

Live Partition Mobility (LPM) Nutshell

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The information below is from multiple sources including:

Live Partition Mobility Redbook (SG24-7460)
IBM Power/System p Notifications

This document is not intended to replace the LPM Redbook or other IBM documentation. It is only to summarize the requirements and point out fixes that have been released. **Changes are in boldface.**

Major requirements for active Live Partition Mobility are:

Software Version Requirements:

Base LPM:

Hardware Management Console (HMC) minimum requirements

- Version 7 Release 3.2.0 or later with required fixes MH01062 for both active and inactive partition migration. If you do not have this level, upgrade the HMC to the correct level.
- Model 7310-CR2 or later, or the 7310-C03
- Version 7 Release 710 when managing at least one Power7 server.

Integrated Virtualization Manager (IVM) minimum requirements

- IVM is provided by the Virtual I/O Server at release level 1.5.1.1 or higher.

PowerVM minimum requirements:

- Both source and destination systems must have the PowerVM Enterprise Edition license code installed.
- Both source and destination systems must be at firmware level 01Ex320 or later, where x is an S for BladeCenter®, an L for Entry servers (such as the Power 520, Power 550, and Power 560), an M for Midrange servers (such as the Power 570) or an H for Enterprise servers (such as the Power 595).
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Although there is a minimum required firmware level, each system may have a different level of firmware. The level of source system firmware must be compatible with the destination firmware. The latest firmware migration matrix can be found here:

<http://www14.software.ibm.com/webapp/set2/sas/f/pm/migrate.html>

Note: When a partition mobility operation is performed from a Power6 system running at xx340_122 (or earlier) firmware level to a Power7 system running at a firmware level xx720_yyy, a BA000100 error log is

generated on the target system, indicating that the partition is running with the partition firmware of the source system. The partition will continue to run normally on the target system, however future firmware updates cannot be concurrently activated on that partition. IBM recommends that the partition be rebooted in a maintenance window so the firmware updates can be applied to the partition on the target system.

If the partition has been booted on a server running firmware level xx340_132 (or later), it is not subject to the generation of an error log after a mobility operation.

Source and destination Virtual I/O Server minimum requirements

- At least one Virtual I/O Server at release level 1.5.1.1 or higher has to be installed both on the source and destination systems.
- Virtual I/O Server at release level 2.12.11 with Fix Pack 22.1 and Service Pack 1, or later for Power7 servers.

Client LPARs using Shared Storage Pool virtual devices are now supported for Live LPAR Mobility (LPM) with the PowerVM V2.2 refresh that shipped on 12/16/2011.

Operating system minimum requirements

The operating system running in the mobile partition has to be AIX or Linux. A Virtual I/O Server logical partition or a logical partition running the IBM i operating system cannot be migrated. The operating system must be at one of the following levels:

Note: The operating system level of the lpar on the source hardware must already meet the minimum operating system requirements of the destination hardware prior to a migration.

- AIX 5L™ Version 5.3 Technology Level 7 or later (the required level is 5300-07-01) or AIX 5.3 Technology Level 09 and Service Pack 7 or later for Power7 servers.
- AIX Version 6.1 or later (the required level is 6100-00-01) or AIX Version 6.1 Technology Level 02 and Service Pack 8 or later for Power7 servers .
- Red Hat Enterprise Linux Version 5 (RHEL5) Update 1 or later (with the required kernel security update)
- SUSE Linux Enterprise Server 10 (SLES 10) Service Pack 1 or later (with the required kernel security update)

Active Memory Sharing (AMS) software minimum requirements:

Note: AMS is not a requirement to perform LPM and is listed because both are features of PowerVM Enterprise Edition but AMS has more restrictive software requirements in case you plan to use both.

- PowerVM Enterprise activation
- Firmware level 01Ex340_075

- HMC version 7.3.4 service pack 2 (V7R3.4.0M2) for HMC managed systems
- Virtual I/O Server Version 2.1.0.1-FP21 for both HMC and IVM managed systems
- AIX 6.1 TL 3
- Novell SuSE SLES 11

See above requirements for Power7 servers.

Virtual Fibre Channel (NPIV) software minimum requirements:

- HMC Version 7 Release 3.4, or later
- Virtual I/O Server Version 2.1 with Fix Pack 20.1, or later
- AIX 5.3 TL9, or later
- AIX 6.1 TL2 SP2, or later

See above requirements for Power7 servers.

