RAID and Storage Options Available on Intel® Server Boards and Systems

based on Intel® 5500/5520 and 3420 PCH Chipset

Revision 2.0

January, 2011

Revision History   RAID and Storage Options Available on Intel® Server Boards
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Revision History

Date	Revision Number	Modifications
March 2009	1.0	Initial Release.
January 2011	2.0	New RAID modules and server platforms added.

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1.   High-Level Comparison Of the RAID Options

	RAID-Entry			RAID-Enterprise
Intel Solution	Intel® Rapid Storage Technology (RST RAID)	Intel® Embedded RAID Technology II (ESRT2 Software RAID)		Entry Hardware RAID (IR RAID)	Intelligent Hardware RAID (IR3 RAID)
Technology	SATA device only: firmware level RAID	SATA device Only: SATA controller with OS-level RAID driver utilizing system processors and memory	SAS/SATA devices: SAS controller with OS-level RAID driver utilizing system processors and memory	SAS/SATA SAS controller with basic RAID logic implemented at silicon level	SAS/SATA Intelligent RAID logic running on a dedicated I/O processor with dedicated cache memory
Storage Controller Option On Intel® Server Boards and Related Accessories[1]	Intel® 3420 PCH chipset	On-board Intel® 82801JR I/O Controller Hub (ICH10R); Intel® 3420 PCH chipset	N/A.	Intel® Integrated RAID Module RMS2LL080 / RMS2LL040 (AXXRMS2LL080 / AXXRMS2LL040)	Intel® Integrated RAID Module RMS2MH080 (AXXRMS2MH080); Intel® Integrated RAID Module RMS2AF080 / RMS2AF040 (AXXRMS2AF080 / AXXRMS2AF040); Intel® Integrated RAID Controller SROMBSASMR[2] (AXXROMBSASMR)
			Intel® SAS Entry RAID Module AXX4SASMOD[2] (See section 4 for how to change mode)		
			Hot-swap active backplane[2] (Order Code: ASR1500SASBP)	Active midplane 2[2] (Order Code: FALSASMP2) – (See section 4 for how to change mode)	
Fault Tolerance	★	★	★★	★★	★★★
Troubleshooting	★	★	★	★	★★★
Performance	★	★	★★	★★	★★★
RAID 5	Yes	Optional	Optional	No	Yes
RAID 6	No	No	No	No	Yes[3]
OS Support	Microsoft Windows*	Microsoft Windows* and select Linux*	Microsoft Windows* and select Linux*	Broad OS Support	Broad OS Support

Notes:
1. All references to Intel® Server Boards in this document refer to server boards that use the Intel® 5500/5520 chipset. For information about additional storage options available with Intel® Server Boards and related accessories, see "Chapter 2. Storage Controller Modes and Capabilities".
2. This is an optional accessory available for purchase from Intel.
3. AXXRMS2AF080 / AXXRMS2AF040 don't support RAID 6 / 60.

The following is a description of the values in the table:

- The green color highlights the advantages.

- The stars represent the features offered by the RAID solution, with one star identifying basic features and three stars identifying more advanced features.

