This is a review article on the recently found dual conformal symmetry in scattering amplitudes of gluons. Of particular focus is on the dual conformal supersymmetry in planar $\mathcal{N} = 4$ super Yang-Mills theory and on the relation between the gluon scattering amplitudes and the so-called light-like Wilson loops in the planar theory. This review is written by one of the discoverers of the dual conformal symmetry and is useful for the readers who are interested in details of its recent developments.