



EtherDrive®

Features & Benefits

Scale-Out Storage

EtherDrive® SAN

(Attributes common to EtherDrive® products)

Features	Benefits
<p>Ethernet SAN</p> <p>(ATA-over-Ethernet (AoE) a simple SAN storage protocol uses tagged Ethernet frames to transport disk read/write commands from host systems to disk drives connected via standard Ethernet networking)</p>	<ul style="list-style-type: none"> • Low latency read/write block storage access over Ethernet (AoE has no TCP/IP overhead) • Ethernet SAN LUNs/Disks look like local disk drives (block devices) • Connection-less AoE packets mean no multi-path I/O setup (iSCSI and FC require complex MPIO configuration)* • Automatic bandwidth aggregation and fault tolerance across all available SAN ports (no port bonding required)* • Robust Ethernet transmission (each AoE packet is uniquely tagged and acknowledged) • Reliability guaranteed (dropped packets are automatically retransmitted) • AoE uses standard Ethernet switching technology (unlike FCoE which requires special loss-less networking) • No IP address requirements makes storage LUN numbering easy to understand • Security is inherent because the AoE protocol is non-routeable
<p>Scalable Storage Capacity</p> <p>(Up to 65,535 EtherDrive® storage appliances, each with 24 disk drives, is connected to a single AoE SAN using standard Ethernet networking)</p>	<ul style="list-style-type: none"> • Storage capacity can scale to hundreds of Petabytes by simply adding more EtherDrive® storage appliances to the SAN and installing disk drives • EtherDrive® LUN size is not restricted, disks can be changed when larger disks become available*
<p>Automatic LUN Discovery</p> <p>(LUNs are automatically discovered by the host systems attached to the SAN)</p>	<ul style="list-style-type: none"> • New storage provisioning is simplified • New LUNs are immediately recognized by hosts attached to the SAN • Host systems are unaffected by intermittent SAN connectivity interruptions • System outages can automatically recover without user intervention
<p>Automatic Configuration Learning*</p> <p>(EtherDrive® storage appliances read previously configured disks to learn RAID and LUN configuration)</p>	<ul style="list-style-type: none"> • Appliance replacement is made simple by moving disks (and data) to a new or spare appliance without data loss • Physically relocating LUNs without data loss, enabling useful features like; LUNs used as fast tape backups, LUNs used to quickly transport data between data centers
<p>Parallel Port Performance*</p> <p>(EtherDrive® storage automatically load balances read/write I/O across all available ports and paths of the SAN fabric)</p>	<ul style="list-style-type: none"> • Parallel port performance maximizes throughput and provides automatic seamless fault tolerance • SAN performance bottlenecks are minimized • Recovery from intermittent SAN connectivity interruptions is seamless to the host systems



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<p>Single Instance LUN View*</p> <p>(A persistent single instance of each LUN is presented to the host system no matter how many network paths are available, eliminating multiple representations of the same LUN)</p>	<ul style="list-style-type: none"> • Eliminates confusion found in iSCSI and FC systems caused by each network path presenting a different name for the same LUN • Each AoE LUN appears with a single common name, no matter how many paths are available • Network paths can change without affecting the LUN names • LUN numbering is persistent and consistent for all host systems if they are rebooted, this useful simplicity is not the case in iSCSI systems
<p>Simple LUN Naming</p> <p>(A “major.minor” numbering scheme is used. Upon initial installation, EtherDrive® appliances are assigned a unique shelf address used as the major number of its LUNs. As each LUN is created it is assigned a minor number. LUNs on the SAN are uniquely numbered from 0.0 to 65535.255)</p>	<ul style="list-style-type: none"> • Using its LUN number, data is physically located in a large SAN environment (LUN 2.3 is LUN #3 located in shelf #2) • AoE LUN numbers are more useful for humans than IP addresses
<p>Dynamic Latency Mitigation*</p> <p>(Dropped packet retransmission timing is dynamically adjusted to reduce latency)</p>	<ul style="list-style-type: none"> • Performance throughput is automatically optimized for any balanced SAN system topology
<p>Automatic Congestion Control*</p> <p>(Packet queues and retransmissions are automatically adjusted to mitigate network congestion)</p>	<ul style="list-style-type: none"> • Storage performance is continuously optimized for each LUN
<p>On-Line/Off-Line LUNs*</p> <p>(LUNs are not discovered by host system until they are put into the On-Line state)</p>	<ul style="list-style-type: none"> • LUNs is taken out of the storage pool for maintenance or testing
<p>LUN Masking*</p> <p>(Each LUN is restricted to a group of allowed host system MAC addresses)</p>	<ul style="list-style-type: none"> • LUN masking provides an mechanism to control access to stored data • Masked LUNs are not auto discovered by restricted hosts • Masking is added or removed on live LUNs



