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Abstract

According to industry experts, in 2012 just over 50% of the server workloads have been virtualized. The main drivers of the rapid transition from physical to virtual over the past several years were cost savings from server consolidation, dynamic resource management and improved business continuity. VMware had the first mover advantage, and as a result, most enterprises currently have large and growing VMware deployments today.

Several impediments stand in the way of virtualizing the remaining server workloads. First, mission critical production workloads are more difficult to virtualize and may have a less compelling payback for doing so. Second, standardizing on VMware across the entire enterprise is cost prohibitive for most. Third, IT rarely has full control to dictate platform choice for all end users.

CIOs need an overarching strategy to address the broad range of virtual infrastructure requirements and use cases spanning the business. Varying levels of criticality, SLAs, technical needs, application affinity and user demands must be accommodated. With distributed teams already deploying non-VMware hypervisors and independently procuring public cloud resources, IT needs to respond with an affirmative and inclusive management approach to avoid the proliferation of “shadow IT.”

While the need to support a range of on and off-premise virtual infrastructure types is clear, management complexity of disparate platforms can be overwhelming due to the close coupling of toolsets with the underlying platforms. To avoid redundant, inconsistent and overlapping administration and management models, heterogeneous administration, management and deployment must be cohesive. This starts with the administration console of the virtual platforms and follows with a management model that, to the maximum extent possible, allows administrators to accomplish the same task on two or more platforms in exactly the same manner. Unified management is critical to delivering a high server to administrator ratio — a key driver of virtualization in the first place.

HotLink has taken a uniquely straightforward approach to enabling the administration, deployment, management and integration of heterogeneous and hybrid environments. Unlike overlay solutions that provide basic cross-platform automation on top of multiple native management toolsets, HotLink abstracts the virtual infrastructure, so VMware vCenter and its ecosystem of compatible tools can natively support other virtual platforms. Non-VMware resources are managed seamlessly and uniformly alongside vSphere — utilizing the underlying capabilities of VMware vCenter.

This white paper is a “Quick Start Guide” for IT teams responsible for evaluating, justifying, planning and deploying heterogeneous virtual platforms in the enterprise.
VMware in the Enterprise — Current State

The low hanging fruit has been virtualized, significant server consolidation has been achieved, and solid OPEX and CAPEX savings have been realized. Most of the currently virtualized workloads are not, however, mission-critical applications. In fact, VMware reports that less than half of the database servers in their customer base have been virtualized.

The non-virtualized workloads create a challenging set of economic issues for IT:

- These applications are often business critical, performance critical or both. Virtualizing these will likely require the advanced virtualization capabilities of vSphere.
- Critical applications often have lower virtualization consolidation ratios than non-critical workloads. Lower consolidation ratios require proportionally more vSphere licenses.
- The economics of virtualizing critical applications can dramatically reduce the overall cost savings from virtualization — creating pressure to reduce cost elsewhere.
- To reduce overall costs, many enterprises are transitioning non-critical workloads to lower cost virtual infrastructure like Microsoft Hyper-V, Citrix XenServer or Red Hat KVM, creating management complexities.
Given that competing virtualization platforms have substantially narrowed the functionality, performance and scalability gaps with VMware, virtualizing the remaining workloads will likely involve managing multiple virtual infrastructure types in most sizable enterprises. Now is the time for CIOs and their teams to look critically at solutions for streamlining the administration, deployment, management and integration of these heterogeneous environments.

Traditional Approaches to Multi-Hypervisor Management

While hypervisors are functionally very similar, providers have integrally coupled advanced and multi-host management capabilities with specific hypervisors. As a result, virtualization platforms each have native consoles for administration and management — VMware vCenter for vSphere, Microsoft SCVMM for Hyper-V, XenCenter for XenServer and RHEV Manager for KVM.

The hypervisor vendors provide APIs for integration but expose only a basic feature set for 3rd parties to use. A long list of tools are available that use these APIs for various overlay management or automation functions like service catalogs, orchestration and self-service provisioning, each citing support for multiple virtual platforms. Note that overlay solutions still require deployment of the native hypervisor consoles for each platform supported — basically, they provide a “manager of managers” model.

