Intel® IOP34x Storage Processor Family

featuring Intel XScale® technology

Fast. Flexible. Protected.

Family Product Guide

Intel® IOP34x Storage Processor Family

Storage Processing

The evolution of storage and the new promise of SAS

Storage requirements are rapidly expanding. Business continuance and regulatory requirements demand that data be secure, reliable, and readily available. The demands for increasingly fast, flexible, and reliable data access have resulted in new evolutions of storage technologies. Now, with the entry of Serial Attached SCSI (SAS), storage solutions can meet the demands of today's business through improved flexibility and improved deployment topologies, while maintaining the legacy SCSI cost structure.

The Intel® IOP34x processor family delivers enterprise-class SAS/SATA and IOP RAID in multiple product offerings. Products range from the cost effective and integrated IOP348 that provides both IOP RAID and SAS/SATA control, to the IOP341 and IOP342 high performance discrete I/O processors and the IOC340 SAS/SATA controller. These next-generation storage devices offer unparalleled flexibility, high performance, multi-protocol support, and advanced data protection based on a common, proven architecture—the fourth generation Intel XScale® Processor.

The result is a new level of storage performance for direct attached and external storage products. These components not only deliver high-performance, power-efficient RAID, SAS, and other storage protocols, but also are flexible enough to allow a wide range of customizations with other storage products. Meeting the demand for ever-increasing storage requirements is a challenge, and the IOP34x family enables businesses to stay ahead of the demand.

New levels of design flexibility

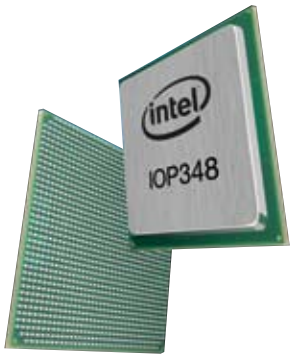
The Intel® IOP34x storage processor family is pin compatible, driver compatible, and interoperable, giving developers maximum product design flexibility and providing a wide range of disk control and RAID options. By building the products within a common architecture, OEMs can more easily customize their solutions, providing superior product design control.

By supporting both SAS and SATA storage devices, the Intel® IOP34x family offers the flexibility to customize the performance, cost, and reliability of a storage solution, and provides businesses a way to consolidate their current storage investments while taking advantage of new technology.

Designers can take advantage of both PCI-Express* and PCI-X* interfaces, increasing end user interface configuration options and accommodating a variety of product solutions. In addition, pin compatibility across the family of products significantly increases an OEM's ability to customize solutions using a single board design, increasing manufacturing options and simplifying SKU management.

End-to-end data protection

The Intel® IOP34x processor family has been architected and optimized to provide significant performance improvements over previous generations. With enhanced hardware acceleration for RAID 5 and RAID 6 storage computations, data is kept safe and available. Data protection is optimized through features such as Intel® Block Protection Technology, byte parity checking on the internal bus, and ECC memory protection, delivering complete end-to-end data protection from the host processor to the disk.

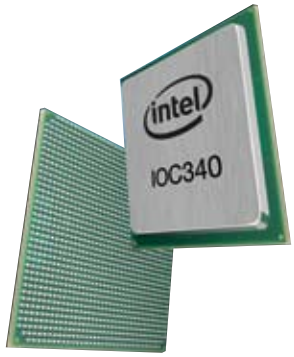


Intel® IOP348 I/O Processor

The Intel® IOP348 I/O processor is well-suited for local direct-attached and external storage products. Fitting perfectly with RAID on motherboard (ROMB) applications, the IOP348 requires minimal board space while providing enterprise-class RAID offload performance at low solution costs. Available in multiple speeds, the features and performance scale between uni-processor (UP), dual-processor (DP) and multi-processor (MP) motherboards, offering consistent storage qualities for an entire product line. The form factor is well suited for use in add-in host-bus adapter cards, allowing existing systems to be easily upgraded with high performance, cost effective storage solutions.

