



Research Report

A Closer Look at IBM System Director VMControl

Executive Summary

Clabby Analytics believes that the information systems marketplace is consolidating around three computing architectures: x86 multi-cores, POWER, and z. We also believe that, thanks to the arrival of Intel x86 multi-core Xeon processors, the computer market is bifurcating into *homogeneous* x86 environments and into *heterogeneous* “workload optimized” environments.

Information technology (IT) executives who choose the homogeneous x86 path will most likely run Microsoft Windows and open source Linux. And, to maximize the utilization of their x86 servers, they will also likely run Hyper-V, EMC VMware, Citrix Xen, open source KVM, or other virtualization products. One of their biggest challenges will be to find a consistent way to manage physical and virtual machines across Windows and Linux environments.

IT executives who choose the heterogeneous path will run x86 servers, POWER-based servers, and mainframes (we think Itanium- and UltraSPARC servers are on their way out). And one of their biggest challenges these IT managers face is trying to manage virtualization, provisioning, and workload balancing in a consistent manner across these three architectures.

In the x86 homogeneous world, several vendors have built or are building virtualization management environments that can transparently manage the build-up and tear-down of virtual machines in a combined Windows/Linux environment. But in the x86/POWER/z world, only two vendors are aggressively building tools and utilities that can help integrate and simplify the management of all three environments. These vendors are CA with its Virtual Performance Management suite, and IBM with its VMControl product set.

The goal of each company is to offer a highly-integrated, cross-platform, systems/storage management environment that can simplify the management of physical and virtualized resources across multiple platforms and operating environments. By simplifying the management of virtualized resources, both companies believe they can greatly reduce management costs while improving overall utilization.

In this *Research Report*, Clabby Analytics takes a closer look IBM’s Systems Director VMControl environment (herein after referred to as “VMControl”). What we find is that VMControl provides a common, consistent, graphical view of virtual machine activity within a given information systems environment — and that it can be used to manage physical and virtual machines in homogeneous x86 environments or mixed heterogeneous environments. Our conclusion is that IT managers who are looking for a way to simplify the management of physical/virtual systems and associated storage in homogeneous x86 and/or heterogeneous environments might be well served to evaluate VMControl.

The Server Market: Major Trends

Clabby Analytics believes that the server market is in the process of consolidating around three processor architectures: x86 multi-cores, POWER, and z (the mainframe). The reason that this consolidation is taking place is because:

- Intel has finally enabled its Xeon multi-core processors (codenamed Nehalem EX, now Intel's Xeon 7500) to compete with Itanium, POWER, and UltraSPARC — making it possible for Xeon-based “industry standard” servers to challenge RISC and EPIC-based high-end servers.
- The impending collapse of the Itanium ecosystem (Microsoft has announced that it will no longer develop Windows for Itanium; Red Hat has discontinued building Linux on Itanium starting with Rev. 6; VMware has shown no interest in developing its virtualization products on Itanium; etc.); and,
 - And Xeon now obviates the need for Itanium...
- Migration trends away from Hewlett-Packard's (HP's) Itanium-based servers and away from Sun UltraSPARC servers.
 - Over the past four years, IBM is reporting that over 2,700 customers have moved from other platforms to IBM servers and storage, with the majority of the migrations coming from Hewlett-Packard and Oracle/Sun.
 - In Q1, 2010, IBM reported that 117 server or storage customers moved from Oracle/Sun iron to IBM platforms and storage — and that 95 moved from HP servers (total: 212 migrations from other platforms to IBM POWER, IBM z, or IBM x86-based servers).

The Ramifications of This Consolidation Trend

The arrival of Xeon multi-cores is changing the way IT executives think of about x86 architecture. Previous generations of Xeon were memory constrained, and scalability was crippled so Xeon did not compete with Intel's own Itanium chip set. Further, Intel used to describe Itanium as more robust, reliable, and secure — and this inferred that Xeon was less robust, reliable and secure (not a good marketing tact...). Today, however, Xeon multi-cores feature advanced memory management, balanced data/serial/parallel performance, and better scalability than previous Intel Xeon generations — and accordingly, this Xeon multi-cores are now poised to challenge midrange servers (Itanium-, POWER-, and UltraSPARC-based servers today — and mainframe computers over time).

Given these improvements in Xeon architecture, many IT executives are now evaluating moving their applications and databases exclusively to Xeon. And this exclusivity is forcing a market schism: homogeneous computing versus heterogeneous computing.

Homogeneous Xeon Multi-cores Ramifications

Given the power of Intel's new Xeon multi-cores, some IT planners believe that the Xeon 7500 class (and subsequent multi-core generations) will be able to handle ALL of their computing needs (batch processing, transaction processing, interactive applications, scientific applications, and so on) adequately. But other IT planners view Xeon multi-cores as one of several systems platforms that should be used to deliver computing services.

