

CFG Gemini

***Release Notes***

**Version: GEMINI-19.04**

**Revision: 0.0**

**Intel Confidential**

Copyright © 2019, Intel Corporation. All rights reserved.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and other countries.

\* Other names and brands may be claimed as the property of others.

This document contains information on products in the design phase of development.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT, OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED OR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked “reserved” or “undefined.” Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your Intel account manager or distributor to obtain the latest specifications and before placing your product order.

Copies of documents that have an order number and are referenced in this document or in other Intel literature can be obtained from your Intel account manager or distributor.

CFG Gemini 19.04 Release Notes

About This Document

This document lists the release notes for CFG Gemini. Using CFG 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 Architects
* NoC Designers
* SoC Architects

Prerequisite

Before proceeding, you should generally understand:

* Basics of Network on Chip technology
* AMBA interconnect standards

Related Documents

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

* CFG NocStudio Gemini User Manual
* CFG Gemini IP Integration Spec

Customer Support

For technical support about this product and general information, contact CFG Support.

Revision History

|  |  |  |
| --- | --- | --- |
| Revision | Date | Updates |
| 0.0 | 04/08/2019 | Initial Version |

Contents

[1 Deliverables 7](#_Toc5727426)

[2 Installation 8](#_Toc5727427)

[2.1 Licensing 8](#_Toc5727428)

[2.2 Deliverables / Tarball set 8](#_Toc5727429)

[3 Feature Updates 10](#_Toc5727430)

[3.1 GUI Shortcuts 10](#_Toc5727431)

[3.2 Configurable Slave Block 10](#_Toc5727432)

[3.3 Multiple Hash Values targeted to Same Destination 10](#_Toc5727433)

[3.4 Support For Filtering Based on AID 10](#_Toc5727434)

[3.5 Multiple Q-Channel / NSPS Domain support on Slave Host 10](#_Toc5727435)

[3.6 New mesh property “arsons” support 10](#_Toc5727436)

[3.7 SAI support in Coherent designs 11](#_Toc5727437)

[3.8 Master port grouping for coherent traffic interleaving among CCCs 11](#_Toc5727438)

[3.9 CMI Support 11](#_Toc5727439)

[3.10 OCP Support 11](#_Toc5727440)

[3.11 Collage Support 11](#_Toc5727441)

[4 EDA Tool Compatibility 12](#_Toc5727442)

[5 Errata 13](#_Toc5727443)

[6 Changes to Commands and Properties 14](#_Toc5727444)

[6.1 Command Changes 14](#_Toc5727445)

[6.2 Default Property Changes 14](#_Toc5727446)

[6.3 Mesh Property Changes 14](#_Toc5727447)

[6.4 Bridge Property Changes 14](#_Toc5727448)

[6.5 Host Property Changes 15](#_Toc5727449)

[6.6 Interface Property Changes 15](#_Toc5727450)

[6.7 Link Property Changes 15](#_Toc5727451)

[6.8 Router Property Changes 15](#_Toc5727452)

[6.9 VC Property Changes 15](#_Toc5727453)

[6.10 CSB Storage Property Changes 15](#_Toc5727454)

# Deliverables

* CFG NocStudio Package contains N7 version of the tool supporting 16 layers and 256 bridges.
* NocStudio executable with interactive GUI.
* Verification checkers to be used in the DV environment.
* Sanity Test Bench.
* Documentation
  1. NocStudio User Manual: The User Guide describes how to set up a system using NocStudio and how to use it to generate CFG IP.
  2. IP Integration Spec: The Integration Manual describes how to integrate a configured network into a larger subsystem.
  3. 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.

# Installation

## Licensing

NocStudio uses FlexLM based licensing hosted by Intel Central Licensing group using two dedicated license servers: one in Santa Clara and the other is located in Israel.

In addition to LM\_PROJECT, a linux environmental variable *NETSPD\_LICENSE\_FILE* shall be set as shown below in order to access the licenses. The LM\_PROJECT is essential for users not to check out the wrong combination of license features by accident.

setenv NETSPD\_LICENSE\_FILE [7010@netspeed01p.elic.intel.com:7010@netspeed02p.elic.intel.com](mailto:7010@netspeed01p.elic.intel.com:7010@netspeed02p.elic.intel.com)

For teams without LM\_PROJECT defined, a node-locked license file may be issued. Simply copy over the license file under NocStudio installation directory and renamed it as “license.dat”. If the license file resides in a separated folder, user may set environment variable *LM\_LICENSE\_FILE* before opening NocStudio.

## Deliverables / Tarball set

The CFG IPs and their configuration tool NocStudio have been packaged individually for maximum flexibility allowing mix and match. Each release is tagged with <yy><mm> where yy is the last 2 digits of the year and mm is the month in integer. As an example, release in Jan 2019 will be referenced as 1901 release. Un-tar all individual tarballs delivered as part of the tarball set using the command below.

linux% tar zxvf <tarball\_name>.tar.gz

Here is a snippet of tarball set in 1904 release: netspeed-<release>.<package>.tar.gz

**Tarball name Description Category**

netspeed-1904.tar.gz NocStudio Base  
netspeed-1904.iculibpkg.tar.gz Unicode ICU lib package Base

netspeed-1904.cruxpkg.tar.gz Crux IP package (non-AMBA) NSIP IP

netspeed-1904.orionpkg.tar.gz Orion IP package AMBA IP  
netspeed-1904.geminipkg.tar.gz Gemini IP package AMBA IP  
netspeed-1904.pegasuspkg.tar.gz Pegasus IP package AMBA IP

netspeed-1904.ocppkg.tar.gz OCP support package Connectivity  
netspeed-1904.daupkg.tar.gz Deadlock Avoidance Unit System

netspeed-1904.syscpkg.tar.gz SysC (PA) support package Flow

netspeed-1904.cpp61pkg.tar.gz C++ Modeling API support Flow  
package for gcc 6.1

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

# Feature Updates

## GUI Shortcuts

Keyboard shortcuts for switching tooltip ON and OFF (Ctrl + t), display nodes as (X,Y) or Grid number (Ctrl + n) and enable web browser to open the noc\_reference\_manual.html after gen\_ip automatically or not (Ctrl + g) have been added in the new release.

