



TOP TO BOTTOM

we know

they know

END TO END

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

In today's changing on demand world, the customers' IT infrastructure must adapt to business and business strategies quickly and efficiently. To stay competitive, the following are the most important requirements for an on demand environment that includes SAP® system landscapes:

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

The current state and associated challenges of customers' 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.

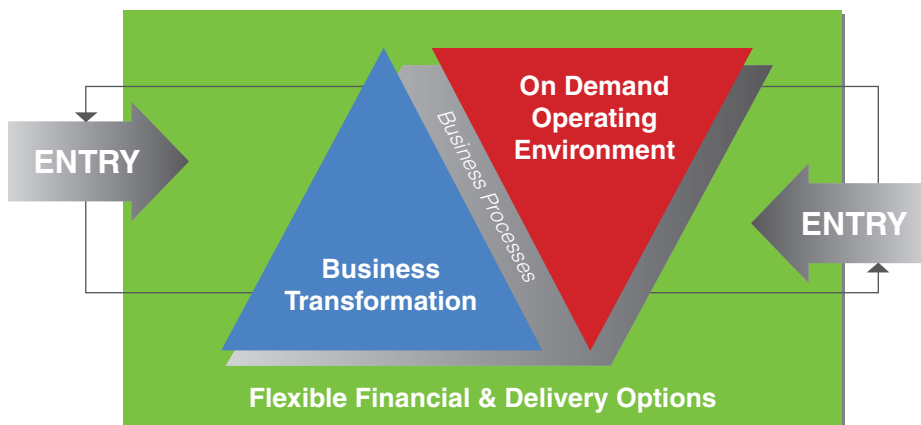
Underutilization of resources:

Server and storage farms are typically growing. Studies show that the average resource allocation is very low, e.g. the average SAP DB-server utilization is in the range of 30 %, regardless of platform, as database servers are typically sized for peak load. (Source: IBM® 'IBM Insight for SAP R/3®' 03/03 – 1,405 customer reports)

Total Cost of Ownership (TCO):

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





IBM on demand operating environment

The IBM e-business on demand is a new movement in business and computing. It is the transformation across processes and enterprises, bringing new levels of integration among processes and applications inside the business, as well as suppliers and distributors at either end of the business, customers outside the enterprise, and employees inside.

Infrastructure management provides the simplification and optimization of IT through automation and virtualization, enabling access to resources across a network, and creating a consolidated, logical view of them across a network. Infrastructure management encompasses a broad spectrum of capabilities. It helps ensure infrastructure reliability and availability to support business operations and allows companies to maximize the utilization of their existing IT infrastructure and reduce costs. In order for more and more flexibility and componentization to be achieved in 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.

First, standards for creating services and allowing services to communicate have evolved and have been accepted by major vendors in the industry. The environment moves beyond simple connectivity toward business-level interoperability. Second, infrastructure to support self-defined, loosely-coupled services has emerged. Third, tools to incorporate existing assets are available. Finally, automation and virtualization solutions are also available to manage the infrastructure.

The underlying principle is based on a 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, it creates business flexibility and optimizes the IT infrastructure.

SAP's Adaptive Computing Infrastructure

SAP's Adaptive Computing portrays the ability to rapidly react to changing conditions and becomes 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 that includes an adaptive computing infrastructure.

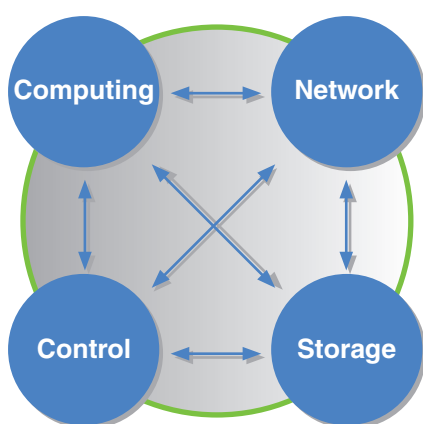
SAP's Adaptive Computing Concept originated from the principles of a single operating system (OS) image and the availability of any service on any server at any time. From a solution point of view, adaptive computing in an SAP business environment consists of four building blocks:

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

By introducing now the new concept and the new technology of adaptive computing, SAP helps the customers to reduce the complexity of their IT infrastructure while maintaining the advantages of a client/server environment. In this way, enables a harmonization of the existing and new IT landscapes through increasing flexibility and optimized server utilization. By the separation of computing, storage and interconnection and the virtualization of the application services by abstracting the hardware layer, SAP's Adaptive Computing Infrastructure adjusts computing demand to help ensure maximum operational efficiency, creating unparalleled levels of scalability and adaptability.

SAP's 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 their dynamic assignment to specific application services. Thus, it helps reduce complexity and optimize operational concepts to run at peak cost efficiency.

The IBM on demand operating environment is the adequate infrastructure architecture to implement the concept of SAP's Adaptive Computing Infrastructure.