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Those IT managers who opt for the homogeneous x86 server approach are also standardizing on Microsoft Windows or Linux as their operating system of choice. To improve the utilization rate of their servers, they tend to buy physical systems management software from their hardware vendors — and they tend to buy virtual (logical) resource management software from large independent software vendors (ISVs) such as VMware, Citrix, or Microsoft — or they take the open source virtualization route (KVM).

IT planners who are taking a homogeneous approach generally find that the management of physical systems is not well integrated with the management of virtual systems. And they find that managing virtualization between Windows and Linux is difficult. All of the leading virtualization ISVs, as well as the hardware original equipment manufacturers (OEMs), are working to better integrate physical and virtual systems management and across both Windows and Linux servers. But, it should be noted that IBM's VMControl can do this today.

Heterogeneous Workload Optimized Ramifications

The reason that IT executives opt for heterogeneous information systems is because they believe that certain applications run better on differing systems architectures. (For instance, batch applications run very well on mainframes; scientific applications run very well on Unix servers; and e-mail/word processing/calendaring applications run very well on x86 servers).

To date, these IT executives have tended to buy one physical/virtual management environment to manage their distributed Unix servers; another to manage their x86 servers; and yet another to manage their mainframes. This approach creates management silos within an organization — and these silos lead to management complexity as different skills are required to manage virtualization in each environment.

IT managers who are taking a heterogeneous approach to applications/database processing are in need of tools and utilities that enable cross-platform physical/virtual systems and storage management — as well as products that flow jobs between operating environments transparently. VMControl is focused on solving these problems.

A Closer Look at VMControl

IBM defines VMControl as:

A virtualization management plug-in for IBM Systems Director 6.2 that is designed to help reduce the total cost of ownership by decreasing management costs, increasing asset utilization, and linking infrastructure performance to business goals. IBM Systems Director VMControl is available in three editions (Express, Standard, and Enterprise) that are tailored to the unique virtualization management needs of enterprise clients.

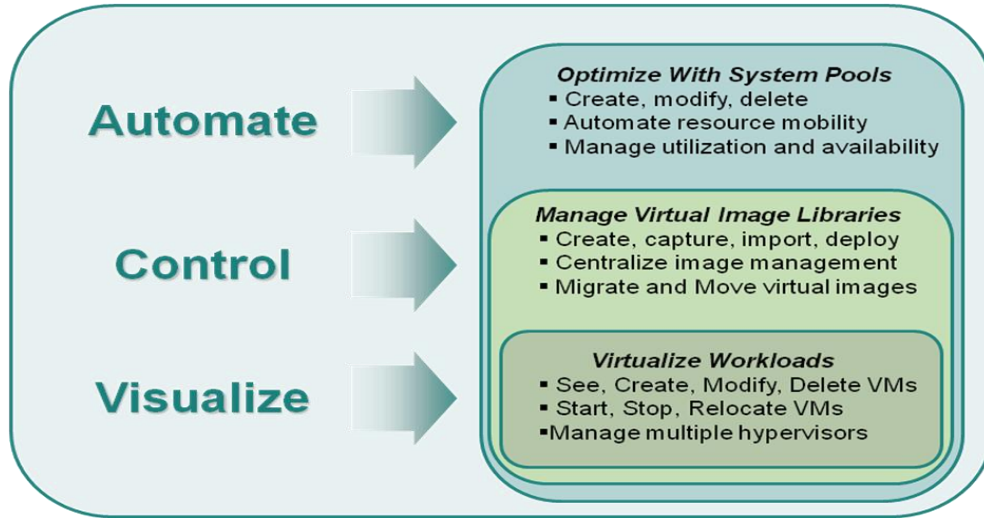
A closer look at VMControl, however, finds that it essentially performs three functions:

1. It helps IT managers and administrators visualize their virtual server/storage environment;
2. It allows IT managers/administrators to control their virtualized environment; and,
3. It enables IT managers and administrators to create “systems pools” designed to execute specific workloads.

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These three functions are illustrated in Figure 1 (below).

