The days of IP-based management are numbered

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The focus of cloud and virtualization discussions today revolve primarily around hypervisors, virtual machines, automation, network and application network infrastructure; on the dynamic infrastructure necessary to enable a truly dynamic data center.

In all the hype we've lost sight of the impact these changes will have on other critical IT systems such as network systems management (NSM) and application performance management (APM).

You know their names: IBM, CA, Compuware, BMC, HP. There are likely one or more of their systems monitoring and managing applications and systems in your data center right now. They provide alerts, notifications, and the reports IT managers demand on a monthly or weekly basis to prove IT is meeting the service-level agreements around performance and availability made with business stakeholders.

In a truly dynamic data center, one in which resources are shared in order to provide the scalability and capacity needed to meet those service-level agreements, IP addresses are likely to become as mobile as the applications and infrastructure that need them. An application may or may not use the same IP address when it moves from one location to another; an application will use multiple IP addresses when it scales automatically and those IP addresses may or may not be static.

It is already apparent that DHCP will play a larger role in the dynamic data center than it does in a classic data center architecture. DHCP is not often used within the core data center precisely because it is not guaranteed. Oh, you can designate that *this* MAC address is always assigned *that* dynamic IP address, but essentially what you're doing is creating a static map that is in execution no different than a static bound IP address. And in a dynamic data center, the MAC address is not guaranteed precisely because virtual instances of applications may move from hardware to hardware based on current performance, availability, and capacity needs.

The problem then is that NMS and APM is often tied to IP addresses. Using aging standards like SNMP to monitor infrastructure and utilizing agents installed at the OS or application server layer to collect performance data that is ultimately used to generate those eye-candy charts and reports for management. These systems can also generate dependency maps, tying applications to servers to network segments and their support infrastructure such that if any one dependent component fails, an administrator is notified.

And it's almost all monitored based on IP address.

When those IP addresses change, as more and more infrastructure is virtualized and applications become more mobile within the data center, the APM and NMS systems will either fail to recognize the change or, more likely, "cry wolf" with alerts and notifications stating an application is down when in truth it is running just fine.

The potential to collect erroneous data is detrimental to the ability of IT to show its value to the business, prove its adherence to agreed upon service-level agreements, and to the ability to accurately forecast growth.

NMS and APM will be affected by the dynamic data center; they will need to alter the basic premise upon which they have always acted: every application and network device and application network infrastructure solution is tied to an IP address.

The bonds between IP address and … everything are slowly being dissolved as we move into an architectural model that abstracts the very network foundations upon which data centers have always been built and then ignores it. While in many cases the bond between a device or application and an IP address will remain, it cannot be *assumed* to be true.

The days of IP-based management are numbered, necessarily, and while that sounds ominous it is really a blessing in disguise. Perhaps the "silver lining in the cloud", even. All the monitoring and management that goes on in IT is centered around one thing: the application. How well is it performing, how much bandwidth does it need/is it using, is it available, is it secure, is it running. By forcing the issue of IP address management into the forefront by effectively dismissing IP address as a primary method of identification, the cloud and virtualization have done the IT industry in general a huge favor. The dismissal of IP address as an integral means by which an application is identified, managed, and monitored means there must be another way to do it. One that provides more information, better information, and increased visibility into the behavior and needs of that application.

NMS and APM, like so many other IT systems management and monitoring solutions, will need to adjust the way in which they monitor, correlate, and manage the infrastructure and applications in the new, dynamic data center. They will need to integrate with whatever means is used to orchestrate and manage the ebb and flow of infrastructure and applications within the data center.

The coming network and data center revolution - the move to a dynamic infrastructure and a dynamic data center - will have long-term effects on the systems and applications traditionally used to manage and monitor them. We need to start considering the ramifications now in order to be ready before it becomes an urgent need.