Adams, Barbasch, and Vogan defined the notion of a strong real form of a connected reductive group defined over the real numbers. It is a rigidification of the usual notion of an inner form and Vogan posed the problem of finding an analogous notion in the p-adic case. We will describe a new cohomology set for affine algebraic groups defined over local fields of characteristic zero. Its construction is uniform for real and p-adic groups and it leads to the notion of a rigid inner form which in the real case turns out to be equivalent to that of a strong real form. We will discuss applications to the internal structure of L-packets and the stabilization of the Arthur-Selberg trace formula. (Received September 17, 2013)