Figure 1 — VM Control: Three Functions

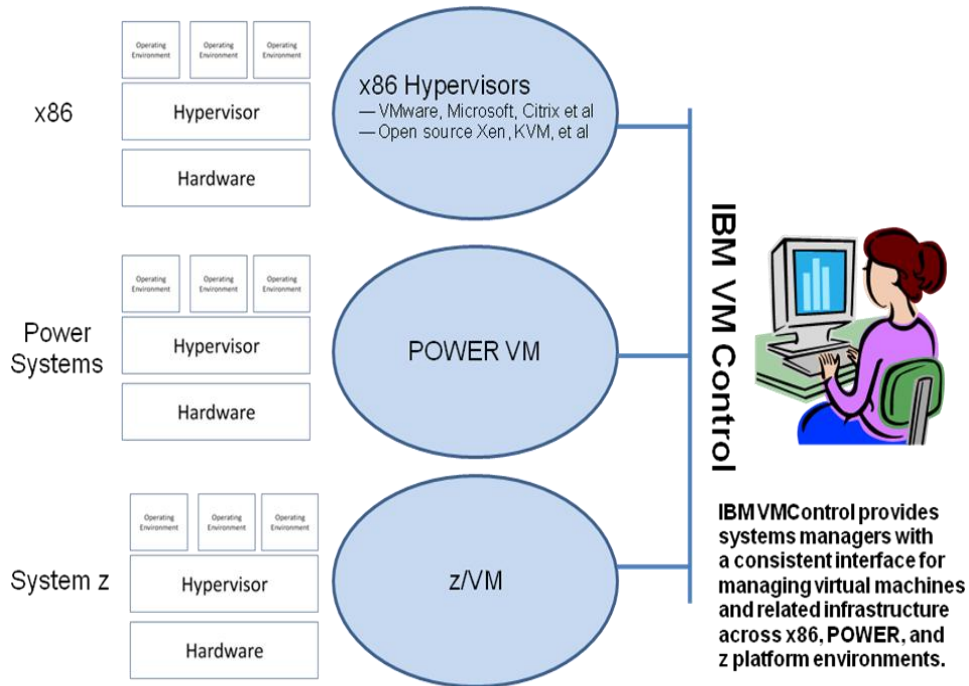


Source: IBM Corp. — June, 2010

Visualization

Using VMControl’s visualization function, IT managers and administrators can see, create, modify, delete, stop, start, and relocate virtual machines across multiple systems platforms (see Figure 2).

Figure 2— IBM VMControl Provides a Common Interface Across Diverse Hypervisors



Source: Clabby Analytics – June, 2010

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Control

The “control” features of VMControl enable virtual image libraries to be created and stored. By creating a library of images, IT managers can quickly deploy a virtual machine environment by launching a stored image of that environment (instead of having to manually recreate a particular environment). By saving virtual images, and by centralizing image management, IT managers and administrators can migrate and move virtual images to available systems — and then quickly deploy applications on those images.

Automate

VMControl’s “automation” function allows IT managers and administrators to create “system pools” — collections of all of the resources needed to execute a particular job. In this case, a “system” refers to servers, storage, and network resources — all of which can be collected into a logical group. By creating optimized systems pools, IT managers/-administrators can quickly exploit available system resources — leading to increased system utilization and lower management costs (because the amount of labor required to launch as systems pools is miniscule compared to having to build a pool every time an application needs to be launched).

To see Systems Director VMControl in action, IBM has created a six minute technical overview that can be found at: <http://www.youtube.com/watch?v=oKrXEKBY2ZM&feature=related>. We suggest that those who choose to view this demo pay particularly close attention to how this product enables managers and administrator to easily manage physical and virtual resources on MULTIPLE PLATFORMS. This is what makes Systems Director VMControl different from homogeneous managers provided by x86 vendors.

Packaging

VMControl is packaged as a plug-in to IBM Systems Director. It is available in “express”, “standard” and “enterprise” editions (see Figure 3 — and for more packaging information, visit: www.ibm.com/systems/software/director/vmcontrol).

Figure 3 — VMControl Packaging

	VMControl Express Edition*	VMControl Standard Edition	VMControl Enterprise Edition
Discovery	✓	✓	✓
Inventory and topology	✓	✓	✓
Health monitoring	✓	✓	✓
Metric thresholds	✓	✓	✓
Power operations	✓	✓	✓
Relocation		✓	✓
Create and manage virtual servers		✓	✓
Deploy and manage workloads		✓	✓
Manage virtual images		✓	✓
Manage virtual resource pools			✓

Source: IBM Corporation — June, 2010

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VMControl Express provides consistent life cycle management capabilities for virtual machines implemented across multiple computing platforms and using multiple virtualization technologies. This includes the ability to create, delete, and modify virtual machine settings. It is intended for IT managers and administrators who want to:

- Manage their virtual machines and physical devices from a single interface;
- Run multiple hypervisors in their environments; and,
- Need basic virtualization management.

VMControl Standard includes the functionality of VMControl Express Edition, and adds the capability to manage a shared repository of multiple preconfigured virtual machines (or virtual appliances) to simplify and standardize the deployment and management of virtualized workloads. It is intended for IT managers and administrators who want to:

- Run PowerVM or Linux in z/VM partitions;
- Are ready to proactively manage their virtual images; and,
- Have either a mid to large test/dev or production virtual environment.