Intel® IOP341 and IOP342 I/O Processors

The Intel® IOP341 I/O processor and Intel® IOP342 I/O processor deliver full-function IOP-based RAID in a flexible, open architecture. With either one (IOP341) or two (IOP342) power-efficient, high-performance Intel XScale® processor cores, the IOP341 and IOP342 enable connectivity to discrete controllers such as the IOC340. The IOP341 and IOP342 are ideal for solutions requiring embedded application flexibility and solution performance on a single chip. As members of a flexible family of storage processors, both processors accommodate a variety of product solutions and performance requirements.



Intel® IOC340 I/O Controller

The Intel® IOC340 I/O controller shares a common SAS/SATA control unit with the IOP348 and is pin compatible for design scalability. The IOC340 also supports usage models that maximize its resources as a discrete controller. For use in both direct attached storage and external storage systems, the high-performance SAS/SATA functionality integrated with embedded RAID results in a power-efficient, high-performance I/O controller. In addition, it offers excellent price-for-performance, enabling businesses of all sizes to benefit from the protection, performance, and power of SAS.

Intel® I/O Processor Comparison

	Intel® IOP348 I/O Processor	Intel® IOP341/342 I/O Processor	Intel® IOC340 I/O Controller	Intel® IOP333 I/O Processor
Intel XScale® Technology Application Cores	1	1/2	0	1
Core Speed	667/800/1200 MHz	800/1200 MHz	800/1200 MHz	500/667/800 MHz
RAID 5/6 offload solution Chip Count	1	2	2	2
SAS/SATA II Ports	8	0	8	0
Package Size	37.5 mm x 37.5 mm FCBGA5	37.5 mm x 37.5 mm FCBGA5	37.5 mm x 37.5 mm FCBGA5	37.5 mm x 37.5 mm FCBGA3
Integrated Host Bus Interfaces	PCI-Express*, PCI-X* or both concurrently	Concurrent PCI-Express and PCI-X	PCI-Express or PCI-X	PCI-Express to PCI-X Bridge
Memory Controller	Multi-ported DDR2 400/533 MHz with ECC	Multi-ported DDR2 400/533 MHz with ECC	n/a	Dual-ported DDR 333 MHz/DDR2 400 MHz
Internal Memory	n/a	1 MB SRAM	n/a	n/a
Max Memory	4 GB	4 GB	n/a	2 GB (DDR 333) 1 GB (DDR2 400)
Internal Bus	128-bit, 400 MHz (up to 6.4 GB/s) Dual Bus. Byte parity on data bus	128-bit, 400 MHz (up to 6.4 GB/s) Dual Bus. Byte parity on data bus	128-bit, 400 MHz (up to 6.4 GB/s) Dual Bus. Byte parity on data bus	333 MHz (up to 2.7 GB/s) Bus
Local Bus Width	16 Bits (66 MHz)	16 Bits (66 MHz)	16 Bits (66 MHz)	8/16 Bits (66 MHz)
DMA Buffer Size	4096 Bytes	4096 Bytes	4096 Bytes	1024 Bytes
ATU Buffer Size	4096 Bytes	4096 Bytes	4096 Bytes	4096 Bytes
I²C Bus Interface Unit	3	3	0	2 Serial Units
Hardware-based Application Accelerators	XOR, P+Q, CRC32C	XOR, P+Q, CRC32C	n/a	XOR, P+Q, CRC32C
UART	2 (1 Available for the IOP)	2	0	(2) 4-Pin (16550)
GPIO	16 GPIO 2 SGPIO units capable of up to 8 devices on the target end	16 GPIO	8 GPIO 2 SGPIO units capable of up to 8 devices on the target end	8 GPIO
External Interrupt Pins	16 + 1 HPI	16 + 1 HPI	n/a	16 + 1 HPI

Conclusion

The storage market continues to require improved performance and lower costs. Intel is providing new products that represent the next evolution of high-performance storage solutions. The Intel® IOP34x storage processor family brings storage processing to a new level, delivering component and power efficiencies with impressive stability, reliability, and flexibility.

 Printed in USA 1107/M_B/HBD Please Recycle 315060-002US