With these constraints in mind, enterprises traditionally had two choices when designing multi-hypervisor management architectures:

1. **Multiple Virtual Silos.** With this approach, the enterprise deploys on or off-premise virtual infrastructure and related native management toolsets for specific use cases. Examples would be VMware in the datacenter and KVM in test and development. For each platform introduced, a new administration console and deployment environment is required, along with skilled administrators. Virtual machines are created and managed from their respective silos, unable to span between tiers or migrate between the different hypervisors — creating a problem for any cross-silo automation needs.

2. **Overlay Automation.** In this case, the enterprise deploys multiple silos and native management toolsets and additionally implements specialized solutions for basic cross-silo management and/or automation. Examples include DynamicOps (recently acquired by VMware) and BMC Cloud Lifecycle Management. Microsoft’s System Center Virtual Machine Manager (SCVMM) is another overlay example, utilizing the VMware APIs to provide limited management of vSphere workloads. The overlay approach provides unifying capability for select functions but is even more complex to integrate, deploy and manage due to the multiple layers of tools required. For most, the overlay automation complexity and cost can only be justified for a small subset of workloads — if at all.

The obvious problems with the traditional approaches to multi-hypervisor management are tool proliferation, complexity of deployment and maintenance, increase in administration skills and training cost, deficiencies in IT agility and overall increase in IT operating cost. In the
next section, we will outline important considerations when evaluating alternative approaches to multi-hypervisor management.

Requirements for Managing Multiple Platforms

Enterprises deploying heterogeneous hypervisors should focus on a number of important considerations when evaluating management architectures and technical solutions spanning multiple virtualization platforms.

- “Managing” multi-hypervisor environments spans administration, deployment and day-to-day operations. If the multi-hypervisor solution under consideration only tackles part of the equation, it’s a point tool and not a management solution.
- Avoid repeating mistakes made in the physical world with multiple overlapping and non-integrated tools for Windows, Linux, .NET, Java, database servers, web servers, etc. Tool
proliferation creates redundant staffing, increased operating costs and significant variation in methodologies for managing disparate environments.

- Management products that introduce another pane of glass to the environment require new administration skills and operational challenges. Instead, leverage existing management infrastructure, if at all possible.
- Look for cross-platform workload portability, migration and automation. The ability to easily clone, convert and migrate workloads to other hypervisors based on changing requirements is necessary for agility.
- Identify multi-platform solutions that are compatible with the tools, automation, workflows and methodologies already implemented in the environment.
- If a sizable professional service engagement is required to implement the heterogeneous solution, this is a big red flag.

A high-level review of vendor websites and presentations might suggest that supporting multiple hypervisors is a checkbox item. Be sure to look closely at prerequisites and limitations — the fine print is likely a showstopper.

The HotLink Approach

HotLink has taken a completely different approach from the traditional methods of multi-platform management previously discussed. The HotLink technology addresses interoperability from the bottom up, rather than top down. Unlike overlay solutions that provide specialized automation on top of multiple native management toolsets, HotLink’s pioneering transformation technology abstracts hypervisor and workload metadata to enable native support of heterogeneous hypervisors and public clouds within the existing enterprise virtualization management infrastructure — VMware vCenter.

In this way, IT can directly extend the management infrastructure of VMware vCenter to Microsoft Hyper-V, Amazon EC2, Citrix XenServer, Red Hat Enterprise Linux (KVM) and CloudStack. No additional consoles are required, and full cross-platform hypervisor functionality is supported — even advanced features like live migration and DRS. Operation is intuitive because the VMware vCenter console is the singular interface. Cross-platform workloads are managed alongside vSphere in a completely unified fashion with:

- Single point administration using VMware vCenter
- Clones, snapshots and migration of heterogeneous workloads
- Ability to use VMware templates cross-platform
- Integrated and automated workload conversions
- Automation easily applied across hybrid resources
The HotLink technology enables VMware vCenter to become the single point of management plus the single integration point for all virtual platforms, both on and off-premise — including native interoperability with VMware vCenter compatible orchestration tools, service catalogs, self-service portals and in-house workflows.

IT teams have the flexibility to apply the optimal mix of resources while seamlessly administering, managing and deploying via the extended VMware vCenter management environment.

