



## IBM PowerVM Lx86 Release Notes for release 1.4.1.0







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**Note**

Before using this information and the product it supports, read the information in “Notices” on page 7.

**Seventh Edition (December 2010)**

This edition applies to version 1.4.1.0 of IBM PowerVM Lx86 and to all subsequent releases and modifications until otherwise indicated in new editions.

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# IBM PowerVM Lx86 Release Notes for release 1.4.1.0

These release notes are for IBM® PowerVM™ Lx86 for x86 Linux Applications (PowerVM Lx86) release 1.4.0.0. They are a supplement to the IBM PowerVM Lx86 Administration Guide.

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## Product and Support references for PowerVM Lx86

PowerVM Lx86 is offered as a standard feature with the purchase of all PowerVM Editions. For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page:

<http://www.ibm.com/planetwide/us/>

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<http://www.ibm.com/planetwide/>

For more detailed information about PowerVM Lx86, visit PowerVM Lx86 for x86 Linux applications:

<http://www.ibm.com/systems/power/software/linux/>

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[http://www.ibm.com/developerworks/linux/lx86/index.html?S\\_TACT=105AGX03](http://www.ibm.com/developerworks/linux/lx86/index.html?S_TACT=105AGX03)

If you obtain your product from the DeveloperWorks website, it is not supported by IBM support as mentioned previously. For self-help, you can join an open forum to exchange information with other users and IBM.

Want to know more?

- Read the IBM Redpaper publication - Getting started with PowerVM Lx86: <http://www.redbooks.ibm.com/redpapers/abstracts/redp4298.html>
- Join the discussion and ask questions at the developerWorks forum on PowerVM Lx86 for x86 Linux applications: [https://www.ibm.com/developerworks/forums/dw\\_forum.jsp?forum=1058](https://www.ibm.com/developerworks/forums/dw_forum.jsp?forum=1058)
- Learn more at **IBM Linux->Linux on Power Systems including System p and System i**: <http://www-03.ibm.com/systems/power/software/linux/>
- Learn more at Linux on System p: <https://www.ibm.com/systems/p/linux/index.html>

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## Changes in the 1.4.1.0 release

The 1.4.1.0 release adds the following improvements to PowerVM Lx86:

- Support for RHEL 6.0.
- Support for SLES11 SP1.
- Performance improvements.
- Additional bug fixes.
- SE Linux now requires Advance Toolchain 2.1-2.
- All testing of this release has been done on version 2.1-2 of the Advance Toolchain.

The 1.4.1.0 release removes the following:

- Support for RHEL 4, all versions.

Support for POWER5 was removed in the 1.4.0.0 release.

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## Registration Codes for Novell SUSE Linux Enterprise Server

The SUSE Linux Enterprise Server subscription for the PowerPC architecture includes a registration code for PowerPC hosts. Additionally, starting September 28, 2009 a second registration code, to be used exclusively for x86 architecture virtual machines hosted on PowerPC hardware via the PowerVM hypervisor, is included.

Customers that want to deploy x86 virtual machines must use the second registration code to register their x86 guests with the Novell Customer Center to receive updates, while continuing to use the PowerPC code to register their PowerPC hosts.

Customers lacking the second registration code to be used with x86 guests should follow the instructions here:

<http://www.novell.com/support/documentLink.do?externalID=7004469>

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## Administration Guide documentation updates

This section details updates to the Administration Guide for PowerVM Lx86 1.4.1.0.

### Update 1: SE Linux and installation to non-default locations

This information is an addition to Chapter 7, SE Linux support with PowerVM Lx86, on page 47 of the Administration Guide.



## SE Linux and installation to non-default locations:

If the x86 World or the PowerVM Lx86 binaries are installed into somewhere other than the default locations, and SE Linux is to be used for translated x86 processes, the directories containing PowerVM Lx86 and the x86 World must be accessible by all restricted SE Linux domains. For example, if the x86 World is installed into /mnt/i386, set the file context of these directories as follows:

```
chcon -t root_t /mnt
```

```
chcon -t root_t /mnt/i386
```

If these directories are not accessible by restricted SE Linux domains, some translated daemon processes may fail to start when SE Linux is set to enforcing mode.

## Update 2: Running the automated installer

This information is an addition to the "Examples of usage" section on page 19 of Chapter 5, Running the automated installer, of the Administration Guide:

Uninstall PowerVM Lx86 and the x86 World:

```
% installer.pl --uninstall Lx86 --uninstall x86world
```

When installing a particular x86 World distro using the --distro option, to find the list of valid arguments for the distribution, type:

```
% installer.pl --help
```

## Update 3: Naming of RHEL5 Advance Platform

The Administration Guide refers to RHEL5 AS when it should be RHEL5 Advanced Platform (AP.)