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VLAN Zoning* (VLAN tags restrict access to authorized LUNs)	<ul style="list-style-type: none"> • VLAN enables a standard Ethernet networking technology to be used to create secure zones within a common SAN fabric to support restricted storage pools • VLAN tags can be assigned for each LUN
LUNs are Filesystem Agnostic (AoE LUNs are block storage devices that can support any disk filesystem format, including clustered filesystems)	<ul style="list-style-type: none"> • Any EtherDrive® LUN is used as a raw disk without a filesystem or formatted with any filesystem just like a local disk drive • LUNs is concurrently accessed by multiple hosts (a cluster filesystem is required)
Virtual Environment Ready* (Virtual Server and Virtual Desktop systems can use EtherDrive® storage)	<ul style="list-style-type: none"> • EtherDrive® LUNs are shared block storage devices that are compatible with advanced cluster filesystems like VMware's VMFS and Windows Hyper-V
Spare Parts Kits (Power supply modules & fans kit or complete all active parts repair kits are available)	<ul style="list-style-type: none"> • Field replaceable parts kits make quick on-site maintenance possible • Spare SR/SRX units without disks can be used as pre-wired hot replacements enabling quick relocation of disk drives from a failed chassis
Zero down time on-site spare (complete storage appliance)	<ul style="list-style-type: none"> • Fast restoration of service by simply moving disks • No LUN configuration required to restore, spare appliance learns correct configuration from disks.
36 Months Hardware Warranty	<ul style="list-style-type: none"> • Free parts replacement • Users can purchase warranty extension up to 60 months
eSupport	<ul style="list-style-type: none"> • Expert operational and troubleshooting advice via email during normal business hours
24/7 Support	<ul style="list-style-type: none"> • Emergency troubleshooting assistance via phone and email 24 hours per day • Next business day advance parts replacement service

* Unique to EtherDrive® products



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EtherDrive® SR/SRX Storage Appliances

SR	SRX	Feature	Benefits
X	X	RAID 0,1,5,6, 10 & JBOD Supported (One or more RAID arrays (LUNs) is set up within the appliance. Each separate LUN can be a different RAID type with different size disks.)	<ul style="list-style-type: none"> Automatic disk failure protection Disks is easily relocated to any EtherDrive® appliance without data loss User can choose the level of disk protection desired for each LUN LUN performance is tuned for any application by selecting appropriate RAID type and size
X	X	Automatic Global Hot Spare Disks (Users can define one or more hot spare disks within a chassis)	<ul style="list-style-type: none"> Disk failures within a RAID LUN are automatically repaired using an available spare disk within the chassis Spare disks protect all RAID LUNs within the EtherDrive® appliance Multiple hot spare disks improved data protection
	X	Hybrid Disk Pools (Use any combination of SAS, SATA, and SSD disk within the same EtherDrive® storage appliance)	<ul style="list-style-type: none"> Customize LUN performance to your application needs Different capacity disks is used within the same EtherDrive® appliance enabling more user flexibility
X	X	Relocate LUNs (LUN configuration stored on each disk, making it possible for the appliance to learn how the disks are to be used.)	<ul style="list-style-type: none"> Eject and hot remove a LUN to allow it to be relocated to another storage appliance Simplify maintenance
X	X	Field Upgradable Firmware (Users with valid support contracts can download CorOS updates from www.coraid.com . CorOS is field installed on live systems enabling bug fixes and new features to be added)	<ul style="list-style-type: none"> New features is added to live systems Bug fixes is corrected on live systems Field upgrades is implemented without downtime (soft reboot I/O interruption is less than 15 seconds)
	X	10 Gigabit Ethernet Interface Options (Interface options are available for dual 10 Gigabit CX4 copper and dual 10 Gigabit fiber optic with SFP+ transceivers)	<ul style="list-style-type: none"> Load balance redundant high speed Ethernet access to storage LUNs is provided Interface type is field upgradable SAN fabric is GigE or 10GigE, copper wire or fiber optic.
	X	Six 1 Gigabit Ethernet Interface Options (Link speed and connection polarity are auto-negotiated.)	<ul style="list-style-type: none"> Load balanced redundant high speed Ethernet access to storage LUNs is provided Interface type is field upgradable Ethernet crossover cables are not required



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EtherDrive® SR/SRX Storage Appliances