2. Storage Controller Modes and Capabilities

Storage Controller	Storage Mode	Description	RAID Types and Levels Supported	Driver and OS Support	RAID Management Software	RAID Software User's Guide
On-board Intel® 82801JR I/O Controller Hub (ICH10R); Intel® 3420 PCH chipset	Enhanced	6 SATA ports in native mode	N/A	Chipset driver or operating system embedded Broad OS support	N/A	N/A
	Compatibility	6 SATA ports: - Port 0, 1, 2, 3 in Legacy IDE mode - Port 4, 5 in native mode	N/A	Chipset driver or operating system embedded Broad OS support	N/A	N/A
	AHCI	6 SATA ports using the Advanced Host Controller Interface with NCQ support	N/A	AHCI driver or OS embedded Broad OS support	N/A	N/A
	SW RAID	6 SATA Ports	Software RAID 0/1/10 standard Software RAID 5 with optional Intel® RAID Activation Key AXXRAKSW5	ESRT2 Driver Microsoft Windows* and selected Linux* versions only	Ctrl+E during POST; Intel® RAID Web Console 2	Intel® RAID Software User's Guide
Intel® 3420 PCH chipset	RST	6 SATA ports	RAID 0/1/10/5	RST Driver Microsoft Windows* only	Ctrl+I during POST; Intel® Rapid Storage Technology console	Intel® Matrix Storage Manager User's Manual; Intel® Matrix Storage Console Reference Content
Optional Intel® SAS Entry RAID Module AXX4SASMOD	Entry Hardware RAID	4 SAS Ports *Up to 10 SAS or SATA drives via expander backplanes*	Native SAS pass-through mode without RAID function; Entry Hardware RAID: - RAID 1 (IM mode) - RAID 1E (IME mode) - RAID 0 (IS mode)	SAS MPT driver (Fully open-source driver) Broad OS support.	Ctrl+C during POST; Intel® RAID Web Console 2	Intel® RAID Software User's Guide
	SW RAID	4 SAS Ports *Up to 8 SAS or SATA drives via expander*	Software RAID 0/1/10 standard Software RAID 5 with optional Intel® RAID	ESRT2 Driver Microsoft Windows*	Ctrl+E during POST; Intel® RAID Web Console	Intel® RAID Software User's Guide

Storage Controller	Storage Mode	Description	RAID Types and Levels Supported	Driver and OS Support	RAID Management Software	RAID Software User's Guide
		backplanes	Activation Key AXXRAKSW5	and selected Linux* versions only	2	
Optional Intel® Integrated RAID Controller SROMBSASMR (AXXROMBSASMR)	Intelligent Hardware RAID	4 SAS Ports *Up to 16 SAS or SATA drives via expander backplanes*	Intelligent Hardware RAID 0/1/10/5/50/6/60	IR3 Driver (Fully open-source driver) Broad OS support.	Ctrl+G during POST Intel® RAID Web Console 2	Intel® RAID Software User's Guide
Optional hot-swap active backplane (ASR1500SASBP)	SW RAID	Up to 3 SAS or SATA drives	Software RAID 0/1/10 standard Software RAID 5 with optional Intel® RAID Activation Key AXXRAKSW5	ESRT2 Driver Microsoft Windows* and selected Linux* versions only	Ctrl+E during POST Intel® RAID Web Console 2	Intel® RAID Software User's Guide
	Native SAS	Up to 3 SAS or SATA drives	Native SAS pass-through mode without RAID function	SAS MPT driver (Fully open-source driver) Broad OS support.	N/A	N/A
Optional active midplane 2 (FALSASMP2)	Entry Hardware RAID	Up to 8 SAS or SATA drives	Native SAS pass-through mode without RAID function Entry Hardware RAID: • RAID 1 (IM mode) • RAID 1E (IME mode) • RAID 0 (IS mode)	SAS MPT driver (Fully open-source driver) Broad OS support.	Ctrl+C during POST Intel® RAID Web Console 2	Intel® RAID Software User's Guide
	Intelligent Hardware RAID	Up to 8 SAS or SATA drives	Intelligent Hardware RAID 0/1/10/5/50/6/60 with Intel® RAID Activation Key AXXRAKSAS2 and RAID mini-DIMM AXXMINIDIMM512	IR3 Driver (Fully open-source driver) Broad OS support.	Ctrl+G during POST Intel® RAID Web Console 2	Intel® RAID Software User's Guide
Optional Intel® Integrated RAID Controller RMS2MH080 (AXXRMS2MH080)	Intelligent Hardware RAID	8 SAS Ports *Up to 240 SAS or SATA drives via expander backplanes*	Intelligent Hardware RAID 0/1/10/5/50/6/60	IR3 Driver (Fully open-source driver) Broad OS support.	Ctrl+G during POST Intel® RAID Web Console 2	Intel® RAID Software User's Guide
Optional Intel® Integrated RAID Module RMS2AF080 / RMS2AF040 (AXXRMS2AF080 / AXXRMS2AF040)	Intelligent Hardware RAID	8 / 4 SAS ports *Up to 64 SAS or SATA drives via expander backplanes, 32 of which can be*	Intelligent Hardware RAID 0/1/10/5/50	IR3 Driver (Fully open-source driver) Broad OS	Ctrl+G during POST Intel® RAID Web Console 2	Intel® RAID Software User's Guide

