# Feature Updates

## NoC Construction Improvements

### Isolate and reduce congestion

NocStudio can now take special consideration while mapping high bandwidth traffic (based on the traffic rate or overall load on the transmitting and receiving interfaces) to isolate them from other traffic so as to reduce congestion in the NoC.

* The user can also sort traffic flows so as to map high bandwidth traffic flows first using the option “high\_rate\_traffic\_flows” in the sort order argument to the map\_opt command. NocStudio also automatically uses “high\_rate\_traffic\_flows” as one of the many sort orders to sort traffic flows in each iteration of map\_opt.
* The user can choose to make NocStudio avoid the mapping of high rate traffic flows and low rate traffic flows on the same VC as part of its mapping algorithm by using the “separate\_high\_rate\_traffic\_flows” argument in map\_opt.

### Automated FIFO sizing

Automatic sizing of FIFO depth on VC’s with high bandwidth traffic during tune\_links to prevent congestion in the NoC and head of line blocking.

### Automated tune\_links

*tune\_links* is now run automatically at the end of map\_opt to tune the link widths and FIFO depths. *tune\_links* is also a separate command that a customer can choose to run.

## GUI Enhancements

### Hide toolbars to increase screen real estate

Press Ctrl+H to hide/unhide the drawing toolbar and the top toolbar to increase the screen real estate.

### Minimize the toolbars and the property panels to side tabs

The drawing toolbar, top toolbar and the property toolbar can be minimized to the sides to appear as tabs.

### Hide inactive layers after mapping

The layers that don’t have any traffic mapped on them are automatically hidden after mapping.

### New way to add/remove link and port blockages in the Blockage View

In the blockage view, left click on a link to add/remove a link blockage (add/remove blockage to that link on all layers), and right click to add/remove a port blockage (add/remove blockage on the link only on the clicked layer).

### Collapse all the buttons to add the different bridges to single ‘Add’ button

The add buttons of different bridges are all collapsed into one ‘Add’ button.

### Errored commands remain on console for editing

An errored command remains on the console so that the user can edit it rather than having to retype the entire command.

### Change color of link when clicked

When a link is clicked, its color changes to pink so that the user knows which link he is currently viewing the state/properties of.

## Multi-NoC

RTL from multiple NoCs can now be integrated into the same design for simulation. Each NoC must have a unique mesh name and the following NocStudio property setting:

prop\_default tag\_project\_name yes

Two or more NoCs can be integrated with no upper limit to the number of NoCs. Only one coherent NoC is supported per set of NoCs. Crux NoCs cannot be mixed with Orion/Gemini NoCs.

## Synchronizer Depth and FIFO Sizing

NocStudio now supports programmable synchronizer depths, both for general synchronizers (ns\_demet.v) and for reset synchronizers (ns\_rst\_n.v). Users may select synchronizer depths, based on their own library/process requirements, on a per-clock-domain granularity.

## Multi-cell-size NoCs

Cell size can be a system-wide constant indicating a common denominator for data sizes. Upsizing and downsizing of data happens on power-of-2 multiples of the cell size. For a system with more than one cell size, where interface data width is specified in terms of one of the cell sizes, and communication only happens between interfaces that share a cell size, the cell size property can be set to -1 to indicate that NocStudio should allow multiple cell sizes. Each physical network (a.k.a. layer) can only support one cell size. NocStudio has been enhanced to support multiple cell sizes within a system.