PLDM Firmware Flash Update Library

`pldmfw` implements functionality for updating the flash on a device using the PLDM for Firmware Update standard <https://www.dmtf.org/documents/pmci/pldm-firmware-update-specification-100>.

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\driver-api\pldmfw\[linux-master][Documentation][driver-api][pldmfw]index.rst`, line 11)

Unknown directive type "toctree".

```
.. toctree::
   :maxdepth: 1

   file-format
   driver-ops
```

Overview of the `pldmfw` library

The `pldmfw` library is intended to be used by device drivers for implementing device flash update based on firmware files following the PLDM firwmare file format.

It is implemented using an ops table that allows device drivers to provide the underlying device specific functionality.

`pldmfw` implements logic to parse the packed binary format of the PLDM firmware file into data structures, and then uses the provided function operations to determine if the firmware file is a match for the device. If so, it sends the record and component data to the firmware using the device specific implementations provided by device drivers. Once the device firmware indicates that the update may be performed, the firmware data is sent to the device for programming.

Parsing the PLDM file

The PLDM file format uses packed binary data, with most multi-byte fields stored in the Little Endian format. Several pieces of data are variable length, including version strings and the number of records and components. Due to this, it is not straight forward to index the record, record descriptors, or components.

To avoid proliferating access to the packed binary data, the `pldmfw` library parses and extracts this data into simpler structures for ease of access.

In order to safely process the firmware file, care is taken to avoid unaligned access of multi-byte fields, and to properly convert from Little Endian to CPU host format. Additionally the records, descriptors, and components are stored in linked lists.

Performing a flash update

To perform a flash update, the `pldmfw` module performs the following steps

1. Parse the firmware file for record and component information
2. Scan through the records and determine if the device matches any record in the file. The first matched record will be used.
3. If the matching record provides package data, send this package data to the device.
4. For each component that the record indicates, send the component data to the device. For each component, the firmware may respond with an indication of whether the update is suitable or not. If any component is not suitable, the update is canceled.
5. For each component, send the binary data to the device firmware for updating.
6. After all components are programmed, perform any final device-specific actions to finalize the update.