Storage Controller	Storage Mode	Description	RAID Types and Levels Supported	Driver and OS Support	RAID Management Software	RAID Software User's Guide
		configured as RAID		support.		
Optional Intel® Integrated RAID Module RMS2LL080 / RMS2LL040 (AXXRMS2LL080 / AXXRMS2LL040)	Entry Hardware RAID	8 / 4 SAS ports *Up to 64 SAS or SATA drives via expander backplanes, 32 of which can be configured as RAID*	Entry Hardware RAID 0/1/1E standard	SAS MPT driver (Fully open-source driver) Broad OS support.	Ctrl+C during POST Intel® RAID Web Console 2	Intel® RAID Software User's Guide

RAID and Storage Options Available on Intel® Server Boards and Systems
based on Intel® 5500/5520 and 3420 PCH Chipset   RAID Options Available With Intel® Server Boards and Related
Accessories

3. RAID Options Available With Intel® Server Boards and Related Accessories

Intel® Server Board SKU	Storage Controller[1]	Storage Ports Supported	RAID Types and Levels Supported
S5520HC S5500HCV S5520SC S5520UR S5500WB	On-board Intel® 82801JR I/O Controller Hub (ICH10R); Intel® 3420 PCH chipset	6 SATA ports	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5
	Optional Intel® SAS Entry RAID Module AXX4SASMOD	4 SAS ports *Up to 10 SAS or SATA drives via expander backplanes*	Entry Hardware RAID 0/1/1E standard
			Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5
	Optional Intel® Integrated RAID Controller SROMBSASMR (AXXROMBSASMR)	4 SAS ports *Up to 16 SAS or SATA drives via expander backplanes*	Intelligent Hardware RAID 0/1/10/5/50/6/60
S3420GPRX S3420GPLX	Optional Intel® Integrated RAID Module RMS2AF080 / RMS2AF040 (AXXRMS2AF080 / AXXRMS2AF040)	8 / 4 SAS ports *Up to 64 SAS or SATA drives via expander backplanes, 32 of which can be configured as RAID*	Intelligent Hardware RAID 0/1/10/5/50
	Optional Intel® Integrated RAID Module RMS2LL080 / RMS2LL040 (AXXRMS2LL080 / AXXRMS2LL040)	8 / 4 SAS ports *Up to 64 SAS or SATA drives via expander backplanes, 32 of which can be configured as RAID*	Entry Hardware RAID 0/1/1E standard
S3420GPRX S3420GPLX S3420GPLC S3420GPV	Intel® 3420 PCH chipset	6 SATA ports	Software RAID 0/1/10/5 standard
S5520UR S5500WB	Optional Intel® Integrated RAID Module RMS2MH080 (AXXRMS2MH080)	8 SAS ports *Up to 240 SAS or SATA drives via expander backplanes*	Intelligent Hardware RAID 0/1/10/5/50/6/60
S5500BC	On-board Intel® 82801JR I/O Controller Hub (ICH10R)	6 SATA ports	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5

Note 1: For information about additional storage options available with Intel® Server Boards and related accessories, see "Chapter 2. Storage Controller Modes and Capabilities".

