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THE MAGAZINE OF USENIX & SAGE

October 2000 • volume 25 • number 6



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SYSADMIN

An Interview with Geoff Halprin



USENIX & SAGE

The Advanced Computing Systems Association &
The System Administrators Guild

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[Editor's Note: *This interview was conducted electronically with SAGE board member Geoff Halprin during July 2000.*]

Rob: Tell us how education works in Australia after one graduates from high school.

Geoff: High school in Australia finishes with year 12. The exact name and nature of the final exams changes from state to state. These scores (partly exam, partly tests and assignments during the final year or two years) determine your university entrance ranking. You select your preferred courses and wait for an anxious month or two for offers.

University is anything from three years to five or six years, depending on the course. Computer science is a three-year course.

I had actually started with computers when I was 11, with PDP-8s. I was contract programming after school on Cromemcos when I was 14. So, choosing my Uni course was not really an issue. That made it all the more interesting to find all these holes in my (self-taught) knowledge when I started Uni.

I treated Uni as a place to learn (not just more exams to pass) and so enrolled in the more esoteric and challenging courses – advanced computer architecture, advanced compiler design, advanced operating systems, advanced software engineering. (Compiler design was a compulsory second-year unit that stretched everyone – we only had seven people choose the third-year elective after having to write a real compiler in second year.)

Rob: How did you prepare for your current career in sysadmin?

Geoff: I got bitten by the bug when I was young. At 12, I started attending meetings of MICOM – the Micro Computer Club of Melbourne. By my 13th birthday I had one of the first Apple IIs in the country – it ran off 110V transformers!

When I was at Uni, I was also working for Melbourne House – a computer-games company. Writing computer games (especially back in those days of 64K 6502-based and Z80-based machines like the Sinclair Spectrum and Commodore 64) was a very challenging exercise; most programming is a trade-off between speed and efficiency. Games programming requires both. You had only the “vertical retrace” (about 30–60 cycles) to update the screen, and only 64KB (minus the overhead) for the program logic, scenery databases, sprite databases, sounds, music, and work area. I learned a lot by stretching machines to their limits. On one project, we had to hand-compile C into assembler.

One of the roles I fell into there was looking after their UNIX (System III) machines. We developed cross-compilers, cross-debuggers and other tools. I was looking after those tools and the UNIX machines they ran on. I guess that was my first real stint as a UNIX systems administrator. (I'd always looked after the PDP-8s and PDP-11s, but no one knew the term “systems administrator” back then.)

So I found myself walking both sides of the fence – software development and systems administration. I had been drawn to the challenges of troubleshooting other people's code right at the beginning, as a tutor to other students, and in the support of other people's code. Managing the system was an extension of this – you had to become very adept at recognizing patterns and forming hypotheses.

Rob: Tell us how you came to be at SysAdmin after University.

Geoff: Having had my taste, I was already forming ideas about how to look after systems. I had also already had my fill of bad management. So a friend and I started a

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company. Initially it was a shell for us to contract through. For several years I alternated between development and operations projects. I found it very useful to be able to help programmers understand the consequences of their choices (and why daily runs that take 27 hours are a bad idea).

Around 1992, after a series of such projects, I decided to step back and look at this emerging need. We were doing work with Sun in Australia, and it was clear to me that there was a huge demand for this nonprogramming skill. I started developing a product that came to be called the "operational support contract." Basically, we established good practices (our toolkit and configuration and documentation), then managed the site through regular visits, all prepaid quarterly in advance. There was incentive built in so that if we did a good job, they wouldn't need to call us, and we would have been paid a retainer that wasn't fully utilized.

We became one of two companies in Australia providing a bank of systems expertise. (It isn't quite clear who was officially first.) We had established a presence with that product, and a close working relationship with several vendors as a consequence.

I became involved in the Sun User Group of Melbourne, later to become SUG-OZ and operate nationwide. In mid-1993 SAGE-AU was founded. The groundswell had begun.

In 1995, I left that business and started The SysAdmin Group to continue my work on developing methodologies and toolkits for systems administration. It has been quite an eye opener to start up another business, and to learn what it is I do well, and what it is I rely on others to provide.

Rob: So you are the founder and sole proprietor?

Geoff: Yes. When I left my first company, the last thing I was going to do was have another partner. I had a lot of emotional turmoil to work through. So I started SysAdmin with the experience of almost ten years as a company director, but with no customer base or intellectual property – all that had to be left behind. It was a huge learning curve.

There is a book called *The E-myth*. It talks about why people start their own businesses, and the three hats you wear as you grow a business. It's quite an enlightening explanation: most people start a business for reasons like, "I can make widgets better than these guys. Why am I putting up with all this frustration and bad management?" So they go into business making widgets. And they really do build better widgets than they were previously.

But as they grow the business something happens – they have to do other things as well. There are three hats – the technician, who looks at the present ("How do I do this right now?"); the manager, who looks at the past ("How do I do that more efficiently, at lower cost?"); and the entrepreneur who looks to the future ("What else can I do?"). It is quite ironic that the first of the roles you jettison as you grow a business is that of technician – the very reason you first started the business.

