

Overview of 25G & 50G Ethernet Specification, Draft 1.4

The 25G & 50G Ethernet specification extends the IEEE 802.3 standard to include operation at 25 Gb/s and 50 Gb/s over copper cables and backplanes. The capability to interconnect devices at these rates is important in next-generation data center networks that need to increase server network throughput beyond 10 Gb/s and 20 Gb/s without using more interconnect lanes. By leveraging switch and NIC functions, SerDes and cabling solutions for 100GBASE-CR4/KR4, operation at 25 Gb/s and 50 Gb/s can be enabled using per-lane breakout capabilities common in 40GBASE-R networks.

The following features are defined by the Draft 1.4 of the specification:

- PCS/PMA Operation at 25 Gb/s over a single lane.
- PCS/PMA Operation at 50 Gb/s over two lanes.
- Optional supported forward error correction (FEC) modes.
- Optional auto-negotiation using an OUI next page.
- Optional link training.
- Electrical specifications and loss budgets for twinax copper cable and backplane channels, with and without FEC.

The specification does not define connectors or specific cable assembly specifications used for 25G and 50G Ethernet interconnect. The spec does not address, nor preclude, the use of optical interconnect – whether active optical cable (AOC) or fiber – in support of 25G or 50G links.

The 25G & 50G Ethernet specification is based on, and refers to, the IEEE Std. 802.3™-2012 and IEEE Std. 802.3bj™-2014 standards including Clause numbers. Mapping of sublayer operations at 25 Gb/s and 50 Gb/s and required modifications are discussed further in the specification.

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