IBM DYNAMIC INFRASTRUCTURE FOR mySAP BUSINESS SUITE INTEGRATES WITH SAP'S ADAPTIVE COMPUTING

THE NEXT STEP IN THE JOURNEY TOWARDS THE ON DEMAND BUSINESS

In today's changing on demand world, the customer´s IT infrastructure must adapt to the business and business strategies quickly and efficiently. IBM Dynamic Infrastructure *for mySAP™ Business Suite* is based on IBM Virtualization Engine and provides the virtualization of resources delivered through a set of hardware and software technologies and service deliverables. With this solution, IBM addresses the most important requirements towards an on demand environment for SAP® customers:

- *Increased flexibility and reduced complexity*
- *Optimized IT infrastructure and resources*
- *Simplified and streamlined business processes*
- *Reduced costs*

The current state and associated challenges of the customer´s IT infrastructure can be characterized by:

STATIC RESOURCE ALLOCATION AND NO VIRTUALIZATION

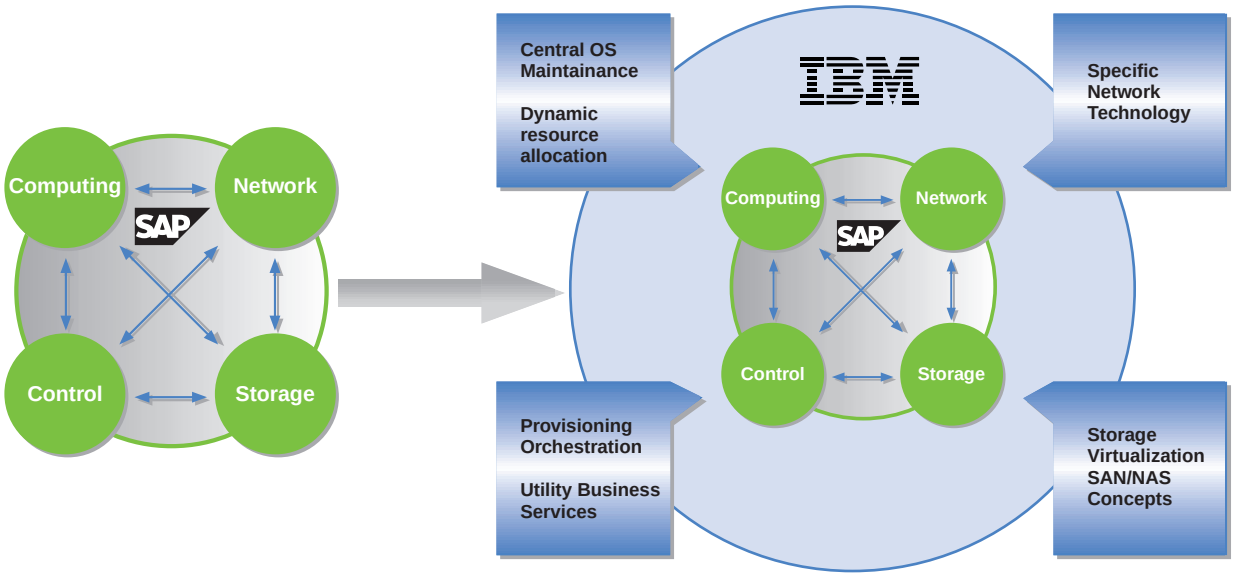
Applications are tightly bound to dedicated servers and storage. Due to the lack of virtualization, various resource types are treated and managed within silos. Deployment of new applications can be complex and expensive.

UNDERUTILIZATION OF RESOURCES

Server and storage farms are typically growing. Studies show that the average resource allocation is very low, e.g. the average SAP database server utilization is in the range of 30%, independent of platform, as database servers are typically sized for peak load. *(Source: IBM 'IBM Insight for SAP R/3®' 03/03 – based on reported numbers from 1405 customers)*

TOTAL COST OF OWNERSHIP

Large, complex and heterogeneous system landscapes have inherent high costs related to hardware, software and maintenance.



IBM ON DEMAND OPERATING ENVIRONMENT

The IBM On Demand Business strategy is the transformation across processes and enterprises. It brings new levels of integration among processes and applications inside the company, suppliers and distributors at either end of the business – customers outside the enterprise, and employees inside it.

Infrastructure management provides the simplification and optimization of IT through automation and virtualization, enabling access to resources and creating a consolidated, logical view of them across a network. Infrastructure management encompasses a broad spectrum of capabilities. It promotes infrastructure reliability and availability to support business operations and helps companies to improve the utilization of their existing IT infrastructure and reduce costs. To achieve more and more flexibility and to componentization in the business design, the infrastructure must evolve from silos of complex, over-provisioned, proprietary hardware and software to a standards-based infrastructure where capacity can be optimized across the entire organization.

The underlying principle is based on Service Oriented Architecture (SOA) that allows applications, processes and defined components to be mixed and matched at will. Through SOA, the on demand operating environment supports end-to-end business processes and enables complete business performance management. Delivered through core capabilities of integration and infrastructure management, the on demand operating environment creates business flexibility and optimizes the IT infrastructure.