The reason I say that is that one of the frustrations that I have faced, as a geek, is the lack of time and focus I've been able to devote to the real technical work. It's really quite distracting having to continually find new customers to pay the bills with. The systems administration market place has changed significantly from when I first started growing a practice in 1992.

SysAdmin has been an experiment. I've had a rare opportunity to try out different management and resourcing models, and learn the strengths and weaknesses of each.

At this point in its life, SysAdmin is a virtual company – using peers who all own their own companies as subcontractors.

Rob: What is SysAdmin’s main business model?

Geoff: I have tried to align incentives for good systems-management practice with good business and customer management. For example, the OSC encourages both parties to plan, but recognizes that it isn’t always possible. There are tariffs for out-of-hours work, and prepaid allotments that attract a discount but are nonrefundable. It all goes to trying to encourage good practices.

Rob: You’re very active in the SAGE community. What do you think are the most important challenges that lie ahead for SAGE?

Geoff: When SAGE first began, the only people who knew what systems administration was were those in the role; the practitioners. SAGE was established with the charter of developing systems administration as a profession. I believe we are now half way there. We have established it as a unique vocation. Companies now hire systems administrators. The second half of the journey is to move from vocation to profession. This may sound quite fuzzy, and I guess it is to some extent. But there are a number of attributes that go along with the term “profession,” such as accountability, continuing education, and standards of practice, to name a few.

We are facing a huge challenge. There is a drastic shortage of systems administrators, and the vendors have responded to this by putting up nice GUI screens and pretending that that is what systems administration is.

We did ourselves a huge disservice by coining the term “systems administrator.” The term “administrator” implies (at least in the eyes of management) that it is a role that can be procedurized and automated. Those of us who work in the field know that there is nothing further from the truth. As the systems we integrate and manage continue to become more complex, the answers are not found in a couple of icon movements.

The word that best describes systems administration is “intricacy.” The dictionary defines this as “the complex interplay of components; perplexingly entangled or involved; confusingly complex.” These are all accurate representations of systems administration. We know that. The people we provide our services to do not. Just as the community appreciates the complexity of the body a doctor deals with, and the complexity of the law a lawyer deals with, so too we need them to appreciate the complex bodies of knowledge that we deal with.

For SAGE, we must embark on a major campaign of educating the users of our skills that there is more to the role than dragging a few icons across a desktop. The certification effort being undertaken at present is one of the strategic ways to address that goal. As the community sees a vendor-neutral certification program, they will start to understand that there are core skills that are intrinsic to good systems administration.

There are also new books appearing, such as Mark Burgess’ book, that are addressing the disciplines and principles of systems administration. These complement the existing excellent task- and platform-oriented texts.

Rob: Which challenges are you personally attacking?

Geoff: My personal area of interest is “best practice” and standards of practice in general. I can change accountants without them having to redesign my accounts, and I can change lawyers without them having to rewrite every contract, but when I change sys-

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tems administrators, there is a huge hidden cost as they re-create the site in their own image; deploying the tools and standards they have become most comfortable with.

We desperately need to develop standards of practice that we can all agree on, or at least live with as reasonable. Even in the complexity of systems administration, there are patterns and recognized good practice. Software engineering has started recognizing the presence of patterns. Long ago (1972) they recognized the need for the “ego-less programmer.” Perhaps we should learn from the world around us?

I’ve started (with lots of help) to define a framework that is independent of technology, vendor or platform; the Systems Administration Body of Knowledge. It has a lot of the meat still missing, but there is a structure that anyone can use to assess their site, and to plan improvement works. That’s a step in the right direction.

Having a framework allows us to communicate effectively with those around us, to show them what it is that we do, how complex it really is, and to provide guidance to both personal and organizational maturity and growth.

Rob: Do you have any idea why tackling all these challenges is taking the “system administration community” such a long time?

Geoff: Systems administration is young. In the broadest sense it’s only been around 40 years, but in any real sense it’s been around for maybe 20 years. Accounting and medicine have been around for hundreds of years, and they’re still getting it wrong.

Another major problem is that the field is not recognized as an independent field of study. A small number of universities offer units in systems administration, not a full degree, and these are part of a computer science course. Just as it took a long time for CS to break away from maths, we’re now seeing similar problems of SA being treated as a subset of CS.

This is also reflected at the corporate level, where software engineering research is recognized, but systems administration research is not. It’s a side effect of other research at best.

Then there’s the minor problem that the industry is so massively short of capable systems administrators that the ones there are don’t get much time to devote to research.

But I see this changing. The community as a whole is now recognizing the need for a more disciplined approach to systems management. This is evidenced by the outsourcing boom. I’ve also noticed the change in the nature of the papers at LISA over the past five years. As a group, we are now ready to be introspective enough, and have enough collective experience to recognize meaningful patterns, and to look at underlying knowledge, skills, and abilities that form the basis of systems administration. The next few years are going to be quite exciting.