About These Release Notes

These release notes cover versions 9.1 through 10.1 of the Altera® Nios® II Embedded Design Suite (EDS). These release notes describe the revision history and errata for the Nios II EDS.

Errata are functional defects or errors, which might cause the product to deviate from published specifications. Documentation issues include errors, unclear descriptions, or omissions from current published specifications or product documents.

For the most up-to-date errata for this release, refer to the latest version of the Nios II Embedded Design Suite Release Notes and Errata on the Altera website. You can refer to release notes and errata for the Nios II processor core in the Nios II Processor chapter of the MegaCore IP Library Release Notes and Errata.

Revision History

Table 1 shows the revision history for the Nios II EDS, including the Nios II C2H Compiler.

Table 1. Nios II Embedded Design Suite Revision History  (Part 1 of 2)

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>10.1</td>
<td>December 2010</td>
<td>Maintenance release</td>
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</table>
| 10.0    | July 2010 | Nios II Software Build Tools (SBT) for Eclipse
  ■ Updated Eclipse to version 3.5 and Eclipse C/C++ development toolkit (CDT) to version 6.0
  ■ Improved Source File management
  ■ Supports Multi-CPU launch
  ■ Updated to Nios II GCC 4.1.2 tool chain
  ■ Supports both Nios II SBT for Eclipse and Nios II Command Shell
  ■ GCC 4 improves compilation time compared to GCC 3 on Windows
  ■ Host platform
  ■ Supports Windows 7
  ■ Supports SUSE Linux Enterprise 11
  ■ Support for SUSE Linux Enterprise 9 discontinued
  ■ New Nios II software design examples for Reduced Gigabit Media Independent Interface (RGMII)
  ■ Web Server (RGMII)
  ■ Simple Socket Server (RGMII)
  ■ Legacy hardware design examples (Stratix® II and Cyclone® II) are removed
  ■ Installer changes
  ■ Nios II EDS must be installed next to Quartus® II
|
Table 1. Nios II Embedded Design Suite Revision History (Part 2 of 2)

<table>
<thead>
<tr>
<th>Version</th>
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<td>9.1 SP2</td>
<td>March 2010</td>
<td>Maintenance release</td>
</tr>
<tr>
<td>9.1 SP1</td>
<td>January 2010</td>
<td>Maintenance release</td>
</tr>
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</table>
| 9.1     | November 2009| - The Nios II SBT for Eclipse, an integrated development environment based on Eclipse. Recommended for all new Nios II projects.  
- The Nios II Integrated Development Environment (IDE) is available in the Nios II EDS, but not recommended for new projects.  
- The Nios II Studio is discontinued.  
- The vectored interrupt controller (VIC) core offers high-performance, low-latency interrupt handling.  
- Nios II Design Examples with memory management unit (MMU):  
  - Nios II 3C120 Hardware Reference Design with MMU, Cyclone III Edition  
  - Nios II 4S230 Hardware Reference Design with MMU, Stratix IV GX Edition  
  Commercial and open-source support for embedded Linux is available for these systems.  
- The Embedded Systems Lab for DE1 for Quartus and Nios II EDS v9.1 is available for download from the Nios Community Wiki (www.nioswiki.com).  
- Tcl scripting for software packages and drivers enhanced to support callback functions.

For more information on new features and changes, refer to the Nios II Processor Reference Handbook, the Nios II Software Developer’s Handbook, and the Nios II C2H Compiler User Guide. For information about changes to the Nios II processor core, refer to the Nios II Processor chapter of the MegaCore IP Library Release Notes and Errata.

Deprecated Features

C2H SBT Command-Line Flow

The C2H command-line flow using `nios2-c2h-generate-makefile` is deprecated as of v10.0.

Notice about Environment Variables

The QUARTUS_ROOTDIR and SOPC_KIT_NIOS2 environment variables will be deprecated in a future release. If you have custom scripts that use these variables, you should be prepared to change them to be independent of these variables, or to set the environment variables yourself.
Revision Details

This section provides details about some of the Nios II EDS revisions shown in Table 1.

Nios II Software Build Tools for Eclipse

The Nios II Software Build Tools (SBT) for Eclipse is a set of plugins based on the popular Eclipse framework and the Eclipse C/C++ development toolkit (CDT) plugins. The Nios II SBT for Eclipse provides a consistent development platform that works for all Nios II processor systems. You can accomplish most Nios II software development tasks within Eclipse, including creating, editing, building, running, debugging, and profiling programs. The Nios II SBT for Eclipse is built from the ground up as a set of plugins to standard Eclipse. The Nios II SBT for Eclipse is based on the Nios II Software Build Tools, a set of powerful commands, utilities and scripts for creating applications, board support packages and software libraries, and managing build options.

Table 2 compares the Nios II Integrated Development Environment (IDE) with the Nios II SBT for Eclipse.

Table 2. Differences Between Nios II SBT for Eclipse and Nios II IDE  (Part 1 of 2)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Nios II IDE</th>
<th>Nios II SBT for Eclipse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of projects</td>
<td>■ Application</td>
<td>■ Application</td>
</tr>
<tr>
<td></td>
<td>■ Board support package (BSP)—Called a system library in the IDE</td>
<td>■ BSP</td>
</tr>
<tr>
<td></td>
<td>■ User Library (optional)</td>
<td>■ User Library (optional)</td>
</tr>
<tr>
<td>Handling updates to the SOPC</td>
<td>Updates the BSP automatically</td>
<td>You must initiate the BSP update (in the Nios II menu, click Generate BSP)</td>
</tr>
<tr>
<td>Builder system</td>
<td></td>
<td>■ New Application and BSP from template</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Standalone application</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Standalone BSP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Standalone library</td>
</tr>
<tr>
<td>Options for creating projects</td>
<td>Application from template. BSP is created automatically as part of application.</td>
<td>■ New Application and BSP from template</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Standalone application</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Standalone BSP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Standalone library</td>
</tr>
<tr>
<td>Handling updates to BSP</td>
<td>Entire BSP is rebuilt. This process can be time-consuming.</td>
<td>Smart rebuild only recompiles changed files</td>
</tr>
<tr>
<td>Compatibility with</td>
<td>None</td>
<td>Full compatibility with the Nios II SBT in the Nios II Command Shell</td>
</tr>
<tr>
<td>command-line flow</td>
<td></td>
<td>■ Full compatibility with the Nios II SBT in the Nios II Command Shell</td>
</tr>
<tr>
<td>Modifying BSP properties</td>
<td>Limited control over BSP properties through the System Library page of the Properties dialog box.</td>
<td>Full control over BSP properties through the BSP Editor</td>
</tr>
</tbody>
</table>
Converting IDE Projects to the Nios II SBT for Eclipse

If you have a pre-existing Nios II IDE project, before you can continue development in the Nios II SBT for Eclipse, you must convert it to the SBT and import it to the Eclipse environment. To convert and import an IDE project to the Nios II SBT for Eclipse, execute the following steps:

1. Convert the IDE project to an SBT-based project with the `nios2-convert-ide2sbt` command line utility.

2. Import the converted project to the Nios II SBT for Eclipse.

For a detailed description of the conversion process, refer to “Porting Nios II IDE Projects to the Software Build Tools” in the Using the Nios II Integrated Development Environment appendix of the Nios II Software Developer’s Handbook. For a description of the process of importing a project, refer to “Importing a Command-Line Project” in the Getting Started with the Graphical User Interface chapter of the Nios II Software Developer’s Handbook.

Learning about the Nios II SBT for Eclipse

Refer to the following documents to help you get acquainted with the Nios II SBT for Eclipse and related tools:

- Getting Started with the Graphical User Interface chapter of the Nios II Software Developer’s Handbook
- Nios II Hardware Development Tutorial
- The Comprehensive Nios II Embedded Design Suite support page
- The Nios II Software Build Tools for Eclipse support page
Errata Summary

Table 3 summarizes the issues that affect the Nios II Embedded Design Suite versions 9.1 through 10.1. For a detailed description of each issue, click on the issue name.

Refer to the Altera Knowledge Database for older errata and solutions.

Table 3. Nios II EDS Errata (1) (Part 1 of 6)

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<td></td>
<td></td>
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<td>10.1</td>
</tr>
<tr>
<td></td>
<td>Nios II SBT for Eclipse</td>
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<tr>
<td>Jan 2011</td>
<td>No .sopcinfo File Name Shown in Nios II BSP Properties Page</td>
<td>10</td>
<td>✓</td>
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<tr>
<td></td>
<td>Only One Thread Visible When Debugging MicroC/OS-II Application</td>
<td>10</td>
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<td>Nios II SBT for Eclipse Unable to Create New Application and BSP from Template</td>
<td>11</td>
<td>✓</td>
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<td></td>
<td>Nios II Consoles Do Not Work With Multiprocessor Project</td>
<td>11</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Nios II SBT for Eclipse Hangs When Project Run as Nios II Hardware</td>
<td>11</td>
<td>✓</td>
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<tr>
<td></td>
<td>Run As Nios II ModelSim Does Not Work</td>
<td>12</td>
<td>✓</td>
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<tr>
<td></td>
<td>Run Configuration Cannot Find Imported Custom Makefile Project</td>
<td>12</td>
<td>Fixed</td>
</tr>
<tr>
<td></td>
<td>SBT for Eclipse Creates NicheStack BSP Incorrectly</td>
<td>13</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Nios II SBT for Eclipse Cannot Step into GCC 3 Library Source Code</td>
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<td>Errors Creating or Importing Software Projects</td>
<td>14</td>
<td>Fixed</td>
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<tr>
<td></td>
<td>Build Errors on Software for Pre-Existing Design with SG-DMA</td>
<td>14</td>
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<td>Spurious System ID Mismatch Error</td>
<td>14</td>
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<td>Errors Debugging as Local C/C++ Application</td>
<td>15</td>
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<td>java.lang.NullPointerException Error When Running Application</td>
<td>15</td>
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<td>Update Failure When Setting Empty Properties in the Nios II Properties Page</td>
<td>16</td>
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<td>DHCP Time-Out on EP3C120</td>
<td>16</td>
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<td>No Nios II Multiprocessor Collection Run Configuration</td>
<td>17</td>
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<tr>
<td></td>
<td>Project Imported From Command Line Fails to Build Correctly</td>
<td>17</td>
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<tr>
<td>Sep 2010</td>
<td>The Restart Button in the Debugger Does Not Work</td>
<td>17</td>
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### Table 3. Nios II EDS Errata (1) (Part 2 of 6)

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<td>July 2010</td>
<td>Error Building Imported Project: ‘No rule to make target’</td>
<td>18</td>
<td>✓</td>
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<tr>
<td></td>
<td>Error Building Imported Project: ‘target pattern contains no %’</td>
<td>19</td>
<td>✓</td>
</tr>
<tr>
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<td>Missing Nios II Perspective</td>
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<td>Error Debugging Imported Project: ‘Can’t find a source file’</td>
<td>19</td>
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<td>Error Marker Persists on BSP Project After Build Error Corrected</td>
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<td>Assembly Language Source File Not Found</td>
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<td>‘Exclude from build’ Not Supported</td>
<td>20</td>
<td>✓</td>
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<tr>
<td>May 2010</td>
<td>Nios II Options Do Not Appear in Eclipse</td>
<td>21</td>
<td>✓</td>
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<tr>
<td>Nov 2009</td>
<td>Error Messages on Console When Debugging</td>
<td>21</td>
<td>✓</td>
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<tr>
<td></td>
<td>Errors Converting Nios II IDE Multiprocessor Project</td>
<td>22</td>
<td>✓</td>
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<tr>
<td></td>
<td>Stop on Startup Option in Run Configuration Has No Effect</td>
<td>22</td>
<td>✓</td>
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<tr>
<td></td>
<td>Debugger Breaks in crt0.s Instead of main()</td>
<td>22</td>
<td>✓</td>
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<td></td>
<td><strong>C2H Compiler</strong></td>
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<td>C2H Compiler Does Not Work in the Nios II Command Shell with GCC 4</td>
<td>22</td>
<td>✓</td>
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<tr>
<td>Jul 2008</td>
<td>Functions Declared Without a Return Type Are Not Supported</td>
<td>23</td>
<td>✓</td>
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<td>Oct 2007</td>
<td>Pre-7.1 Systems Are Not Supported</td>
<td>23</td>
<td>✓</td>
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<td>--src-dir SBT Argument Does Not Work With C2H</td>
<td>23</td>
<td>✓</td>
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<td>May 2007</td>
<td>Accelerator Generation Failure If Tools Are Installed in Path With</td>
<td>23</td>
<td>✓</td>
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<tr>
<td></td>
<td>Spaces</td>
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<td>The C2H Compiler Regenerates an Accelerator Unnecessarily</td>
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<td>Error: c2h_accelerator_base_addresses.h: No such file or directory</td>
<td>24</td>
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<td>Java Heap Space Exception if Quartus II Compilation is Enabled</td>
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<td>Pointer Dereferences to Volatile Types</td>
<td>25</td>
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<td>C2H Compiler Does Not Accelerate Subfunctions Located in a Separate</td>
<td>25</td>
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<td>File</td>
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<td>Jun 2006</td>
<td>Array Elements in Structures Do Not Copy Correctly</td>
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<td>Clean Build Causes Build Failure</td>
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<td>Changing Build Configurations Produces Unexpected Results</td>
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<td>Hardware Accelerators Remain After Deleting the Software Project (2)</td>
<td>27</td>
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<td>Incorrect Results From Logical or Conditional Operation With</td>
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<td>Side-Effects</td>
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<td>Launch SOPC Builder Button in C2H View</td>
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## Table 3. Nios II EDS Errata (1) (Part 3 of 6)