SAP'S ADAPTIVE COMPUTING CONCEPT

SAP's Adaptive Computing Concept delivers the ability to rapidly react to changing conditions which has become the most important critical success factor for businesses. Adaptability is the foundation for the future success of companies. A software solution without adaptive business processes is no longer acceptable in today's global business environments. Adaptive business processes require an adaptive computing model including an adaptive computing infrastructure.

The SAP Adaptive Computing Concept originated from the principles of a single operating system (OS) image and the availability of any service on any server at any time. From a solution point of view Adaptive Computing in an SAP business environment consists of four building blocks:

- *Computing*
- *Storage*
- *Network*
- *Control*

By introducing the new concept and the new technology of Adaptive Computing, SAP helps customers to reduce the complexity of their IT infrastructure while retaining the advantages of a client/server environment. In this way, Adaptive Computing enables a harmonization of the existing and new IT landscapes through increasing flexibility and optimized server utilization. By the separation of computing, storage, interconnection and the virtualization of these services, the Adaptive Computing Infrastructure adjusts computing demand to help provide optimal operational efficiency, creating unparalleled levels of scalability and adaptability.

The SAP Adaptive Computing Infrastructure builds upon services as the layer of abstraction and is fully integrated in SAP's Enterprise Service Architecture (ESA). It comprises virtualization of the hardware resources and the dynamic assignment to specific application services and thus helps reduce complexity and optimize operational processes for peak cost efficiency.

The IBM on demand operating environment provides the infrastructure architecture to implement SAP's Adaptive Computing Infrastructure.

REDUCING TCO THROUGH THE INTEGRATION OF IBM AND SAP TECHNOLOGIES

IBM Dynamic Infrastructure *for mySAP Business Suite* (referred to as IBM Dynamic Infrastructure) is built upon the virtualization technology offered by IBM @server, IBM TotalStorage® and IBM Software.

The building blocks provide the virtualization of servers, storage and network. The solution manages the availability, security and the provisioning of the environment and creates a policy-based orchestration shell for leveraging and integrating SAP's Adaptive Computing Concept. This has been demonstrated through multiple SAP Adaptive Compliance Tests (http://service.sap.com/adaptive).

The recently announced IBM Virtualization Engine (referred to as VE) delivers resource virtualization capabilities through systems technologies in the individual server and storage products. VE systems services provide the fabric to unite the individual systems into a single image and IBM TotalStorage virtualization software adds virtualization and heterogeneous management capabilities to storage systems. These capabilities work in concert to help satisfy the virtualization needs of an on demand operating environment to achieve reduced costs in the IT department and be able to react flexibly to business changes. IBM VE systems services are provided in a suite of services for server platforms, both for IBM and other operating systems. The services include IBM Director Multiplatform, Tivoli® Systems Provisioning Manager, Enterprise Workload Management and IBM Grid Toolbox for Multiplatform.

MULTIPLATFORM SUPPORT AND INTEGRATION CAPABILITIES

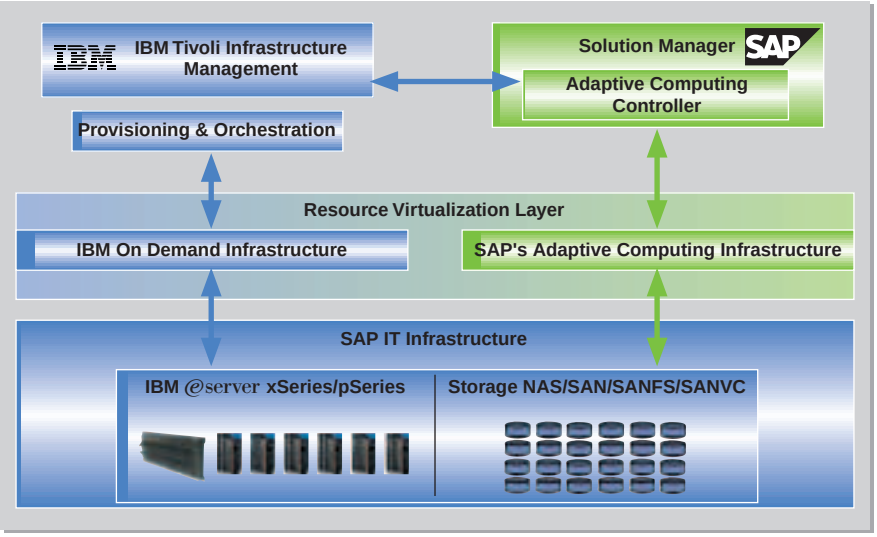
The scope of IBM Dynamic Infrastructure has been extended towards multiplatform and new integration capabilities between IBM Virtualization Engine components and SAP's Adaptive Computing.