## Update 4: Enabling SE Linux in PowerVM Lx86 for RHEL 5

This information is an addition to Chapter 7, SE Linux support with PowerVM Lx86, on page 49 of the Administration Guide. The SE Linux enablement procedure for RHEL 5 requires the following extra step:

1. Before step 6, you must copy the /opt/powervm-lx86/selinux/rhel5u?/exec\_types file to /etc/opt/powervm-lx86/exec\_types. As with installing the lx86\_x86.pp module you must install the correct file for your version of RHEL 5.  

```
% cp /opt/powervm-lx86/selinux/<distro>/exec_types /etc/opt/powervm-lx86/exec_types
```
2. The command in step 6 should read: % /etc/init.d/powervm-lx86 restart.

Note that if you create an x86 World with SELinux disabled you must run restorecon -R / in a translated shell once you have enabled SELinux in order to properly label the filesystem. This is also the case when extracting an x86 World archive created with SELinux disabled; see the Known Issues section below for more information.

## Update 5: Enabling SE Linux in PowerVM Lx86 for RHEL 6

This information is an addition to Chapter 7, SE Linux support with PowerVM Lx86, on page 49 of the Administration Guide. The SE Linux enablement procedure for RHEL 6 closely matches RHEL 5 with two additions:

1. In step 4, when installing the `lx86_x86.pp` module, you should also install all the modules in the `modules/subdirectory`. As with installing the `lx86_x86.pp` module you must install the correct modules for your version of RHEL 6. At the time of writing, there is only `rhel6u0/`.  

```
% semodule -i /opt/powervm-lx86/selinux/<distro>/modules/*.pp
```
2. Before step 6, you must copy the `/opt/powervm-lx86/selinux/rhel6u0/exec_types` file to `/etc/opt/powervm-lx86/exec_types`. As with installing the `lx86_x86.pp` module you must install the correct file for your version of RHEL 6. At the time of writing, there is only `rhel6u0/`.  

```
% cp /opt/powervm-lx86/selinux/<distro>/exec_types /etc/opt/powervm-lx86/exec_types
```
3. The command in step 6 should read: `% /etc/init.d/powervm-lx86 restart`.

Note that if you create an x86 World with SELinux disabled you must run `restorecon -R /` in a translated shell once you have enabled SELinux in order to properly label the filesystem. This is also the case when extracting an x86 World archive created with SELinux disabled; see the Known Issues section below for more information.

## Update 6: Installing with SE Linux enabled on RHEL 6

When SELinux is enabled on RHEL6 there is a conflict with PowerVM Lx86 and x86 applications that map memory into the first four pages of the virtual address space. This conflict occurs during the creation of a RHEL6 x86 World. To avoid this conflict you must disable the `mmap_low` protection during the x86 World creation with the following command:

```
% setsebool -P mmap_low_allowed 1
```

It is rare for applications to map into the first four pages of memory so you may wish to re-enable the SELinux protection of the zero page after the install with the following command:

```
% setsebool -P mmap_low_allowed 0
```

The PowerVM Lx86 installer will prompt you with both of these steps.

---

## Upgrading and reinstallation options for previous installations of PowerVM Lx86

The 1.4.1.0 release supports upgrading from all previously released versions of PowerVM Lx86, including all 1.1.x, 1.2.x, and 1.3.x versions. If you choose to upgrade the PowerVM Lx86 binary from a previous 1.1.x or 1.2.x installation, you will be prompted to update the location of the PowerVM Lx86 binaries and associated log files to locations that use the new `powervm-lx86` directory and file naming conventions. You can use the existing directory locations, but the product binaries and log file will use the new naming convention.

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## PowerVM Lx86 CD and package structure

The PowerVM Lx86 CD structure is:

- `powervm-lx86-<release_version>-<build_number>.tgz`
- `powervm-lx86-release-notes-<release_version>.txt`
- `powervm-lx86-release-notes-<release_version>.pdf`

The PowerVM Lx86 directory structure within the tar file is:

- `powervm-lx86-installer-<release_version>-<build_number>/installer.pl`
- `powervm-lx86-installer-<release_version>-<build_number>/lib/`
- `powervm-lx86-installer-<release_version>-<build_number>/resources/`
- `powervm-lx86-installer-<release_version>-<build_number>/doc/`

To install PowerVM Lx86, copy `powervm-lx86-<release_version>-<build_number>.tgz` to the local machine, extract it and then, as root, run the `powervm-lx86-installer-<release_version>-<build_number>/installer.pl` script.