![Multi-Platform Management Simplicity with HotLink](image)

The HotLink technology was designed from the ground up to provide enterprise IT with a streamlined, agile and extensible solution to heterogeneous computing — using the VMware management already implemented. It’s the only solution to enable multi-hypervisor administration, deployment and management without imposing the complexity of multiple management stacks. Deployment is straightforward and takes less than four hours, without special skills or training. Let’s look at the HotLink transformation technology in more detail.
HotLink Transformation Technology

HotLink’s technology was specifically designed as the most streamlined possible technical solution to multi-hypervisor administration, deployment, management and integration. With an enterprise-class, fully automated platform for deployments spanning all major virtual and cloud-based infrastructures — VMware vSphere, Microsoft Hyper-V, Citrix XenServer, Red Hat Enterprise Linux (KVM), CloudStack and Amazon EC2, HotLink transformation enables VMware vCenter users to manage multi-hypervisor environments as easily as vSphere-only deployments.

Key to the elegant design is the HotLink Transformation Engine, patent-pending technology that abstracts virtual platform and workload metadata and decouples it from the management layer. Combining this abstraction with a management plug-in architecture enables HotLink to natively and seamlessly extend existing management infrastructure to other virtual platforms.

Attacking the hypervisor interoperability problem from the bottom up enables existing management infrastructure to manage diverse hypervisors and workloads as uniform objects without requiring multiple native management toolsets or increasing management complexity. In fact, with HotLink’s transformation technology, VMware vCenter is unable to distinguish Hyper-V, XenServer, KVM, Amazon EC2 and CloudStack from vSphere. As previously mentioned, this native compatibility extends to vCenter compatible orchestration tools, service catalogs, self-service portals and in-house workflows, as well.
Seamless interoperability of hypervisors in an agile IT environment requires easy workload conversions between native image formats. The HotLink Transformation Engine enables “any-to-any” conversions without utilizing point tools or having dependency on a multi-step OVF conversion process. In fact, this integrated workload transformation technology is a fundamental enabler of heterogeneous cloning, templates, snapshots & migrations — all managed natively by VMware vCenter.

Enabling VMware-skilled administrators to manage heterogeneous virtualization platforms using the well-honed management infrastructure already in place enables versatility and agility without adding operational complexity or degrading productivity. HotLink does the transformation behind the scenes, so cross-platform resources can easily be deployed and natively managed in the existing virtualization management environment. No other vendor can deliver this.

**Conclusion**

As server virtualization continues to proliferate in the enterprise, cost considerations, end user needs, application affinity and a range of other requirements will drive increased diversity of both on and off-premise virtual infrastructures. HotLink spent years developing the industry’s most streamlined solution for administering, managing, deploying and integrating
heterogeneous virtual platforms. Using HotLink transformation technology as the interoperability engine for cross-platform deployments, data centers can quickly and easily deploy the virtual infrastructure that best matches business needs while leveraging the VMware management investment already made and:

- Unify management of all on and off-premise resources
- Choose the best virtual platform for each workload
- Administer, manage and deploy hybrid resources easily
- Leverage existing management skills & investments
- Standardize policies & automation
- Eliminate lock-in & reduce operating costs

HotLink’s transformation technology provides compelling advantages over traditional approaches to mixed-hypervisor management along with a solid foundation for multi-platform cloud automation projects.

<table>
<thead>
<tr>
<th>Example Vendors</th>
<th>Cloud Transformation</th>
<th>Cloud Automation</th>
<th>Cloud Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>HotLink w/VMware vCenter</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>DynamicOps, RightScale, Eucalyptus</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>IBM, HP, CA</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

CIOs are responsible for an overarching strategy to address the broad range of virtual infrastructure requirements in the enterprise. HotLink provides a unique ability to leverage the existing virtual infrastructure management investment, ecosystem and know-how and natively
extend those capabilities to a range of other on and off-premise virtual infrastructures. A proactive cross-platform strategy is obviously much more desirable than a reactive shadow-IT recovery plan.

Winner of VMworld 2012 Best of Show, Top Virtualization Management, Best Cloud Application, and Best Cross-Platform Management, the HotLink platform is a giant leap forward in simplicity of integrating multi-platform resources in the enterprise.

If your organization is evaluating, planning or deploying multi-hypervisor or hybrid public cloud resources, please contact HotLink to learn more about its uniquely simple transformation solution.