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<td>Development Boards</td>
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<td>Intermittent Failures While Accessing CompactFlash Card</td>
<td>28</td>
<td>✓</td>
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<tr>
<td>Documentation Issues</td>
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<tr>
<td>Jan 2011</td>
<td>Incorrect information about Embedded C++</td>
<td>29</td>
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<td></td>
<td>Missing Documentation of Interrupt API Properties</td>
<td>30</td>
<td>—</td>
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<td>Error Message on Invalid Exception or Reset Vector</td>
<td>30</td>
<td>—</td>
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<tr>
<td>July 2010</td>
<td>Error Building Project: ‘No rule to make target’</td>
<td>31</td>
<td>✓</td>
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<td>AN543 Contains Incorrect Information about Updating the Flash</td>
<td>32</td>
<td>✓</td>
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<td>Incorrect Information about Floating-Point Instruction Precision</td>
<td>32</td>
<td>—</td>
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<tr>
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<td>Eclipse CDT Features Not Supported by Nios II Plugins</td>
<td>33</td>
<td>✓</td>
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<tr>
<td>May 2010</td>
<td>Incorrect Information about Nested Exceptions</td>
<td>35</td>
<td>✓</td>
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<tr>
<td>Feb 2010</td>
<td>Valid Range of hal.log_flags is –1 to 3</td>
<td>35</td>
<td>✓</td>
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<td>Error Message After Renaming Project: “Resource is out of sync with the system”</td>
<td>36</td>
<td>✓</td>
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<tr>
<td>Mar 2009</td>
<td>Compiler Flags for Building Custom Newlib</td>
<td>36</td>
<td>✓</td>
</tr>
<tr>
<td>Oct 2007</td>
<td>Nios II IDE Online Help Expand Buttons Do Not Work</td>
<td>37</td>
<td>✓</td>
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<tr>
<td>Hardware Abstraction Layer</td>
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<tr>
<td>Jan 2011</td>
<td>“unused variable” Warning When Building alt_main.c</td>
<td>38</td>
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<tr>
<td></td>
<td>Build Warnings in Performance Counter Driver Files</td>
<td>38</td>
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<tr>
<td>Feb 2010</td>
<td>Missing Structure Member Errors in alt_log_printf.c with Small JTAG UART Driver</td>
<td>39</td>
<td>✓</td>
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<tr>
<td></td>
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<td>Hardware Example Designs</td>
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<tr>
<td>Jan 2011</td>
<td>Quartus II Compilation Warnings for Nios II Stratix II 2S60 ROHS Example</td>
<td>39</td>
<td>✓</td>
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<td>Software Examples</td>
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<tr>
<td>Jan 2011</td>
<td>Hardware Tutorial Software Example Hangs on Some Boards</td>
<td>40</td>
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<td>Jun 2006</td>
<td>Networking Examples</td>
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<td>Flash Programmer</td>
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<td>Feb 2010</td>
<td>Unable to Configure FPGA from Flash with Parallel Flash Loader</td>
<td>41</td>
<td>—</td>
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<tr>
<td>Dec 2006</td>
<td>elf2flash File Size Limit</td>
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<td>Hardware Simulation</td>
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<tr>
<td>Jan 2011</td>
<td>Vectored Interrupt Controller Does Not Support VHDL Simulation Models</td>
<td>42</td>
<td>—</td>
</tr>
<tr>
<td>Dec 2006</td>
<td>Error “UNC paths are not supported” Launching ModelSim</td>
<td>42</td>
<td>✓</td>
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<td>Jun 2006</td>
<td>Uninitialized .bss Variables in Simulation</td>
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### Table 3. Nios II EDS Errata (1) (Part 4 of 6)

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<td><strong>Host Platform</strong></td>
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<tr>
<td>Jan 2011</td>
<td>Nios II EDS Requires Administrative Permissions on Windows Vista and Windows 7</td>
<td>43</td>
</tr>
<tr>
<td>Nov 2009</td>
<td>Cannot Launch Nios II SBT for Eclipse on Red Hat Linux</td>
<td>43</td>
</tr>
<tr>
<td>Dec 2007</td>
<td>Windows/Cygwin: Nios II Processor Generation Failure</td>
<td>43</td>
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<td>Jan 2011</td>
<td>Nios II SBT Creates Spurious BSP for System with MMU</td>
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<td>Error Running Nios II Project: 'Downloading ELF Process failed'</td>
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<td>User-Managed BSP Settings Not Supported in Nios II IDE</td>
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<td>Jan 2011</td>
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<td>58</td>
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<td>cout From MicroC/OS-II Task Does Not Send Data to stdout</td>
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<td>Warning Message: &quot;'pragma_reverse_bitfields' attribute directive ignored&quot;</td>
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<td>nios2-download Cannot Find JTAG Instance IDs</td>
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<td>nios2-console Does Not Work in the GCC 4 Command Shell</td>
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<td>✓</td>
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Table 3. Nios II EDS Errata (1) (Part 6 of 6)

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<td>Dec 2006</td>
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<td>GNU Assembler Does Not Accept the --defsym Flag</td>
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</table>

Notes to Table 3:
(1) Refer to the Altera Knowledge Database for older errata and solutions.
(2) For further information, refer to the Nios II C2H Compiler User Guide.

Nios II SBT for Eclipse Errata

This section describes in detail the issues related to the Nios II SBT for Eclipse.

No .sopcinfo File Name Shown in Nios II BSP Properties Page

In the Nios II SBT for Eclipse, the SOPC Info field in the Nios II BSP properties page should display the .sopcinfo filename for the underlying hardware design. In the Nios II SBT for Eclipse running on the Windows operating system, this field is empty.

**Design Impact**

The SOPC Info field is a read-only field. This issue does not affect functionality.

**Workaround**

None needed.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.

Only One Thread Visible When Debugging MicroC/OS-II Application

When you use GCC 4 tool chain, the Nios II SBT for Eclipse debugs a multi-threaded application as if it were a single-threaded application.

**Workaround**

Use GCC 3 tool chain.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.
Nios II SBT for Eclipse Unable to Create New Application and BSP from Template

You should be able to create a new application and BSP from a template with the following steps:

1. Select **Nios II Application and BSP from Template**.
2. Choose your .sopcinfo file and select a template.
3. Click **Select an existing BSP project from your workspace**.
4. Click **Create**.
5. Choose the desired BSP options.
6. Click **Finish**.

However, if you try to create a new application and BSP with this method, the SBT creates a BSP, but no application, and the GUI becomes unresponsive.

**Workaround**

Perform the following steps:

1. Click **Cancel** to close the previous GUI.
2. Select **Nios II Application and BSP from Template** again.
3. Choose your .sopcinfo file and select a template.
4. Click **Select an existing BSP project from your workspace**.
5. From the BSP list, select the BSP created previously.
6. Click **Finish**.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.

Nios II Consoles Do Not Work With Multiprocessor Project

Launch groups do not work with multiple JTAG UARTs in multiprocessor projects.

When you launch a multiprocessor software project with a launch group, if the design uses multiple JTAG UARTs, multiple Nios II consoles appear, but only one of them is active.

**Workaround**

Launch the software projects individually.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.

Nios II SBT for Eclipse Hangs When Project Run as Nios II Hardware

On Windows, the Nios II SBT for Eclipse sometimes becomes unresponsive when you try to run (or debug) a project with the **Run as Nios II Hardware** (or **Debug as Nios II Hardware**) command.
**Workaround**

In the Run Configuration (or Debug Configuration) dialog box, on the Target Connection tab, click Refresh Connections before running (or debugging) the application. Each time you restart the SBT for Eclipse, you must perform this step for each application you wish to run or debug.

Alternatively, visit the MySupport website and request Quartus® II 10.1 patch 0.18.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.

---

**Run As Nios II ModelSim Does Not Work**

In the Windows operating system, if you try to run an application with the Run As Nios II ModelSim command, you see the following error message:

No such file or directory

**Workaround**

Visit the MySupport website and request Quartus II 10.1 patch 0.18.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.

---

**Run Configuration Cannot Find Imported Custom Makefile Project**

After you import a project using the Import Custom Makefile for Nios II Software Build Tools Project option, the Nios II SBT fails to recognize the imported custom makefile as a Nios II C/C++ application project. As a result, the project name does not appear in the list in the run configuration.

**Workaround**

1. In the Run Configuration dialog box, select any visible Nios II C/C++ project. The project need not be related to your custom makefile project.

   ![If there is no Nios II C/C++ project in your workspace, create a dummy project, such as Hello World, through the File menu, by clicking New, Nios II Application and BSP from Template.]

2. Turn on Enable browse for file system ELF file.
3. Browse to the correct .elf file for your custom makefile project to complete creation of a run configuration.

**Solution Status**

Fixed in v10.1 of the Nios II EDS
SBT for Eclipse Creates NicheStack BSP Incorrectly

NicheStack applications encounter runtime failures if you use the following steps to create a NicheStack BSP:

1. Create a new Nios II Board Support Package with the BSP type selected as Micrium MicroC/OS-II. Notice that the HAL component generates `alt_syscall.h`.
2. Using the Nios II BSP Editor, in the Software Packages tab, select `altera_iniche`. Save and build the BSP. Notice that the NicheStack (iniche) component generates another `alt_syscall.h`.

`public.mk` includes the HAL header files before the NicheStack header files. This causes the HAL `alt_syscall.h` to be used in the build, instead of the required `alt_syscall.h` from the NicheStack component.

If a NicheStack application links to such a BSP, the application builds successfully, but encounters runtime failures that are difficult to debug.

Workaround

Manually edit `public.mk`. Under Software Component & Driver Include Paths, rearrange the include paths to include the NicheStack header files before the HAL header files.

In general, include paths should appear in the following order:

1. Drivers
2. Software packages
3. Extended BSP type (e.g., MicroC/OS-II)
4. Base BSP type (HAL)

Example 1 shows include path directories added in the correct order.

Example 1. Include Path Ordering in `public.mk`

```
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/drivers/inc
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/drivers/inc/iniche
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/iniche/inc
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/iniche/src/h
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/iniche/src/h/nios2
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/iniche/src/nios2
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/UCOSII/inc
ALT_INCLUDE_DIRS += $(ALT_LIBRARY_ROOT_DIR)/HAL/inc
```

Solution Status

Fixed in v10.0 of the Nios II EDS

Nios II SBT for Eclipse Cannot Step into GCC 3 Library Source Code

If your project uses the Nios II GCC 3 toolchain, when debugging with the Nios II SBT for Eclipse, you might be unable to step into library source code. A message such as the following message appears:

```
Resource '/xxx/xxx.c' does not exist.
```
**Workaround**
Upgrade to the Nios II EDS v10.0 or later and use the Nios II GCC 4 toolchain.

**Solution Status**
Fixed in v10.0 of the Nios II EDS

---

**Errors Creating or Importing Software Projects**

If you place software projects in your Eclipse workspace directory, you might experience project-related errors. For example, you might see one of the following error messages:

- Unable to create project  
  Reason: Unable to create project in workspace directory
- Failed to import  
  Reason: Unable to import project

**Workaround**
Switch to a different workspace, or create a new workspace, separate from your project files. To switch workspaces or create a workspace, on the File menu, click **Switch Workspace**.

**Solution Status**
Fixed in v10.0 of the Nios II EDS

---

**Build Errors on Software for Pre-Existing Design with SG-DMA**

If you have a Nios II system generated with SOPC Builder v. 9.0 or earlier, and it contains the Scatter-Gather DMA (SG-DMA) component, you cannot build software for it with the Nios II SBT for Eclipse v. 9.1 or later. If you attempt to do so, the Nios II compiler reports errors.

**Workaround**
Regenerate the design with SOPC Builder v. 9.1 or later before attempting to compile the software in the Nios II SBT for Eclipse.

**Solution Status**
Fixed in v10.0 of the Nios II EDS

---

**Spurious System ID Mismatch Error**

You might see the following error message when attempting to run or debug a Nios II software project, or to edit a launch configuration:

```
[Target Connection]: System ID mismatch - actual: "0xffffffff", expected: "<system id>
```

*<system id> is replaced by the system ID in your software project. When this error occurs, you cannot run or debug software.*
This error normally means that the FPGA is unconfigured, or configured with a .sof file that does not correspond to your software project. However, the error occasionally appears even when the FPGA is configured with the correct .sof.

Workaround
After verifying that the FPGA is configured with the correct .sof, you can use one of the following methods to work around this issue:

- In the Run Configuration or Debug Configuration dialog box, on the Target Connection tab, click Refresh Connections repeatedly until the error message disappears.
- Delete the launch configuration and create a new launch configuration.