To target a broader spectrum of customer requirements, heterogeneous platform support in the managed system landscape is a key element. Any combination of IBM @server® pSeries® running AIX® and xSeries® running Linux® can be managed through IBM Dynamic Infrastructure and can operate SAP solutions side by side. The hardware alternatives include the entire IBM @server – range of high-performance systems. The IBM @server pSeries Server architecture exploits built-in on demand capabilities; the new hardware based on POWER5™ technology adds another dimension of flexibility and virtualization complementing the solution. For example, the shared-processor LPAR and Dynamic LPAR functionalities provide dynamic resource allocation – CPU, memory and adapters can be added and removed without disrupting the application service, and by micro-partitioning, hardware resources can be defined at a much higher granularity implementing in increments of 1/10 of a CPU.

STORAGE SOLUTIONS AND VIRTUALIZATION

IBM TotalStorage solutions offer end-to-end integration based on open platforms, and many support different storage products, vendors and server/OS platforms. Resources within a Storage Area Network (SAN) are provisioned automatically; policies are in place for system management and for prevention and resolution of failures. A common file system called SAN File System (SANFS), available for multiple operating systems, allows direct I/O from application servers to the storage LUNs for file data. With SANFS, files and file systems are no longer managed by individual computers – they are viewed and managed as a centralized IT resource with a single point of administrative control. SANFS presents a unified file system in a single global name space for all applications and is the virtualization layer for global storage. SAN Volume Controller simplifies the physical disk management and a heterogeneous disk farm is possible.

One of the key elements of SAP's Adaptive Computing Concept is storage virtualization. All data including the SAP installation is managed via virtualized storage. The IBM SANFS is the perfect fit for this high-performance environment, and allows arbitrary relocation of SAP services. The extension to heterogeneous system landscapes is provided out of the box. Alternate options for storage virtualization within IBM Dynamic Infrastructure are network attached storage (NAS) products.



INTEGRATION OF IBM TIVOLI PROVISIONING MANAGER WITH SAP ADAPTIVE COMPUTING CONTROLLER

SAP has developed an application services management tool, called the Adaptive Computing Controller (ACC). The controller uses a CIM-based data model interfacing with the System Landscape Directory, and is delivered with the SAP Solution Manager. The ACC represents a single technical instance, which typically runs on the control node. SAP provides additional agents interfacing with the controller which must be started on the computing nodes of an Adaptive Computing enabled landscape. The ACC controls the available SAP application services like central systems, database and / or application servers, and has a set of operations such as start, stop and relocate.

For integration with other system management products such as IBM Tivoli Provisioning Manager, SAP has extended the ACC with an application program interface (API). The command interface allows external programs to connect to the ACC and trigger start / stop / relocate operations. The request-reply-sequence is based on HTTP and XML standards.

IBM Tivoli Provisioning and Orchestration as part of IBM Dynamic Infrastructure for SAP's Adaptive Computing Concept is the provisioning engine for SAP environments across IBM @server platforms. It provides automated, policy-based, end-to-end management of resources, performance, availability, security, and metering/billing.

This solution can help reduce the high management effort required by growing SAP landscapes, speed up the deployment of new SAP systems, improve the utilization of systems, and can lower total cost of ownership (TCO). By using IBM Tivoli Provisioning and Orchestration, SAP application services can be more easily added or removed.

With the integration between Tivoli System Provisioning and the SAP ACC, IBM Dynamic Infrastructure can be used as the system management environment for the whole data center. With the ACC API, the corresponding SAP services can be transparently integrated. Tivoli System Provisioning handles the organization and management of hardware resources on a physical and virtual layer, and supports dynamic provisioning of server capacity. IBM has developed new workflows for Tivoli Provisioning Manager, leveraging the best of both worlds.

A typical use for the new workflows is to address the lack of server capacity in a managed SAP system landscape. In order to provision the necessary server, the SAP ACC asks IBM Tivoli Provisioning Manager to look for an appropriate resource in the data center. The server will be prepared with the operating system image and the required SAP software components and the system can be available to the SAP ACC within minutes.

A second usage example would be the integration of IBM Virtualization Engine console with the SAP ACC. In case of a system part failure, VE health center detects the problem and triggers ACC operations in order to relocate an SAP service.

SUMMARY

IBM Dynamic Infrastructure *for mySAP Business Suite* takes SAP customers to the next level of becoming an on demand business.

Significant savings can be achieved through the combination of new hardware capabilities such as shared processor LPARs, software features like dynamic system provisioning, and the integration into SAP's Adaptive Computing Infrastructure. Using the IBM Virtualization Engine technologies and system services, IBM Dynamic Infrastructure helps enable optimal hardware utilization.

Synergies between IBM Dynamic Infrastructure *for mySAP Business Suite* and SAP Adaptive Computing features have been exploited and create a unique solution when compared to competitive offers.

As demand changes, resources are automatically added or removed as required – simplifying the management of SAP landscapes. Existing servers can be rapidly re-purposed if no longer needed, being returned to the shared resource pool. The solution includes capabilities for cost accounting and external billing. The shorter deployment time allows customers to react much faster to changing market demands.

IBM and SAP continue to invest in a close cooperation with applied research and exploration of new technologies, designed to will enhance and extend the solution to provide ever greater value for customers.

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