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# How I Learned to Stop Worrying and Love Commoditization

NOVEMBER 10, 2014 PETER WAGNER ESSAYS

***This post first appeared on GigaOm on November 8, 2014. You can see the original here (https://gigaom.com/2014/11/08/how-i-learned-to-stop-worrying-and-love-commoditization/#comments).***

Customers love commoditization. It improves their capital economics, allows them to standardize their operational procedures and reduces their operational expenses. History has shown that cost and performance curves favor the commodity, and more to the point, key customers have come to believe this as an article of faith. While this is bad news for certain classes of startups – the vertically-integrated system, the proprietary platform – it opens the door for another: the "commoditization accelerant".

Commoditization accelerants are not commodities themselves, but make it easier for customers to do what they already want to do: consume commodity technology. The trick here is to identify a potential commoditization wave that is somehow held back by a missing capability -- and then to supply it.

Here are three examples:

**1.The Network Commoditization Accelerant**

Networking is the last bastion of proprietary IT. It is here that the mainframe-style business model has been most persistent and most deeply entrenched. If the major infrastructure disciplines were all cast as Cold War dictatorships, networking would be North Korea. The big opportunity is to bring the commodity economics of the server industry to networking. This means cleaving the vertically-integrated networking business model into an open structure where customers choose their hardware and software separately.

Data center switching is the segment most ready to take this leap. There are at least two reasons for

this. First is the arrival of standardized top-of-rack switch designs, available from a growing number of ODMs and all based on the same highly performant merchant silicon. Second is the influence of the giant webscale operators (e.g. Amazon, Facebook, Google), who have the massive scale and technical know-how that allows them to substitute their own R&D dollars for vendor margin dollars and come out way ahead. They have already begun the move to commodity hardware. A quick look at Open Compute Project attendee lists reveals that this agenda has crossed over into the enterprise market as well.

So what is holding back the complete commoditization of data center switching? Software. The operating systems available to run on the new breed of hardware have been sorely lacking. Prior efforts like FutureSoft, Level7 and Vyatta have all fallen short and were probably too early. These days a new cohort of startups such as Cumulus Networks (disclosure: Wing is an investor in Cumulus Networks) and Pica8 is taking a fresh run at it, aided by better market timing, a more robust technical approach and the runaway success of Linux in the data center. Stakes are high: the company that provides a capable networking operating system will be lighting the match on a multi-billion-dollar commoditization bonfire. This is as big a threat to proprietary networking incumbents like Cisco as Linux-on-x86 posed to Sun (and we all know how that turned out).

**2.The Storage Commoditization Accelerant**

Years ago I was having lunch with Dan Warmenhoeven, then CEO of NetApp. One of the companies I was working with at the time, Acopia Networks, was trying to create a market for “network file virtualization”. I mentioned Acopia to Dan and while he was gracious as always, I could tell he wasn’t a fan. “Why?” I asked. “They suck our brains out,” he stated plainly. NetApp and EMC did everything they could to marginalize Acopia and their ilk. Through this experience I learned a lesson that seems obvious today: nobody likes to be virtualized. If you are virtualized, you are commoditized. Circling back to our thesis, all forms of “virtualization” are commoditization accelerants. And in storage there is a lot to commoditize.

For years, storage systems vendors like NetApp and EMC have gotten away with marking up commodity disks to high, proprietary-vendor margins. This has always been obvious to customers, who can easily compare the $ per GB of their integrated storage arrays with that of the disks themselves. While customers haven’t liked the price disparity, they have had no other way to achieve enterprise-grade storage capabilities.

The dramatic arrival of Flash on the enterprise storage scene exposed the vulnerability of the incumbents, who were slow to exploit its potential. New competitors such as Nimble Storage (disclosure: Wing is an investor in Nimble Storage), Nutanix and Pure Storage took advantage. But these companies all operate on the same vertically-integrated business model as the incumbents. They are not commoditization accelerants, just superior evolutions of the traditional strategy.

Hadoop taps into customers' desire to use commodity in-server disks, and brings a new storage architecture to the table that radically reduces $ per GB. But this storage architecture is tightly linked to batch analytic workloads and Hadoop's own protocols and processing frameworks. It was never intended to be a horizontal primary storage technology.