Solution Status
Fixed in v10.0 of the Nios II EDS

Errors Debugging as Local C/C++ Application
If you try to debug a Nios II software project as the Local C/C++ Application launch configuration type, you see one of the following errors, depending on your platform:

- Windows: “Error creating session”
- Linux: “Execution is suspended because of error”

The Nios II debug perspective fails to open.

This is expected CDT behavior in the Eclipse platform. Local C/C++ Application is the launch configuration type for a standard CDT project. To invoke the Nios II plugins, you must use a Nios II launch configuration type.

Workaround
Always debug Nios II software projects as the Nios II Hardware launch configuration type.

Solution Status
Fixed in v10.0 of the Nios II EDS

java.lang.NullPointerException Error When Running Application
When you attempt to run or debug an application, the Nios II SBT for Eclipse might show an internal error message similar to the following:

```
Launching New_configuration java.lang.NullPointerException
```

This error occurs in either of the following circumstances:

- You attempt to run your project without rebuilding after performing a make clean.
- You delete a run configuration belonging to your project while the project is running.

You must restart Nios II SBT for Eclipse to recover from this error.
**Workaround**
Build the project before attempting to run or debug it. Do not delete a run configuration while it is in use.

**Solution Status**
Fixed in v10.0 of the Nios II EDS

**Update Failure When Setting Empty Properties in the Nios II Properties Page**
If you use the Nios II Properties page to update more than one board support package (BSP) setting to the empty string (""), the BSP is not updated.

**Workaround**
You can use either of the following workarounds to set multiple BSP settings to the empty string:
- Use the keyword none instead of "" to set settings to the empty string.
- Use the BSP Editor instead of the Nios II Properties page.

**Solution Status**
Fixed in v9.1 of the Nios II EDS

**DHCP Time-Out on EP3C120**
If you create a project based on the web server template targeting the Altera Embedded Systems Development Kit, Cyclone® III Edition (EP3C120) board, the system is unable to get an IP address at startup. DHCP times out and the system reverts to the default IP address.

**Workaround**
Create the project in the Nios II Command Shell and then import it to the Nios II SBT for Eclipse, by executing the following steps:

1. In the Nios II Command Shell, navigate to the following path:
   
   `<Nios II EDS install path>/examples/<language>/niosII_cycloneIII_3c120/tserd/software_examples/app/web_server_tse_3c120_rgmii`

   where `<language>` is either vhdl or verilog.

2. Type the following command to create a web server example for the EP3C120 kit:
   ```
   create-this-app
   ```

3. Import the command-line project to the Nios II SBT for Eclipse.

   For information about importing command-line projects, refer to “Importing a Command-Line Project” in the Getting Started with the Graphical User Interface chapter of the Nios II Software Developer’s Handbook.

**Solution Status**
Fixed in v10.0 of the Nios II EDS
No Nios II Multiprocessor Collection Run Configuration

The multiprocessor collection run configuration is not available in the Run menu. Therefore, you cannot use a single run configuration to download Executable and Linking Format Files (.elf) to run on multiple Nios II processors in the Nios II SBT for Eclipse.

Workaround

Create a separate run configuration for each Nios II processor in the hardware design, and launch them one at a time

Solution Status

Fixed in v10.0 of the Nios II EDS

Project Imported From Command Line Fails to Build Correctly

If you try to import a command-line project to the Nios II SBT for Eclipse, and your project has source files located outside the project folder, the Nios II SBT for Eclipse fails to build your project because the makefile does not include source files located outside the project folder.

Workaround

You can work around this issue with either of the following methods:

■ When importing the project, disable source management through the Nios II Application Properties or Nios II Library Properties dialog box.
  - You must manually keep your makefile updated to reflect source files added to or removed from the project.

■ Manually link the affected source files to the project. Right-click the project, click Properties, expand C/C++ General, select Paths and Symbols and then Source Location, and click Link Folder.

Solution Status

Fixed in v10.0 of the Nios II EDS

The Restart Button in the Debugger Does Not Work

When debugging in the Nios II SBT for Eclipse, if you click the Restart icon, execution is suspended, with the following error message:

Don't know how to run. Try "help target."

Workaround

Terminate the program, download it again, and start the debugger.

Solution Status

This issue will be fixed in a future release of the Nios II EDS.
Error Building Imported Project: ‘No rule to make target’

If an application or library project is created with v9.1 SP2 or earlier (using the GCC 3 toolchain), and you import it to the v10.0 Nios II SBT for Eclipse using the GCC 4 toolchain, you might see the build error shown in Example 2.

Example 2.

```
make all
make --no-print-directory -C ..\hw_bsp
make[1]: *** No rule to make target `\cygdrive/c/tmp/verilog_niosII_stratixII_2s60_standard/software/hw_bsp/alt_sys_init.c', needed by `all'. Stop.
make: *** [\cygdrive/c/tmp/hw_bsp-recurs-make-lib] Error 2
```

This error can also happen if you import a GCC 3 project to the v10.0 SBT for Eclipse using the GCC 3 toolchain, and later change the toolchain to MinGW Nios II GCC4. This issue only affects platforms running the Windows operating system.

Workaround

To avoid this error, follow these steps:

1. Edit the application project and library project makefiles and add the italicized code as shown in Example 3.

Example 3.

```
#ifndef COMSPEC
    ifdef ComSpec
        COMSPEC = $(ComSpec)
    endif # ComSpec
    ifdef !COMSPEC
        #end of inserted code
#endif

ifdef COMSPEC
    adjust-path = $(shell cygpath -u "$1")
    adjust-path-mixed = $(shell cygpath -m "$1")
    else
        adjust-path = $1
        adjust-path-mixed = $1
endif
```

2. Right-click the BSP project, point to Nios II and click Generate BSP.

3. Clean and rebuild the application and library projects.
**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

**Error Building Imported Project: ‘target pattern contains no %’**

If your application or library makefile uses an absolute path and is generated with the GCC 3 toolchain, and you import it to the v10.0 Nios II SBT for Eclipse using the GCC 4 toolchain, you get the following build error:

```
makefile:587: *** target pattern contains no '%'. Stop.
```

**Workaround**
Recreate the project using the SBT for Eclipse v10.0.
Alternatively, use the GCC 3 toolchain.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

**Missing Nios II Perspective**

If you launch the Nios II SBT for Eclipse from a universal naming convention (UNC) path, the Nios II perspective does not appear in Eclipse.

This issue appears only on platforms running the Windows operating system.

**Workaround**
Do not use a UNC path to launch the Nios II SBT for Eclipse. For example, if the SBT for Eclipse is installed on a network drive, map the network path to a Windows drive letter.

**Solution Status**
Not fixed

**Error Debugging Imported Project: ‘Can't find a source file’**

If you create a project using the Nios II SBT in the Nios II Command Shell, and then import the project to Nios II SBT for Eclipse for debugging, the debugger cannot find source files located outside of project folder.

Example of error message:

```
Can't find a source file at "../src/test.c"
```

**Workaround**
To link the affected source files to the project, follow these steps:
1. Right-click the project and click Properties to open the Properties dialog box.
2. Click + to expand C/C++ General, and click the Paths and Symbols tab.
3. Click the Source Location tab.
4. Click Link Folder and navigate to the folder containing the source file.
**Solution Status**
Fixed in v10.0 of the Nios II EDS

**Error Marker Persists on BSP Project After Build Error Corrected**
In the Nios II SBT for Eclipse, if an application project fails to build, error markers appear in the BSP project, if the build error message contains a path to BSP project source files. Even after you have rebuilt the application project without errors, the error markers persist in the BSP project.

**Workaround**
Rebuild your BSP project.

Alternatively, if your application will always be associated with the same BSP, set the Eclipse project references by following these steps:

1. Right-click your application project, point to **Properties** and click **Project References**.
2. Select the desired BSP for your application.
3. Build your application project again to clear the error markers in the BSP project.

If you later link your application project with a different BSP, you must manually correct the Eclipse project references.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

**Assembly Language Source File Not Found**
The Nios II SBT for Eclipse does not support assembly language files with the upper case file extension .S. If your project includes a file with an upper case extension, the compiler is not able to find the assembly language file during build.

**Workaround**
Rename the assembly language files with the lower-case extension .s.

**Solution Status**
Fixed in v10.0 of the Nios II EDS

**‘Exclude from build’ Not Supported**
In the Nios II SBT for Eclipse v9.1 SP2 and earlier, you can use the **Exclude from build** command to omit a source file from your project at build time. Starting with v10.0, **Exclude from build** is replaced by the **Remove from Nios II build** and **Add to Nios II build** commands.

Due to an Eclipse platform limitation, **Exclude from build** still appears in the project context menu in v10.0. However, it has no effect.
Workaround
To exclude a source file from your project when it is built, on the project context menu, click **Remove from Nios II build**. To restore it to the build, click **Add to Nios II build**.

**Nios II Options Do Not Appear in Eclipse**

When Nios II SBT for Eclipse starts, the Nios II plugins might fail to load, resulting in the following symptoms:

- The Nios II perspective is not available
- No Nios II items appear when you click **New** in the File menu

Eclipse can behave this way if you have installed the Nios II EDS in the same directory as a previous installation.

When the Altera Complete Design Suite (ACDS) installer installs the Nios II EDS, you specify a root directory for the EDS file structure. For example, if the Nios II EDS 9.1 is installed on the Windows operating system, the root directory might be `c:\altera\91\nios2eds`. For simplicity, Altera documentation refers to this directory as `<Nios II EDS install path>`.

When the ACDS installer removes the Nios II EDS, it leaves behind some files in `<Nios II EDS install path>`. If you reinstall the Nios II EDS in the same directory, these leftover files might cause the Nios II SBT for Eclipse to work incorrectly.

**Workaround**
To correct this problem, execute the following steps:

1. Uninstall the Nios II EDS.
2. Delete `<Nios II EDS install path>`, including all subdirectories, before reinstalling the Nios II EDS.
   Alternatively, reinstall the Nios II EDS in a different directory.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

**Error Messages on Console When Debugging**

When debugging, you might see the following messages in the Nios II SBT for Eclipse console:

- `No symbol "auto" in current context.`
- `No symbol "new" in current context.`

These are normal messages from the GNU Debugger (GDB) console, not error messages. This issue does not impact the debug process.

**Workaround**
No workaround needed.

**Solution Status**
None needed.
Errors Converting Nios II IDE Multiprocessor Project

If you try to use the `nios2-convert-ide2sbt` utility to convert an IDE multiprocessor project to the Nios II SBT, error messages appear, and the project fails to generate properly.

**Workaround**
Create new Nios II SBT application and BSP projects using project settings equivalent to the original Nios II IDE project settings.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

Stop on Startup Option in Run Configuration Has No Effect

Turning on **Stop on Startup** at in the **Debugger** tab of a run configuration has no effect.

**Workaround**
You can manually set any breakpoint in the debug perspective.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

Debugger Breaks in `crt0.s` Instead of main()

If you attempt to launch a debug session by right clicking the project, without first creating a run configuration, the debugger breaks in the initialization code in `crt0.s`, rather than at the top of the `main()` function. You must explicitly create the run configuration before launching the debug session.

**Workaround**
You can work around this issue with either of the following methods:

- Create the run configuration with the **Run Configuration** dialog box. You can then debug with this run configuration by right-clicking the project, clicking **Debug As**, and selecting the debug configuration. The program correctly breaks at `main()`.
- Manually set a breakpoint at `main()`.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

C2H Compiler ERRATA

This section describes in detail the issues related to the Nios II C2H Compiler.

C2H Compiler Does Not Work in the Nios II Command Shell with GCC 4

The Nios II Command Shell with GCC 4 does not support the C2H Compiler.
**Workaround**
Use the Nios II Command Shell with GCC 3.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

**Functions Declared Without a Return Type Are Not Supported**

The C2H compiler does not support functions without an explicitly declared return type.

**Workaround**
If you are using the implicit `int` return type, declare the return type explicitly. If your function has no return value, declare it as `void`.

**Solution Status**
Not fixed

**Pre-7.1 Systems Are Not Supported**

Starting in v. 7.1, the C2H Compiler does not support SOPC Builder systems created in SOPC Builder 7.0 or earlier (systems based on a *class.ptf* file).

**Workaround**
Before using the C2H Compiler, you must upgrade your SOPC Builder system. Open the system in SOPC Builder v. 7.1 or later. SOPC Builder prompts you to convert the system, creating a *_.hw.tcl* file compatible with the C2H Compiler.

**Solution Status**
Not fixed

**--src-dir SBT Argument Does Not Work With C2H**

When using the C2H Compiler with Nios II SBT, an error occurs when using the `nios2-app-generate-makefile` argument `--src-dir` to specify a directory of source files. An example of the error is:

```
multiple definition of 'my_accelerated_function'
```

**Workaround**
Specify source files individually using the `--src-files` argument.

**Solution Status**
Not fixed

**Accelerator Generation Failure If Tools Are Installed in Path With Spaces**

If the path to your installation of the Altera Design Suite contains spaces, the C2H Compiler fails to generate the accelerators.
Workaround
Reinstall the tools to a path containing no spaces.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

The C2H Compiler Regenerates an Accelerator Unnecessarily
The C2H Compiler might regenerate an accelerator even when the accelerated function is unchanged. This problem can result from changes to files included by the C file containing the accelerated function. The C2H Compiler fails to check that the generated hardware description language (HDL) matches the previously generated HDL causing the system to be regenerated.

