RAID Matters. Rely on Intel RAID.

Complete Portfolio for the Storage Needs of Today and Beyond

Featuring SAS 3 and SATA 3 architected add-in cards, modules, expanders, SSD Cache and High Availability

Why Intel® RAID?

Intel® RAID offers a broad portfolio of RAID solutions designed to address the storage-related challenges of the modern day datacenter as well as the small business. Intel® RAID RS3 Controllers, Intel® Integrated RAID RMS25/S3 Modules, Intel® RAID High Availability and Intel® RAID SSD Cache provide organizations with:

- **Industry leading performance** – delivering up to 500MB/s throughput and 750K IOPs in RAID mode; and over 1M IOPs in pass-through SAS (JBOD) mode[1]
- **Advanced data protection** – powered by reliable LSI* MegaRAID technology
- **Ease of use** – fully validated for thousands of hours to ensure it "just works" and manageable by a web-based GUI and command line tool that works across products
- **World-class training, support and partner programs** – customized training, design-win and post-sales support; backed by Intel Advanced Warranty Replacement

The right product for your target market

The following sub-sections include spotlights of Intel's current RAID portfolio from basic to the highest scalable performance. The last section on "Next Generation Products" portrays five near-term additions to the Intel RAID catalog. These products are expected to launch during 2014. For a complete list of current and expected 2014 Intel RAID products, see the Product Matrix available at intel.com/go/RAID.

Basic: Software RAID

Software RAID offers a subset of the features delivered in hardware RAID and is delivered as part of an operating system. Software RAID relies on system resources, processors, and memory. Software RAID is typically used for economic reasons or for mirroring an operating system. Intel sells 8 different software RAID keys including:

- **Intel® RAID Software RAID 5 Key RKSATA4R5**: Delivers Intel® Embedded Server RAID Technology with RAID levels 0/1/5/10.

Entry-Level: I/O Controller-based Hardware RAID

Entry-level RAID offers hardware RAID 0/1/10/1E for budget oriented solutions where performance and mainstream features are not pertinent. Intel's entry-level RAID modules are also excellent for use with JBODs when combined with accessory AXXRCVT8788. The following solutions are recommended for most customers desiring an entry-level solution:

- **Intel® Integrated RAID Module RMS3JC080:** Delivers 12Gb/s SAS ports for Intel® Server Boards and Systems with a Storage I/O Module Connector. Use for simple RAID 0,1,1E or JBOD mode while preserving add-in card slot in 1U or 2U system.
- **Intel® RAID Controller RS3UC080**: Delivers 8 x 12Gb/s ports with SAS 3.0 functionality for installation in a PCIe-slot. Use for RAID 0,1,1E or JBOD mode with Intel or 3rd party server boards.

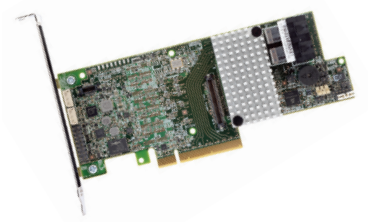
SMB (Mid-Tier): I/O Controller-based with Advanced Firmware

Many servers targeted at Small and Medium Business (SMB) require advanced RAID and storage management, but do not require Mainstream (Intelligent Hardware RAID) performance. For these customers, Intel offers a unique blend of our Mainstream RAID software stack on less expensive I/O Processor-based hardware. The following products are recommended:

- **Intel® Integrated RAID Module RMS3HC080**: Delivers 8 x 12Gb/s SAS 3.0 Ports with a I/O controller for low cost and LSI* MegaRAID technology for Advance Management and Hybrid RAID 5/50 (in addition to JBOD and HW RAID 0,1,10 modes). For Intel Server Boards with a Storage I/O Module Connector.
- **Intel® RAID Controller RS3WC080**: Delivers 8 x 12Gb/s SAS Ports with an I/O processor and MegaRAID-based firmware. Hardware RAID 0,1,10 and Hybrid RAID 5/50. Hybrid refers to RAID which is firmware based (not OS driver based like Software RAID), but uses system resources for parity calculations.