## Configurable Slave Block

In the current release, the Configurable Slave Block has been enhanced with low-power and full registers support. This is a feature complete release.

## Multiple Hash Values targeted to Same Destination

In this release, NocStudio allows user to define the same member multiple times in a group (ccc, ice, llc, ram, cache, slave groups) which removes the power-of-2 restriction defined in a group in prior releases. As an example, the command below allows user to specify ccc0 twice resulting 50% load and both ccc1 and ccc2 get 25% each using address bits [11:10] as slicing bits.

add\_ccc\_group grp1 -members ccc0 ccc0 ccc1 ccc2 -slice\_bits 0xC00

## Support For Filtering Based on AID

In this release, the performance statistical counter can now filter events based on the transaction IDs. Please refer to the programming model chapter (AXIM\_EVENT\_CAPTURE\_ID\_\* registers) for details.

## Multiple Q-Channel / NSPS Domain support on Slave Host

In this release, NocStudio allows user to define multiple Q-channel interfaces along with its corresponding NSPS (Netspeed Power Supervisor) on an external slave host which is in a single power domain) using “add\_qchannel\_domain” and bridge property “qchannel\_domains\_host”. All qchannels are automatically added to the power domain dependency derivation which means all these domains need to be active for transactions destined to this slave host.

## New mesh property “arsons” support

In this release, user can use this mesh property to map Address Request (AR) channel on NOC using the sideband wires which doesn’t have the limitation of power-of-2 multiplication when wiring resource is not enough. This can remove un-necessary NOC wire overhead for the AR channel.

## SAI support in Coherent designs

In this release, user can set bridge property to enable SAI field in a coherent design.

## Master port grouping for coherent traffic interleaving among CCCs

In this release, NocStudio supports the concept of a master grouping. Similar to slave grouping, user can assign N number of coherent masters (N is power-of-2) to a master group using “add\_master\_group” command with a hash function or desirable slice bits. For hosts with multiple coherent master ports, NocStudio constructs the NOC in such way that coherent requests interleave among multiple coherent agents (CCCs) for an optimized implementation.

***Preliminary Features***

## CMI Support

In this release, a license controlled CMI support has been added. Please contact CFG support for details.

## OCP Support

In this release, a license controlled OCP support has been added. Please contact CFG support for details.

## Collage Support

In this release, NocStudio has the capability to generate preliminary collaterals for Collage. This is a license-controlled feature, please contact CFG support for details.

# EDA Tool Compatibility

* Cadence EDA tools were used for verification and synthesis of this product.
* Incisive RTL Simulator 15.22.018
* Design Compiler RTL Synthesis N-2017.09-SP3
* HAL Linting tool 15.20.027
* Conformal 16.20.s240
* Compatibility testing has been done with VCS N-2017.12-SP2-4.
* For Platform Architect, used GCC version is gcc-6.1.0a. (Backward compatible upto gcc-5.2.0-64)
* Please refer to IP Integration specification to enable/disable specific CFG checker in order to resolve or workaround any verification related issues, if any.

Contact your CFG or Synopsys support team for assistance.

# Errata

None

# Changes to Commands and Properties

## Command Changes

|  |  |
| --- | --- |
| **Command Name** | **Comment** |
| add\_qchannel\_domain | Command to add a new Q-channel domain |
| del\_qchannel\_domain | Command to remove a Q-channel domain |
| list\_qchannel\_domains | Command to list all Q-channel domains |
| add\_master\_group | Command to add a new master group |
| del\_master\_group | Command to delete a specific master group |
| list\_master\_groups | Command to list all the master groups |
| add\_csb\_range\_filter | Command to add a security range filter to a configurable slave block |
| del\_csb\_range\_filter | Command to delete a range filter from a configurable slave block |
| list\_csb\_range\_filters | Command to list all the range filters in one or more configurable slave blocks |

## Default Property Changes

None

## Mesh Property Changes

|  |  |  |
| --- | --- | --- |
| **Property Name** | **Default Value** | **Comment** |
| ar\_on\_sb | no | Command to use sideband to carry ar data |
| b\_on\_sb | no | Command to use sideband to carry b data |

## Bridge Property Changes

|  |  |  |
| --- | --- | --- |
| **Property Name** | **Default Value** | **Comment** |
| axi4s\_drain\_b\_response | no | Command to indicate whether axi4s device has pre-allocated space for B response packets to drain into the bridge |
| qchannel\_domains\_host |  | Command to set the list of Q-channel domains on the host side of the bridge |
| ocpm\_pipelining\_level | 0 | Command to set the level of pipelining for timing, latency and area trade-off |

## Host Property Changes

|  |  |  |
| --- | --- | --- |
| **Property Name** | **Default Value** | **Comment** |
| cc\_directory\_hash\_mode | hash\_w\_tag\_reversed | Command to specify the type of hashing used in the directory for the CCC |

## Interface Property Changes

None

## Link Property Changes

None

## Router Property Changes

None

## VC Property Changes

None

## CSB Storage Property Changes

None

Intel Corporation

2200 Mission College Blvd,

Santa Clara, CA - 95054.