Workaround
To avoid this issue move the accelerator-specific information from the include file to a separate include file. This workaround prevents regeneration of the system when the HDL is unchanged.

Solution Status
Not fixed

Error: c2h_accelerator_base_addresses.h: No such file or directory
When a C2H accelerator is compiled for the first time, the following compile-time error can result if the Analyze all accelerators option is selected:
c2h_accelerator_base_addresses.h: No such file or directory.

Workaround
Click Build software and generate SOPC Builder system and build once before building with the Analyze all accelerators option.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Java Heap Space Exception if Quartus II Compilation is Enabled
If your design contains a C2H accelerator, and you select Build software, generate SOPC Builder system, and run Quartus II compilation in the C2H view, you might see the following error during Quartus II compilation:

```
Exception in thread "main" java.lang.OutOfMemoryError: Java heap space
make: *** [c2h_hdl-t] Error 1
```

Workaround
Select the Build software and generate SOPC builder system option in the C2H Compiler settings window, and then manually launch the Quartus II software to compile the design.
Solution Status
Not fixed

Pointer Dereferences to Volatile Types

The C2H Compiler treats pointer dereferences to a volatile type as if they alias all other pointer dereferences. Pointers that are restrict-qualified are treated the same way.

The two loops in Example 4 cannot be scheduled concurrently because the volatile qualification overrides the __restrict__ pragma.

Example 4. Non-Concurrent Loops

```c
volatile int * __restrict__ fifo_rd = FIFO_RD_BASE;
volatile int * __restrict__ fifo_wr = FIFO_WR_BASE;
for ()
{
    *fifo_wr = ....;
}
for ()
{
    ... = *fifo_rd;
}
```

Workaround
Divide the function into multiple interrupt request (IRQ)-enabled accelerators that are launched concurrently from the processor, and use FIFO buffers to communicate between them.

Solution Status
Not fixed

C2H Compiler Does Not Accelerate Subfunctions Located in a Separate File

When accelerating a function in a file, the C2H Compiler cannot link subfunctions that are defined in a different file.

Workaround
Include all subfunctions called by the accelerated function within the same source code file.

Solution Status
Not fixed

Array Elements in Structures Do Not Copy Correctly

C2H accelerators do not correctly copy array elements that are elements of structures.

In Example 5, the a and b elements of the structure copy correctly, but the buf element does not. After this assignment, struct_a equals `{9, 8, {3, 3, 3, 3}}`.
Example 5. Array Elements of Structs

typedef struct my_struct {
    int a;
    int b;
    int buf[BUF_SIZE];
} MY_STRUCT;
MY_STRUCT struct_a = {1, 2, {3, 3, 3, 3}};
MY_STRUCT struct_b = {9, 8, {7, 7, 7, 7}};
struct_a = struct_b;

Workaround
Copy the array elements explicitly, as shown in Example 6.

Example 6. Copying Array Elements Explicitly

{  
    int i=0;
    do  
    {  
        struct_a.buf[i] = struct_b.buf[i];
        i++;
    } while (i<LENGTH_OF_BUF_ELEMENT)
}

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Clean Build Causes Build Failure

Performing a clean build on a Nios II IDE project that contains a hardware accelerator can cause the next build to fail in the IDE, because the clean build erroneously deletes a file required by the C2H Compiler.

Workaround
Do not perform a clean build on projects that use hardware accelerators. If you have already performed a clean build, recompile with option Build software, generate SOPC Builder system, and run Quartus II compilation to regenerate the necessary files.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Changing Build Configurations Produces Unexpected Results

The C2H Compiler does not support multiple build configurations (for example Release or Debug) in the Nios II IDE. After creating one or more accelerators in a particular configuration, the C2H Compiler produces undefined results if you switch to a different build configurations and create more accelerators.
Workaround
For a specific SOPC Builder system and Nios II IDE project, specify C2H accelerators in only one build configuration. You can use multiple build configurations, as long as only one configuration specifies C2H Compiler settings.

Solution Status
Not fixed

Hardware Accelerators Remain After Deleting the Software Project
If a system contains C2H accelerators, deleting the software project that defines the accelerators does not remove the accelerators from the hardware system, and the accelerator logic remains in the SOPC Builder system.

Workaround
To remove an accelerator from a system, delete the accelerator from the C2H view in the Nios II IDE first, and then recompile the software project. The C2H Compiler then removes the accelerator from the SOPC Builder system. Once the compilation is complete then the software application can be deleted from the workspace.

Solution Status
Not fixed

Incorrect Results From Logical or Conditional Operation With Side-Effects
The C2H Compiler always evaluates both operands of logical (&&, ||) and conditional (?:) operators. This is different from expected American National Standards Institute (ANSI) C behavior, where operands are evaluated left-to-right, and unnecessary operands are skipped.

For example, in the expression (i-- && j--), if the value of i is zero, ANSI C does not evaluate the right-hand-side (RHS) expression, and j is not decremented. By contrast, the C2H Compiler evaluates both sides, decrementing j.

The following expressions are other examples that might be affected by this issue:

```c
if (i-- || j++)
```

```c
...;
```

```c
a = ((cond == 1)? i++ : j++);
```

Workaround
Use logical and conditional operations whose operators have no side effects. Operations with side effects include pre- and post- increment and decrement operations (++, --), memory operations (*, [], . , ->), and function calls.

Solution Status
Not fixed
Launch SOPC Builder Button in C2H View

When the Nios II IDE workspace contains multiple projects with multiple system libraries, the incorrect SOPC Builder system might open when you click Launch SOPC Builder in the C2H view.

Workaround
Launch SOPC Builder from the Quartus II software. Alternatively, keep only one system library project open at a time while using the C2H Compiler.

Solution Status
Not fixed

Development Board Errata

This section describes in detail the Nios II EDS issues related to Nios development boards.

Intermittent Failures While Accessing CompactFlash Card

The Nios II Development Kit version 5.0 and later includes a CompactFlash controller peripheral suitable for interfacing to CompactFlash cards in True IDE mode on Nios development boards. For True IDE mode to operate, CompactFlash cards require that the ATASEL_N input be driven to ground during power-up.

The CompactFlash controller peripheral includes a configurable power register, used to cycle power to CompactFlash cards from Nios II software through a metal oxide semiconductor field-effect transistor (MOSFET) on the Nios development boards. However, in certain development boards, power to the CompactFlash card does not turn off completely during this power cycle operation. Because of this condition, the CompactFlash might not sample the ATASEL_N pin during the power-cycle operation after FPGA configuration when this pin is driven to ground. Instead, the CompactFlash card might sample the ATASEL_N pin when power is first applied to the development board, when I/O is not yet driven by the FPGA (before FPGA configuration).

Workaround
If you encounter errors with CompactFlash when using the Nios development boards, try one of the following solutions:

■ Use a different CompactFlash card. Certain cards are more susceptible to the power-cycling issue than others.

■ Modify the Nios development board. This is recommended if you are familiar and comfortable with board-level modifications. Disconnect pin 9 (ATASEL_N) on the CompactFlash socket on your Nios development board and tie this pin to ground.

The CompactFlash socket uses a staggered numbering on the pins (starting from pin 1: 1, 26, 2, 27, ...); refer to the CompactFlash Association specification for right-angle surface-mount connectors for exact specifications on this connector. This modification permanently enables True IDE mode operation.
Solution Status
Not fixed

Documentation Errata
This section describes in detail the Nios II EDS documentation issues.

Incorrect information about Embedded C++

The Nios II Software Developer’s Handbook contains the following incorrect statement about C++ support:

The HAL supports only the standard Embedded C++ subset of the full C++ language. C++ programs that use features beyond this subset fail in the HAL environment. C++ features not available in Embedded C++ include polymorphism, templates, and single and multiple object inheritance. In general, features that consume a large amount of memory are not included in Embedded C++. Catch/throw exceptions fail in the MicroC/OS-II environment.

Nios II C++ support is not restricted to the obsolete Embedded C++ specification.

Workaround
In place of the incorrect paragraph, refer to the following correct information:

Nios II C++ language support depends on the GCC tool chain. The Nios II GCC 4 C++ tool chain supports the following features:

- Polymorphism
- Friendship and inheritance
- Multiple inheritance
- Virtual base classes
- Run-time type information (typeid)
- The mutable type qualifier
- Namespaces
- Templates
- New-and-delete style dynamic memory allocation
- Operator overloading
- Standard Template Library (STL)

Exceptions and new-style dynamic casts are not supported.

Solution Status
This issue will be fixed in a future release of the Nios II EDS documentation.
Missing Documentation of Interrupt API Properties

“Tcl Commands” in the Nios II Software Build Tools Reference chapter of the Nios II Software Developer’s Handbook does not include information about two set_sw_property command properties related to the application programming interfaces (APIs) for interrupts.

Workaround

The missing information belongs with the set_sw_property command, in “Tcl Commands” in the Nios II Software Build Tools Reference chapter of the Nios II Software Developer’s Handbook.

The missing information follows:

- **supported_interrupt_apis**—Specifies the interrupt API that the device driver supports. The Nios II SBT analyzes this property for each driver in the system to determine the appropriate API to be used in the system.

  Specify `legacy_interrupt_api` if the device driver supports the legacy API only or `enhanced_interrupt_api` if the device driver supports the enhanced API only. Specify both using a quoted list if the device driver supports both APIs.

  If you do not specify which API your device driver supports, the Nios II SBT assumes that only the legacy interrupt API is supported.

  ![This property is only available for device drivers.](image)

  For more information about the legacy and enhanced APIs, refer to “Exception Handling” in the Nios II Software Build Tools chapter of the Nios II Software Developer’s Handbook.

- **isr_preemption_supported**—Specify `true` if your device driver’s interrupt service routine (ISR) can be preempted by a higher priority ISR. If you do not specify whether the driver supports preemption, the Nios II SBT assumes that your device driver does not support preemption. If your driver does not have an ISR, but the associated device has an interrupt port, you can set this property to `true`.

  ![This property is valid for operating systems and device drivers.](image)

Solution Status

Fixed in v10.0 of the Nios II EDS documentation

Error Message on Invalid Exception or Reset Vector

Nios II compiler error messages, added in v 8.1, are not documented in the Nios II Software Developer’s Handbook.
Workaround
The missing information is as follows:

While building a Nios II software project, the compiler produces an error message if the SOPC Builder system defines an invalid exception or reset vector. Table 4 shows possible error messages and their causes.

In the SOPC Builder system, ensure that the exception and reset vectors conform to all the criteria listed in Table 4.

Solution Status
Fixed in v9.1 of the Nios II EDS documentation

<table>
<thead>
<tr>
<th>Table 4. Exception and Reset Vector Error Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message</strong></td>
</tr>
<tr>
<td>The section mapping &quot;.entry&quot; is not mapped to a</td>
</tr>
<tr>
<td>memory region.</td>
</tr>
<tr>
<td>The section mapping &quot;.exceptions&quot; is not mapped</td>
</tr>
<tr>
<td>to a memory region.</td>
</tr>
<tr>
<td>The section mapping &quot;.entry&quot; maps to a memory</td>
</tr>
<tr>
<td>region &quot;&lt;region name&gt;&quot; which is not the required</td>
</tr>
<tr>
<td>length &quot;32&quot;.</td>
</tr>
<tr>
<td>The section mapping &quot;.entry&quot; maps to a memory</td>
</tr>
<tr>
<td>region &quot;&lt;region name&gt;&quot; which does not start at</td>
</tr>
<tr>
<td>the SOPC Design specified address &quot;&lt;base</td>
</tr>
<tr>
<td>address&gt;&quot;.</td>
</tr>
<tr>
<td>The section mapping &quot;.exceptions&quot; maps to a</td>
</tr>
<tr>
<td>memory region &quot;&lt;region name&gt;&quot; which does not</td>
</tr>
<tr>
<td>start at the SOPC Design specified address &quot;&lt;</td>
</tr>
<tr>
<td>base address&gt;&quot;.</td>
</tr>
<tr>
<td>The SOPC design Nios II reset and exception</td>
</tr>
<tr>
<td>vector addresses are mapped to the same memory.</td>
</tr>
<tr>
<td>For HAL the exception address must be at least</td>
</tr>
<tr>
<td>32 bytes larger than the reset address.</td>
</tr>
<tr>
<td>The section mapping &quot;.exceptions&quot; mapped device</td>
</tr>
<tr>
<td>&quot;,&lt;memory 1&gt;&quot; is not the same as the SOPC Design</td>
</tr>
<tr>
<td>specified device &quot;,&lt;memory 2&gt;&quot;.</td>
</tr>
<tr>
<td>The section mapping &quot;.entry&quot; mapped device</td>
</tr>
<tr>
<td>&quot;,&lt;memory 1&gt;&quot; is not the same as the SOPC Design</td>
</tr>
<tr>
<td>specified device &quot;,&lt;memory 2&gt;&quot;.</td>
</tr>
</tbody>
</table>
| Error Building Project: ‘No rule to make target’

The Getting Started with Graphical User Interface and Getting Started from the Command Line chapters of the Nios II Software Developer’s Handbook do not include the following information:

You cannot link Nios II GCC 3 projects with Nios II GCC 4 projects. Your application, library and BSP projects must all use the same Nios II GCC toolchain.
If you switch between Nios II GCC 3 and Nios II GCC 4, make sure you run `make clean` on your application, library and BSP projects before rebuilding.