4. RAID Options Available With Intel® Server Systems

Note: below table lists controller types for server systems. The table doesn't include supported RAID accessories for server boards as listed in section 3. RAID accessories that are compatible with certain server board in section 3 don't necessarily support the server system in section 4 which is assembled with the same server board. Check the *Tested Hardware and Operating System List* of the RAID modules in section 3, in order to confirm the latest list of supported server systems.

Intel® Server System SKU	Embedded / Integrated RAID		Drives Supported in The Chassis (On-board controller may not support some configurations)	Add-in RAID Card Support for Internal Drives
	Controller Type	RAID Types and Levels		
SR1690WB	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Four fixed SAS[1]/SATA 3.5-inch drives	Yes
SR1695WB	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Four fixed SAS[1]/SATA 3.5-inch drives	Yes
SC5650SCWS	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Six fixed SAS[1]/SATA 3.5-inch drives	Yes
SC5650HCBRP	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Six fixed SAS[1]/SATA 3.5-inch drives	Yes
SR1630GP / SR1630HGP	SATA Intel® 3420 PCH chipset	Software RAID 0/1 standard	Two fixed SATA 3.5-inch drives	Yes
SR1630GP / SR1630HGP	SATA Intel® 3420 PCH chipset	RST RAID 0/1	Two fixed SATA 3.5-inch drives	Yes
SR2612UR	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1 standard	Internel Two fixed SATA 2.5-inch drives (On-board controller) 12 hot-swap SAS[1]/SATA 3.5-inch drives (Add-in RAID card or module required)	Yes
SR1630BC	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1 standard	Two fixed SATA 3.5-inch drives	Yes
SR1600UR	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Three fixed SAS[1]/SATA 3.5-inch drives	Yes
SR1600URHS (with hot-swap passive backplane ASR1500PASBP)	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Three hot-swap SAS[1]/SATA 3.5-inch drives	Yes

SR1600URHS (with hot-swap active backplane ASR1500SASBP)	SAS/SATA Optional hot-swap active backplane	Software RAID 0/1 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Three hot-swap SAS/SATA 3.5-inch drives	No
SR1625UR	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Eight hot-swap SAS[1]/SATA 2.5-inch drives *Seventh and eighth drive slots optional with FXX25HDDCAR*	Yes
SR1625URSAS	SAS/SATA Active midplane 2 (FALSASMP2)	Entry Hardware RAID 0/1/1E standard Intelligent Hardware RAID 0/1/10/5/50/6/60 with Intel® RAID Activation Key AXXRAKSAS2 and RAID mini-DIMM AXXMINIDIMM512	Eight hot-swap SAS/SATA 2.5-inch drives *Seventh and eighth drive slots optional with FXX25HDDCAR*	No
SR2600URBRP	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Six hot-swap SAS[1]/SATA 3.5-inch drives *Sixth drive slot optional with ASR2500SIXDRV*	Yes
SR2600URLX	SAS/SATA Active midplane 2 (FALSASMP2)	Entry Hardware RAID 0/1/1E standard Intelligent Hardware RAID 0/1/10/5/50/6/60 with Intel® RAID Activation Key AXXRAKSAS2 and RAID mini-DIMM AXXMINIDIMM512	Six hot-swap SAS/SATA 3.5-inch drives *Sixth drive slot optional with ASR2500SIXDRV*	No
SR2625URBRP	SATA On-board Intel® 82801JR I/O Controller Hub (ICH10R)	Software RAID 0/1/10 standard Software RAID 5 with Intel® RAID Activation Key AXXRAKSW5	Six hot-swap SAS[1]/SATA 2.5-inch drives	Yes
SR2625URLX	SAS/SATA Active midplane 2 (FALSASMP2)	Entry Hardware RAID 0/1/1E standard Intelligent Hardware RAID 0/1/10/5/50/6/60 with Intel® RAID Activation Key AXXRAKSAS2 and RAID mini-DIMM AXXMINIDIMM512	Eight hot-swap SAS/SATA 2.5-inch drives	No

Note 1: An add-in SAS adapter is required.