



**SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY**

**Enterprise Standards and Best Practices for IT Infrastructure**

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## **V motion Requirements**

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**VMware VMotion** enables the live migration of running virtual machines from one physical server to another with zero downtime, continuous service availability, and complete transaction integrity. It is transparent to users.

## Requirements

Since vMotion is intervening in an active virtual machine without that virtual machine's knowledge, certain conditions must be fulfilled so that the process can run without problems or failures:

- CPU compatibility
- vMotion interface (minimum 1 Gb adapter)
- shared central mass storage
- same naming for virtual port groups
- sufficient resources on the target host
- at least one vSphere Essentials Plus license on the corresponding ESX host

The only point which can sometimes present significant problems is CPU compatibility. In many firms the server infrastructure developed organically and not every server is built on the same hardware components. It is easy to determine if a virtual machine can be migrated between two ESX servers because in the case of an incompatibility vCenter will issue a warning before the actual migration process begins.

## CPU Compatibility

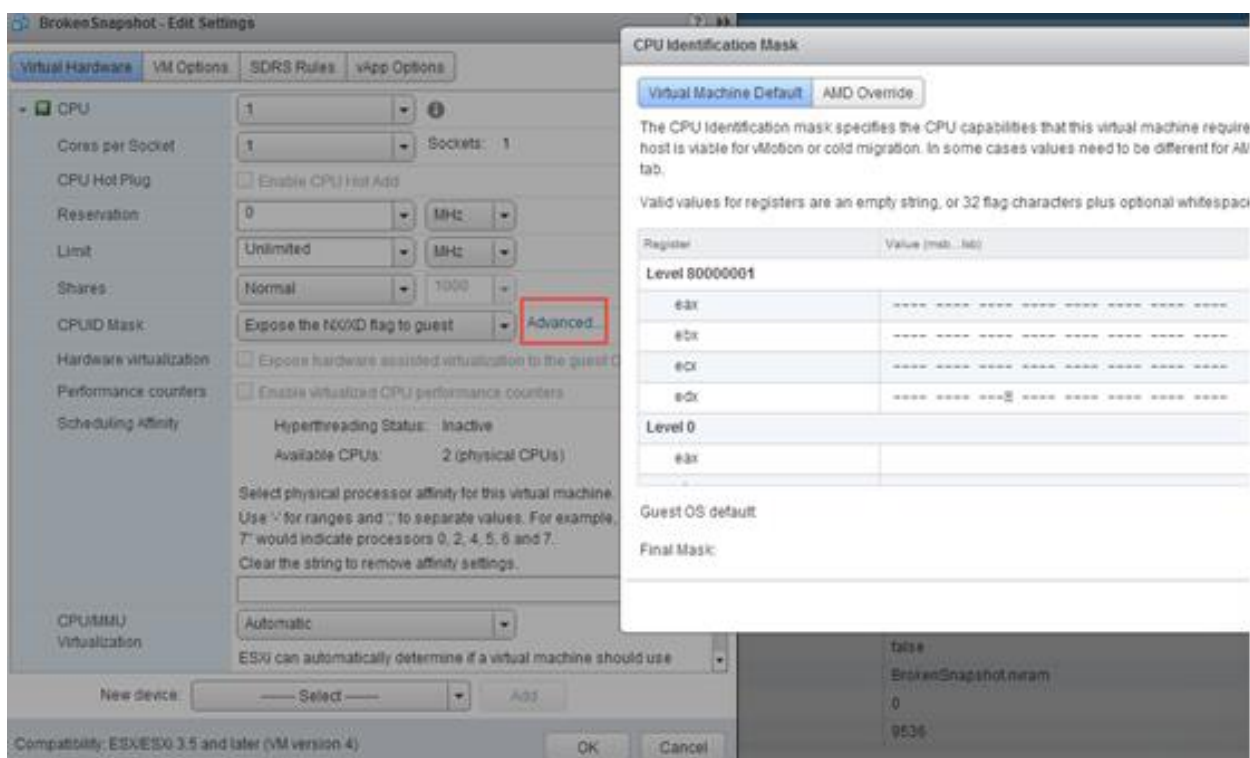
The CPU compatibility problem is easy to explain. Imagine that a virtual machine is started on an ESX host with an AMD CPU and SSE3 functionality. Since VMware ESX is a virtualizer, the guest operating system sees all of the standard CPU functionality and can be adapted to the hardware with extra drivers to more effectively utilize multimedia functions.

If this virtual machine is simply transferred to another host with a CPU that only supports SSE2, the guest operating system will still want to use the SSE3 functionality. This can cause problems or even a system crash. While these problems can sometimes be managed by so-called “CPU masking”, very large differences between CPUs remain unresolvable. Examples of large differences include switching from an AMD to an Intel CPU, or from a 64-bit to a 32-bit CPU.

Since the ESX server cannot predict which CPU instructions the virtual machine (or rather the guest operating system) will use, the user must pay attention to either use identical CPUs or to configure a proper masking.

## CPU Masking and EVC

In the settings for a virtual machine the option CPU-ID -Mask can be activated to hide disabled VM CPU functionality. By hiding certain CPU features, vMotion compatibility between ESX hosts with different CPU generations can be improved .



VMware vMotion requirements - CPU advanced settings

The standard option is the hiding of non-execution bits, which is only supported by newer CPUs (NX/XD flag). If this is activated a virtual machine can be migrated between ESX servers where it doesn't matter if the processors provide NX functionality or not, unless there are other CPU instructions which are different and cannot be hidden.

## **Convenience or Speed**

When regulating CPU mask settings you should keep in mind that hiding certain functionality can slow down the guest operating system. Effectively you must decide between convenience and speed, depending on the guest operating system.