Provisioning a Virtual Network is Only the Beginning

Lori MacVittie, 2010-27-09

Deploying a virtual network appliance is the easy part, it's the operational management that's hard.

The buzz and excitement over VMware's announcement of its new products at VMworld was high and for a brief moment there was a return to focusing on the network. You know, the large portion of the data center that provides connectivity and enables collaboration; the part that delivers applications to users (which really is the point of all architectures). Unfortunately the buzz reared up and overtook that focus with yet another round of double rainbow guy commentary regarding how cool and great it's going to be when the network is virtualized and is "flexible" and "rapidly provisioned" and "cheap."

Two of out three ain't bad, I guess.

As noted by open-source management provider Xenoss in a forthcoming survey a lot of the folks (more than 70 percent) actually doing the work of managing a virtualized environment "prefer tools that manage their entire infrastructure as opposed to a virtualization-specific solution". Interestingly the author of the aforementioned article echoes the belief that the "killer" application for cloud computing is tooling, i.e. management.

So let's get our head out of the clouds for a minute and think about this realistically. There are, after all, two different sets of concerns regarding network and application network infrastructure in the data center and only one of them is addressed by the vision of a completely virtualized data center. The other requires a deeper management strategy and dynamic infrastructure components.

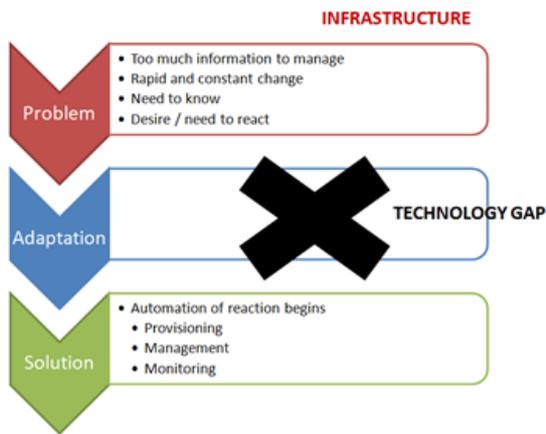## THE TWO FACES of CLOUD and DYNAMIC DATA CENTERS

There are two parts to a dynamic data center:

1. *Deployment*
2. Execution

What virtualization of the infrastructure makes easy is the tasks associated with number one: deployment. The "flexibility" touted by proponents of virtual network appliance-comprised architectures speak only to the *deployment* flexibility of traditional hardware-based network components. There's almost no discussion of the flexibility of the network infrastructure component itself (which is just as if not more important to a dynamic data center) and of the way in which components (virtual or iron) will be integrated with the rest of the infrastructure.

No, no they don't. And "integration" with a management or orchestration system for the purposes of provisioning and initial configuration is (again) only half (or less) of the picture. The use of something like VMware's vCloud API will certainly get a virtual network appliance deployed (a.k.a. rapidly provisioned) and if you need to move it or launch more there's no better way to integrate the operational procedures associated with those tasks.

But if you need to deploy a new web application firewall policy, that's a way different story. The vCloud API is generalized, it's not going to necessarily have the specific means by which you can deploy – and subsequently codify the appropriate application of that policy – on any given network component. And even if it did, at this point it's going to be very general, as in *the policy will still have to be specific to the component.* Managing a network infrastructure component is not the same as managing a virtual machine. Moving around a VM is easy, moving around what's *in that VM* is not. If you move across network partitions (VLANs, subnets, networks) you're going to have to reconfigure the component. Period. It is the management of that aspect of a network infrastructure component – physical or virtual – that is problematic and which is not addressed by virtualization.

ADAPTATION at RUN-TIME

The second face of a dynamic data center is the adaptability and the capability to collaborate (share context) of the infrastructure itself. Without the ability of the infrastructure to essentially "reconfigure" itself *during execution*, what you end up with is the means to rapidly deploy and migrate a *static* infrastructure. If the behavior of each of the networking components deployed as virtual network appliances is codified in a rigid manner and does not automatically adapt based on the context of the environment and applications it is delivering, it is *static.* It is the adaptability of the infrastructure that makes it dynamic, not the way in which it is deployed.

