

## about xpress disk (xpd)

The Kove® XPD® L3-4 I/O appliance provides the highest performance Fibre Channel and InfiniBand persistent I/O available, holding world records for bandwidth, latency, and IOPS. XPD® L3-4 uses DRAM to deliver deterministic performance across all I/O patterns, whether reads or writes, small or large blocks, sequential, random, burst or sustained access, one minute or ten year duration, 10% or 100% full, or any combination thereof.



Applications using Kove® XPD® L3-4's don't worry about media wearing down or out, or performance changing because of load or occupancy. With determinacy and concurrency literally 100s of times better than Flash, apps can scale-out processing like no other product in the world. This means fewer CPUs, less energy, better output. For example, 4 servers using 4 XPDs have demonstrated 65 terabytes database processing per hour at more than 800 million database operations per second. I/O is no longer the bottleneck in XPD installations.

**performance** The Kove® XPD® L3-4i delivers performance I/O across the spectrum: reads at **47 GB/sec** bandwidth (at <5  $\mu$ s latency and <100 ns variance), **53+ million IOPS** (at <3  $\mu$ s latency and <100 ns variance), or **360K IOPS** (at <2.7  $\mu$ s and <30 ns variance). Or ingest (write) at **>32 GB/s** or **>1.9 TB/min**. All performance is sustained and deterministic: XPD® L3-4i's do just as well in customer testing as in workhorse performance lasting years at a time under load. And performance doesn't change because of age, usage, load, profile, capacity, or any other factor.

Some vendors "tune" product performance for 4K blocks, or optimize for access pattern, and then perform poorly when using 512-byte or 1MB blocks, or sequential or random I/O. Kove® XPD® L3-4's deliver consistent performance across the I/O spectrum without qualification. They just work — faster. Apps just work — better.

*This is the value of deterministic and concurrent I/O, the next new. Run faster, longer, better, reduce core count, drop licensing fees, reduce energy footprint, save more money, make more money. Let design drive profitability.*

**features** XPD® L3-4's are InfiniBand and Fibre Channel direct and mesh attachable to accommodate scalable, high performance I/O needs. All speeds are supported: SDR, DDR, QDR, FDR for InfiniBand, and 2-8 Gbps for Fibre Channel.

Kove® XPD® L3-4 I/O appliances monitor overall system health, and tracks 100s of system components and monitorables. The device can self-heal most problems before they are ever noticed, and report health status via SNMP, syslog, or HTTP.

The XPD® L3-4 uses an uninterruptable-power supply (UPS) to protect against downtime. Utility-company power spikes or outages do not threaten data integrity.



<b>Capacity</b>	128GB – 6TB per unit, mesh connectable for larger capacities
<b>Bandwidth</b>	Up to 47 GB/sec (<5 $\mu$ s latency, <100 ns variance), sustained (world record)
<b>IOPS</b>	Up to 53 million (<3 $\mu$ s latency, <100 ns variance), sustained (world record)
<b>Response Time</b>	<2.7 $\mu$ s, random, consistent, & sustainable for any time duration (world record)
<b>Instant Copy</b>	6.7 PB/sec (Fibre Channel) – no disruption during operation (world record)
<b>Management Connectivity</b>	10/100/1000 Ethernet twisted pair, 4 ports
<b>Volumes</b>	Up to 256
<b>Disk Drives</b>	Up to 24 SAS
<b>Connectivity</b>	
<b>InfiniBand:</b>	SDR, DDR, QDR, FDR
<b>Fibre Channel:</b>	2,4,8 Gbps
<b>Ports</b>	
<b>InfiniBand:</b>	Up to 16 ports SDR, DDR, QDR, FDR
<b>Fibre Channel:</b>	Up to 16 ports 2,4,8 Gbps per port
<b>Memory RAS Features</b>	ECC plus DDDC (standard), rank sparing and RAM mirroring (optional)
<b>Sparing</b>	Prevent DIMM rank failure from affecting data integrity. Device copies failing rank to spare and then disables failed rank.
<b>Mirroring</b>	Device maintains mirrored copy of memory image. Device fails over to mirrored copy if an uncorrectable error occurs.
<b>Management</b>	HTTPS Command Line via SSH, SNMP, and syslog Phone home, customer selectable
<b>Data Protection</b>	Multiple modes for de-staging data from RAM onto persistent media Integrated instant copying Integrated monitoring logic for system health management and UPS
<b>Uninterruptible Power Supply</b>	XPD <sup>®</sup> L3-4 tightly integrates with standard UPS, bringing unit down gracefully if ever necessary. Integration with centralized UPS infrastructure available in many contexts.
<b>Health Monitoring</b>	Device tracks health components for >100 monitorables, and self-heals most problems that can occur
<b>Hot Swappable</b>	Disk drives and power supplies
<b>Power</b>	Up to 1100 watts, 4 redundant power supplies. USA UL listed, FCC; Canada CUL listed; Germany TUV Certified; EN 60950/IEC 60950-Compliant; CB Report; CCC Certification.
<b>Warranty</b>	World-wide support under contract: on-site next day to 2-hour on-site same day