Application Binary Interface (ABI) Incompatibility with MLNX_EN Kernel Modules

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Note

This section is relevant for RedHat and SLES distributions only.

Overview

MLNX_EN package for RedHat comes with RPMs that support KMP (weak-modules), meaning that when a new errata kernel is installed, compatibility links will be created under the weak-updates directory for the new kernel. Those links allow using the existing MLNX_EN kernel modules without the need for recompilation. However, at times, the ABI of the new kernel may not be compatible with the MLNX_EN modules, which will prevent loading them. In this case, the MLNX_EN modules must be rebuilt against the new kernel.

Detecting ABI Incompatibility with MLNX_EN Modules

When MLNX_EN modules are not compatible with a new kernel from a new OS or errata kernel, no links will be created under the weak-updates directory for the new kernel, causing the driver load to fail. Checking for the existence of needed module links under weak-updates directory can be done by reloading the MLNX_EN modules. If one or more modules are missing, the driver reload will fail with an error message.

Example:

```
********************************************************************************
# /etc/init.d/mlnx-en.d restart
Unloading HCA driver: [ OK ]
Loading HCA driver and Access Layer: [ OK ]
Module rdma_cm belong to kernel which is not a part of MLNX[FAILED]kipping...
Loading rdma_ucm [FAILED]
********************************************************************************
```

Resolving ABI Incompatibility with MLNX_EN Modules

In order to fix ABI incompatibility with MLNX_EN modules, the modules should be recompiled against the new kernel, using the mlnx_add_kernel_support.sh script, available in MLNX_EN installation image.
There are two ways to recompile the MLNX_EN modules:

1. Local recompilation and installation on one server.
   Run the install command to recompile the kernel modules and reinstall the whole MLNX_EN on the server. Mount MLNX_EN ISO image or extract the TGZ file:

   ```
   # cd <MLNX_EN dir>
   # ./install --skip-distro-check --add-kernel-support --kmp --force
   ```

   Notes:

   - The --kmp flag will enable rebuilding RPMs with KMP (weak-updates) support for the new kernel. Therefore, in the next OS/kernel update, the same modules can be used with the new kernel (assuming that the ABI compatibility was not broken again).

   - The command above will rebuild only the kernel RPMs (using mlnx_add_kernel_support.sh), and will save the resulting MLNX_EN package under /tmp and start installing it automatically. This package can be used for installation on other servers using regular install command or yum.

2. Preparing a new image on one server and deploying it on the cluster.

   1. Use the mlnx_add_kernel_support.sh script directly only to rebuild the kernel RPMs (without running any installations) on one server. Mount MLNX_EN ISO image or extract the TGZ file:

      ```
      # cd <MLNX_EN dir>
      # ./mlnx_add_kernel_support.sh -m $PWD --kmp -y
      ```

      Note: This command will save the resulting MLNX_EN package under /tmp.

      Example:

      ```
      ************************************************************
      ```

```
# cd /tmp/MLNX_EN_LINUX-5.2-2.2.0.0-DB-rhel7.8-x86_64
# ./mlnx_add_kernel_support.sh -m $PWD --kmp -y
Note: This program will create mlnx-en TGZ for rhel7.8 under /tmp
directory.
See log file /tmp/mlnx_iso.28286_logs/mlnx_ofed_iso.28286.log

Checking if all needed packages are installed...
Building mlnx-en RPMS . Please wait...

Creating metadata-rpms for 3.10.0-1127.el7.x86_64 ...
WARNING: If you are going to configure this package as a repository, then
please note
WARNING: that it contains unsigned rpms, therefore, you need to disable
the gpgcheck
WARNING: by setting 'gpgcheck=0' in the repository conf file.
Created /tmp/mlnx-en-5.3-1.0.0.1-rhel7.8-x86_64-ext.tgz
**********************************************************
```

2. Install the newly created MLNX_EN package on the cluster:

   Option 1: Copy the package to the servers and install it using the install script.

   Option 2: Deploy the MLNX_EN package using YUM (for YUM installation instructions, refer to Installing MLNX_EN Using YUM section):

   i. Extract the resulting MLNX_EN image and copy it to a shared NFS location.

   ii. Create a YUM repository configuration.

   iii. Install the new MLNX_EN kernel RPMs on the servers: # yum update **Example**:

```
**********************************************************
...
...
==========================================================
Package Arch Version Repository Size
==========================================================
```

```
Updating:
epel-release noarch 7-7 epel 14 k
kmod-iser x86_64 1.8.0-OFED.3.3.1.0.0.1.gf583963.201606210906.rhel7u1
mlnx_ofed 35 k
kmod-isert x86_64 1.0-OFED.3.3.1.0.0.1.gf583963.201606210906.rhel7u1
mlnx_ofed 32 k
kmod-kernel-mft-mlnx x86_64 4.4.0-1.201606210906.rhel7u1 mlnx_ofed 10 k
kmod-knem-mlnx x86_64 1.1.2.90mlnx1-
OFED.3.3.0.0.1.0.3.1.ga04469b.201606210906.rhel7u1 mlnx_ofed 22 k
kmod-mlnx-ofa_kernel x86_64 3.3-
OFED.3.3.1.0.0.1.gf583963.201606210906.rhel7u1 mlnx_ofed 1.4 M
kmod-srp x86_64 1.6.0-OFED.3.3.1.0.0.1.gf583963.201606210906.rhel7u1
mlnx_ofed 39 k

Transaction Summary
================================================================
Upgrade 7 Packages
...
...
****************************************************************
```

Note: The MLNX_EN user-space packages will not change; only the kernel RPMs will be updated. However, "YUM update" can also update other inbox packages (not related to OFED). In order to install the MLNX_EN kernel RPMs only, make sure to run:

```
# yum install mlnx-en-kernel-only
```

Note: mlnx-en-kernel-only is a metadata RPM that requires the MLNX_EN kernel RPMs only.

3. Verify that the driver can be reloaded:

```
# /etc/init.d/mlnx-en.d restart
```