Example: You deployed a Load balancer as a virtual network appliance. It can be migrated and even scaled out using virtual data center management technology. It can be deployed on-demand. It is now flexible. But while it's running how do you add new resources to a pool? Remove resources from a pool? How do you ensure that users accessing applications in that environment doing so via a high-latency WAN are experiencing the best possible response time? How do you virtually patch a platform level vulnerability to prevent exploitation while the defect is addressed? How do you marry the very different delivery requirements for a mobile device with a LAN-attached desktop browser? How do you integrate it with the management platform so you can manage *it* and not just its virtual container?

More importantly, perhaps, to the operational (devops) folks is *how do you adapt to the changing application environment?* As applications are being launched and decommissioned, how does one instruct the infrastructure to modify its configuration to the "new" environment? It is this adaptation, this automation, that provides the greatest value in a highly virtualized or cloud computing environment because this is where the rubber meets the road. The rapid provisioning of components requires the rapid adaption of supporting network and application network infrastructure as a means to eliminate the cost in dollars and time of manually adapting infrastructure configuration to the "real-time" configuration and needs of applications.

CLOUD is ABOUT APPS and OPS

Rich Miller summed it up well when he said "cloud is all about ops and apps." It is not about any single technology. It's a means to deliver and scale applications in a way that is efficient and more affordable than it's ever been. But in order to achieve that efficiency and that reduction in costs the focus is necessarily on *ops* and the infrastructure they are tasked with deploying and subsequently managing. While virtualization certainly addresses many of the challenges associated with the former, it does almost nothing to ease the costs and effort required for the latter.
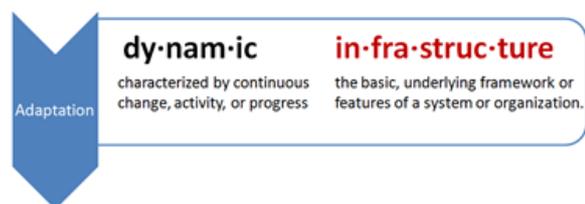
Consider the additional layer of networking abstraction introduced by virtualization. That has to be managed. For every IP address you add in the virtualization layer (that's in addition to the IP addresses already used/required by the the cost of managing every other IP address already in service *also* increases. The cost of IP address management is linear function of the number of IP addresses in use. And if you're going to be managing that virtual machine via a management system, it's going to have at least one IP address itself.

Increasing the cost of IP address management is exactly the opposite of what the new network and a dynamic infrastructure, a.k.a. infrastructure 2.0, is supposed to be producing. This is not solving the diseconomy of scale problem introduced by virtualization and cloud computing so often referenced by Greg Ness 🐦, it *is* the problem. Virtualization is making it easier to deploy and even scale applications and lowering CAPEX, but in doing so it is introducing additional complexity that can only be addressed by a solid, holistic management strategy – one that embraces integration across the entire infrastructure. That does not, by the way, yet exist. But they're coming.

In a services based infrastructure, which is what a dynamic infrastructure strategy is trying to achieve, the "platform" is less important than the services (and how they are integrated) are provided. It is not virtualization that makes a network fluid instead of brittle, it is the *services* and the way in which they adapt to the environment to ensure availability, security, and a high-performing delivery system. Virtualization is a means to an end, it is not the end itself. It is not addressing the operational needs of a highly fluid and volatile environment.

Virtualization is not making it any easier to manage the actual components or behavior of the network, it's just making it easier to deploy them.

- Survey: Virtualization and cloud need management
- The IT-as-a-Service Evolution: What Does it Mean for Your Job?
- And the Killer App for Private Cloud Computing Is…
- Infrastructure 2.0: Aligning the network with the business (and ...