The inter-relationship between hot and cool jets, which is not well understood, is very important in order to unravel the details of their formation and evolution in the solar atmosphere. An active-region jet having both, hot and cool components, is observed on 21st July 2013 in AR 11798 by the Interface Region Imaging Spectrometer (IRIS), the X-ray Telescope onboard Hinode and the Atmospheric Imaging Assembly (AIA) onboard the Solar Dynamics Observatory (SDO). Using these observations, we have studied the formation and evolution of hot and cool components to understand their interrelationship. We find that the cool jet is formed $\sim$ 4 minutes before the hot jet and that there was an spatial offset of about 36 $''$ in their source regions. To the best of our knowledge, this is the first time such an observation is being reported. The evolution and dynamics of the jet studied here is consistent with the 3D model of jets proposed by Moreno-Insertis & Galsgaard (2013). Based on the similarities between the observed and simulated jets, we conclude that both the jets are triggered due to magnetic reconnection processes.