RELEASE NOTES

NOTE: **The SystemRDL 1.0 Standard** was transferred to Accellera upon the merger of Accellera Systems Initiative with Accellera Organization in 2010. The terms of use of the SystemRDL package are detailed in the "Notices" section of the document "SystemRDL Terms of Use 2012", and are the governing terms and supersede all previous terms and apply to all sections of this specification including the documentation, examples, and grammar.

Document Name:	Register Description Working Group Release Notes 1.0.3
SystemRDL Version:	1.0
First Date of Issue:	May 11th 2009
Author:	The Members of the SPIRIT Register Description Working Group
Purpose:	To provide a description of the SystemRDL 1.0 Package

Announcement Text:

In May 2009, Accellera Systems Initiative announced the release of the SystemRDL specification. SystemRDL is a language for the design and delivery of registers to be used in IP blocks within electronic designs.

The SystemRDL semantics support the entire life-cycle of registers from specification, model generation, and design verification to maintenance and documentation. Registers are not just limited to traditional configuration registers, but can also refer to register arrays and memories. The SystemRDL language has been designed to increase productivity, quality, and reuse during the design and development of complex digital systems. It can and has been used to share IP within and between groups, companies, and consortiums.

This is accomplished by specifying a single source for the register description from which all views, software, hardware and documentation, can be automatically generated, which ensures consistency between multiple views. A view is any output generated from the SystemRDL description, e.g., RTL code or documentation. These views include the production of IP-XACT descriptions. SystemRDL is used by many teams to tersely capture a human readable and writable description from which the rest of the deliverables are produced.

"*Accellera Systems Initiative would like to gratefully acknowledge the Contribution of SystemRDL to The Consortium by Denali. This contribution provides the industry with a language to comprehensively describe registers and has extended the IP-XACT register descriptions extensively thereby also extending the uses of the IP-XACT standard into many practicable design areas,*" says Ralph von Vignau, president of The Consortium. "*SystemRDL together with the next release of IP-XACT v1.5 will provide the industry with a welcome design environment to manage and create registers in complex designs.*"

For more information, see:
www.accellera.org/activities/committees/systemrdl/

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1   ABOUT THIS DOCUMENT

1.1   Purpose of this Document

This document acts as a guide to the release bundle.

This document provides information for users to adopt the specification against their own design flows, tools and Intellectual Property (IP).

1.2   Access and license to material in document

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> Napa, CA 94558
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2   BACKGROUND OF THE REGISTER DESCRIPTION WORKING GROUP

The Register Description Working Group (RDWG) was originally chartered by the SPIRIT Board of Directors, and then later by the Board of Directors of Accellera Systems Initiative, to do the following:

1. Produce a specification for a register description language based on the work of the SystemRDL Alliance, whose language efforts were donated originally to The SPIRIT Consortium and then through mergers to Accellera Systems Initiative.
2. Validate the specification with at least two reference implementations
3. Produce recommendations for IP-XACT schema changes required to capture the additional semantic information that can be expressed in the register description language standard.
4. Produce a converter from the register description language standard to IP-XACT.
5. Validate the converter.

To date, the work of the SystemRDL WG has been to review, augment, and update the original SystemRDL language definition (called SystemRDL in this bundle for historical reasons), and to create a proposed mapping from each SystemRDL language construct to IP-XACT. There are cases in which there is no current mapping to IP-XACT. In this case the SystemRDL WG took the liberty to propose an IP-XACT extension to all the information to be described. The SystemRDL WG realizes that the proposed extensions may not be approved, or even the best way to proceed, but it was a vehicle to allow us to make forward progress in parallel with resolving the mappings.

