After a brief review on the subject of holographic renormalization within the theory of Einstein-Hilbert gravity, we turn to the case of conformal gravity which is a higher derivative theory of gravity with the distinctive property of invariance under Weyl rescalings of the metric. We show how one can obtain 2-point functions of fields of the conformal field theory which is dual to the conformal gravity in AdS space-time by means of holographic methods.