(intel logo)

Intel® Rapid Storage Technology enterprise (Intel® RSTe)

Enterprise RAID driver powered by Intel® Xeon® Processors

RAID running at the speed of Intel® Xeon® processors

How things have changed! 10 years ago we told you that software RAID (redundant array of independent disks) was underpowered and incapable of providing the performance required to service enterprise RAID applications. Back then, software RAID was just not a viable solution. But that has begun to change – in a big way. With more and faster CPU cores available, RAID can run at speeds matching solutions that sell for hundreds of dollars more. Since the processor load is very low — in some cases less than five percent of the CPU — software can now deliver a full-performing RAID subsystem.

Yes, things have changed. Software RAID solutions running on the Intel® Intel® Xeon® Processor E5-2600/2400/1600/1400/4600 with the Intel® C600 series chipset (Romley platform) now equals or outperforms hardware RAID.

Reduce total cost of ownership

Combining the Intel® RSTe 3.0 driver running on the Intel® Xeon® Processor E5-2600/2400/1600/1400/4600 with the integration of Serial Attached SCSI (SAS) and SATA controllers into the Intel® C600 series chipset can increase overall IO system performance and greatly reduce the overall solution costs incurred in previous generation solutions. With SAS (and SATA) functionality integrated into the server chipset, IT administrators can experience the full performance, reliability, and cost-efficiency of server storage. Advantages of SAS integration on the chipset for OEMs include a reduction in total cost of ownership (TCO), a reduced bill of materials (BOM), and fewer devices, leading to better real estate management on the motherboard.

- **Slotless RAID**
  Why use up a valued PCIe* slot for an expensive RAID card when you can run Intel® RSTe 3.0 for a fraction of the cost? The slot or ports dedicated for the RAID card are no longer taken when you use Intel® RSTe 3.0. The integrated configuration also offers better power management. With no card to configure or maintain, the software approach can help reduce IT support and training costs.

- **SAS and SATA RAID levels**
  SATA RAID levels 0, 1, 10 and 5 are supported and included in all SKUs of the Intel® C600 series chipset. SAS RAID levels 0, 1, and 10 are included in the base SAS SKUs. SAS RAID 5 is added in the premium chipset SKU. There are no additional hardware or software charges - making this one of the least expensive enterprise RAID solutions available.

Features for enterprise RAID

- SAS RAID Support (supports SAS or SATA drives)
  - RAID 0/1/10 included with Intel® C600 series chipset
  - Upgradable to SAS RAID 5
  - SAS expander support - 1 expander level, up to 36 drives for simple capacity expansion

- SATA mode only RAID support
  - RAID 0/1/10/5 included with SATA-only Intel® C600 series chipset SKUs
  - Direct attach support for up to 8 ports of SATA on the storage controller unit (SCU) controller
  - Direct attach support for up to 6 ports of SATA on the AHCI controller
  - SATA drive roaming between AHCI and SCU controllers

- Open-source Linux*
  - Intel is the only SW RAID vendor that supports boot/install
  - Multiple Devices RAID (MDRAID) support
  - XEN*/KVM* on RHEL*; XEN on SLES*
  - Intel-developed feature set similar to what is provided by Intel on Windows* based operating systems

- Data protection
  - Write through cache
  - Bad block management
  - Write journaling
  - Read Patrol

- System Management Flexibility
  - System Management Common Information Model (CIM)
  - Universal Extensible Firmware Interface (UEFI)
  - Legacy Option ROM (OROM)
  - Disk coercion
  - Email alerting
  - Serial General Purpose IO (SGPIO)
  - Self Monitoring Analysis Reporting Technology (SMART) alerts
  - RAID level migration
  - Online capacity expansion
  - Rebuild on hot insert
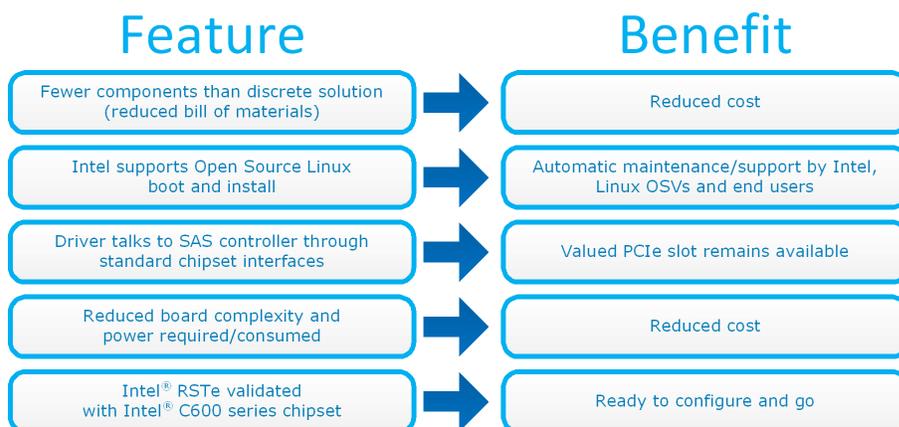 - Write-back cache available for maximum performance

High performance processors power RAID

Today's RAID combines the performance of software RAID and integrated SAS with the reliability of hardware features.

- RAID driver runs on the CPU
- Integrated SAS/SATA
- Support for RAID 0/1/10/5

Active and growing open-source RAID community

Intel is dedicated to support open-source Linux development. Intel is the only RAID vendor working to ensure first class support for its RAID format in the established Linux raid toolset Multiple Devices Administration (MDADM). In fact, Intel is the leading contributor to MDADM among all storage vendors. MDRAID now has a large and growing ecosystem of industry storage players who are actively developing and disclosing enterprise RAID features to the open-source RAID community.

Feature		Benefit
Fewer components than discrete solution (reduced bill of materials)	→	Reduced cost
Intel supports Open Source Linux boot and install	→	Automatic maintenance/support by Intel, Linux OSVs and end users
Driver talks to SAS controller through standard chipset interfaces	→	Valued PCIe slot remains available
Reduced board complexity and power required/consumed	→	Reduced cost
Intel® RSTe validated with Intel® C600 series chipset	→	Ready to configure and go

Variety of validated Operating Systems

Intel® RSTe 3.0 is validated with a variety of Windows* and Linux* operating systems. Intel® RSTe 3.0 is also validated with virtualized environments such as Microsoft* Hyper-V; and Linux XEN* and KVM*.

Intel® Rapid Storage Technology enterprise 3.0 validated operating systems	
	Validated Operating System[1]
Windows*	Microsoft Server 2008R2 Enterprise (x64)
	Microsoft Server 2008 Enterprise (x32 and x64)
	Microsoft Server 2003 Enterprise SP2 (x32 and x64)
	Microsoft Windows 7 SP1 (x32 and x64)
	Windows Vista SP2 (x32 and x64)
Linux*	Red Hat Enterprise Linux Server* (x32 and x64)[2]
	SUSE SuSE Linux Enterprise Server* (x32 and x64)[3]
Virtualization	Hyper-V*
	Xen*
	KVM*

1. The listing of an operating system in the table indicates only that it is being used by Intel for Romley platform validation. The listing of an OS in the table does not imply that Intel has completed Romley platform validation with it, or that the platform has full support from the OS supplier. Contact your OS supplier to learn more about support for the Romley platform. Intel is not validating or certifying OS for the Romley platform and related silicon. Customers are responsible for certification of operating systems on their platform. They may validate additional operating systems and/or platform features that are not validated by Intel and claim support on their platforms.
2. Contact Red Hat for details.
3. Contact SUSE for details.

For more information, visit www.intel.com/go/raid

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