

## 3.1 Red Hat Enterprise Linux

Red Hat Enterprise Linux is one of the world's leading enterprise Linux platforms. It runs on highly scalable, multi-core systems that support the most demanding workloads. Collaboration between Red Hat and engineers from major hardware vendors ensures that the operating system (OS) uses the newest hardware innovations that are available in processor design, system architecture, and device drivers to improve performance and reduce power utilization.

For more information, see [Red Hat Customer Portal](#).

## 3.2 Device drivers

This section provides information about the device drivers that are used in this solution.

### 3.2.1 Mellanox OpenFabrics Enterprise Distribution

This is a single Virtual Protocol Interconnect (VPI) software stack that operates across all Mellanox network adapter solutions. The stack supports specific uplinks and Mellanox InfiniBand Host Channel Adapters (HCAs) to servers.

Mellanox OpenFabrics Enterprise Distribution (OFED) contains many important components, for example:

- ▶ Mellanox HCA drivers:
  - Includes both InfiniBand and Ethernet drivers.
- ▶ Upper layer protocols (ULPs):
  - For example, IP over InfiniBand.
- ▶ Utilities:
  - Diagnostic tools.
  - Performance tests.
- ▶ OpenSM: InfiniBand Subnet Manager
- ▶ Mellanox Firmware Tools (MFT)
- ▶ Message Passing Interface (MPI):
  - The OpenMPI stack supports the InfiniBand, RoCE, and Ethernet interfaces.
  - MPI benchmark tests.

Mellanox OFED supports adaptive routing (AR) management. The AR manager supports the following advanced InfiniBand features:

- ▶ Adaptive Routing (AR)
- ▶ Fast Link Fault Recovery and Notification (FLFR)

AR enables the switch to select the output port based on the port's load. AR supports two routing modes:

- ▶ Free AR: No constraints on the output port selection.
- ▶ Bounded AR: The switch does not change the output port during the same transmission burst. This mode minimizes the appearance of out-of-order packets.