Configuration Requirements:

Base LPM:

Source and destination system requirements for HMC managed systems:

- The source and destination system must be an IBM Power Systems POWER6 or POWER7 technology- based model such as:
 - 8203-E4A (IBM Power System 520 Express)
 - 8231-E2B, E1C (IBM Power System 710 Express)
 - 8202-E4B, E4C (IBM Power System 720 Express)
 - 8231-E2B, E2C (IBM Power System 730 Express)
 - 8205-E6B, E6C (IBM Power System 740 Express)
 - 8204-E8A (IBM Power System 550 Express)
 - 8234-EMA (IBM Power System 560 Express)
 - 9117-MMA (IBM Power System 570)
 - 9119-FHA (IBM Power System 595)
 - 9125-F2A (IBM Power System 575)
 - 8233-E8B (IBM Power System 750 Express)
 - **9117-MMB, MMC, MMD (IBM Power System 770)**
 - **9179-MHB, MHC, MMD (IBM Power System 780)**
 - 9119-FHB (IBM Power System 795)

Source and destination system requirements for IVM managed systems:

- 8203-E4A (IBM Power System 520 Express)
- 8204-E8A (IBM Power System 550 Express)
- 8234-EMA (IBM Power System 560 Express)
- BladeCenter JS12
- BladeCenter JS22
- BladeCenter JS23
- BladeCenter JS43

- BladeCenter PS700
- BladeCenter PS701
- BladeCenter PS702
- BladeCenter PS703
- BladeCenter PS704
- 8233-E8B (IBM Power System 750 Express)
- 8231-E2B, E1C (IBM Power System 710 Express)
- 8202-E4B, E4C (IBM Power System 720 Express)
- 8231-E2B, E2C (IBM Power System 730 Express)
- 8205-E6B, E6C (IBM Power System 740 Express)

Source and destination system requirements for Flexible Systems Manager (FSM) managed systems:

- **7895-22X, 23X (IBM Flex System p260 Compute Node)**
- 7895-42X (IBM Flex System p460 Compute Node)

A system is capable of being either the source or destination of a migration if it contains the necessary processor hardware to support it.

Source and destination Virtual I/O Server minimum requirements

- A new partition attribute, called the mover service partition, has been defined that enables you to indicate whether a mover-capable Virtual I/O Server partition should be considered during the selection process of the MSP for a migration. By default, all Virtual I/O Server partitions have this new partition attribute set to FALSE.
- In addition to having the mover partition attribute set to TRUE, the source and destination mover service partitions communicate with each other over the network. On both the source and destination servers, the Virtual Asynchronous Services Interface (VASI) device provides communication between the mover service partition and the POWER Hypervisor.

Storage requirements

For a list of supported disks and optical devices, see the Virtual I/O Server data sheet for VIOS:

<http://www14.software.ibm.com/webapp/set2/sas/f/vios/documentation/datasheet.html>

Make sure the reserve_lock on SAN disk is set to no_reserve.

Network requirements

The migrating partition uses the virtual LAN (VLAN) for network access. The VLAN must be bridged (if there is more than one, then it also has to be bridged) to a physical network using a shared Ethernet adapter in the Virtual I/O Server partition. Your LAN must be configured so that migrating partitions can continue to communicate with other necessary clients and servers after a migration is completed.

Note: VIOS V2.1.3 adds support of 10 Gb FCoE Adapters (5708, 8275) on the Linux and IBM AIX operating systems by adding N Port ID Virtualization (NPIV) VIOS.

Requirements for remote migration

The Remote Live Partition Mobility feature is available starting with HMC Version 7 Release 3.4. This feature allows a user to migrate a client partition to a destination server that is managed by a different HMC. The function relies on Secure Shell (SSH) to communicate with the remote HMC.

The following list indicates the requirements for remote HMC migrations:

- A local HMC managing the source server
- A remote HMC managing the destination server
- Version 7 Release 3.4 or later HMC version (Release 710 for Power7)
- Network access to a remote HMC
- SSH key authentication to the remote HMC

The source and destination servers, mover service partitions, and Virtual I/O Servers are required to be configured exactly as though they were going to be performing migrations managed by a single HMC.

To initiate the remote migration operation, you may use only the HMC that contains the mobile partition.

Active Memory Sharing configuration:

An IBM Power System server based on the POWER6 or Power7 processor

Virtual Fibre Channel (NPIV) configuration

Virtual Fibre Channel is a virtualization feature. Virtual Fibre Channel uses N_Port ID Virtualization (NPIV), and enables PowerVM logical partitions to access SAN resources using virtual Fibre Channel adapters mapped to a physical NPIV-capable adapter.

The mobile partition must meet the requirements described above. In addition, the following components must be configured in the environment:

- An NPIV-capable SAN switch
- An NPIV-capable physical Fibre Channel adapter on the source and destination Virtual I/O Servers
- Each virtual Fibre Channel adapter on the Virtual I/O Server mapped to an NPIV-capable physical Fibre Channel adapter
- Each virtual Fibre Channel adapter on the mobile partition mapped to a virtual Fibre Channel adapter in the Virtual I/O Server
- At least one LUN mapped to the mobile partition's virtual Fibre Channel adapter

Mobile partitions may have virtual SCSI and virtual Fibre Channel LUNs. Migration of LUNs between virtual SCSI and virtual Fibre Channel is not supported at the time of publication.

Fixes that effect LPM:

Firmware Release Ex340_095:

On systems running system firmware Ex340_075 and Active Memory Sharing, a problem was fixed

that might have caused a partition to lose I/O entitlement after the partition was moved from one system to another using PowerVM Mobility.

Firmware Release Ex350_063

A problem was fixed which caused software licensing issues after a live partition mobility operation in which a partition was moved to an 8203-E4A or 8204-E8A system.

