

NetSpeed Crux

Release Notes

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NetSpeed Crux 17.04 Release Notes

About This Document

This document lists the release notes for NetSpeed Crux. Using NetSpeed NocStudio, users can define NoC architectures, describe specifications and requirements, optimize the NoC design and finally generate the NoC IP files such as RTL, testbench, synthesis scripts, NoC IP documentation etc.

Audience

This document is intended for users of NocStudio:

- NoC Designers
- NoC Architects
- SoC Architects

Prerequisite

Before proceeding, you should generally understand:

- Basics of NetSpeed Crux IP Technology

Related Documents

The following documents can be used as a reference to this document.

- NetSpeed NocStudio User Manual

Customer Support

For technical support about this product, please contact support@netspeedsystems.com

For general information about NetSpeed products refer to: www.netspeedsystems.com

Contents

About This Document.....	2
Audience	2
Prerequisite	2
Related Documents.....	2
Customer Support.....	2
1 Deliverables.....	4
2 Installation.....	5
3 Feature Updates: System Interconnect	6
3.1 IEEE Std 1364™-2005 format	6
3.2 TCL Interface support	6
3.3 Enhanced Performance counter support	6
4 Feature Updates: Streaming Protocol	7
5 EDA Tool Compatibility	8
6 Errata: System Interconnect	9
7 Errata: Streaming Protocol	10
7.1 Synthesis results with Multi Cell Size NoCs	10
8 Changes to Commands and Properties	11
8.1 Command Changes	11
8.2 Default Property Changes	12
8.3 Mesh Property Changes	12
8.4 Bridge Property Changes	12
8.5 Host Property Changes	12
8.6 Interface Property Changes	12
8.7 Link Property Changes.....	13
8.8 Router Property Changes.....	13
8.9 VC Property Changes	13

1 Deliverables

- NetSpeed NocStudio Package and one of the license options:
 - N7 version supporting 16 layers and 256 bridges
 - N5 version supporting 4 layers and 60 bridges
 - N3 version supporting 1 layers and 12 bridges
- NocStudio executable with interactive GUI.
- Verification checkers to be used in the DV environment.
- Sanity Test Bench.
- Documentation
 - a. NocStudio User Manual: The User Guide describes how to set up a system using NocStudio and how to use it to generate NetSpeed IP.
 - b. IP Integration Spec: The Integration Manual describes how to integrate a configured network into a larger subsystem.
 - c. Technical Reference Manual: The Technical Reference Manual describes how the functionality of the various NoC elements, the features and functions available, and how to dynamically change the functions using the programmer's mode.

2 Installation

- NocStudio uses FlexLM based licensing.
 - Linux CentOS 5.5 or higher
 - For node-locked license file, copy over the license file under NocStudio installation directory and renamed it as “license.dat”. If the license file resides in a separated folder, please set environment variable LM_LICENSE_FILE with the proper path.
 - For floating licensing scheme, please download and extract netspeed.flexlmpkg.tar.gz for 32- or 64-bit license daemon and follow FlexLM documentation.

NOTE: When untarring Linux files, ensure it is done on a Linux machine. Untarring Linux files on a Windows machine causes problems with symbolic links.

- The release makes use of Qt libraries covered under LGPL:
 - <http://qt-project.org/downloads>

3 Feature Updates: System Interconnect

3.1 IEEE STD 1364™-2005 FORMAT

Interconnect RTL format has been updated to be compliant with IEEE Std 1364™-2005 format.

3.2 TCL INTERFACE SUPPORT

NetSpeed adds support in NocStudio to use TCL interpreter to process input. All NocStudio commands will be registered in the *netspeed::namespace*, and all commands that don't overlap builtin commands will be registered without namespace. The text output of NocStudio commands will be available as the result of running them in TCL mode. When the TCL command being run returns a value, that value will be printed in the console. Within TCL mode, *\$()* and *\$[]* interpolation is not available, and defcmd-defined commands will not be registered in the TCL interpreter. NocStudio commands that use '[', ']', in their syntax will need special escaping to be executed in TCL mode, while '{' and '}' will normally be interpreted properly without escaping. TCL's stdout is not yet redirected into the NocStudio console, so this output will appear in the terminal that NocStudio runs in.

Examples:

```
enter_tcl_mode
info tclversion
# Prints the version of TCL built into NocStudio
enter_tcl_mode
source json.tcl; [dict keys [dict get [json::json2dict [json_dump] hosts]
# Prints the list of hosts reported from json_dump (requires json.tcl library)
```

3.3 ENHANCED PERFORMANCE COUNTER SUPPORT

Enhanced configurable performance counters have been added for

- Counting cycles on an RX host interface where the interface is out of parity
- Counting cycles where NoC VCs have valid flits for an RX host interface
- Cycles with credit stalls (valid request but no credit) on output VCs of router output port

In Addition, destination bridge ID, interface ID and QoS fields are logged when a route looking failure occurs on TX host interface.

