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DIFFERENCE BETWEEN CATEGORY: CAT5, CAT5e, CAT6, CAT6e, & 7 & 7e CABLE

By Ken "KC" Clements

Category 5

Category 5 transmits at 100MHz frequencies, providing a rated line speed of up to 100Mbit/s and a max cable segment length of 100 meters. Most Category 5 cables, designed for early networks, only used two twisted pairs. Older Category 5 cables continue to make up the bulk of the world's network infrastructure.

Category 5e

An improved specification to Category 5 was later introduced. By reducing noise and signal interference, Category 5e is capable of increasing rated transfer speeds to 350 Mbit/s over 100 meters. The new standard also required all cables to include four twisted pairs (all eight contacts). An optimized encoding scheme allows up to 50-meter lengths of Category 5e cable to perform at, or near, Gigabit Ethernet (1000BASE-T) speeds.



Category 6

The mainstream adoption of Gigabit Ethernet (1000BASE-T) required new industry-standard cables capable of transmitting at a higher frequency of 250 MHz. Category 6 cable uses thicker-gauge wire, increased shielding, and more pair twists per inch to reduce signal noise and interference. The tighter specifications guarantee that 100-meter runs of Category 6 are capable of 1000 Mbit/s transfer speeds. 10-Gigabit Ethernet speeds are achievable when reducing cable lengths to less than 50 meters.



Category 6e

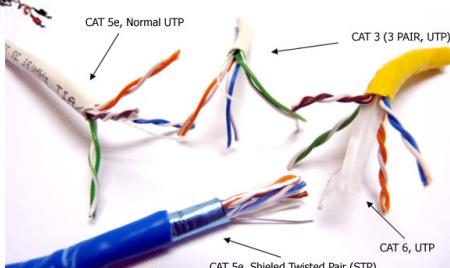
Category *6 Enhanced (6e) is an augmented specification designed to double transmission frequency to 500 MHz. By wrapping Category 6e in grounded foil shielding, full 10-Gigabit Ethernet speeds can be reached without sacrificing the max cable length of 100 meters. (*) Category 6e is also referred to as: Category 6a. NFD

Categories 7 & 7e or (7a)

Category 7 is the informal name for "Class F" cabling defined by a different standards body than Cat6, 6e and lower. It supports frequencies up to 600MHz and may support the upcoming 100GbE standard. Category 7a or 7e is an upcoming standard that allows frequencies up to 1,000MHz. Supported Ethernet bandwidths have not been defined currently and Cat7 & Cat 7e cable and connectors are not readily available at the time of this report.

Construction

All four types of cables are constructed with four pairs of 22 to 24 AWG conductors, with each pair twisted using a different number of turns per meter; this reduces the interference from neighboring pairs. An outer sheath of PVC for standard cables or fire-resistant plastic for plenum-rated cables covers all four conducting pairs. Category 6e or 6a cable is optionally available with a foil shield between the outer sheath and the inner conductors, which reduces outside interference and may increase network performance.



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