Energy dissipation is highly intermittent in large-scale turbulent plasmas, being locali ed in both space and time. This intermittency is manifest by the presence of coherent structures such as current (and vorticity) sheets, which account for a large fraction of the overall energy dissipation and may serve as sites for magnetic reconnection and particle acceleration. The statistical analysis of these structures is a robust and informative methodology for probing the dynamics. In this talk, the statistical properties of dissipative current sheets in numerical simulations of driven magnetohydrodynamic (MHD) turbulence are described. Instantaneously, the overall energy dissipation is evenly spread among current sheets spanning a continuum of inertial-range si es and energy dissipation rates, while their thicknesses are locali ed deep inside the dissipation range. The temporal intermittency is investigated by tracking current sheets in time and characteri ing the resulting four-dimensional spatiotemporal structures, which correspond to dissipative events or flares in astrophysical systems. These dissipative events exhibit robust power-law distributions and scaling relations, and are often highly complex, long-lived, and weakly asymmetric in time. The strongest dissipative events dominate the overall energy dissipation in the system. These results are compared to the observed statistics of solar flares.