

SAP Co-Innovation Lab

**HIGHEST LEVEL OF FLEXIBILITY FOR  
YOUR SAP® SOFTWARE ENVIRONMENT**

INTEL® VT FlexMigration AND VMware®  
ENHANCED VMotion™



vmware®



Your business, your customers, and your competitors don't stand still – and neither can your technology resources. You need the best technology platforms to respond quickly and flexibly to business opportunities and challenges, rapidly adapting your strategy and execution while also minimizing your risks and costs.

Intel, SAP, and VMware understand the challenges businesses have always needed to meet, as well as the new pressures surfacing in today's volatile global marketplace. Each company is among the top industry leaders within its own market, and each offers highly advanced technology and expertise for creating the dynamic IT landscape that enables business transformation.

The combined expertise of Intel, SAP, and VMware helps ensure that IT infrastructure resources for your SAP® solutions are designed, manufactured, and optimized to handle current and

continually evolving requirements. The close partnership between the three companies allows users to enjoy the performance they expect from their SAP applications, whether running in virtualized environments or on dedicated physical hardware. Features such as Intel® Virtualization Technology (Intel VT) provide extensive hardware assists for core virtualization functions, while VMware® technologies take advantage of Intel VT features and functions within the silicon. Together, Intel and VMware help you apply the full range

of virtualization benefits to all sizes of SAP software deployments.

Using Intel Xeon® processor-based hardware and VMware vSphere™ software to virtualize your SAP applications can help you quickly respond to customer requests and adapt to business and market changes. Together, the solutions deliver lower costs coupled with the reliability and scalability, flexibility for upgrades, and performance needed to adapt to today's business environment.



Intel and VMware have teamed up with SAP to provide a solution that offers the highest level of flexibility for customers' SAP software environments.

# INTEL VIRTUALIZATION TECHNOLOGY FlexMigration

## BALANCING COMPUTING RESOURCES

As enterprises move beyond server consolidation toward dynamic, agile data centers, IT infrastructure can better align with corporate business goals by dynamically allocating and balancing computing resources across the breadth of applications. When virtual-machine resources are constrained, additional capacity is made available by moving live virtual machines to a different physical server, allowing users to move active virtual machines among a pool of physical resources. This reduces the extra work traditionally involved with moving applications, including notifying users, shutting down the applications, moving the virtual machine to a new server, and then restarting the applications. Eliminating these steps improves flexibility, reduces downtime, and increases efficiency in the management of data center resources.

In the past, successful live virtual-machine migration was dependent on compatibility between the source and destination CPUs of the physical servers to guarantee virtual-machine stability after the migration. For some data center end users, this dependency created isolated islands of resources (physical servers) resulting in data center fragmentation.