The 1.0 release is intended to drive the discussion of how many and what extensions should be made to IP-XACT to capture the extra information included in the SystemRDL language standard.
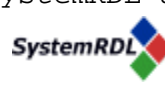
3   CONTENTS OF THE 1.0 RELEASE

3.1 Contents of the Bundle

If you are reading this file, then it is likely that you have successfully unpacked the bundle. If not, you may want to get the latest version of the bundle at: http://www.accellera.org/downloads/standards/

The structure of the bundle is as follows:

- `SystemRDL_1.0`
    - `Docs` – Documentation directory
      `SystemRDL_1.0_Standard.pdf` – The SystemRDL language standard.

      `SystemRDL_Release_Notes_1.0.pdf` – The document that you are reading.

      `SystemRDL.ico` – An icon file that can be used to indicate file type.

      `SystemRDL.png` – A graphic of SystemRDL used on the front cover of this set of notes:

    - `Examples` – Examples of SystemRDL descriptions and the mapping to IP-XACT.

    - `generic_rdl` – This example demonstrates a large number of SystemRDL constructs and their mapping into IP-XACT.

    - `generic_example.rdl` – the input SystemRDL
    - `generic_example.xml` – the output IP-XACT
    - ƒ `hier_intrpt` – This example demonstrates the SystemRDL capabilities for describing interrupt registers.
    - `interrupt.rdl` – the input SystemRDL
    - `interrupt.xml` – the output IP-XACT
    - ƒ `incr_cntr_test` – This example demonstrates the SystemRDL capabilities for describing counters.
    - `counter_example.rdl` – the input SystemRDL
    - `counter_example.xml` – the output IP-XACT
    - ƒ `leon2` – This example demonstrates the SystemRDL transformation of the Leon2 IP-XACT example. Please refer to the IP-XACT Examples for more information on the Leon2 example.

```
lock_and_key – This example demonstrates the SystemRDL
capabilities for describing fields which have a software
write-enable in another register.
```

```
In addition to the normal IP-XACT output, this example
contains a C file in which register write routines are
automatically generated from the IP- XACT description.
```

- lock_and_key.c – the output C routines
- lock_and_key.rdl – the input SystemRDL
- lock_and_key.xml – the output IP-XACT
- pci_example – This example demonstrates the register definitions for a more complex block. It also demonstrates the use of SystemRDL include files.
- pci.rdl – the input SystemRDL
- pci.xml – the output IP-XACT
- pci_bar.rdl – an input SystemRDL include file
- pci_enums.xml – an input SystemRDL include file
- sata_achi – This example demonstrates the register definitions for a more complex block a SATA AHCI Controller. It also demonstrates the use of include files and the perl pre-processor in SystemRDL.
- sata_achi_example.rdl – the input SystemRDL
- sata_ahci_example.xml – the output IP-XACT
- sata_constants.rdl – the constants that are needed to compile the sata_ahci_example.rdl file.
- sata_achi_example.ppp.rdl – the example after the Perl preprocessor has completed executed. Parameters have been resolved.

o   Grammar – The ANTLR Grammar for SystemRDL

- SystemRDL.g – The ANTLR 2.6 Grammar for SystemRDL
- SystemRDLLexer.html – An HTML representation of the lexer
- SystemRDLParser.html – An HTML representation of the parser

3.1.1 Documents

The Docs directory contains the SystemRDL language standard, which includes precise definitions for both syntax and semantics for the SystemRDL language.

3.1.2 Examples

This directory contains a number of sub-directories containing examples of the use of various features of SystemRDL and the translation from those features to IP-XACT using the proposed mappings. Every sub-directory contains one or more .rdl files and a corresponding .xml file which is the proposed translation to IP-XACT.

3.1.3 Grammar

This directory contains the ANTLR 2.6 grammar for the SystemRDL language as well as two html versions describing the lexer and the parser for SystemRDL.

4   KNOWN PROBLEMS AND SOLUTIONS

None.

4.1 Feedback

Comments and issues can be sent to the SystemRDL WG chair at systemrdl-chair@lists.accellera.org. General comments can be sent to info@accellera.org.