

# Standalone Sysadmin

SYSTEM ADMINISTRATION

## THE COMING FUTURE OF SYSTEM ADMINISTRATION

2012/03/06 | MATT SIMMONS | 10 COMMENTS

Four years ago, I wrote a blog entry titled [The Future of System Administration](#). It started out with “Here’s a hint...it’s not sitting at a shell prompt typing out commands.”

In it, I discussed how system administration would become development, much more like coding than like swapping disks...

*The future is already here – it’s just not very evenly distributed.*

*–William Gibson*

Basically, yes, it has come to pass. No, not everyone is using that particular strategy, but the number of people who aren’t will continue to get fewer and fewer, especially as cloud-based offerings get more and more prevalent, accepted, and expected. But all of this is just tangential to what I really want to talk about.

System Administration has to divide in order to continue to grow. [Tom Limoncelli](#) has been saying it for a few years, but I didn’t really *get it* until relatively recently. I don’t know if we agree about the underlying reasons, but I suspect we’re on the same page. Let me lay the ground work, and then I think you’ll also agree that it’s pretty much inevitable.

System Administration is a relatively recent field compared to pretty much every other professional endeavor. Medicine has been around in an organized form for over 100 years. Accounting for [400-500 years](#), and other..um..professions...for considerably longer. (*Note: this is not to say that the art and science of these are not much, much older, but I am speaking here of organized professions*).

The profession of System Administration is still coalescing, but that's only because we're still very much in the formative years of the art and science. It's exciting, because we get to experience the transition from humors and leeches into germ theory and beyond.

As we've progressed, something has become clear; a single person is unable to handle all aspects of the job. We've all seen this, of course. There are administrators specific to networks, storage, virtualization, applications, and more. This division has been caused by the domain-specific knowledge required to adequately perform a certain aspect of running IT. Not everyone can know everything...

It is this last point that is going to cause the division that I speak of. Currently, the field is very roughly divided into junior and senior sysadmins. The [Job Descriptions for System Administrators](#) short booklet by USENIX is a good effort to add some qualification to the distinctions between the various job levels, but it still supposes a continual advancement from the very entry level administrator up through senior, level IV System Administrator. I don't think this can continue for much longer, particularly in an infrastructure of any complexity.

As time progresses, here's what I think will need to happen (and in some cases, it's already happening, but it's going to become more widespread).

We're going to start seeing two career paths for people who work with servers. At the top of the professional career paths, there will be the people who are in charge of physical infrastructures, and there will be people who are in charge of the operational infrastructures. The inevitable move to cloud-like infrastructures is going to mean that, to the operational architect, the physical hardware is almost completely irrelevant. At the same time, the physical administrator is going to be concerned with those aspects of running the infrastructure, such as physical Moves, Adds, and Changes (MACs) as hardware becomes more numerous and anonymous.

Almost no one is the size of Google, so when machines die, they will need to be replaced. They will need to be monitored, and their performance, independent of the software installed on them, will need to be monitored for efficiency, with underperforming equipment being fixed. The cloud layer of abstraction will allow machines to be pulled in and out of service to be repaired and replaced, but certainly a degree of expertise will be required to engineer the best, most efficient datacenter solutions. This is what the top tier physical infrastructure will concern themselves with.

The other side of the coin is the operational administrator, who concerns themselves primarily with ensuring the business operations and continuity. If the physical infrastructure admin's

concerns are hardware, the operational administrator's concerns are data and software. The operational admin won't ever have to consider what disk array to purchase, or how large the storage needs to be, but will instead concern themselves with things like the performance growth rate and the number of CPU units required for a particular task. Infrastructures will be developed like software is now, using the same methodologies, sharing some of the tools, if not the languages. Someone in a senior operational role will need business intelligence, as well, because they will be responsible for translating business directives into infrastructure.

These specialized roles will have junior members, of course. An entry level physical infrastructure admin will probably enter the field in the same way that many of us did, as an apprentice, then moving to a journeyman type of level while learning more. I imagine that more education will be necessary to fill the truly senior physical roles, but it's not inconceivable to learn everything on the job.

In the operational role, it's harder to imagine many people making the same transition from non-admin to admin. My own path, from Tech Support to SysAdmin, won't be nearly as common. Many current admins were able to make the transition between non-admin and admin because the operating environments are similar on their laptops and their production infrastructure. Once the operating system ceases to be important, this easy path will disappear, and the only people who make that transition are those who actively work at it.

Because the operational aspects have such an emphasis on programming, it's easy to see that more administrators will become sysadmins directly out of CS programs at universities. Hopefully the people who dictate the curriculum will take notice of this and start adding operational electives.

I don't have a time frame for this, but I suspect that in another four years, we'll see more and more companies coming online with this model. Over the past couple of years, I've seen a lot of blog entries and online articles talking about the disappearance of System Administrators. These articles are mostly hyperbole. The sysadmin of today is not going to disappear, but they are going to be fewer in number.

Companies who, right now, have their own physical infrastructure are not going to go through a lot of expense to get rid of it, but companies who come online in the future are going to see more and more reason to use a public cloud service, which means that they'll only be employing the operational administrators. Sure, there will still be desktop support in most cases, but in terms of sysadmins, for those companies, it's mostly going to be architects. Once a company grows to the point where it's not economical to host at Amazon, they may build their own cloud infrastructure,

in which case they'll employ the physical infrastructure admins, too.

Just so you know, this isn't a dystopian future. Specialization is a good thing. It's going to require us all to work together, but the end result will be that we can accomplish much more than we could before. The knowledge level required to do our jobs is going to go up, but we should see this as a challenge to learn more and to be better.

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**Steve** · 3 years ago

I think the more accurate terms are System Administrator and System Architect. System Architects will retain value within a company - they translate business requirements and processes to the required architecture. System administrators, on the other hand, will become more of a commodity as IT infrastructure itself becomes more of a utility-style commodity over coming decades.

It's not a bold claim to make at this point that System Administration jobs will become increasingly outsourced as this occurs. This goes hand-in-hand with this blog post though. As System Administrator jobs migrate away from enterprises towards specialized outsourced utility companies, the role of System Administrator will also become much more specialized.

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**mrG** · 2 years ago

I'm agreeing with the gist of this, and frankly had already in my own mind largely diverged the *hardware* sysadmin, which I am not really much of myself, from the *O/S & Network* sysadmin that is concerned, yes, with a form of software, although I'd say that form is very different from the sort of sysadmin that handles applications configurations (which I also do) and different again from the straight applications coders (a field that more and more I don't recognize anymore).

But what I also see in my encounters with vendors and clients is a preponderance of sites