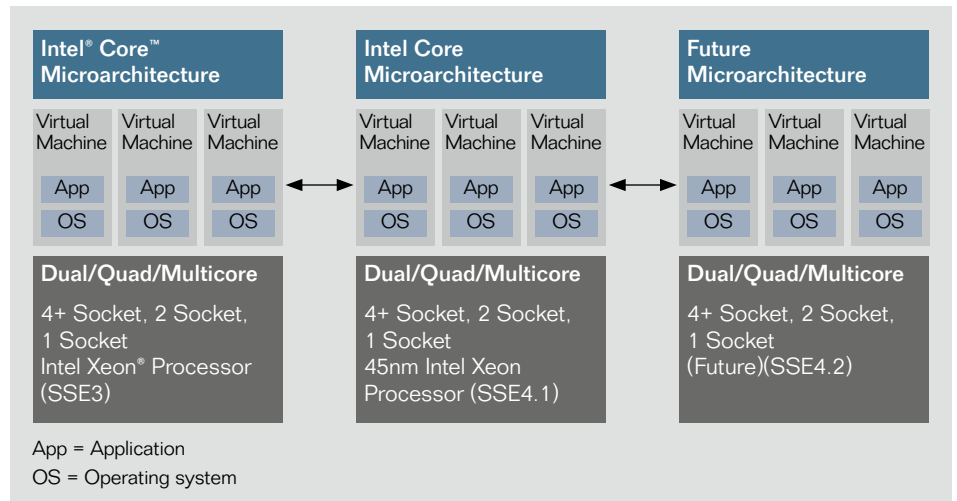


Figure 1: Broadening the Live Migration Capabilities of a Resource Pool

Intel solved the challenge by introducing Intel VT FlexMigration, which allows virtualization software vendors to deliver live migration solutions across different generations of Intel Xeon processor-based servers. By dramatically enlarging the server resource pool that can be accessed in a virtual-machine migration, Intel VT FlexMigration enables IT managers to accelerate the adoption of emerging usage models such as load balancing and business continuity during unforeseen spikes in data center resource demand. It also provides investment protection by allowing users

to combine older-generation servers with new-generation servers in a common resource pool.

Intel VT FlexMigration is one of the many built-in hardware-assist virtualization features found in Intel VT for Intel Xeon processors.

# VMware VMotion

## LEVERAGING VIRTUALIZATION FOR LIVE MIGRATION



Intel Virtualization Technology FlexMigration allows virtualization software vendors to deliver live migration solutions across different generations of Intel Xeon processor-based servers.

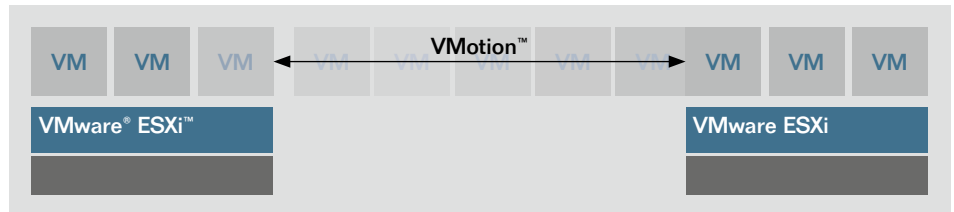


Figure 2: VMware VMotion – For Reliably Managing Live Migrations

VMware VMotion™ technology, deployed in production by 70% of VMware customers, leverages the complete virtualization of servers, storage, and networking to move an entire running virtual machine instantaneously from one server to another. VMware VMotion uses the VMware cluster file system to control access to a virtual machine's storage. During migration with VMotion, the active memory and precise execution state of a virtual machine is rapidly transmitted over a high-speed network from one physical server to another (see Figure 2). Access to the virtual machine's disk storage is instantly switched to the new physical host. Since the network is also virtualized by VMware vSphere, the virtual machine retains its network identity and connections, dramatically streamlining the migration process.

VMware Enhanced VMotion combined with Intel VT FlexMigration allows you to:

- Perform live migrations across host systems with different generations of CPU with zero downtime, undetectable to the user
- Continuously and automatically optimize virtual-machine resources within a single resource pool containing multiple generations of Intel Xeon-based systems
- Perform hardware maintenance without scheduling downtime and disrupting business operations
- Proactively move virtual machines away from failing or underperforming servers

## Highest Level of Flexibility for Your SAP Software Environment

Intel and VMware have joined forces with SAP to test a scenario with enhanced VMotion and Intel VT FlexMigration functionality in SAP Co-Innovation Lab at the SAP Labs location in Palo Alto, California. In this scenario, an SAP ERP Central Component 6.0 demo and evaluation system was used to show live migration between servers running different CPU types (see Figure 3):

- Intel Xeon processor 5200 series (formerly code-named Harpertown)
- Intel Xeon processor 7400 series (formerly code-named Dunnington)
- Intel Xeon processor 5500 series (formerly code-named Nehalem)

The live migration, triggered using VMware vCenter™ Server, was tested successfully and did not cause any negative impact for end users. For an SAP software user, the usage of virtualization technologies is 100% transparent, and live migration scenarios with Intel VT FlexMigration and VMware Enhanced VMotion can be used continuously and automatically without any interruption of the business process.