When importing a GCC 3 BSP, such as a project created with v9.1 SP2 or earlier, to v10.0 SBT for Eclipse using the GCC 4 toolchain, after importing the BSP, regenerate the makefile.

If you do not follow these rules, you might see the following error:

```
make[1]: *** No rule to make target `/cygdrive/c/.../bsp/alt_sys_init.c', needed by 'all'. Stop.
make: *** `[../bsp/-recurs-make-lib] Error 2
```

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS documentation.

**AN543 Contains Incorrect Information about Updating the Flash**

“Updating the Flash Option Bits on the Cyclone III Development Board” in AN543, *Debugging Nios II Software Using the Lauterbach Debugger* contains incorrect information about updating the flash.

**Workaround**

The correct information is as follows:

**Updating the Flash on the Cyclone III Development Board**

To restore the flash factory image, refer to “Restoring the Factory Design to the Flash Device” in the *Cyclone III Development Kit User Guide*.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS documentation.

**Incorrect Information about Floating-Point Instruction Precision**

In “Arithmetic Logic Unit” in the *Processor Architecture* chapter, the *Nios II Processor Reference Handbook* incorrectly states that the Nios II compiler treats floating-point constants as double-precision numbers.

**Workaround**

The correct information is as follow:

All the floating-point custom instructions are single-precision operations. Double-precision floating-point operations are implemented in software.

When the floating-point custom instructions are not present, the Nios II compiler treats floating-point constants as double-precision values. However, with the floating-point custom instructions, the Nios II compiler treats floating-point constants as single-precision numbers by default. This allows all floating-point expressions to be evaluated in hardware, at a possible cost in precision.
If you do not wish floating-point constants to be cast down to single precision values, append \( L \) to each constant value, to instruct the compiler to treat the constant as a double-precision floating-point value. In this case, if an expression contains a floating-point constant, each term in the expression is cast to double precision. As a result, the expression is computed with software-implemented double-precision arithmetic, at a possible cost in computation speed.

Table 5 shows code examples using floating-point constants, indicating how each computation is implemented.

<table>
<thead>
<tr>
<th>Example Code</th>
<th>Floating-Point Custom Instructions Present?</th>
<th>Precision</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>( b = a \times 4.67 )</td>
<td>No</td>
<td>Double</td>
<td>Software</td>
</tr>
<tr>
<td>( b = a \times 4.67f )</td>
<td>No</td>
<td>Single</td>
<td>Software</td>
</tr>
<tr>
<td>( b = a \times 4.67L )</td>
<td>No</td>
<td>Double</td>
<td>Software</td>
</tr>
<tr>
<td>( b = a \times 4.67 )</td>
<td>Yes</td>
<td>Single</td>
<td>Hardware</td>
</tr>
<tr>
<td>( b = a \times 4.67f )</td>
<td>Yes</td>
<td>Single</td>
<td>Hardware</td>
</tr>
<tr>
<td>( b = a \times 4.67L )</td>
<td>Yes</td>
<td>Double</td>
<td>Software</td>
</tr>
</tbody>
</table>

**Solution Status**

Fixed in v10.0 documentation

**Eclipse CDT Features Not Supported by Nios II Plugins**

The following information is missing from the *Getting Started with Graphical User Interface* chapter of the *Nios II Software Developer’s Handbook*:

The features listed in the left column of Table 6 are supported by the Eclipse CDT plugins, but are not supported by Nios II plugins. The right column lists alternative features supported by the Nios II plugins.

**Table 6. Eclipse CDT Features Not Supported by the Nios II Plugins (Part 1 of 2)**

<table>
<thead>
<tr>
<th>Unsupported CDT Feature</th>
<th>Alternative Nios II Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Project Wizard C/C++</td>
<td>To create a new project, use one of the following Nios II wizards:</td>
</tr>
<tr>
<td>■ C Project</td>
<td>■ Nios II Application</td>
</tr>
<tr>
<td>■ C++ Project</td>
<td>■ Nios II Application and BSP from Template</td>
</tr>
<tr>
<td>■ C/C++</td>
<td>■ Nios II Board Support Package</td>
</tr>
<tr>
<td>■ Convert to a C/C++ Project</td>
<td></td>
</tr>
<tr>
<td>■ Source Folder</td>
<td>■ Nios II Library</td>
</tr>
</tbody>
</table>
Table 6. Eclipse CDT Features Not Supported by the Nios II Plugins (Part 2 of 2)

<table>
<thead>
<tr>
<th>Unsupported CDT Feature</th>
<th>Alternative Nios II Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Build configurations</strong></td>
<td>The Nios II plugins only support a single build configuration.</td>
</tr>
<tr>
<td>Right-click project and point to <strong>Build Configurations</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Exclude from Build</strong> (from v10.0 onwards)</td>
<td>Use <strong>Remove from Nios II Build</strong> and <strong>Add to Nios II Build</strong>.</td>
</tr>
<tr>
<td>Right-click source files</td>
<td>See ““Exclude from build’ Not Supported” on page 20.</td>
</tr>
<tr>
<td><strong>Project Properties</strong></td>
<td></td>
</tr>
<tr>
<td><strong>C/C++ Build</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Builder Settings</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Makefile generation</strong></td>
<td>By default, the Nios II SBT generates makefiles automatically.</td>
</tr>
<tr>
<td>● <strong>Build location</strong></td>
<td>The build location is fixed.</td>
</tr>
<tr>
<td>● <strong>Behaviour</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Build on resource save (Auto build)</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Build Variables</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Discovery Options</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Environment</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Settings</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Tool Chain Editor</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Current builder</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Used tool</strong></td>
<td>To change the toolchain, use the <strong>Current tool chain</strong> option</td>
</tr>
<tr>
<td><strong>C/C++ General</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Enable project specific settings</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Documentation</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>File Types</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Indexer</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Build configuration for the indexer</strong></td>
<td>The Nios II plugins only support a single build configuration.</td>
</tr>
<tr>
<td>● <strong>Language Mappings</strong></td>
<td>Use <strong>Nios II Application Properties</strong> and <strong>Nios II Application Paths</strong></td>
</tr>
<tr>
<td>● <strong>Paths and Symbols</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Window Preferences</strong></td>
<td></td>
</tr>
<tr>
<td><strong>C/C++</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Build scope</strong></td>
<td>The Nios II plugins only support a single build configuration.</td>
</tr>
<tr>
<td>● <strong>Build project configurations</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Build Variables</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Environment</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>File Types</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Indexer</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>Build configuration for the indexer</strong></td>
<td>The Nios II plugins only support a single build configuration.</td>
</tr>
<tr>
<td>● <strong>Language Mappings</strong></td>
<td></td>
</tr>
<tr>
<td>● <strong>New CDT project wizard</strong></td>
<td></td>
</tr>
</tbody>
</table>
Incorrect Information about Nested Exceptions

“Exception Processing” in the Programming Model chapter of the Nios II Processor Reference Handbook incorrectly states that multiple interrupts with different requested interrupt levels (RILs) must not be assigned to the same shadow register set.

Workaround

The correct information is as follows:

Multiple interrupts with different RILs can be assigned to a single shadow register set. However, with multiple register sets, you must not allow the RILs assigned to one shadow register set to overlap the RILs assigned to another register set.

Table 2–7 and Table 2–8 illustrate the validity of register set assignments when preemption within a register set is enabled.

<table>
<thead>
<tr>
<th>RIL</th>
<th>Register Set 1</th>
<th>Register Set 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IRQ0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>IRQ1</td>
<td>IRQ2</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>IRQ3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>IRQ4</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>IRQ5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>IRQ6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RIL</th>
<th>Register Set 1</th>
<th>Register Set 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IRQ0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>IRQ1</td>
<td>IRQ2</td>
</tr>
<tr>
<td>3</td>
<td>IRQ3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>IRQ4</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>IRQ5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>IRQ6</td>
</tr>
</tbody>
</table>

Table 2–7. Example of Illegal RIL Assignment

Table 2–8. Example of Legal RIL Assignment

Solution Status

This issue will be fixed in a future release of the Nios II EDS documentation.

Valid Range of hal.log_flags is –1 to 3

The Nios II EDS documentation incorrectly states the valid range for the hal.log_flags BSP setting. Valid values of hal.log_flags range from –1 through 3.

Solution Status

This issue will be fixed in a future release of the Nios II EDS documentation.
Nios II Edition Does Not Support TFTP

The Nios II documentation should include the following information:

Versions of the NicheStack TCP/IP Stack other than the Nios II Edition include optional Trivial File Transfer Protocol (TFTP) client and server applications. However, the TFTP client and server are not thread safe. They cannot be used in systems with the MicroC/OS-II RTOS.

TFTP is not available with the NicheStack TCP/IP Stack - Nios II Edition. The TFTP client and server features are disabled.

Solution Status
This issue will be fixed in a future release of Nios II EDS documentation.

Error Message After Renaming Project: “Resource is out of sync with the system”

The Getting Started with the Graphical User Interface chapter of the Nios II Software Developer’s Handbook does not explain the correct procedure for renaming a project.

Workaround
The missing information is as follows:
To rename a project in the Nios II SBT for Eclipse, execute the following steps:
1. Right click the BSP project and click Rename.
2. Type the new BSP name.
3. Right click the BSP project and click Refresh.

If you neglect to refresh the project, you might see the following error message when you attempt to build it:

Resource <original_bsp_name> is out of sync with the system

Solution Status
This issue will be fixed in a future release of Nios II EDS documentation.

Compiler Flags for Building Custom Newlib

“Common BSP Tasks” in the Using the Nios II Software Build Tools chapter of the Nios II Software Developer’s Handbook describes how to compile a custom version of the newlib library. However, it does not list the compiler flags that must be selected to generate the correct library.

Workaround
The missing information is as follows:

The Nios II EDS provides a number of precompiled newlib implementations. The provided libraries are precompiled with every viable combination of the GCC compiler flags shown in Table 7.
When you create a BSP with a precompiled newlib, the Nios II SBT selects the newlib matching your BSP’s compiler settings. When you create a custom newlib, you must ensure that the compiler flags listed in Table 7 match your BSP’s settings.

### Table 7. GCC Compiler Options for Newlib

<table>
<thead>
<tr>
<th>Option Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>-pg</td>
<td>Link for profiling with gprof</td>
</tr>
<tr>
<td>-EB</td>
<td>Generate big-endian code</td>
</tr>
<tr>
<td>-mstack-check</td>
<td>Enable stack checking</td>
</tr>
<tr>
<td>-mno-hw-mul</td>
<td>Disable use of the mul family of instructions</td>
</tr>
<tr>
<td>-mhw-mulx</td>
<td>Enable use of the mulx family of instructions</td>
</tr>
<tr>
<td>-mcustom-fpu-cfg</td>
<td>Use a floating point custom instruction</td>
</tr>
</tbody>
</table>

The Nios II-specific compiler flag `-mcustom-fpu-cfg` requires the Nios II processor core to be implemented with the floating-point custom instruction as specified in the flag argument. The compiler flag can have one of the following two argument values:

- `-mcustom-fpu-cfg=60-1`—Use the Nios II floating-point custom instruction without divider
- `-mcustom-fpu-cfg=60-2`—Use the Nios II floating-point custom instruction with divider

For details about the Nios II-specific compiler flags `-mstack-check`, `-mno-hw-mul`, and `-mhw-mulx`, refer to “Altera Nios II Options” in *Using the GNU Compiler Collection (GCC)*, installed with the Nios II EDS. For details about the `-pg` compiler flag, refer to “Compiling a Program for Profiling” in *GNU Profiler*, installed with the Nios II EDS. To find the installed documentation, on the Windows Start menu, click Programs > Altera > Nios II EDS <version> > Nios II <version> Documentation, and then click Literature.

### Solution Status

This issue will be fixed in a future release of Nios II EDS documentation.

### Nios II IDE Online Help Expand Buttons Do Not Work

The expand text arrow and the Show All option in the online help do not work in Internet Explorer.

#### Workaround

In Internet Explorer, carry out the following actions:

1. Click the Refresh/Show Current Topic icon (yellow arrows icon at the top of the search pane). The table of contents appears with the selected topic highlighted.
2. Click the highlighted topic to refresh the browser frame. Expanded text works.

   Alternatively, use Firefox 2.0.0.6.
Solution Status
Not fixed

Hardware Abstraction Layer Errata

This section describes in detail the Nios II Hardware Abstraction Layer issues.

“unused variable” Warning When Building alt_main.c

If you set the hal.enable_exit BSP setting to false, when building the project you see the following warning in alt_main.c:

warning: unused variable 'result'

Design Impact
This warning is harmless.

Workaround
Set hal.enable_exit to true.
Alternatively, you can ignore this harmless warning.