SR	SRX	Feature	Benefits
X		Dual 1 Gigabit Ethernet Interface (Link speed and connection polarity are auto-negotiated.)	<ul style="list-style-type: none"> • Load balanced redundant Ethernet links are used to access the storage LUNs • Ethernet crossover cables are not required
X	X	Syslog Output (Alarms and alert messages are posted to a user defined syslog server)	<ul style="list-style-type: none"> • Disk failure events are reported • RAIDShield disk repairs are reported • Chassis power, fan, and temperature alarms are reported
X	X	Hot Swap Disk Drives (Standard disk drives are mounted on hot swap disk carriers)	<ul style="list-style-type: none"> • Disk replacement maintenance is quick and easy • Disk carriers for all slots in the chassis are included with each product
X	X	Hot Swap Redundant Power Supplies	<ul style="list-style-type: none"> • Redundant power increases system availability • Hot swap makes maintenance on live system possible
X	X	Hot Swap Redundant Cooling Fans (SR431 does not have hot sap fans)	<ul style="list-style-type: none"> • Redundant fans increases system availability • Hot swap makes maintenance on live system possible
X	X	LUN Masking (Using LUN masking is optional. LUNs access is restricted to specific MAC addresses on the SAN by setting MAC address filtering for each LUN)	<ul style="list-style-type: none"> • Restricting LUN access to only allowed host systems may improve privacy and system security • LUN masking working with EtherDrive® virtual storage products enables No Single Point of Failure (NSPOF) fault tolerant system designs
X	X	RAIDShield Disk Scrubbing (Continuous automatic disk test and repair of soft failures that is corrected by remapping bad blocks within the disk drive)	<ul style="list-style-type: none"> • Soft disk failures are detected and repaired without hard failing the disk • RAIDShield reduces RAID failures by enabling read failures to be automatically remapped
X	X	Disk SMART monitoring (SMART threshold alerts on each disk are monitored and reported)	<ul style="list-style-type: none"> • SMART alerts may warn users of a pending disk failure so advance disk replacement is scheduled
X	X	I/O Performance Statistics (Disk and LUN read/write throughput and latency statistics are continuously monitored)	<ul style="list-style-type: none"> • Troubleshooting storage and network performance is improved • Real world usage patterns is monitored
X	X	SAN Interface Status Monitoring (Ethernet port settings are monitored)	<ul style="list-style-type: none"> • Troubleshooting storage and network performance is improved



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SR	SRX	Feature	Benefits
	X	OpenSolaris NAS Supported (Integrated with OpenSolaris NAS to provide hybrid storage pools and ZIL write acceleration)	<ul style="list-style-type: none"> Hybrid storage (SAS, SSD or SATA disks) pools enable users to select the desired performance for each ZFS and client requirement. ZIL acceleration LUN maximizes performance and supports HA clustered operation. Environmental status displayed in OpenSolaris GUI
	X	Optimized for Virtualized Environments	<ul style="list-style-type: none"> Best performance is achieved for shared LUNs with cluster filesystem
X		SATA Disks Only	<ul style="list-style-type: none"> Lowest Cost/TB
	X	SAS, SSD or SATA Disks	<ul style="list-style-type: none"> User can select disk type to match the host application performance requirement
X		Highly Efficient Platform	<ul style="list-style-type: none"> Lowest Cost/TB
	X	High Performance Platform	<ul style="list-style-type: none"> Highest SAN Performance
X	X	Simple Command Line Interface	<ul style="list-style-type: none"> Setup with 3 simple commands
X	X	Password Protected Console (The console port is set to require a user password for access)	<ul style="list-style-type: none"> System administration security policies are improved
X	X	Multiple Console Port Connections (Configuration and control access to the CorOS command line interface is performed via the console port)	<ul style="list-style-type: none"> Users can choose to access the console port via an RS232 serial connection, PS2 style KVM connection, or CORAIID Ethernet Console (CEC) AoE network connection
X	X	Staggered Disk Spin Up (Cold system boot staggers disk drive spin up, to minimize power line current surge)	<ul style="list-style-type: none"> UPS system does not need to be over sized to handle large current surges during cold startup
X	X	Disk Status Indicators (Disk slots include LED status indicators for disk activity and disk failure)	<ul style="list-style-type: none"> Maintenance mistakes caused by inadvertent removal of a working disks are minimized
X	X	Slide Out Rack Rails (Rack mounted slide out rails are provided)	<ul style="list-style-type: none"> Access to hot swap fans for live system maintenance is possible System installation is easier
X	X	2.5" to 3.5" Disk Adapter (Accessory disk adapters are available)	<ul style="list-style-type: none"> Smaller 2.5" form factor SAS and SSD disk drives is used in appliances design for 3.5" disk drives