This paper proposes the use of wavelet packet transform in a transform based video coding scheme, which is mainly used in low/very low bit-rate video coding schemes i.e. H.263 standard. In the experiments, the discrete cosine transform in the video coding scheme is replaced by the wavelet packet transform, and the improved performance in term of peak signal to noise ratio is measured and compared with the results obtained from the coding scheme implementing the ordinary wavelet transform. The experimental results show an impressive improvement obtained from the use of wavelet packet transform.