Solution Status
Fixed in v10.0 of the Nios II EDS

Build Warnings in Performance Counter Driver Files

If your Nios II system contains a performance counter, you might see the following warning when you build a BSP:

warning: return makes pointer from integer without a cast

This warning appears in alt_get_performance_counter_base() in the software file altera_avalon_performance_counter.c.

This warning appears when the your BSP uses the Altera performance counter driver, and the C preprocessor symbol PERFORMANCE_COUNTER_0_BASE is defined.
This warning is harmless.

Workaround
In the alt_get_performance_counter_base() function in altera_avalon_performance_counter.c, add typecast (void *) to PERFORMANCE_COUNTER_0_BASE.

Solution Status
Fixed in v10.0 of the Nios II EDS
Missing Structure Member Errors in alt_log_printf.c with Small JTAG UART Driver

In a BSP, if you enable the small JTAG UART driver (altera_avalon_jtag_uart_driver.enable_small_driver), and enable Altera logging (hal.log_port) using the JTAG UART as the log port, when you build the project, the compiler reports missing structure members in alt_log_printf.c. The project fails to build.

Workaround

To avoid this issue, execute the following steps:

1. In function alt_log_jtag_uart_print_control_reg() in alt_log_printf.c, insert the italicized code as shown in Example 9.

Example 9. ALT_LOG_PRINTF() Correction

```
ALT_LOG_PRINTF(
    "\%s SW CirBuf = \%d, HW FIFO wspace=\%d AC=\%d WI=\%d RI=\%d WE=\%d RE=\%d\n",
    header,

    /* Beginning of inserted code */
    ifndef ALTERA_AVALON_JTAG_UART_SMALL
    (dev->tx_out-dev->tx_in),
    else
    0,
    endif
    /* End of inserted code */

    space,ac,wi,ri,we,re);
```

2. Rebuild the project.

Solution Status

This issue will be fixed in a future release of the Nios II EDS.

Hardware Example Design Errata

This section describes in detail the Nios II EDS hardware example design issues.

Quartus II Compilation Warnings for Nios II Stratix II 2S60 ROHS Example

You might see the following warnings if you try to compile the Nios II Stratix® II 2S60 ROHS example design, installed at <Nios II EDS install path>/examples/vhdl/niosII_stratixII_2s60/standard or downloaded from the Altera Wiki (www.alterawiki.com):

Warning (10541): VHDL Signal Declaration warning at\NiosII_stratixII_2s60_standard.vhd(59): used implicit default value for signal\"cpu_data_master_read_data_valid_NiosII_stratixII_2s60_standard_clock_0_in"\because signal was never assigned a value or an explicit default value. Use of\implicit default value may introduce unintended design optimizations.

Warning (10542): VHDL Variable Declaration warning at\altera_europa_support_lib.vhd(340): used initial value expression for variable\"arg_copy" because variable was never assigned a value

Warning (10542): VHDL Variable Declaration warning at\altera_europa_support_lib.vhd(344): used initial value expression for variable\"arg_length" because variable was never assigned a value
You can safely ignore these warnings.

The Nios II Stratix II 2S60 ROHS example is deprecated.

**Workaround**
None.

**Solution Status**
Not fixed.

## Software Example Errata

This section describes in detail the Nios II EDS software example issues.

### Hardware Tutorial Software Example Hangs on Some Boards

The *count binary* application used in the tutorial hangs when run on some Altera development boards. The software runs through the binary count once and stops responding.

This issue affects boards that do not have a display to handle the LCD output. The affected boards include the following:

- Embedded Systems Development Kit, Cyclone III Edition (EP3C120)
- Stratix IV GX FPGA Development Kit (EP4SGX230)

**Workaround**
Modify line 18 of the `count_binary.h` file, as follows:

```c
#define LCD_PRINTF(lcd, args...) /* Do Nothing */
```

Rebuild and run the software again.

**Solution Status**
Fixed in v10.0 of the Nios II EDS

### Networking Examples

If you are running a networking software example, you might be asked for a nine-digit number. You are directed to find this number on a sticker on your Nios development board, identified by the prefix **ASJ**. Not all Nios development boards have this sticker.

**Workaround**
If your Nios development board does not have a sticker with the letters **ASJ** followed by a nine-digit number, enter a unique nine-digit number when prompted. To avoid network address conflicts, ensure that this number is unique to each Nios board connected to your network.

**Solution Status**
Not fixed
Flash Programmer Errata

This section describes in detail the Nios II EDS issues related to the flash programmer.

Unable to Configure FPGA from Flash with Parallel Flash Loader

If you program an FPGA image to flash memory on a board that utilizes the Parallel Flash Loader, the FPGA subsequently fails to load from flash memory. This issue arises because the sof2flash utility generates a flash file with an incompatible Programmer Object File (.pof) bitstream format.

Affected Configurations

This issue impacts the following target hardware:

- The Stratix IV GX FPGA Development Kit
- The Arria® II GX FPGA Development Kit
- Any hardware using the Parallel Flash Loader

Workaround

1. Visit the MySupport website and request Nios II EDS patch 0.73.
   Alternatively, upgrade to the Nios II EDS v. 9.1 SP1 or later.
2. Invoke sof2flash with the following options:
   - --pfl
   - --optionbits=<option bit address>

   With these options, sof2flash generates a flash file with a compatible .pof file bitstream format.

Solution Status

Fixed in v. 9.1 SP1 of the Nios II EDS

elf2flash File Size Limit

The elf2flash utility supports .elf files up to approximately 24 MBytes in size. The elf2flash utility might fail on files larger than 24 MBytes, with the error message java.lang.OutOfMemoryError.

Workaround

Lower the number of symbols in your .elf file by turning off debug symbols.
Alternatively, specify less initialized data in the application.

Solution Status

Not fixed
Hardware Simulation Errata

This section describes in detail the Nios II EDS issues related to hardware simulation.

Vectored Interrupt Controller Does Not Support VHDL Simulation Models

SOPC Builder reports errors when you try to generate VHDL simulation files for the Vectored Interrupt Controller.

Workaround

There is no workaround.

Solution Status

Fixed in 9.1 of the Nios II EDS

Error “UNC paths are not supported” Launching ModelSim

If you launch ModelSim® from a working directory that is mapped via a universal naming convention (UNC) path (a path that starts with // instead of drive letter), you receive the following error message in SOPC Builder: UNC paths are not supported. Defaulting to Windows directory. This error occurs because ModelSim is calling a command shell, which does not support UNC paths.

Workaround

Map the UNC path to a drive letter and use the drive letter to reference the working directory in the launching shell.

Solution Status

Not fixed

Uninitialized .bss Variables in Simulation

If your program reads the value of an uninitialized .bss variable during HDL simulation, and the BSP (system library) is compiled with the ModelSim only, no hardware support property enabled in Nios II IDE, a warning appears about unfiltered data being ‘x’. This warning appears because when this property is enabled, the code that clears the .bss memory region is omitted to speed up HDL simulation so this memory region is uninitialized. The .bss region contains global and static local variables that are not initialized by the application so they default to a value of zero. When the Nios II processor reads uninitialized variables, it displays a warning and converts any of the bits of the uninitialized data to zero which correctly mimics the effect of the missing .bss clearing code. The Hardware Abstraction Layer (HAL) code that executes before and after main() might use .bss variables, so these warnings might appear even if your application does not use the .bss section.

Solution Status

Not fixed
Host Platform Errata

This section describes in detail the Nios II EDS issues related to the host development platform.

Nios II EDS Requires Administrative Permissions on Windows Vista and Windows 7

On the Windows Vista and Windows 7 operating systems, the Nios II EDS requires your user account to have administrative permissions.

Attempts to write to a directory other than the user home directory might fail, especially writing to an installation directory. For example, you might be unable to create a software project under an example design directory. Error messages might vary.

Workaround
Obtain an administrator account on your workstation.

Alternatively, start Nios II EDS applications in administrator mode. For example, when launching the Nios II SBT for Eclipse, right-click Nios II <version> Software Build Tools for Eclipse and click Run As Administrator.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Cannot Launch Nios II SBT for Eclipse on Red Hat Linux

You might be unable to launch Nios II SBT for Eclipse on the Red Hat Linux operating system. This is an issue with the version of XULRunner in Eclipse 3.4. The issue is resolved in XULRunner 1.9.1, which is available with Eclipse 3.5.

Workaround
Upgrade XULRunner to a newer version. To determine what version of XULRunner you have, type the following command at the command prompt:

```
xulrunner -v
```

To upgrade XULRunner using the `yum` software package manager, type the following command:

```
sudo yum update xulrunner
```

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Windows/Cygwin: Nios II Processor Generation Failure

You might see the following error message when you generate your Nios II system in SOPC Builder:

```
Error: Generator program for module 'cpu_fpoint' did NOT run successfully
```
This error might occur on a Windows-based system when all of the following conditions are true:

- You have installed a version of Cygwin other than the one distributed with the Quartus II software.
- You launch the Quartus II software and SOPC Builder from a Nios II Command Shell.
- You enable the floating point custom instruction (FPCI) in the Nios II processor core.

**Workaround**

Launch the Quartus II software and SOPC Builder from the Windows Start menu, and regenerate your system.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.

---

**Windows Vista: Limited Support in Nios II EDS**

The Quartus II software introduces Windows Vista (32-bit and 64-bit) support in version 7.2. However, the Nios II Embedded Design Suite supports only the following platforms:

- Windows 2000
- Windows XP
- Windows XP (64)
- SUSE 9 (32-bit)
- SUSE 9 (64-bit)
- Red Hat Linux v3.0 (32-bit)
- Red Hat Linux v3.0 (64-bit)
- Red Hat Linux v4.0 (32-bit)
- Red Hat Linux v4.0 (64-bit)

**Workaround**

There is no workaround.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.
Nios II IDE Errata: Building Projects

This section describes in detail the issues related to building projects in the Nios II IDE.

Nios II IDE Command-Line Tools Select Wrong Workspace on Linux

On Linux systems, the Nios II IDE command-line tools use the default Eclipse project workspace, regardless what workspace you are using in the IDE. The default workspace is at $SOPC_KIT_NIOS2/eclipse/nios2-ide-workspace-<version>.

This issue affects the following tools:

- nios2-create-system-library
- nios2-create-application-project
- nios2-build-project
- nios2-import-project
- nios2-delete-project

Workaround

Explicitly supply the Nios II IDE command-line tools with a workspace location, by means of the -data command-line argument. The syntax of the -data argument is as follows:

```
-data <path to workspace>
```

The path to the workspace must be absolute, and must not contain whitespace. Aside from these restrictions, any valid file system path can be used for the workspace. Example 10 shows how to specify a workspace path.

**Example 10. Providing a Non-Default Workspace Location in Linux**

```
nios2-create-project -data $HOME/myworkspace <other arguments>
```

Solution Status

Not fixed

Nios II IDE Command-Line Tools Hang on Windows

On Windows systems, the Nios II IDE command-line tools are sometimes unable to locate the project workspace. When this happens, the tools might hang.

This issue potentially affects the following tools:

- nios2-create-system-library
- nios2-create-application-project
- nios2-build-project
- nios2-import-project
- nios2-delete-project
Workaround
Explicitly supply the Nios II IDE command-line tools with a workspace location, by means of the `-data` command-line argument. The syntax of the `-data` argument is as follows:

```
-data <path to workspace>
```

The path to the workspace must be absolute, and must not contain whitespace. Aside from these restrictions, any valid file system path can be used for the workspace. The workspace shown in Example 11 is the default workspace used by the Nios II IDE in version 9.0.

**Example 11.** Providing a Workspace Location

```
nios2-create-project -data c:/altera/90/nios2eds/\bin/eclipse/nios2-ide-workspace-9.0 <other arguments>
```

Solution Status
Not fixed

**Nios II IDE Cannot Find stdio.h in Outline View**

If you create a new project using the Nios II IDE and try to open the `stdio.h` file from the Outline view before building the project, the IDE displays the error message *No include files were found that matched that name*.

**Workaround**
Build the project before attempting to open `stdio.h`.

Solution Status
Not fixed

**Nios II IDE Hangs With UNC Project Path**

In the New Project dialog box, if you turn on Specify Location and specify the path in UNC form, the IDE might hang.

**Workaround**
Map the UNC path to a remote drive which looks like a Windows drive to the Nios II IDE.

Solution Status
Not fixed
Build Failure with Nios II Advanced Exceptions, MMU, and MPU

Projects created in the Nios II IDE for an SOPC Builder system containing a Nios II processor configured with advanced exceptions, the memory management unit (MMU), or the memory protection unit (MPU) fail to build, and generate the following error messages:

```
ERROR - Classic build flow for Nios II system library does not support the Nios II advanced exceptions.
Use the non-classic Nios II Board Support Package instead.
```

```
<timestamp> - (SEVERE) generate: java.lang.IllegalArgumentException: 
java.lang.IllegalArgumentException:
com.altera.ingenuous.GTFElement.GTFElementErrorException:
<error>
element in GTF script
make[1]: *** [system_description/../obj/system.h-t] Error 1
make: *** [system_project] Error 2
```

**Workaround**

Create the software project with the Nios II SBT command-line development flow. Alternatively, use the Nios II SBT for Eclipse.

