



Frame Error Rate Testing

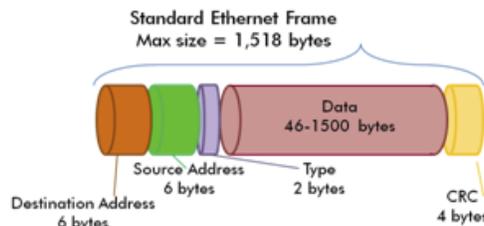
September 2015

- Frame error rate testing characterizes data packet transmission performance in real-world conditions.
- Increasingly important metric with so many IP devices connected and powered via the network, that the additional heat can lead to more errors.
- More stringent metric than BER because a single frame includes many bits
- The results can be expressed as a total number of errors, as a percentage between 0% (no errors) and 100% (all errors), or as 10^{-xx} (lab use).

There are multiple ways in which the quality of networking products can be assessed. Two clearly defined techniques are the measurement of bit error rate (BER) and frame error rate (FER). Many networking products are specified with the bit error rate that they achieve or support. BER is simply the ratio of bits that have been incorrectly received to the total number of bits sent. The test is performed by sending strings of pseudo-randomly generated bits through the device.

Frame error rate (FER) is a better test for two reasons:

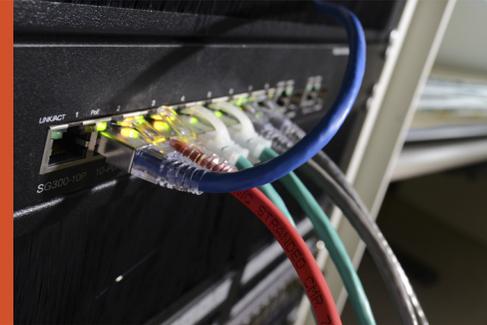
1. In real-world Ethernet networks, the basic data unit is a frame, a collection of bits arranged in a format consistent with the Ethernet standard. A frame can contain between 512 and 12,144 bits per the Ethernet standard. If a switch or a NIC receives a frame with one or many incorrectly transmitted bits, the complete frame will be discarded. The degradation of network performance due to dropped frames is the same for one or many bit errors within a frame. BER does not account for this fact.
2. FER testing takes longer to complete. Berk-Tek performs FER testing for a minimum of one hour per test, whereas a BER test would take about two (2) minutes. This increased test time is significant because it allows the hardware and cabling to reach operating temperatures. The performance of networking products decreases as the temperature increases. Robust performance is therefore better verified during longer tests that allow for transceivers, switches, cabling, etc., to reach their true operating temperature.



Berk-Tek's team of scientists and engineers characterize all of Berk-Tek's copper and fiber optic solutions with FER using state-of-the-art test equipment and proprietary methodologies. This provides customers with robust networking solutions that perform in real-world conditions.



This stamp certifies that all testing was performed, reviewed, and approved by highly trained, experienced engineers dedicated to studying and developing solutions for future network infrastructures.



Application:

Converging IP traffic

Challenge:

Quantifying converged network performance under real-world conditions.

Solution:

Measure the Frame Error Rate of Berk-Tek LANmark™-1000, LANmark™-2000, and LANmark™-XTP cabling using state-of-the-art test equipment in real-world conditions to ensure robust network performance today, and into the future.