

End-to-End Server Virtualization Orchestration and Automation

As more organizations take hypervisors into the core of their data center and add more business centric applications, end-to-end orchestration of infrastructure services (server, network, storage) become increasingly critical. And while there is a clear desire to move in this direction by many customers, many of the current operational best practices of consolidating test, development, and non business essential applications with very basic network and storage services are poorly aligned with these directions. Customers must evolve operational best practices to better align with the more stringent service delivery requirements specific to this next tier of business centric virtual machines. These services need to include the ability to quickly recover or replace any physical servers, within minutes via end to end failover automation, the ability to quickly expand LUN capacity within minutes, and the ability to move bare metal capacity between clusters, to insure automation between clusters, not just within the clusters.

From an ROI perspective, today's best practices of deploying hypervisors as a server siloed project, with little to no coordination with the network and storage teams, come at a poorly optimized infrastructure price as too much storage, networking resources and bare metal server capacity are typically over provisioned, and costly to change as the manual steps to remove this capacity are often more than the hardware cost itself. The potential efficiencies and cost advantages from virtualization are attenuated by the retention of physical hosting procedures. As the newness of these projects wears off, and as customers place more reliance on the availability and security of the applications that run on top of virtualized servers, any inadequacies in orchestration and automation will negatively impact the number of applications that can be virtualized.

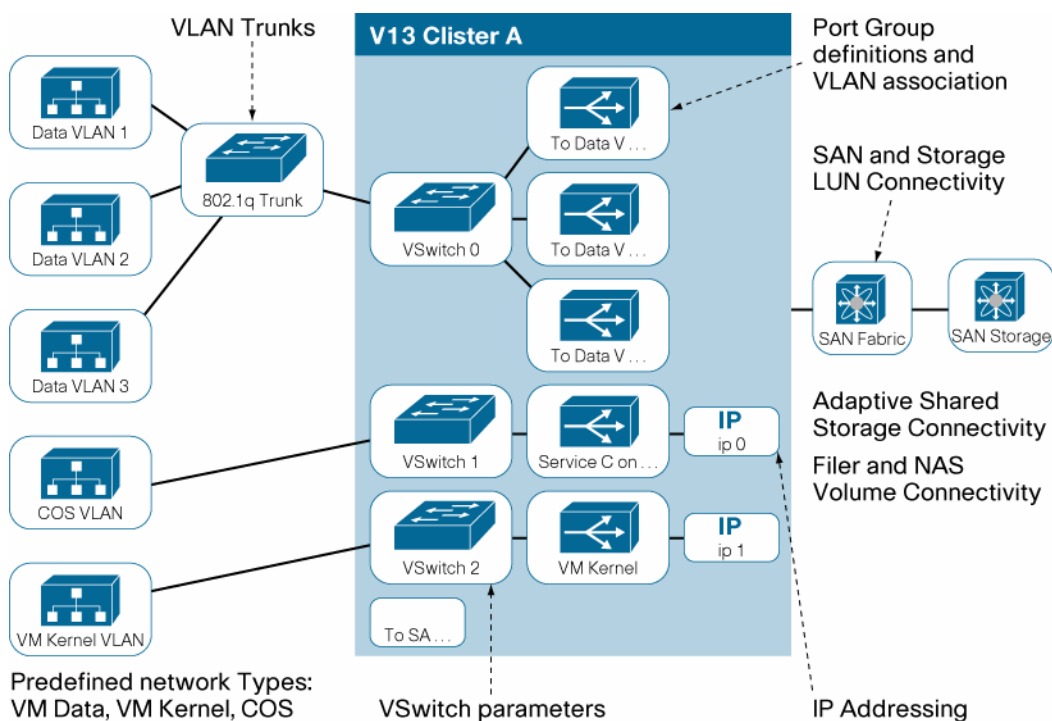
To meet the growing need for end-to-end virtualized server orchestration, Cisco offers the VFrame DC 1.2 infrastructure provisioning platform. VFrame DC is a template-based approach for configuring infrastructure services. This template driven model greatly reduces the complexities associated with configuring virtualized servers at the hypervisor layers—and enabling the dynamic re-alignment of infrastructure capacity to match requirements via a policies, that would enable breakthrough levels of productivity, efficiency and cost-savings

These policies include the following:

- Automatic detection of failed physical servers within virtualized server clusters and rapid remediation by bringing up a new server. Server capacity is lost for only minutes, rather than hours or days with manual provisioning approaches.
- Remediation of LUN (Logical Unit Number) capacity constraints with simple LUN addition script additions. Simple script additions within Cisco VFrame DC are applied to all physical servers within the cluster within minutes. This helps address VM hang issues (Stuck VMs), as well as issues such as VMs running out of storage capacity, that take usually hours to correct.

- Remediation of misconfigurations between the Virtual Switch, Virtual NIC, NIC, and Access Switching ports. The template approach of Cisco VFrame DC helps ensure consistent configuration of 802.1Q trunk ports, VLANs, and quality of service (QoS) settings across all of these interfaces. Manual configuration often creates errors that result in connectivity problems as well as complexities associated with troubleshooting the problems. These problems can take hours and days to diagnose and correct and results in unacceptable service levels with the applications running as virtual machine. Figure-1, illustrates the functionalities offered by the VFrame DC template based automatic provisioning approach
- VFrame detection of bare metal capacity constraints (or excess) and the ability to add more capacity within a cluster, based upon available X86 resources from a utility pool, and/or VFrame's ability to move capacity from one ESX cluster to another based upon load balancing policies at the X86 bare metal level.

Figure 1. Cisco VFrame Data Center Template based ESX Hypervisor Provisioning



Cisco VFrame DC complements server virtualization management and provisioning tools. Server virtualization tools tend to focus on the provision and dynamic resource allocation at the VM layer and do not offer much in the way of provisioning and mapping the network and storage interfaces. VFrame DC excels in the area of mapping the hypervisor interfaces end to end, being able to bring up a spare server with a hypervisor operating system via automated boot and server imaging, as well as insuring there is consistency and compliancy to these configurations with a configuration rules checking engine as part of the template design.

“Cisco IT is moving to the next phase of virtualizing servers with the addition of internet facing and business critical applications. We currently host many applications on hypervisors including finance applications, payroll applications, E-learning applications and more. We will continue our consolidation efforts in calendar year 09 and will look to extend the use of virtualization to gain operational efficiencies.”

“VFrame Data Center is critical to these deployments based on its ability to configure new servers end-to-end within minutes (in comparison to days and weeks). It also provides the ability to add server capacity based upon failover and resource utilization policies”, said Ken Bulkin, IT Hosting Manager, Cisco Systems. “VFrame not only saves time regarding the automation of very repetitive configuration tasks, it also insures that SLA's are being met with server recovery and user defined capacity utilization policies.”

For many customers the benefits that VFrame DC offers are not top of mind today as a majority of applications being virtualized have very basic, if any SLA agreements behind them. Virtualized applications can hang, can suffer from lack of resources resulting from physical server outages, can have connectivity issues that take hours to research, and many new VM's can be held in queue for days, while waiting on the IT group to install new X86 servers end to end. As the cost savings benefits of server consolidation outweigh these issues, many customers are willing to live with this problem. Customers however should take stock in these problems, and better understand and work through the end to end orchestration issues, especially as they begin adding new Virtual Machines with higher SLA requirements. VFrame addresses many of these scaling issues thus enabling the infrastructure to better handle the end to end service delivery requirements of server hypervisors and their related Virtual Machines.

For additional information on Cisco VFrame Data Center, visit <http://www.cisco.com/go/vframe>.



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