VMControl Enterprise Edition includes the functionality of VMControl Standard Edition, and adds the capability to manage system pools (which are groups of virtual appliances running across multiple physical servers) as easily as managing an individual virtual machine. It is intended for IT managers and administrators who want to:

- Run PowerVM;
- Use VMware for their x86 environment and are looking for advanced features for Unix; and,
- Are ready to let their systems lighten their administrative burden.

VMControl's Relationship to IBM's Tivoli Product Offerings

VMControl provides image management and virtual machine automation for its supported hypervisors (the various x86 hypervisors, the POWER hypervisor, and the System z hypervisor). Clients that want to perform image management across currently unsupported virtual environments (such as Itanium or UltraSPARC environments) — or that want to consolidate their physical and virtual image management/automation environment into a single offering — should use IBM's *Tivoli Provisioning Manager (TPM)* and *Tivoli Provisioning Manager for Images* offerings to build a consistent cross-platform view of single virtual systems or pools of cooperating systems.

Frequently Asked Questions

Probably the most frequently asked question about VMControl is “Does VMControl work in a VMware environment?” And the answer to this question is that VMControl Express works in tandem with VMware — allowing IT managers and administrators to see their VMware virtualization environment, and allowing them to initiate actions to manage servers that are running VMware. What VMControl does in this circumstance is it allows IT managers/administrators to manage their virtualized VMware servers from the same

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interface that they use to manage their physical servers (an IBM System Director interface). For more details on IBM System Director, please see our report at:

http://www.clabbyanalytics.com/uploads/IBM_Systems_Director_Article_Final.pdf

Another popular question is: “Does VMControl replace VMware vCenter?” And the answer to this question is “no”. vCenter provides the mobility and placement services for a VMware environment, whereas VMControl provides physical and virtual system integration and management functions. IBM is currently working with VMware to expand VMware support into its VMControl standard and enterprise editions.

Clabby Analytics’ favorite question about VMControl comes from IT managers who are running Sun UltraSPARC based servers and/or HP Itanium-based servers. What these managers are typically searching for is a virtualization manager that can manage x86 and HP/Sun virtualized environments that is better than the products that Sun and HP offer to perform that task. At present, VMControl supports the integration of mainframes, Power Systems and x86 servers. And, given our perspective that Itanium and UltraSPARC are dying architectures, we doubt that IBM will ever offer VMControl support for those environments.

Summary Observations

In an ideal world, information systems would be able to manage themselves. Computers are, after all, capable of being programmed to respond to issues and alerts — and scripts can be written to configure systems automatically, launch applications, and provide services in a prioritized fashion to end users.

Now, back to reality. What really happens today is that humans:

- find available physical computing resources and make those resources available for use by putting unused computing capacity into virtualized pools;
- configure (provision) those resources with the images needed to run specific applications;
- manage those applications to their appropriate service levels; and finally, they sometimes remember to
- tear-down those resources and place them back into the pool such that they can be reused by other applications.

Should problems arise during this process, humans are also responsible for finding the source of the problem and remediating it.

Virtualization technologies (technologies that enable resources to be discovered and placed into common resource pools) help enterprises reap a better return on their systems/storage/-network investments by improving the utilization rate of the computing equipment and storage that an enterprise already owns. But virtualization can also add dozens to hundreds or thousands of “virtual servers” and storage devices to the enterprise resource pool — exponentially increasing the amount of work a systems administrator or IT manager needs to perform in order to manage his or her information systems environment.

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To make this situation even more complex, also consider that systems administrators and IT managers usually have to manage a mix of different virtualized environments. A typical enterprise may run a Microsoft Windows environment using Hyper-V to virtualize and manage Windows servers. Or it may run EMC VMware to perform the same task and/or manage Linux servers. Or it may use Citrix Xen or open source KVM or any of a number of other virtualization programs to manage its Windows/Linux x86 resource pools. Or it may use POWER VM to manage Power Systems; and/or Intel VT or Hewlett-Packard's Virtual Server Environment for its Itanium systems; or Sun containers to manage virtualization tasks. Imagine the complexity! Imagine the management expense!

What is needed to help reduce this complexity is:

1. A set of tools and utilities that can help find and automatically provision virtualized resources;
2. Tools that can help ensure that service levels are met; and,
3. Tools that can tear-down a configuration and then place unused computing power and storage resources back into the enterprise resource pool such that those resources can be used by other applications and databases.

Further, these tools and utilities need to help IT managers manage their virtualized resources (systems, storage, networks) as *one entity* — not a series of separate silos serving Windows, Unix, Linux, and other operating environments.

In order to reduce complexity and lower operational costs related to systems management, Clabby Analytics recommends that IT executives who operate multiple different systems types, and who run multiple different hypervisors and related infrastructure/management stacks, should consider using VMControl as a common management environment for virtualized systems environments.

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