early 2008 and appears to be (yet another) attempt by Sun to create a Solaris administration and provisioning tool. The project is supposed to be released under the GPLv3 license, which gives it a much higher likelihood of success than previous closed-source attempts.

The Future of Sun, Revisited

Certainly, this is not your Mama's Sun. Solaris and OpenSolaris (both the distribution and the Web site) are welcome changes from the old slower-moving Sun. Signs of the revitalization of Sun are everywhere. Take, for example, the inclusion of Solaris components in other operating systems. My other favorite operating system, Mac OS X Leopard, includes DTrace, read-only ZFS, and other components from OpenSolaris. Of course Mac OS X is built on FreeBSD, which also has those features.

Another sign of the times is that Solaris is being installed and supported by Sun competitors. As of December 2007, HP, IBM, and Dell allow the purchase and preinstallation of Solaris on some of their systems. Dell has gone from one end of the spectrum to the other, offering both Solaris and the OpenSolaris distribution (once it is available, presumably!) preinstalled and supported on all of their blades and rack-mount servers. Who knows where this is all heading, but can OpenSolaris on Dell's desktops and laptops be far behind? (See the *eWEEK* article [6].)

Many IT managers don't yet seem to realize that Sun makes x86 systems (both AMD and Intel) that are certified for Red Hat, SUSE, and VMware. Unfortunately, Sun has not yet announced the inclusion of the VMware "ESX Lite" firmware in its systems, somewhat limiting them as a VMware choice. ESX Lite is a new feature as well, so Sun may include it as it ripens. The most stunning change in Sun moving from "the SPARC/Solaris Company" to "a tier-1 multi-OS systems provider" was the recent deal with Microsoft. Sun is now a Microsoft Windows OEM, allowing Sun to preinstall and provide support for Windows on all of its x86 systems.

Conclusions

It used to be easy to fill in vendor-feature checklists and cross Sun off IT vendor lists. Those days appear to be gone, with Solaris and OpenSolaris expanding their feature sets and platforms, and Sun's platforms supporting more and more operating systems. The future of Sun seems brighter than it has been since the good ol' dot-com days. (It was difficult to avoid quoting Timbuk3 here, but I managed, and you are welcome.)

Next Time

There are certainly many interesting Sun topics to cover here in the future. In the next issue security will come to the fore. There's a new security sheriff in town—and it's publishing security standards documents for many operating systems, complete with scripts to test the level of security on a system compared to the standard. Such efforts should be applauded, but how does it work in the real world? Tune in to PATS to find out.

REFERENCES

- [1] http://en.wikipedia.org/wiki/Andy_Bechtolsheim.
- [2] <http://www.opensolaris.org/os/project/indiana/resources/getit/>.
- [3] http://www.opensolaris.org/os/project/indiana/resources/problem_statement/.
- [4] <http://opensolaris.org/os/projects/#portal>.
- [5] <http://www.opensolaris.org>.
- [6] <http://www.eweek.com/article2/0,1895,2216876,00.asp>.