### Summary

Flexibility in virtualized SAP software landscapes is an increasingly important and desirable capability for IT managers to support business goals beyond server consolidation. Previous barriers to live

migrations using VMware VMotion across generations of servers have been solved with Intel VT FlexMigration and VMware Enhanced VMotion. IT managers can now get benefits of investment protection for SAP software installations with enlarged resource pools across multiple generations of Intel Xeon processor-based servers.

### Built in SAP Co-Innovation Lab

Intel and VMware joined forces with SAP to test the solution in SAP Co-Innovation Lab, working together to build a fully integrated and ready-to-deploy solution. The global SAP Co-Innovation Lab network enhances the SAP partner and customer ecosystem by facilitating project-based co-innovation with its members. SAP Co-Innovation Lab extends SAP partner and customer capabilities through an integrated network of worldwide expertise and best-in-class technologies and platforms. Joint achievements are ultimately packaged and showcased on a broad scale in SAP Co-Innovation Lab facilities, events, SAP Community Network, and more. Learn more about the SAP Co-Innovation Lab network at <http://coil.sap.com>.

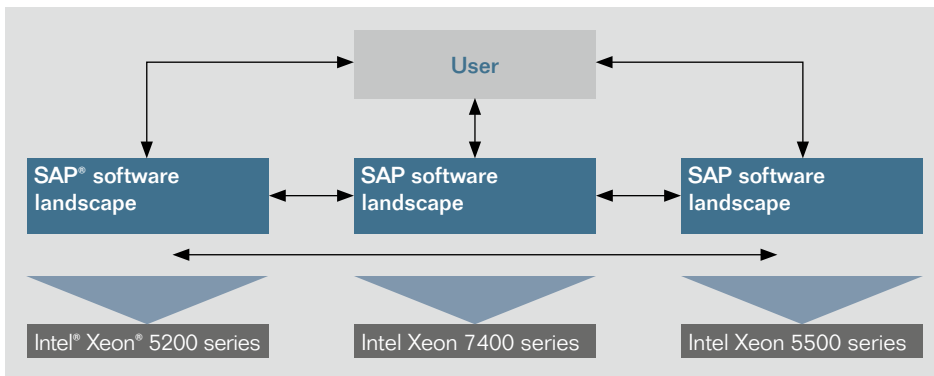


Figure 3: SAP Solutions in an Intel VT FlexMigration/VMware® VMotion™ Environment

# ABOUT THE PARTNERS

## A COALITION OF INDUSTRY LEADERS

### About Intel

Intel (NASDAQ: INTC), the world leader in silicon innovation, develops technologies, products, and initiatives to continually advance how people work and live. Additional information about Intel is available at [www.intel.com/pressroom](http://www.intel.com/pressroom) and [blogs.intel.com](http://blogs.intel.com).

### About SAP

SAP is the world's leading provider of business software, offering applications and services that enable companies of all sizes and in all industries to become best-run businesses. SAP defines business software as comprising enterprise resource planning and related applica-

tions such as supply chain management, customer relationship management, product lifecycle management, and supplier relationship management. With approximately 89,000 customers in over 120 countries, SAP is listed on several exchanges, including the Frankfurt stock exchange and NYSE, under the symbol "SAP." For more information, please visit [www.sap.com](http://www.sap.com).

### About VMware

VMware delivers solutions for business infrastructure virtualization that enable IT organizations to energize businesses of all sizes. With the industry-leading virtualization platform – VMware vSphere – customers rely on VMware to reduce capital and operating expenses, improve agility, ensure business continuity, strengthen security, and go green. With 2008 revenues of US\$1.9 billion, more than 150,000 customers, and 22,000 partners, VMware is the leader in virtualization, which consistently ranks as a top priority among CIOs. VMware is headquartered in Silicon Valley with offices throughout the world and can be found online at [www.vmware.com](http://www.vmware.com).

### Find Out More

For more information, please visit <http://coil.sap.com> or contact your SAP representative.



VMware VMotion technology leverages the complete virtualization of servers, storage, and networking to move an entire running virtual machine instantaneously from one server to another.

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