The next and ultimately more hazardous shoe to drop will be a software-based approach that squarely targets existing enterprise storage requirements – a phenomenon sweepingly referred to as "software-defined storage". Some of the more relevant offerings in this camp include VMware's VSAN as well as products from startups such as Coho Data, Maxta, StoreVisor and PernixData. All these companies are following a classic "Innovator's Dilemma" strategy by attacking the incumbents from below and gradually expanding their addressable market as their products become more capable. They have abandoned the vertically-integrated model, and in particular the egregious markup of commodity disks and SSD's that constitutes such a large proportion of total vendor margin. Once again, conditions are ripe for a software accelerant of this pent-up commoditization wave.

The two examples above, in networking and storage, take advantage of the commoditization of hardware. Commoditization of software is trickier. Software products are less likely to be "perfect substitutes", are more likely to sport differentiating capabilities that enable divergent use cases, and often pose higher switching costs. These caveats firmly on the table, let's explore the new commoditization dynamics around one of today's most critical software platforms: server virtualization.

## 3.The Virtualization Commoditization Accelerant

We've seen that all forms of virtualization can act as commoditization accelerants. However, it is also true that virtualization itself is vulnerable to commoditization. The main historical threat to proprietary server virtualization has come from open source hypervisors such as Xen and KVM,

which made inroads in key segments like the public cloud. But recently a very old alternative has started to make very new gains. Linux containers, which have been around for more than a decade, are suddenly all the rage.

One important reason for container-mania is the impact of a commoditization accelerant: Docker. Docker didn't invent containers, but it has made them vastly more usable and useful to developers. In doing so, Docker is tapping into a pent-up desire for a lighter weight, commodity alternative to virtual machine technology, and helping unleash a powerful commoditization wave that poses a real problem for hypervisor vendors VMware, Microsoft and Citrix. Aided by Docker, the "new" container-based approach has crossed the "good enough" threshold on enough dimensions that a tipping point has clearly been reached.

The case of Linux containers and virtualization is more nuanced than the networking and storage examples. Virtualization proponents quickly point out that there remain important properties of virtual machines (such as superior isolation) that are still not delivered with containers. And that existing enterprise workloads running on virtual infrastructure (especially Windows workloads) are not going to be redeployed into containers anytime soon. Meanwhile Linux container proponents argue that their most important implication is not VM-replacement, but the enablement of a new way of building applications based on "micro-services". And then there is the inconvenient truth that many containers will actually be deployed inside VMs, not instead of them! Valid points all, but the underlying trend remains: many new applications that might have been deployed directly in VMs will now be deployed in containers. The effect of this on the programming, systems management and operations model will be profound. The virtualization platform's primacy will be eroded even in those environments where it is not completely eliminated.

There are certainly other accelerants besides Docker that will be required for Linux containers to expand into additional enterprise use cases.Innovations in security, storage and networking are a few that come to mind. There will be others.Some may even be substantial enough to sustain independent businesses riding the containerization wave.

**Accelerants Are Not Commodities**

Note that the commoditization accelerant should never be confused with the commodity itself. The networking OS enables white-box switching hardware but is itself quite distinctive. Software-defined storage products are themselves proprietary but allow the use of standard in-server disks.

Docker may not yet have found its revenue model but has staked out a unique piece of prime real estate atop the Linux container movement. All three accelerants hold the potential for defensible high-margin businesses buoyed by the flood of commoditization they have unleashed.

| Segment | Commodity | Commoditized | Accelerant | Most at Risk |
|---|---|---|---|---|
| Networking | White box switches | Proprietary switches | Networking OS | CISCO |
| Storage | In-server disks, JBOD's | Proprietary arrays | Software-defined storage | EMC², NetApp |
| Virtualization | Linux Containers | Hypervisors | Docker | vmware |

What are some other pent-up commoditization waves? What accelerants can be injected to unlock their potential? We believe such opportunities also exist in databases, the "cloud stack" and other primary elements of data center infrastructure. The gravity of commoditization is too powerful to be held in check, and great companies will be built by channeling this potential. They will be the ones that succeed in translating the gravitational pull of commoditization into high velocity, without straying too close to the black hole and ending up crushed inside the event horizon themselves!

*Disclosure: Wing is an investor in Cumulus Networks and Nimble Storage.*

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