Firmware Release Ex350_103

HIPER: IBM testing has uncovered a potential undetected data corruption issue when a mobility operation is performed on an AMS (Active Memory Sharing) partition. The data corruption can occur in rare instances due to a problem in IBM firmware. This issue was discovered during internal IBM testing, and has not been reported on any customer system. IBM recommends that systems running on EL340_075 or later move to EL350_103 to pick up the fix for this potential problem. (Firmware levels older than EL340_075 are not exposed to the problem.)

Firmware Release Ex350_126

On system performing Live Partition Mobility (LPM), a problem was fixed that caused a partition to crash if the following sequence of operations is performed:

- 1. The partition is configured with, and is using, more than 1 dedicated processor.**
- 2. The partition is migrated using LPM from a POWER6 to a POWER7 platform.**
- 3. At any time following the migration from POWER6 to POWER7, one or more of the dedicated processors is removed from the partition using a Dynamic Logical Partitioning (DLPAR) operation.**

Once these 3 steps operations have been done, a partition crash is likely if either:

The partition is subsequently migrated to any other platform (POWER6 or POWER7) using LPM, or the partition is resumed from hibernation.

Firmware Release Ex350_132

PARTITION-DEFERRED: Support for live partition mobility between systems running Ex350 system firmware, and 8246-L2S systems.

- The partition is resumed from hibernation.**

Firmware Release Ax710_083

A problem was fixed that caused SRC BA210000 to be erroneously logged on the target system when a partition was moved (using Live Partition Mobility) from a Power7 system to a Power6 system.

A problem was fixed that caused SRC BA280000 to be erroneously logged on the target system when a partition was moved (using Live Partition Mobility) from a Power7 system to a Power6 system.

Firmware Release Ax720_082

A problem was fixed that caused the system ID to change, which caused software licensing problems, when a live partition mobility operation was done where the target system was an 8203-E4A or an 8204-E8A.

A problem was fixed that caused SRC BA210000 to be erroneously logged on the target system when a partition was moved (using Live Partition Mobility) from a Power7 system to a Power6 system.
A problem was fixed that caused SRC BA280000 to be erroneously logged on the target system when a partition was moved (using Live Partition Mobility) from a Power7 system to a Power6 system.
A problem was fixed that caused a partition to hang following a partition migration operation (using Live Partition Mobility) from a system running Ax720 system firmware to a system running Ex340, or older, system firmware.

Firmware Release Ax720_090

HIPER: IBM testing has uncovered a potential undetected data corruption issue when a mobility operation is performed on an AMS (Active Memory Sharing) partition. The data corruption can occur in rare instances due to a problem in IBM firmware. This issue was discovered during internal IBM testing, and has not been reported on any customer system.

Firmware Release Ax730_065

HIPER/Pervasive: On systems running firmware level AH730_051, or AH730_058, a problem was fixed that caused the target server to hang, or go to the incomplete state on the management console, after a Live Partition Mobility (LPM) operation. This problem can also occur when a partition hibernation operation is done.

Firmware Release Ax730_087

Support for IBM i Live Partition Mobility (LPM)

Firmware Release Ax730_095

A problem was fixed that caused a partition with dedicated processors to hang with SRC BA33xxxx when rebooted, after it was migrated using a Live Partition Mobility (LPM) operation from a system running Ax730 to a system running Ax740, or vice versa.

VIOS V2.1.0

Fixed problem with disk reservation changes for partition mobility

Fixed problem where Mobility fails between VIOS levels due to version mismatch

Interim Fix IZ77189 corrects a problem where an operation to change the preferred path of a LUN can cause an I/O operation to become stuck, which in turn causes the operation to hang. A Live Partition Mobility Operation also involves a change of preferred path and could encounter a similar hang. This fix applies to a VIOS that has already been updated to Fix Pack 23 (2.1.3.10-FP-23).

VIOS V2.2.0.10 FP-24

Fixed problems with Live partition mobility Fix Pack 24 (VIOS V2.2.0.10 FP-24)

Documented limitation with shared storage pools

VIOS V2.2.0.12 FP-24 SP 02, V2.2.0.13 FP-24 SP 03

Fixed a potential VIOS crash issue while running AMS or during live partition mobility

Fixed an issue with wrong client DRC name after mobility operation

VIOS V2.2.2.1 FP-26

Fixed issues with LPM validation using NPIV

Change history:

10/20/2009 - added SoD for converged network adapters.

04/15/2010 - added NPIV support for converged network adapters.

09/13/2010 - added new Power7 models

01/25/2011 - added OS source to destination requirement, updated fix information.

03/28/2011 – added BA000100 error log entry on certain firmware levels and firmware fixes.

10/17/2011 – added new Power 7 models and SDMC requirements.

01/27/2012 – corrected new location for supported firmware matrix, LPM now supported with SSPs.

06/11/2012 – corrected availability of NPIV with FCoE adapters, added Flex Power nodes.

11/28/2012 – removed SDMC, added Power7+ models, added LPM fixes.