Fred Cohen & Associates - Analyst Report and Newsletter
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Partitioning and virtualization - a strategic approach

For many years, data centers prevailed because of the high cost of the computing, storage, and support resource, and the cost and performance benefits of centralization. As the "PC revolution" came, we moved toward everybody controlling everything on their own, and there has been a lot of talk lately about cloud computing, going back to the central computing model, and the network as removing the import of location on computation. But long before any of this, there was the period when storage, computation, and I/O were separate and distinct devices. While we have unified these increasingly in moving toward the palmtop computing environment, and perhaps will eventually get to large-scale embedded-in-the-brain versions, we seem to continue to go back to the future. Round and round we go - and where it stops, nobody knows.

The three components of strategy

The strategy I want to discuss today, has three components, and communication between them. They are old, as is the strategy, but it still works:

- **Storage:** Storage in high volume and with reasonable surety, belongs in a data center. Here it can be dealt with in a professional manner, by trained specialists, who spend their time dealing with the issues of the enormous volume, data retention and disposition, policy fulfillment, legal holds, backups and restoration, high performance and long-terms utility needs, archival, searching, and meta-data issues, and all of the complexity of data in all of its myriad uses.

- **Computation:** Computation belongs in three places.

  - The end user has computational needs, largely related to the peripheral devices they carry with them and use at fixed locations. But these are small-time computational systems that ultimately support more of the interface to the content than the performance of complex analytical functions with it.

  - The storage facility has computational needs as well, but again, these are highly specialized to the storage system and its efficient functioning, and less about the content than the mechanisms used to assure its proper care and control.

  - Somewhere, there has to be a computational facility to support the needs for high-end computation, large-scale processing, and complex interactions between multiple systems. Again, this is the data center, with its high reliability, effective physical protection, high level of expertise, and capacity to handle more for less.

- **Peripherals:** From the workstation to the palm computer, it's all peripherals from there. Built to suit the need, and as compatible as you can make them

Not really very new - what has changed?

So this was nothing new, at least if you're old enough to know that it's not new. But what is new, is that we now have (1) terabyte disks that cost less than $100 and use very little power when not in use, (2) $150 computers that connect to storage and peripherals, have no moving parts, very low power consumption, and enough computation to pack a punch, and (3) $100 end points that have GUIs, decent speed real-time connectivity from most places most people want to be most of the time. And that means that instead of building out computers with all three components, we can literally buy as many as we want of each, hook them together any way we want, and have any reasonable mix of capacity, flexing it as we need it. And that doesn't just apply to large enterprises. In fact, increasingly, it's becoming a rational choice for every small and medium business.

- I can have a data center that fits in a half rack, that includes 100 terabytes of data, 100 CPUs, and use it from anywhere in the world, for about $25,000 a year. And that assumes that I replace everything every year, or better yet, use last year's versions as a backup!

- When something breaks, if it's a peripheral, I buy a new one, if it's a disk, I plug it out and plug in the backup (mirror), and if it's a CPU, I plug the interfaces into a backup. Push reset, and off you go! Mean time to repair? 1 minute after I figure out what broke. And diagnostic time is on the order of a minute if I build out minimal checking systems.

- A data center move takes about an hour (plus travel time), and I don't have to move it all at once. I can move as much or as little as I like, or I can build the new one at the new location, and shut down the old one or use it as a backup site after the new one is up and running.

What's missing from this picture?

The only thing missing from this picture today is companies starting to apply it. While the large enterprises have done variations on this theme for years, the small and medium market segment largely still buys pre-built complete computer systems with pre-installed software, and spends lots of time and effort in dealing with the limited and fixed nature of these devices, eschewing flexibility for what they are used to. In a very real sense, the missing piece of this picture is the architectural diagram and instructions on how to apply the technologies for those who are simple assemblers and installers and not designers or architects. And even those are starting to work their way into the SMB market, as the small-business service and support industry starts to find ways to better help their customers.

Summary

The evolution and emerging systems and components are taking us forward to the past, and the architectures of the 1960s and 70s, reapplied to the new technologies and methods, will serve us well in building out a fast, flexible, reliable, lower cost, and more efficient information infrastructure for every size and type of enterprise. It's time to go back to the future.