**Solution Status**

Not fixed

Build Command Not Functional for BSPs Created With the Nios II SBT

The build option in the Nios II IDE menu does not rebuild BSPs imported to the IDE.

**Workaround**

The Nios II SBT for Eclipse can both build and debug projects created on the command line. The Nios II SBT for Eclipse is the preferred tool for debugging Nios II SBT projects.

For information about the Nios II SBT for Eclipse, refer to the Getting Started with the Graphical User Interface chapter of the Nios II Software Developer’s Handbook.

In the Nios II IDE, you can build the BSP by building the associated application project.

**Solution Status**

Not fixed

Linker Errors with Dual-Port Memories

If your instruction master and data master ports are connected to the same dual-port memory and the ports have different addresses, your code fails to run or you experience a linker error. The Nios II IDE does not warn you of the addressing violation.

**Workaround**

Assign the same address to both ports of the dual-port memory.
Solution Status
Not fixed

User-Managed BSP Settings Not Supported in Nios II IDE
For projects created with the Nios II SBT and imported to the Nios II IDE, the IDE configuration settings have no effect.

For example, objdump, compiler, and linker settings made in the IDE are ignored. This behavior occurs because Nios II SBT projects are not IDE-managed projects. In addition, the make-related preferences do not pertain to imported Nios II SBT projects. The IDE ignores these options during the build process.

Workaround
Make these settings in the project's makefile.

Solution Status
Not fixed

URL Project Location Causes Project Creation Error
When you try to create a new project in an existing workspace, you might see an error dialog box saying:

Project cannot be created. Reason: Internal Error

This error might occur if the path to any project in the workspace is a URL location, for example file:/F:/Design. To view the path, right-click on the project and select Properties.

Workaround
Import your existing application and system library projects to a new workspace.

Solution Status
Not fixed

Compilation Error with Separate Exception Stack Option
Choosing the Use a separate exception stack option might cause the following compilation error when building a project:

VARIABLE %STACK_POINTER%"

This error occurs if the exception stack is larger than the memory available for it.

Workaround
On the system library properties page for the project, turn off the separate exception stack or reduce the Maximum exception stack size setting.

Solution Status
Not fixed
Incorrect Stack and Heap Free Space Report

The makefile reports an incorrect number of bytes free for the stack and heap, if the heap and stack are in different memory regions.

Workaround

No workaround available.

Solution Status

Not fixed

Nios II IDE Reports Problems Without Displaying Error in Console

When building a project, the Nios II IDE reports problems, but the build output in the console does not contain any errors.

The Nios II IDE incorrectly reports some linker warnings as errors, with a dialog box saying Errors exist in a required project. The Dhrystone software example exhibits this behavior, and recompiling the project again makes the issue go away.

Workaround

If the Console output does not contain errors, then the project built correctly. On subsequent builds, the linker step is skipped and the errors do not appear.

Solution Status

Not fixed

Nios II IDE Errata: Debugging Projects

This section describes in detail the issues related to debugging projects in the Nios II IDE.

Method for Accessing MMU and MPU Registers in the Debugger

You might observe an error if you try to read or write an MMU or MPU register via the Nios II Debugger.

Workaround

To read an MPU region, execute the following steps:
1. Set region INDEX in the MPUBASE register.
2. Exit and reenter debug mode, that is, single step.
3. Set the RD bit in the MPUACC register.
4. Exit and reenter debug mode, that is, single step.
5. Read back MPUBASE for pertinent information.
6. Read back MPUACC for pertinent information.
For a system with an MMU or MPU, this workaround allows you to read and write the current values of the registers. However, you cannot use it to control MPU regions or MMU TLB entries.

The debug core copies the Nios II processor’s register values to its internal memory when the processor enters debug mode. The debug core writes register values back to the processor only when the processor leaves debug mode. Therefore, if you attempt to set an MPU region with several consecutive values, only the last one, when leaving debug mode, is committed to the processor.

**Solution Status**
Not fixed

**IDE Cannot Display Imported Profiling Data**

If you create a software project in the Nios II SBT command line flow, generate profiling data to `gmon.out` in the Nios II command shell, and then import the project to the IDE, you cannot use the Profiling perspective to view the profiling data. When you attempt to view `gmon.out`, the IDE displays the following error message:

```
nios2-elf-gprof: ../: not in a.out format.
```

**Workaround**
Run `nios2-elf-gprof` from the Nios II command shell to generate a profiler report.

**Solution Status**
Not fixed

**Error Message when Downloading .elf File**

If the Build Automatically option is turned on in the IDE, you might get the following error when downloading a .elf:

```
2 [main] sh 5736 fork: child 3892 - died waiting; \
for longjmp before initialization, errno 11
```

The Build Automatically option is off by default, as recommended by the Eclipse help system.

**Workaround**
Turn off the Build Automatically option and download the .elf file again.

**Solution Status**
Not fixed

**Variable Casting Unsupported in ISS**

Casting variables in the Variables view in the Debug perspective when using the Nios II ISS might cause an exception dialog box to open.

This exception might occur if you select **Debug as ISS** in the Nios II IDE and try to cast variables via the Variables view.
Workaround
There is no workaround.

Solution Status
Not fixed

Trace Debug Does Not Support Instruction-Related Exceptions
The instruction-related exception handler is not supported by the Nios II trace tools.

Workaround
There is no workaround.

Solution Status
Not fixed

Trace Debug Does Not Support the JMPI Instruction
The JMPI instruction is not supported by the Nios II trace tools.

Workaround
There is no workaround.

Solution Status
Not fixed

Cannot Locate Source Code in Driver Files Shared by Multiple Projects
If you hit a breakpoint in a driver file, and that driver file is shared with another project that is closed, the Nios II IDE might indicate that it cannot locate the source code.

Workaround
Open the closed system library project and resume debugging.

Solution Status
Not fixed

Console Window Is Not Updated After ISS Error
After performing a Run as ISS, if you receive an ISS error in the console window, the console is not updated subsequently.

Workaround
Close the console window after receiving an ISS error. A new console window opens when a new message is available.
Solution Status
Not fixed

ISS Fails on Designs Containing Triple Speed Ethernet MAC or SG-DMA Components
You receive an Internal Error when attempting to perform an ISS simulation of designs containing the Altera Triple Speed Ethernet media access control (MAC) or SG-DMA components because the Nios II ISS does not support these components.

Workaround
Remove the Triple Speed Ethernet MAC and SG-DMA components from your system and perform ISS simulation on the simplified system. You can also simulate the design in ModelSim or test it on hardware.

Before removing the Triple Speed Ethernet MAC and SG-DMA components, make a copy of the unmodified system to ensure that you can return to the original configuration.

Solution Status
Not fixed

Memory Window Sets Control Register Values Incorrectly
The memory window might incorrectly set values in memory-mapped control registers. For example, writing 0x1234 to a byte addressed register results in the value 0x3434 being stored in the register. The memory window shows this incorrect value.

Workaround
Use the GNU debugger (GDB) console window in the IDE, instead of the memory window, to write to the registers. For example, type the following command:

```
set {int} <register address>=0x1234
```

You must refresh the memory window for it to correctly display the target value.

Solution Status
Not fixed

Programs That Interact With a Terminal Console on Windows Do Not Work
Programs with this behavior work in v. 6.0 and earlier, but do not work in Nios II IDE v. 6.1 and later.

The Eclipse platform in v. 6.1 and later of the IDE (on Windows only) sends the string \r\n instead of just \n when running or debugging using the Terminal. This behavior can break existing software designs, and it is inconsistent with nios2-terminal, which still just sends \n.

Workaround
Change the software running on the Nios II processor to parse for \r\n as well as \n.
Solution Status
Not fixed

“Run as ModelSim” in the Nios II IDE Fails
The Run as ModelSim command might fail on launch configurations created in v. 7.0 or earlier of the IDE. This problem does not occur for new launch configurations.

Workaround
Select a location for the ModelSim tool from the launch configuration dialog box. You can use the Browse button next to the ModelSim path group, or type in a path to the ModelSim directory (for example c:/altera/71/modelsim_ae/win32aloem).

Solution Status
Not fixed

The Restart Command on the Run Menu Does Not Work
The Restart command on the Run menu does not work.

Workaround
Stop the program, then debug it again. If the debugger is hung in an endless loop, use the following bash alias to break the target, then stop it:

```
alias break="kill -2 \'ps -a | grep nios2-elf-gdb | cut -f6 -d\' \""
```

Solution Status
Not fixed

Watchpoints Do Not Work on Certain Variables
Watchpoints do not work on a variable whose size is not 32 bits.

Workaround
Change the types of global and static local variables to int, long, or unsigned long before setting watchpoints on them.

Solution Status
Not fixed

Nios II IDE Errata: Navigating Projects
This section describes in detail the issues related to navigating projects in the Nios II IDE.

Nios II IDE Freezes While Displaying the Splash Screen
After clicking Switch Workspace on the File menu on a Windows machine, a Nios II IDE splash screen appears. Unfortunately, this splash screen obscures the dialog box that asks you to specify the new workspace. As a result, the IDE appears to freeze.
Workaround
Press Alt-Tab to switch applications. Two relevant application icons appear: an Eclipse icon associated with the splash screen and a Nios II IDE icon associated with the Workspace dialog box. Select the Nios II icon to bring the dialog box to the foreground.

Solution Status
Not fixed

Internal Error When Double-Clicking on a Large Objdump File
On Windows when opening a large objdump file in the Nios II IDE, you might get the following error message:

Unable to create this part due to an internal error.
Reason for the failure: Editor could not be initialized.

Workaround
Adjust the Windows launch arguments for the Nios II IDE editor. Perform the following steps:

1. On the Windows Start menu, browse to the Nios II EDS program icon, right-click it, then click Properties. The Windows Properties dialog box appears.
2. In the Target field, append "vmargs -Xmx1024m" to the end of the path to the Nios II IDE executable. For example:
   
   `C:\altera\72\nios2eds\bin\eclipse\nios2-ide.exe -vmargs -Xmx1024m`

Solution Status
Not fixed

C/C++ Scanner Does Not Support Certain C/C++ Constructs
The C/C++ scanner performs C/C++ Search, navigation, open declaration, and parts of content assist. Due to limitations of the C/C++ scanner, these features do not work with C code constructs not supported by the C++ language. An example is functions that take a function pointer as an argument.

Workaround
If the C/C++ Search fails, use the File Search facility.

Solution Status
Not fixed
Nios II SBT Errata

This section describes in detail the issues in the Nios II SBT.

Nios II SBT Creates Spurious BSP for System with MMU

The Nios II SBT is not intended to generate BSPs for the Nios II MMU. The SBT incorrectly lets you create a BSP for a Qsys-generated Nios II system with an MMU. This BSP includes a `system.h` file with incorrect MMU information.

You cannot use the Nios II SBT to create a BSP for the Nios II MMU.

Affected Configurations
Qsys designs with the Nios II MMU

Workaround
None.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Error Running Nios II Project: 'Downloading ELF Process failed'

If the Nios II processor’s cpu.data_master port is not connected to all program memories (memories to which the `.elf` file is downloaded) the software project fails to run on Nios II hardware.

Failure to connect cpu.data_master to all program memories is a design error that the Nios II SBT does not detect.

Workaround
Connect cpu.data_master to all program memories.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

BSP Editor Does Not Show Command-Line Help

The following commands in the Nios II Command Shell should display command-line help:

- `nios2-bsp-editor --help`
- `nios2-bsp-editor --extended-help`

Instead, these commands launch the BSP Editor.

Workaround
For help with the BSP Editor, refer to “Using the BSP Editor” in the Getting Started with the Graphical User Interface chapter of the Nios II Software Developer’s Handbook.
**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

**BSP Not Updated for Memory Size Changes in SOPC Builder**

If you change the size of a memory in SOPC Builder, the memory region size in any previously created BSP is no longer correct. Regenerating the BSP does not update the BSP’s memory region size.

**Workaround**
In the BSP Editor, on the **Linker Script** tab, you can correct the memory region size either of the following ways:

- Edit the memory region size manually.
- Click **Restore Defaults** to rerun the default Tcl script. The default Tcl script reads the updated memory region size from the SOPC information file (.sopcinfo) and updates the BSP.

For detailed information about keeping your BSP consistent with changes in the underlying SOPC Builder system, refer to “Revising Your BSP” in the Nios II Software Build Tools chapter of the Nios II Software Developer’s Handbook.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

**Build Errors on Interrupt API Calls**

You might observe build errors if your application project installs an ISR that calls the `alt_irq_register()` function.

The Nios II EDS v9.1 includes support for an optional External Interrupt Controller (EIC) interface on the Nios II processor. To support the EIC interface, the HAL includes an enhanced interrupt API.

When you create a BSP, the SBT determines which interrupt API(s) the device drivers in your system support. If all registered drivers in the BSP identify themselves as supporting the enhanced API, the SBT implements the enhanced API. All Altera device drivers in v9.1 and later support the enhanced API.

When the enhanced API is implemented, the legacy interrupt API, including `alt_irq_register()`, is not available. Therefore, if the application code contains a call to a legacy API function, a linker error occurs.

This issue might affect application projects that call `alt_irq_register()` or other legacy interrupt API functions directly, rather than depending on drivers in the BSP for interrupt support.

