

A New Approach to Synthesis of Transition Signaling Asynchronous Circuits

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Abstract

Asynchronous circuits work based on handshaking without using any global clocks, and thus, have potential for solving various problems that synchronous designs currently suffer in terms of global clocking. The handshake styles of asynchronous circuits are classified into the level signaling and the transition signaling. The transition signaling asynchronous circuits use "transitions" instead of "levels" in order to indicate events, which is beneficial on performance because it is not needed to reset the signal levels to zero. However, their design is more complicated compared to the level signaling asynchronous circuits. This talk introduces our trial approach to synthesis of transition signaling asynchronous circuits. This new approach is based on multi-clock flipflops that we recently developed, and I believe that the design of transition signaling asynchronous circuit can be done much more intuitively using this design style. This talk will show as an example how an NoC router is designed in this design style.