A free neutron provides the simplest example of nuclear beta-decay, leading to a unique suite of tests for fundamental parameters of electroweak theory. The neutron lifetime tau_n, in conjunction with other neutron beta-decay observables, can be used to probe the Standard Model of particle physics by experimentally determining the CKM matrix element V_ud. The UCN-tau experiment at Los Alamos National Laboratory (LANL) traps ultracold neutrons (UCN) in a magnetogravitational “bottle” for periods of time longer than the neutron lifetime. A permanent magnet Halbach array minimizes neutron losses, ensuring that the loss rates of neutrons in UCN-tau generate systematic corrections no greater than the statistical precision of the experiment. Potential sources of loss have been benchmarked by using the in-situ “dagger” and “active cleaner” detectors to probe neutrons near the trapping threshold. In this talk, I will present the results of three independent, blinded, analyses utilizing ~10^7 neutrons collected over two calendar years of operation. This leads to a lifetime of 877.75 +/- 0.28 (stat.) + 0.22 / - 0.16 (sys.) sec, the most precise measurement of the neutron lifetime to date.