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## Documentation location

The PowerVM Lx86 Administration Guide and the PowerVM Lx86 Release Notes can be found in the following location in the tgz file:

```
powervm-lx86-installer-<release_version>-<build_number>/doc
```

which is a symlink to `powervm-lx86-installer-<release_version>-<build_number>/resources/doc/RO`

After installation, the PowerVM Lx86 Administration Guide and Release Notes can be found here:

```
<PowerVM Lx86 install location>/doc
```

which is a symlink to `<PowerVM Lx86 install location>/installer/resources/doc/RO`

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## Reporting a failure

If a Linux x86 application fails while being translated, an error is displayed. In addition, an error log is created in the `/var/opt/powervm-lx86/log` directory. You can change the location of the default log directory during installation. Log files are created for each running process that encounters an error.

Report the error to IBM Support. Include a description of the failure and what events preceded the failure. Also include details of the POWER hardware and the operating system running on the POWER system.

**Note:** The reported error may be caused by an issue with the Linux x86 application being executed and may not be a problem with PowerVM Lx86.

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## Performance notes

### Performance overview

There are various architectural differences between x86 and Power that can affect performance of translated applications. For example, translating dynamically generated code like Java bytecode is an ongoing translation process that can be expected to affect the performance of x86 Java applications that are using an x86 Java virtual machine. Floating point intensive applications may have some performance penalties. Finally, translating multi-threaded applications can incur an additional performance overhead as the translator works to manage shared memory accesses.

### LPAR Mobility

PowerVM Lx86 tunes itself to the processor it is started on. If PowerVM Lx86 is started in an LPAR on a POWER6 machine and that LPAR is then migrated while active to a POWER7 machine there will be a significant performance impact. This impact can be avoided by restarting PowerVM Lx86 after migrating from POWER6 to POWER7.

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## Functionality notes

### Memory limit defaults to off in 1.3.2.0, 1.4.0.0 and 1.4.1.0

In this release of PowerVM Lx86, the memory limit default is set to off to maximize performance of applications being translated.

If you want to limit the amount of memory used by Lx86, read the Administration Guide section describing the use of the `MEMORY_MONITOR_TRIGGER_RATIO` in the configuration file.

### Increased memory required by Oracle database

Oracle database makes accurate calculations based on the number of processors and the amount of memory in the system in order to expand and make the fullest use of the system resources. Oracle database estimates the total overhead of these processes to be 40 MB. As PowerVM uses additional memory Oracle database will underestimate the amount of memory a given configuration will use and thus cause an out of memory condition. The database creates more processes when more processors are available, thus the overhead becomes more apparent on systems with many reported processors. Therefore, when configuring the memory available to the system it is important to take this extra overhead into consideration. You should add an extra 700 MB per processor (count as reported in `/proc/cpuinfo`) to cover the overhead of PowerVM. You can solve this issue by:

- Reducing the number of processors visible to Oracle database. On POWER7, one approach to reducing the number of processors is to run the processors in SMT-2 mode rather than the default SMT-4 mode. For example, running Oracle database 10 g on a 16-core POWER7 in SMT-4 mode with 64 h/w threads available the total extra overhead will be  $700 \text{ MB} * 64 = 45 \text{ GB}$ . In SMT-2 mode, with 32 h/w threads available, the overhead will be half that of SMT-4; around 22 GB.
- Increasing the available RAM, such that the total amount of RAM is sufficient to hold the PowerVM overhead.

## Known issues

There are some known issues with PowerVM Lx86. This section details those issues and any workarounds that are available.

### SE Linux file attributes in x86 World archives

If an x86 World archive is created on a system with SE Linux disabled, when extracting the x86 World archive onto a system with SE Linux enabled, the SE Linux file attributes will be incorrect. Similarly, if an x86 World is installed onto a system with SE Linux disabled and SE Linux is then enabled, the file system labels must be corrected. To fix this issue, relabel the file system using the **restorecon** command in a translated x86 shell. For example you can run the command **restorecon -R /**. Note that this command may take some time to complete.

### setrlimit(RLIMIT\_AS) not supported; affects vsftpd on RHEL 6.

The RLIMIT\_AS resource used by setrlimit is enforced with the exact limit specified by the x86 application running in PowerVM Lx86. This does not account for the extra virtual address space used by PowerVM Lx86 in the processes memory space. **vsftpd** on RHEL 6 uses this rlimit with tight constraints and causes application failure.

### sfcbd daemon segfault exposed by PowerVM Lx86.

A segmentation fault present in the **sfcbd** daemon happens more regularly when the program is run with PowerVM Lx86. You may see this during the creation of an x86 World on SLES11 resulting in the creation of a PowerVM Lx86 crash log. This does not affect the created x86 World install. The service can be restarted manually with `% /etc/init.d/sfcbd start`.

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