Linux Integration Services 4.0

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Abstract

The Linux Integration Services package updates Linux Hyper-V drivers in applicable Linux distributions to the latest available, ensuring the best performance and fullest use of Hyper-V features.

Copyright Information

Contents

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Supported Virtualization Server Operating Systems

Linux Integration Services (LIS) 4.0 allows Linux guests to use Hyper-V virtualization on the following host operating systems:

- Windows Server 2008 R2 (applicable editions)
- Microsoft Hyper-V Server 2008 R2
- Windows 8 Pro and 8.1 Pro
- Windows Server 2012 and 2012 R2
- Microsoft Hyper-V Server 2012 and 2012 R2
- Windows Server Technical Preview
- Microsoft Hyper-V Server Technical Preview
- Microsoft Azure.

Applicable Linux Distributions

Microsoft provides Linux Integration Services for a broad range of Linux distros as documented in the Linux and FreeBSD Virtual Machines on Hyper-V topic on TechNet. Per that documentation, many Linux distributions and versions have Linux Integration Services built-in and do not require installation of this separate LIS package from Microsoft. This LIS package is available for a subset of supported distributions in order to provide the best performance and fullest use of Hyper-V features. It can be installed in the listed distribution versions that do not already have LIS built, and can be installed as an upgrade in listed distribution versions that already have LIS built-in.

LIS 4.0 is applicable to the following guest operating systems:

- Red Hat Enterprise Linux 5.5-5.11 32-bit, 32-bit PAE, and 64-bit
- Red Hat Enterprise Linux 6.0-6.7 32-bit and 64-bit
- Red Hat Enterprise Linux 7.0-7.1 64-bit
- CentOS 5.5-5.11 32-bit, 32-bit PAE, and 64-bit
- CentOS 6.0-6.7 32-bit and 64-bit
- CentOS 7.0-7.1 64-bit
- Oracle Linux 6.4-6.7 with Red Hat Compatible Kernel 32-bit and 64-bit
- Oracle Linux 7.0-7.1 with Red Hat Compatible Kernel 64-bit

Linux Integration Services 4.0 Feature Set

When installed on a virtual machine that is running a supported Linux distribution, LIS 4.0 for Hyper-V provides the additional functionality listed in the table below.

- Installable on Red Hat Enterprise Linux 6.6, 6.7, and 7.1
- Installable on CentOS 6.6, 6.7, and 7.1
- Installable on Oracle Linux 6.6, 6.7, and 7.1 when running the Red Hat Compatible Kernel
- Networking and storage performance improvements
- Dynamic Memory – Hot Add

More details on individual features can be found at http://technet.microsoft.com/en-us/library/dn531031.aspx

Installing Linux Integration Services 4.0

To install LIS components onto a Linux installation that has no Linux Integration Services installed, or has the built-in version of LIS, use the “install” method. The installation script will remove the distribution-supplied version of LIS and associated packages.

If a previous package of LIS has been installed—for example LIS 3.5--use the “upgrade” method in the next section. The upgrade script will automatically remove the superceded LIS packages and install new versions.

LIS is available in two formats, a tarfile which can be transferred to a target virtual machine or an ISO file which can be attached to a virtual DVD.

To install Linux Integration Services 4.0 from the tar file:

1. Connect to the target virtual machine.
2. Transfer the lis4-0-11.tar.gz file to the target virtual machine.
3. Extract the archived directory of files

   ```
   # tar xvzf lis4-0-11.tar.gz
   ```

4. Change to the lis4 directory

   ```
   # cd lis4.0.11
   ```

5. Execute the installation script (there will not be any user prompts) as root or with `sudo`:

   ```
   # ./install.sh
   ```

6. Restart the virtual machine.

   ```
   # reboot
   ```

To install Linux Integration Services 4.0 from the ISO file:

1. Connect to the target virtual machine.
2. In Hyper-V Manager, attach the ISO to the virtual machine as a virtual DVD drive.
3. Some kernels may be missing the necessary driver to mount the virtual device. This can be corrected by loading the appropriate module as root or with `sudo`:

```
# insmod /lib/modules/$(uname -r)/kernel/drivers/ata/ata_piix.ko
```

4. Mount the virtual DVD as root or with `sudo`:

```
# mount /dev/cdrom /media

mount: /dev/sr0 is write-protected, mounting read-only
```

5. Change to the CD-ROM root directory

```
# cd /media
```

6. Execute the installation script (there will not be any user prompts) as root or with `sudo`:

```
# ./install.sh
```

7. Restart the virtual machine.

```
# reboot
```

Upgrading to Linux Integration Services 4.0

To upgrade to LIS 4.0 from a previous LIS release with tar file:

1. Connect to the target virtual machine.
2. Transfer the lis4-0-11.tar.gz file to the target virtual machine.
3. Extract the archived directory of files

```
# tar xvzf lis4-0-11.tar.gz
```

4. Change to the lis4 directory

```
# cd lis4.0.11
```

5. Execute the upgrade script (there will not be any user prompts) as root or with `sudo`:

```
# ./upgrade.sh
```

6. Restart the virtual machine.

```
# reboot
```

To upgrade Linux Integration Services 4.0 from the ISO file:

1. Connect to the target virtual machine.

2. In Hyper-V Manager, attach the ISO to the virtual machine as a virtual DVD drive.
3. Some kernels may be missing the necessary driver to mount the virtual device. This can be corrected by loading the appropriate module as root or with `sudo`:

```
# insmod /lib/modules/$(uname -r)/kernel/drivers/ata/ata_piix.ko
```

4. Mount the virtual DVD as root or with `sudo`:

```
# mount /dev/cdrom /media

mount: /dev/sr0 is write-protected, mounting read-only
```

5. Change to the CD-ROM root directory

```
# cd /media
```

6. Execute the installation script (there will not be any user prompts) as root or with `sudo`:

```
# ./upgrade.sh
```

7. Restart the virtual machine.

```
# reboot
```

Verifying Linux Integration Services 4.0 Functionality

LIS provides support for the **modinfo** command. To get module information for each installed kernel module, run the following command and note the returned “version” information:

```
# /sbin/modinfo hv_vmbus
filename:       /lib/modules/2.6.32-71.el6.x86_64/extra/microsoft-hyper-
v/hv_vmbus.ko
version:        4.0.11
license:        GPL
srcversion:     ACE0AA64B58744D00E54C12
alias:          acpi*:VMBus:*
alias:          acpi*:VMBUS:*
depends:
vermagic:       2.6.32-71.el6.x86_64 SMP mod_unload modversions
```

Filename, srcversion, and vermagic will vary depending on the Linux distribution release and kernel version. This command can be repeated for all kernel modules (hv_vmbus, hv_netvsc, hv_storvsc, hv_blkvsc, and hv_utils).

To verify that all subcomponents are running in the kernel, execute the following command:

```
# /sbin/lsmod | grep hv
```

The output should include lines similar to the following:

```
hv_netvsc              24309  0
hv_utils                9499  0
hv_storvsc             11641  2
hv_vmbus              146721  7
hyperv_keyboard,hid_hyperv,hv_netvsc,hv_utils,hyperv_fb,hv_storvsc
```

Note

Your file system type or other local factors might result in different file sizes in your deployment.

Source Code for Linux Integration Services

GitHub repository for LIS 4.0. To access the source code for Linux Integration Services 4.0 visit the LIS “lis-next” public github repository at https://github.com/LIS/lis-next/

Additional Information About Linux Integration Services

Review “Best Practices for running Linux on Hyper-V” at https://technet.microsoft.com/en-us/library/dn720239.aspx for more information on features, solutions, procedures, and workarounds.

Customers can provide feedback through the Linux and FreeBSD Virtual Machines on Hyper-V forum. We look forward to hearing about your experiences with LIS.