4 Feature Updates: Streaming Protocol

None

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5 EDA Tool Compatibility

- Cadence EDA tools were used for verification and synthesis of this product.
 - Incisive RTL Simulator 15.22.012
 - Genus RTL Synthesis 15.20-p004_1
 - HAL Linting tool 13.20.036
 - Confirml 15.10.120
- Compatibility testing has been done with VCS J-2014.12-SP3-3. Please refer to IP Integration specification to enable/disable specific NetSpeed checker in order to resolve or workaround any verification related issues, if any. Contact your NetSpeed or Synopsys support team for assistance.

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6 Errata: System Interconnect

None

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7 Errata: Streaming Protocol

7.1 SYNTHESIS RESULTS WITH MULTI CELL SIZE NOCs

It has been observed that the synthesis tools do not propagate constants defined in the RTL code properly for some configuration with multi cell_size option. This results in dividers being instantiated in the netlist and reducing the achievable frequency. Please contact NetSpeed Support team if your design intends to implement multi cell size NoC.

8 Changes to Commands and Properties

8.1 COMMAND CHANGES

Command Name	Comment
set_ivc_ovc_mapping	New command to set the mapping between an input VC at a router port and an output port on the same router.
reset_ivc_ovc_mapping	New command to reset the mapping between an input VC at a router port and an output port
list_ivc_ovc_mapping	New command to to list the input VC to output VC mapping on a router.
set_max_outstanding_counter_limit	New command to update the max outstanding limit of a previously created max outstanding counter.
create_max_outstanding_counter	New command to create a max outstanding counter that can be assigned to nsip interfaces.
del_max_outstanding_counter	New command to delete a max outstanding counter.
list_max_outstanding_counters	New command to list the max outstanding counters created.
assert_group_clocks	New command to check that the specified rtl group has no clocks other than the listed clocks
list_curves	New command to list the points of a curve/probability mass function or show all curves/probability mass functions
set_curve	New command to set the piecewise linear curve associated with a name.
reset_map	New command to reset the mapping of traffic.
set_transfer_column	New command to specify the transfer columns between one or more source and destination interfaces
reset_transfer_columns	New command to reset the transfer columns between all source and destination interfaces.
list_transfer_columns	New command to list the transfer columns between one or more source and destination interfaces
enter_tcl_mode	New command to enable use of the TCL interpreter to process further input
exit_tcl_mode	New command to return to processing NCF input format from TCL mode
ml_build	New command to build NoCs using machine learning

8.2 DEFAULT PROPERTY CHANGES

Property Name	Default Value	Comment
noc_injection_queue_depth	0	This property has been replaced by niq_depth
niq_depth	0	This property is meant to replace noc_injection_queue_depth
noc_ejection_queue_depth	0	This property has been replaced by neq_depth
neq_depth	0	This property is meant to replace noc_ejection_queue_depth
host_processing_queue_depth	32	This property has been renamed to hpq_depth
hpq_depth	32	This property has replaced host_processing_queue_depth
guaranteed_sink	no	New property that forces the interface to sink every packet that it receives without any backpressure into the NoC
prefer_shortest_path_routes	yes	New property to prefer shortest path routes with more turns over longer routes with fewer turns in route computation between 2 points
synchronizer_depth	2	This property is used to set the default depth of clock synchronizers inserted by NocStudio

8.3 MESH PROPERTY CHANGES

None

8.4 BRIDGE PROPERTY CHANGES

None

8.5 HOST PROPERTY CHANGES

None

8.6 INTERFACE PROPERTY CHANGES

Property Name	Comment
noc_injection_queue_depth	This property has been replaced by niq_depth
niq_depth	This property is meant to replace noc_injection_queue_depth
noc_ejection_queue_depth	This property has been replaced by neq_depth

neq_depth	This property is meant to replace noc_ejection_queue_depth
host_processing_queue_depth	This property has been replaced by hpq_depth
hpq_depth	This property is meant to replace host_processing_queue_depth
hpq_latency_curve	This property is used to automatically control host processing latency based on the specified curve
hpq_latency	This property is used to automatically control host processing latency based on the specified constant value.
hpq_rate_curve	This property is used to automatically control host processing completion rate.
hpq_rate	This property is used to automatically control host processing completion rate based on a specified constant value.
shared_hpq	This property is used to control the host processing queue that requests arriving at this interface should go to.
guaranteed_sink	This property forces the interface to sink every packet that it receives without any backpressure into the NoC

8.7 LINK PROPERTY CHANGES

None

8.8 ROUTER PROPERTY CHANGES

None

8.9 VC PROPERTY CHANGES

None

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