

## Data Center News:

### SYSTEMS MANAGEMENT TIPS

# Consolidation and virtualization: The same, but different

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Many IT administrators have discovered that there is overlap between consolidation and virtualization, and they are wondering how they should reconcile these two techniques in datacenter environments. Virtualization tools such as partitions, virtual machines, and resource management software all enable multiple dominant workloads to run simultaneously on larger servers, which is typically a key aspect of consolidation. But virtualization also offers far-reaching opportunities for administrators to fundamentally transform the operations in their datacenters.

How should the tactical use of virtualization tools for consolidation purposes be balanced with long-term strategic goals for virtualized datacenters? First, some definitions. •

- Server Consolidation implies combining workloads from separate machines or applications into a smaller number of systems or applications. There are several forms of consolidation. Heterogeneous workloads from multiple servers can be moved to a single larger server. Multiple workloads may be combined under a single OS, reducing OS images. Finally, multiple applications such as email systems or database instances can be combined into a single system. •
- Server virtualization involves decoupling a workload and its data from the functional details of the physical platform on which it is hosted. This increases the flexibility with which the workloads can be matched with physical resources, enabling administrators to develop business-driven policies for delivering resources that are appropriate given specific time, cost, and service level requirements. Virtualization therefore promises the ability for IT operations to be performed with far better economies of scale, allowing infrastructures to be managed efficiently even as they undergo high rates of growth, while maximizing the utilization of existing resources.

At one level, there is similarity between consolidation and virtualization, but there are also fundamental differences between the two approaches. Consolidation is generally most effective with homogeneous workloads. The ideal consolidation approach is to host multiple workloads within the scope of a single OS, with some form of workload management tool providing the necessary management of resources. In this case, consolidation lowers operational costs by reducing the number of operating environments that administrators have to manage. It also has the advantage of eliminating excess software, and thus reducing

licensing costs and the administrator time required to maintain that software.

By contrast, virtualization does not require workloads to be separated from the OS on which they are running. Thus, virtualization may reduce the number of physical servers that have to be managed, but the number of operating systems remains the same, or it may even grow, given the ease at which new systems can be instantiated. There is no question that virtualization offers major benefits in terms of improved administrator productivity, dramatically lowering the time required to bring up new applications in production, and simplifying the test and development process. However, strictly from the standpoint of lowering operational costs, the benefits of virtualization materialize somewhat indirectly.

In general, it is probably easier to virtualize workloads than it is to consolidate them. But virtualization is not a panacea, and there are a number of cases where it will not fit. For example, complicated applications requiring servers inside and outside the firewall may not work well if they are virtualized. Heavily utilized systems probably should not be virtualized, either, since they may not deliver acceptable performance when the virtualization overhead is added. For most customers, some combination of consolidation and virtualization represents the correct solution, with the potential to enable considerable financial savings in the short term. Good IT planners will explore how to use both options together to solve their particular pain points.

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