



Intel® Ethernet SR-IOV Toolkit

Single Root I/O Virtualization and Sharing Toolkit for Intel Ethernet

LAN Access Division

322191-002

Revision 1.1

May 2010

Legal

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

UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED NOR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

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

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

Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain computer system software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

BunnyPeople, Celeron, Celeron Inside, Centrino, Centrino logo, Chips, Core Inside, Dialogic, EtherExpress, ETOX, FlashFile, i386, i486, i960, iCOMP, InstantIP, Intel, Intel logo, Intel386, Intel486, Intel740, IntelDX2, IntelDX4, IntelSX2, Intel Core, Intel Inside, Intel Inside logo, Intel. Leap ahead., Intel. Leap ahead. logo, Intel NetBurst, Intel NetMerge, Intel NetStructure, Intel SingleDriver, Intel SpeedStep, Intel StrataFlash, Intel Viiv, Intel XScale, IPLink, Itanium, Itanium Inside, MCS, MMX, MMX logo, Optimizer logo, OverDrive, Paragon, PDCharm, Pentium, Pentium II Xeon, Pentium III Xeon, Performance at Your Command, Pentium Inside, skool, Sound Mark, The Computer Inside., The Journey Inside, VTune, Xeon, Xeon Inside and Xircom are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

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

Copyright © 2009, 2010; Intel Corporation

Revisions

Date	Revision	Description
June 2, 2009	0.75	Initial Draft
June 10, 2009	1.00	Initial public release.
May 24, 2010	1.10	Updated with Intel 82599 information.

Contents

1	SR-IOV General References	5
2	SR-IOV Resources for Intel® 82576 1GbE	6
3	SR-IOV Resources for Intel® 82599 10GbE	7

1 SR-IOV General References

This document acts as a portal for SR-IOV resources available for Intel® Ethernet Controllers. It provides links to a collection of documents which contain overviews and technical information.

The following are general references.

- *PCI-SIG SR-IOV Primer, An Introduction to SR-IOV Technology.*
 - A high-level overview of SR-IOV and the system requirements. Access through the listing at <http://developer.intel.com/products/ethernet/index.htm?iid=nc+ethernet>.¹
- *PCI SIG SR-IOV Specification*
 - The SR-IOV specification, available from the PCI Sig. See: <http://www.pcisig.com/specifications/iov/>
- *SR-IOV Networking in Xen: Architecture, Design and Implementation*
 - A 2008 paper Intel co-presented at the Xen Summit. See: http://www.sagecertification.org/events/wiov08/tech/full_papers/dong/dong.pdf.
- *Intel® Virtualization Technology for Directed I/O (VT-d)*
 - An overview of Intel® Virtualization Technology for Directed I/O (VT-d). See: <http://software.intel.com/en-us/articles/intel-virtualization-technology-for-directed-io-vt-d-enhancing-intel-platforms-for-efficient-virtualization-of-io-devices/>.
- *Intel SR-IOV Explanation*
 - A short 10 minute video explaining at a high-level how SR-IOV works <http://www.youtube.com/watch?v=hRHsk8Nycdg>

¹ For the Intel Developer links: select 82576EB or 82599ES from the Pick List. Then move to the SR-IOV entries.

2 SR-IOV Resources for Intel® 82576 1GbE

The Intel® 82576 GbE Controller is the first Intel Ethernet controller to support PCI SIG SR-IOV. It has sufficient resources for eight virtual functions for each port. The following resources are available for 82576 support.

- *Intel® 82576 Gigabit Ethernet Controller Datasheet*
 - The datasheet documents the controller. It includes descriptions of the virtualization features and registers for the control of those features. See the listing at <http://developer.intel.com/products/ethernet/index.htm?iid=nc+ethernet#s1=Gigabit%20Ethernet&s2=82576EB&s3=all>.²
- *Intel® 82576 SR-IOV Driver Companion Guide*
 - The guide bridges the gap between the reference drivers and the datasheet. It provides an overview of the Linux SR-IOV drivers (PF and VF) for the 82576. See the listing at <http://developer.intel.com/products/ethernet/index.htm?iid=nc+ethernet>.
- Notes on Sample Drivers
 - The SR-IOV drivers for the Intel® 82576 Gigabit Ethernet Controller are available as part of the Linux* Kernel 2.6.30 and later. See: www.kernel.org. In addition, the drivers are available on SourceForge at: <http://sourceforge.net/projects/e1000/files/>
 - Select the igb driver for the PF driver source.
 - Select the igbvf driver for the VF driver source

² For the Intel Developer links: select the SR-IOV entries.

3 SR-IOV Resources for Intel® 82599 10GbE

The Intel® 82599 10GbE Controller is the second Intel Ethernet controller to support PCI SIG SR-IOV. It has sufficient resources for sixty-four virtual functions for each port. The following resources are available for the Intel 82599 10GbE controller.

- *Intel® 82599 10 Gigabit Ethernet Controller Datasheet*
 - The datasheet documents the controller. It includes descriptions of the virtualization features and registers for the control of those features. See the listing at <http://developer.intel.com/products/ethernet/index.htm?iid=nc+ethernet#s1=10%20Gigabit%20Ethernet&s2=82599ES&s3=all>³
- *Intel® 82599 SR-IOV Driver Companion Guide*
 - The guide bridges the gap between the reference drivers and the datasheet. It provides an overview of the Linux SR-IOV drivers (PF and VF) for the 82599. See the listing at <http://developer.intel.com/products/ethernet/index.htm?iid=nc+ethernet#s1=10%20Gigabit%20Ethernet&s2=82599ES&s3=all>
- Notes on Sample Drivers
- The SR-IOV drivers for the Intel® 82599 Gigabit Ethernet Controller are available as part of the Linux* Kernel 2.6.32 and later. See: www.kernel.org. In addition, the drivers are available on SourceForge at: <http://sourceforge.net/projects/e1000/files/>
 - Select the ixgbe driver for the PF driver source.
 - Select the ixgbevfv driver for the VF driver source

³ For the Intel Developer links: select the SR-IOV entries.