

DEDICATED SSR PIPELINE STAGE OF ROUTER FOR EXPRESS TRAVERSAL (EXTRA) NOC

ABSTRACT

This invention is related to an Express Traversal (EXTRA) Network on Chip (NoC) comprising a number of EXTRA routers. The EXTRA NoC comprises a Buffer Write and Route Computation (BW/RC) pipeline, a Switch Allocation-Local (SA-L) pipeline, a Setup Request (SR) pipeline, a Switch Allocation-Global (SA-G) pipeline, and a Switch Traversal and Link Traversal (ST/LT) pipeline. The BW/RC pipeline is configured to write an incoming flit to an input buffer(s) of a start EXTRA router and compute the route for the incoming head flit by selecting an output port to depart from the start EXTRA router. The SA-L pipeline is configured to arbitrate the start EXTRA router to choose an input port and an output port for a winning flit. The SR pipeline is configured to handle the transmission of a number of SR signals from the start EXTRA router to downstream EXTRA routers. The SA-G pipeline is configured to arbitrate a Buffer write enable (BW_{ena}), a Bypass Mux (BM_{sel}), and a Crossbar select signal (XB_{sel}) based on the SR signals received from the start EXTRA router to build an express path for the winning flit. The ST/LT pipeline is configured to traverse the winning flit to the selected output port of the start EXTRA router and transmit the winning flit to the destination EXTRA router bypassing EXTRA routers between the start EXTRA router and destination EXTRA router.

FIGURE 7