Reducing TCO by combining complementary technologies

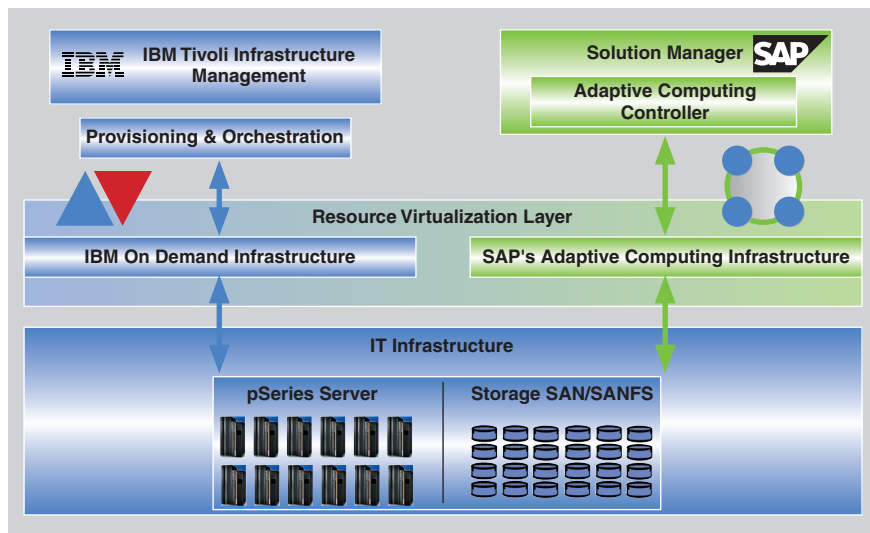
The IBM Dynamic Infrastructure for mySAP™ Business Suite is built upon technology from IBM @server®, IBM TotalStorage® and IBM Software. The building blocks provide the virtualization of servers, storage and network, manage the availability, security and the provisioning of the environment and create a policy-based orchestration shell for leveraging SAP's Adaptive Computing Concept.

The first UNIX based implementation for the SAP ecosystem uses IBM @server pSeries™ servers running on AIX. The IBM pSeries architecture itself already exploits a set of on demand capabilities. The LPAR and Dynamic LPAR functionality provides dynamic server capacities. CPU, memory and adapters can be added and removed without disrupting the application service.

The Network Installation Manager (NIM) in AIX is an integrated feature that aids with configuration, installation and maintenance of servers and associated software across the network. NIM enables entire processes to be automated, results in reduced maintenance requirements and productivity gains in environments with multiple servers or LPAR server partitions.

The available functionality with pSeries complies with SAP's Adaptive Computing by covering a single OS image and network-supported boot feature. Any server in this environment can operate any SAP service. Furthermore, with the dynamic LPAR capability, it is possible to have dynamic assignment of system resources within the individual server itself at runtime.

IBM TotalStorage solutions have end-to-end integration based on open platforms and 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 the 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. IBM's 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.

SAP has developed an application services management tool called the Adaptive Computing Controller. The controller uses a CIM-based data model that interfaces with the System Landscape Directory and will be delivered with the SAP Solution Manager. The Adaptive Computing Controller represents an own technical instance that typically runs on the control node. Additional agents interfacing with the controller will be provided by SAP; they must be started on the computing nodes of an adaptive computing-enabled landscape. The Adaptive Computing Controller controls the available SAP application services such as central systems, database and/or application servers and has a set of operations including start, stop and relocate.

IBM Tivoli® Provisioning and Orchestration for SAP's Adaptive Computing Concept is the provisioning engine for SAP environments across IBM **@server** pSeries platforms. It provides automated, policy-based, end-to-end management of resources, performance, availability, security and metering/billing. This solution can reduce the high management effort for growing SAP landscapes, speed up the deployment of new SAP systems, improve the utilization of systems and can lower TCO.

IBM Tivoli Infrastructure Management supports dynamic provisioning of server capacity regarding CPUs, memory and/or adapters based for a single partition in an pSeries based on dynamic LPAR. Also, SAP application servers can be added or removed where required.

IBM Tivoli System Automation manages availability of business applications running in single Linux, AIX and z/OS® systems or clusters. mySAP Business Suite can be instrumented with Tivoli System Automation. By providing fast detection of outages – and based on customer-defined objectives – the high availability of clusters is ensured. Sophisticated knowledge about SAP and non-SAP application components and their relationships as well as quick and consistent recovery of failed resources are part of the sample policies shipped with the sample policies which coming with the product. IBM Tivoli System Automation ships sample policies for many resources and applications, including SAP R/3®, DB2®, or Web servers.

Summary

This solution is the first implementation of SAP's Adaptive Computing Infrastructure on IBM **@server** pSeries™ and IBM TotalStorage. SAP works in close cooperation with IBM and other technology partners through a well-defined engagement model. Through continuous applied research and exploration of new technologies, SAP and IBM are facilitating existing and future SAP solution landscapes. Using the IBM Virtualization Engine™ systems technologies and systems services, IBM Dynamic Infrastructure for mySAP Business Suite enables optimal hardware utilization.

With the new IBM Dynamic Infrastructure for mySAP Business Suite realizing SAP's Adaptive Computing, shared resource pools, storage virtualization and dynamic system provisioning enable better infrastructure exploitation, which can lead to major cost reduction. As demand changes, resources are automatically added or removed as required – simplifying the management of SAP landscapes. Existing servers can be rapidly repurposed if no longer needed, and 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.

Interfaces between SAP's Adaptive Computing Controller and IBM software solutions will be available to integrate multilevel system landscapes at customer locations. Going forward, IBM and SAP will continue to invest in a close cooperation with ongoing work that enhances and extends the solution towards broader IBM **@server** platform support and more system automation and provisioning features.

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Further Information

To learn more about how the IBM and SAP alliance can help your business, please visit: **ibm-sap.com**.



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