If your Nios II application project’s source code registers an ISR using `alt_irq_register()`, or includes an ISR, your application might fail to compile in the Nios II EDS v. 9.1, due to undefined references to `alt_irq_register()`, or to a change in the ISR function prototype.
**Workaround**
Modify your application code to use the new enhanced interrupt API. To use the enhanced API, you must modify several function calls and all ISR function prototypes.

For information about supporting the enhanced interrupt API, refer to the Exception Handling chapter of the Nios II Software Developer’s Handbook, or to AN 595: Vectored Interrupt Controller Usage and Applications.

You must upgrade to the enhanced API if you wish to use an EIC in your hardware design to accelerate interrupt response time. The enhanced API also works with the Nios II processor’s internal interrupt controller.

**Solution Status**
Not fixed

**SBT Fails if Nios II EDS is Installed in a Path Containing Spaces**
The Nios II Command Line SBT fails if you install the Nios II EDS in a path containing spaces.

**Workaround**
Reinstall the Nios II EDS to a path that does not contain spaces.

**Solution Status**
Not fixed

**User-Managed BSP Settings Not Supported in Nios II IDE**
This issue is described on page 48.

**Peripheral Errata**
This section describes in detail the Nios II EDS issues related to peripheral components.

**Vectored Interrupt Controller Does Not Support VHDL Simulation Models**
This issue is described on page 42.

**Unaligned Transfers of Small Payloads Fail on SG-DMA**
The Scatter Gather DMA SOPC Builder peripheral does not correctly handle unaligned transfers with small payloads. A payload length smaller than the data width causes erroneous data transfers.

**Workaround**
Avoid using DMA devices to transfer small payloads.
If absolutely necessary, for a 32-bit SG-DMA, a minimum length of 4 bytes guarantees that data is transferred correctly.

Solution Status
Not fixed

DMA Controller Always Busy in Burst Mode
The DMA controller component (altera_avalon_dma), when enabled for burst transactions, does not perform transfers at widths other than its full data width. The DMA controller is always busy.

Workaround
When bursting is enabled, the DMA controller must be programmed to perform transactions at its full data width.

Solution Status
Not fixed

Non-System-Wide Reset Can Cause Improper Initialization of Mailbox Core
The altera_avalon_mailbox peripheral might not be initialized properly when a soft (non-system-wide) reset occurs. In this condition, mailbox contents (read and write pointers) are not reinitialized and might show potentially stale data.

Workaround
Ensure that a system-wide reset event occurs by asserting the reset_n input to the SOPC Builder system containing the mailbox. This resets all peripherals and Nios II processors in the system.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Target Software Errata
This section describes in detail the Nios II EDS issues related to target software packages.

NicheStack tcp_wake() Function Does Not Awaken All select() Sleepers
This issue impacts software based on the NicheStack TCP/IP Stack - Nios II Edition, with multiple sleeping tasks that depend on the same select() event to wake up. The tcp_sleep() and tcp_wake() functions do not work properly for tasks that call select().

Tasks can normally use tcp_sleep() and tcp_wake() to suspend and then awaken themselves upon specific events. The select() function passes an event pointer to tcp_sleep() that is identical for every task that might call select(). All other events that call tcp_sleep() pass it a unique event pointer that specifically identifies them as the task to be awakened at the next event.
The `tcp_wake()` function apparently assumes that the list of sleepers contains unique event pointers by which they can be identified. Therefore, when a `select()` event occurs, instead of awakening all tasks waiting for it, `tcp_wake()` awaken only the first task in the list. Therefore, when more than one task calls `select()` to await some outcome on a socket, only the highest-priority task in the sleepers list is awakened at `select()` events. Other sleeping tasks that depend on the same `select()` event do not wake up.

**Workaround**

There is no workaround.

**Solution Status**

Fixed in v10.0 of the Nios II EDS

---

**malloc(), realloc() Failures With MicroC/OS-II**

When you use the MicroC/OS-II RTOS, calls to `malloc()` and `realloc()` might fail if successive calls to `malloc()` or `realloc()` within a MicroC/OS-II task occur after changing the task priority of the task in which a memory block is originally allocated.

**Workaround**

Use one of the following workarounds:

- Allocate and/or reallocate memory blocks outside of MicroC/OS-II tasks, before task switching starts. Preallocated memory blocks make it possible to change thread priorities at runtime.

- Allocate fixed areas of memory using arrays (rather than using `malloc()` before task switching starts. Fixed memory arrays make it possible to change thread priorities at runtime.

- Allocate memory using `malloc()` or `realloc()` from a MicroC/OS-II task. You can change task priorities at runtime, but only for tasks that have not used `malloc()` or `realloc()`.

**Solution Status**

Fixed in v10.0 of the Nios II EDS

---

**EIC-Based Nios II System Crashes With NicheStack**

When you attempt to run software based on the NicheStack TCP/IP Stack - Nios II Edition on a hardware design incorporating an external interrupt controller such as the VIC, the Nios II system crashes during initialization, with unpredictable results.

**Workaround**

There is no workaround.

**Solution Status**

This issue will be fixed in a future release of the Nios II EDS.
stdio Does Not Work with MicroC/OS-II and Small C Library

`stdin`, `stdout`, and `stderr` do not work in MicroC/OS-II applications built with the Small C library option.

**Workaround**
Disable the small C library option.

**Solution Status**
Not fixed

cout From MicroC/OS-II Task Does Not Send Data to stdout

If neither `printf()` or `cout` is used from `main()` before tasks are started, `cout` does not work from a task.

**Workaround**
Add the following C++ code to the beginning of `main()`:

```cpp
std::ios_base::sync_with_stdio(false);
```

**Solution Status**
Not fixed

Toolchain and Utilities Errata

This section describes in detail the Nios II EDS issues related to the Nios II and GNU compiler toolchains, including tools such as `gcc`, `gdb`, and `sof2flash`.

**Warning Message: "pragma_reverse_bitfields' attribute directive ignored"**

The Nios II GCC 4 tool chain does not support the C compiler pragma and flag for reverse bit fields. If you try to use the compiler pragma `reverse_bitfields`, you see the following warning:

'pragma_reverse_bitfields' attribute directive ignored

Similarly, the C compiler flag `-mreverse-bitfields` is unsupported.

**Workaround**
Use the GCC 3 tool chain.

**Solution Status**
This issue will be fixed in a future release of the Nios II EDS.

nios2-download Cannot Find JTAG Instance IDs

Because Qsys uses different instance naming conventions compared to SOPC Builder, if you use the `--jdi` and `--cpu_name` flags with the `nios2-download` command, `nios2-download` cannot properly parse the Qsys instance names to find the correct JTAG debug module instance ID in the `.jdi` file.
Design Impact
Qsys designs with multiple JTAG debug modules

Workaround
Manually find the JTAG debug module ID in the .jdi file. Pass this value to `nios2-download` with the `--instance` flag.

The JTAG debug module ID might change after each Quartus II compilation.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

nios2-console Does Not Work in the GCC 4 Command Shell
If you try to run the `nios2-console` command in the GCC 4 Command Shell, you see the following error message:

`Can't locate strict.pm in @INC ...`

Workaround
Use the GCC 3 Command Shell.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

C++ Exceptions Unsupported in a Multi-Threaded Environment
C++ exceptions are only supported in a single-threaded environment. They cannot be used in a multi-threaded environment such as MicroC/OS-II.

Also see “C++ Exceptions Unsupported by the Nios II GCC 4 Toolchain”.

Workaround
In a multi-threaded environment, you need to guard C++ exceptions with semaphores.

Solution Status
Not fixed

C++ Exceptions Unsupported by the Nios II GCC 4 Toolchain
With the GCC 4 toolchain, C++ exceptions are not supported.

Also see “C++ Exceptions Unsupported in a Multi-Threaded Environment”.

Workaround
If your single-threaded project requires C++ exceptions, use the GCC 3 toolchain.
Solution Status
This issue will be fixed in a future release of the Nios II EDS.

memcpy() Optimization Misalignment
When optimization is turned on (-O1 or higher), if you use memcpy() and the source pointer is aligned to a 32-bit boundary, the compiler implements memcpy() with word-oriented instructions as part of the optimization process. This optimization technique causes unexpected results in your software if memcpy() is used on a misaligned address.

Workaround
Take steps to ensure that an optimized implementation of memcpy() is called only with aligned data pointers.

Solution Status
This issue will be fixed in a future release of the Nios II EDS.

Unable to Configure FPGA from Flash with Parallel Flash Loader
This issue is described on page 41.

GNU Assembler Does Not Accept the --defsym Flag
According the GNU documentation, you can set an assembler definition by using the --defsym flag, but it does not work in the following form: --defsym MY_VAR=1.

Workaround
There is no workaround.

Solution Status
Not fixed

How to Contact Altera
For the most up-to-date information about Altera products, refer to Table 8.

Table 8. Contact Information

<table>
<thead>
<tr>
<th>Contact (1)</th>
<th>Contact Method</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical support</td>
<td>Website</td>
<td><a href="http://www.altera.com/support">www.altera.com/support</a></td>
</tr>
<tr>
<td>Technical training</td>
<td>Website</td>
<td><a href="http://www.altera.com/training">www.altera.com/training</a></td>
</tr>
<tr>
<td></td>
<td>Email</td>
<td><a href="mailto:custrain@altera.com">custrain@altera.com</a></td>
</tr>
<tr>
<td>Altera literature services</td>
<td>Email</td>
<td><a href="mailto:literature@altera.com">literature@altera.com</a></td>
</tr>
<tr>
<td>Non-technical support (General)</td>
<td>Email</td>
<td><a href="mailto:nacomp@altera.com">nacomp@altera.com</a></td>
</tr>
<tr>
<td>(Software Licensing)</td>
<td>Email</td>
<td><a href="mailto:authorization@altera.com">authorization@altera.com</a></td>
</tr>
</tbody>
</table>

Note:
(1) You can also contact your local Altera sales office or sales representative.
Typographic Conventions

Table 9 shows the typographic conventions that this document uses.

Table 9. Typographic Conventions

<table>
<thead>
<tr>
<th>Visual Cue</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold Type with Initial Capital Letters</strong></td>
<td>Indicates command names, dialog box titles, dialog box options, and other graphical user interface (GUI) labels. For example, <strong>Save As</strong> dialog box. For GUI elements, capitalization matches the GUI.</td>
</tr>
<tr>
<td><strong>bold type</strong></td>
<td>Indicates directory names, project names, disk drive names, file names, file name extensions, dialog box options, software utility names, and other GUI labels. For example, <code>\qdesigns</code> directory, <code>d:</code> drive, and <code>chiptrip.gdf</code> file.</td>
</tr>
<tr>
<td><strong>Italic Type with Initial Capital Letters</strong></td>
<td>Indicates document titles. For example, <em>AN 519: Stratix IV Design Guidelines.</em></td>
</tr>
<tr>
<td><strong>Italic type</strong></td>
<td>Indicates variables. For example, <code>n + 1</code>. Variable names are enclosed in angle brackets (<code>&lt;&gt;</code>). For example, <code>&lt;file name&gt;</code> and <code>&lt;project name&gt;.pof</code> file.</td>
</tr>
<tr>
<td>Initial Capital Letters</td>
<td>Indicates keyboard keys and menu names. For example, Delete key and the Options menu.</td>
</tr>
<tr>
<td>“Subheading Title”</td>
<td>Quotation marks indicate references to sections within a document and titles of Quartus II Help topics. For example, “Typographic Conventions.”</td>
</tr>
<tr>
<td><strong>Courier type</strong></td>
<td>Indicates signal, port, register, bit, block, and primitive names. For example, <code>data1</code>, <code>tdi</code>, and <code>input</code>. Active-low signals are denoted by suffix <code>n</code>. For example, <code>resetn</code>. Indicates command line commands and anything that must be typed exactly as it appears. For example, <code>c:\qdesigns\tutorial\chiptrip.gdf</code>. Also indicates sections of an actual file, such as a Report File, references to parts of files (for example, the AHDL keyword <code>SUBDESIGN</code>), and logic function names (for example, <code>TRI</code>).</td>
</tr>
<tr>
<td>1., 2., 3., and a., b., c., and so on.</td>
<td>Numbered steps indicate a list of items when the sequence of the items is important, such as the steps listed in a procedure.</td>
</tr>
<tr>
<td>■ ■</td>
<td>Bullets indicate a list of items when the sequence of the items is not important.</td>
</tr>
<tr>
<td>■ ■</td>
<td>The hand points to information that requires special attention.</td>
</tr>
<tr>
<td><img src="caution.png" alt="CAUTION" /></td>
<td>A caution calls attention to a condition or possible situation that can damage or destroy the product or your work.</td>
</tr>
<tr>
<td><img src="warning.png" alt="WARNING" /></td>
<td>A warning calls attention to a condition or possible situation that can cause you injury.</td>
</tr>
<tr>
<td><img src="arrow.png" alt="ARROW" /></td>
<td>The angled arrow instructs you to press Enter.</td>
</tr>
<tr>
<td><img src="feet.png" alt="FEET" /></td>
<td>The feet direct you to more information about a particular topic.</td>
</tr>
</tbody>
</table>