Integration of Virtual System and Business Application Management Using Standardized Interfaces

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Abstract

Virtualization is designed to be transparent. However, when management of complex business application is concerned the application management components must be aware of virtualization.

In a proof-of-concept the author has shown how to integrate SAP application management with system virtualization managers like IBM Power Systems management console. The integration has been built on top of the newly defined DMTF System Virtualization standard. Most likely it is the first exploitation of this new DMTF standard in the context of commercial applications.

Challenges of multi-platform support and standardization approaches are discussed.

1. Introduction

A virtualization platform (like a hypervisor or virtual machine) provides functions and capabilities which allow decoupling virtual systems and virtual resources from their physical representation. Although a virtual system may behave like a physical system, there is not necessarily a direct or permanent relationship between a virtual system and the physical host system.

Virtualization is designed to be transparent which means that existing applications can run on virtual systems without changes. Especially when monitoring and management of complex applications is concerned the application management components should be aware of virtualization. Furthermore, the concept of virtualization introduces new capabilities that allow for additional use cases, as listed in "Figure 1. Virtualization use cases vs. capabilities".
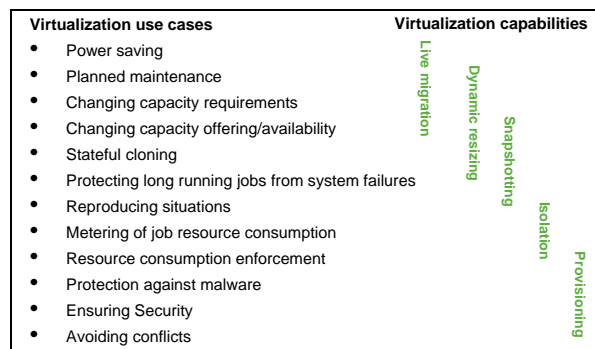

Figure 1. Virtualization use cases vs. capabilities

Complex business applications typically have their own management components. The challenges in a virtual environment are **integration of application and system management** and **support of different virtualization platforms.**

2. In search of standards

In November 2007, the DMTF (*Distributed Management Task Force,* http://www.dmtf.org) released the long-awaited CIM standard for System Virtualization Management. Implementations have been already made available for several platforms.

The CIM standard, however, is a low-level model exposing all platform-specific details to the caller. This interface is not easily consumable for business applications. Rather a simple, higher level interface would be preferred.

Architects from IBM (the author) and SAP initiated recently the virtualization working group at OGF (*Open Grid Forum,* http://www.ogf.org) with the objective to develop usage scenarios and a tailored interface between application managers and virtualization platforms.

This year the RESERVOIR project was initiated, a European Community funded project on virtualization, software-as-a-service and business application management in a cloud environment (*Resources and Services Virtualization without Barriers,* http://www.reservoir-fp7.eu). IBM, SAP and OGF are members of the consortium. One of designated use cases is about managing SAP business applications in a virtual system landscape.

3. Proof-of-Concept

In a proof-of-concept the integration of system virtualization management within a modern business application has been shown. Large customers, especially application service providers, ask for application awareness and integration with virtualization managers.

As prominent business application SAP was chosen. SAP already implemented the concept of central monitoring and landscape management some time ago. The SAP Solution Manager is the single point of control for services, support, SAP software distribution, licensing etc. The Solution Manager knows what application components and releases are deployed on which server. This information is stored in the SAP System Landscape Directory (SLD).

However, until now the SAP management components were neither aware of system virtualization nor able to exploit new methods like resizing and live mobility (live migration) of virtual systems.

SAP runs on many platforms. Those heterogeneous platforms provide different capabilities and interfaces, mainly due to the lack of appropriate standards. IBM Power Systems and IBM System z support the CIM methods according to the new DMTF System Virtualization standard, while other platforms require a proprietary implementation.

For this proof-of-concept a new, simple set of services has been defined that allows:

- discovery of the system landscape,
- basic system management tasks.

The concept and basic architecture is depicted in "Figure 2. Application management concept".

The author has shown that the simplified services are extendible and flexible enough to support multiple platforms and a common set of typical use cases. Furthermore, it has been shown that these services can be mapped to CIM methods. Most likely, this is the first commercial (i. e. business application) usage of the new DMTF System Virtualization standard.
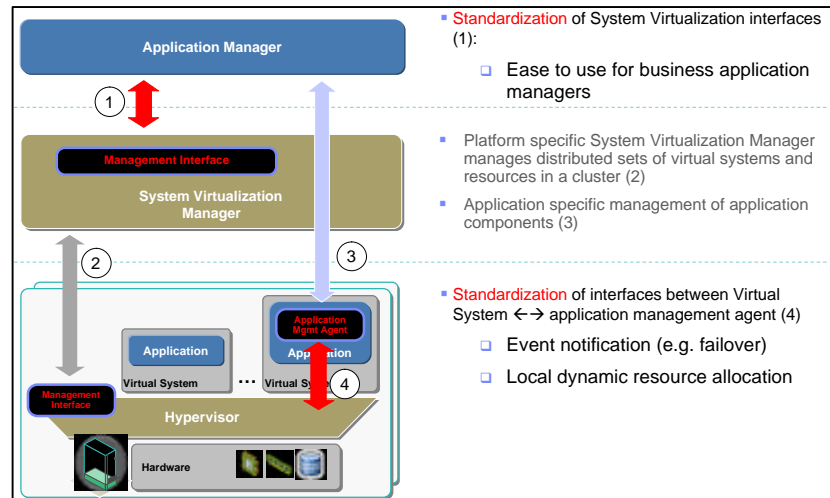

Figure 2. Application management concept

This mapping to existing standards and implementations is quite relevant since it allows for immediate exploitation and smooth transition. The
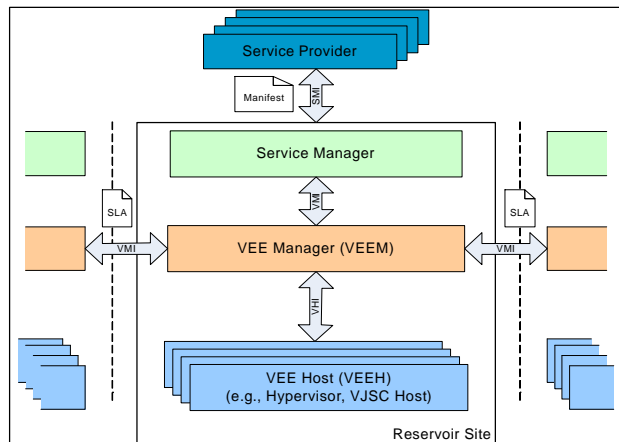

Figure 2. Overview of RESERVOIR architecture

final goal is to promote such an interface as standard. For comparison the RESERVOIR model is shown in "Figure 3. Overview of RESERVOIR architecture". This model is similar to the one chosen for our proof-of-concept. Hence we expect a high degree of alignment and synergy.