Mainstream: RAID-On-Chip Intelligent Hardware RAID

Mainstream RAID offers advanced application acceleration technology delivered to both add-in cards and modules with advanced firmware, drivers, utilities and management software. Mainstream RAID cards have powerful onboard processors with capabilities to perform parity generation (RAID levels 5/6/50/60) and RAID recovery operations, as well as data, memory and bus management. The following solutions are recommended for most customers desiring a mainstream solution:



- **Intel® Integrated RAID Module RMS3CC080/040**: Delivers 8 or 4 x 12Gb/s SAS 3.0 ports with a high performance RAID-On-Chip processor, 1GB DDR3 memory and LSI* MegaRAID technology. For Intel Server Boards with a Storage I/O Module Connector.
- **Intel® RAID Controller RS3DC080/040**: Delivers 8 or 4 x 12Gb/s SAS ports with a high performance SAS 3.0 capable processor, 1GB DDR3 memory and LSI* MegaRAID technology. For Intel and qualified 3rd party server boards. Uses a standard PCIe slot.

Scalable Performance with SAS Expanders and External Ports for JBOD Connectivity

Scalable Performance offers more than 8 SAS/SATA ports and delivers high performance associated with the throughput and IOPs possible with a high number of drives. To architect a scalable performance solution, it is recommended that a mainstream RAID product be combined with one of the following SAS expanders:

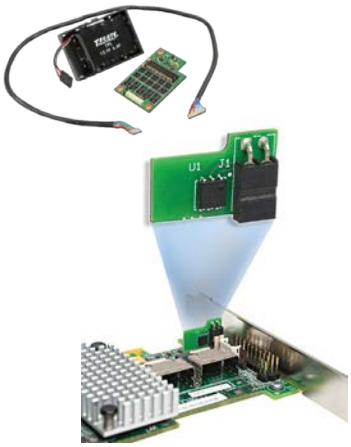
- **Intel® RAID Expander RES3TV360**: Expander board that enables the connection of up to 28 inside-the-box SAS or Serial ATA (SATA) devices. Compliant with the SAS 3.0 protocol, this expander aggregates 6Gb/s signals to allow 12Gb/s communication with RAID add-in cards capable of supporting the higher rate.
- **Intel® RAID Expander RES3FV288**: PCIe x1 card (for power) that allows four or eight ports on a RAID initiator to be expanded to up to 20 internal and eight external ports. This expander also complies to the SAS 3.0 protocol and therefore enables bandwidth aggregation from 6G target devices (hard drives or SSD) to a 12Gb/s signal.

Did you know that Intel offers a wide range of RAID cards with external ports for JBOD connectivity? For instance, the Intelligent Hardware RAID card Intel® RAID Controller RS3MC044 which offers the flexibility of both internal and external ports.

SSD-like Performance from Hard-Drive-based RAID using SSD Cache

Solid State technology allows for drastically higher throughput and IOPs than traditional spinning drives. However, an entire array of Solid State Drives is often cost prohibitive. To allow for the best of both worlds, Intel offers the following:

- **Intel® RAID SSD Cache Controller RCS25ZB040**: Includes up to 1TB of onboard Flash-based cache which it utilizes to accelerate Writes and also host frequently accessed data or "hot spots" in order to provide SSD array-like performance.
- **SSD Cache 2.0 with FastPath* I/O Key**: Allows for one or more SSD to be used as super-sized cache for the RAID module or unlocks a SSD-optimized code base for SSD RAID arrays (Order code: AXXRPFKSSD2).



Common Accessories: Cache Backup, Premium Feature Upgrade and Cables

Intel offers accessories to help ensure the highest data protection and storage availability. These include:

- **Maintenance Free Backup Units** to protect the dynamic cache.
- **Premium Feature Keys** to allow for features such as Disk Encryption Management of SED drives and High Availability failover redundancy.
- **Cable kits** to deliver high bend radius, high signal integrity and a perfect fit.

For a complete list of accessories, please see the Product Matrix available at: intel.com/go/RAID.

For more information on Intel RAID products; visit www.intel.com/go/RAID

For more information on how to make Intel RAID products part of your server environment, please contact an Intel® Channel Partner Program participant.

1 - Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing.

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