



Media &
Entertainment
Division

Product Overview >

ISO 9001:2008 &
ISO 13485:2003 Certified

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Aurora RAID & HyperDrive

Storage Solutions for File-based Workflows

*Aurora is a purpose-built direct-attach RAID or SAN appliance that is a natural addition to Rorke's open architecture philosophy. **HyperDrive™**, developed by Rorke Data and Falconstor is a scalable, high-performance storage area network (SAN) that keeps post workflows on time and on budget, and helps ensure profitable operations. **HyperDrive™** offers the Video, Film, and Broadcast industries an outstanding performance/cost per gigabyte ratio while delivering high performance scalability and redundancy.*

The Aurora RAID family is a purpose-built, feature-rich RAID that can be used as a direct attached system or as a SAN appliance. Aurora's performance and unique adaptable design integrates our RAID 6 engine technology (EOS™) with the latest industry-standard hardware components. This design allows Aurora to "leap-frog" other manufacturers' hardware ASIC-based RAID controller roadmaps. Our engineers have developed Aurora with a unique set of tools to simplify your storage environment and deliver industry leading performance. The resulting solution is affordable cross-platform storage for Mac, Windows and Linux users while delivering reliable and sustained high bandwidth performance.



Galaxy® Aurora LP
Ideal for On-site/On-set or Mobile Post Production



Galaxy® Aurora LS
Ideal for Boutique Post, Religious, Educational & Corporate



Galaxy® Aurora
Ideal for Studios & Post Facilities

Aurora LP	Aurora LS
<ul style="list-style-type: none"> » 3000+ MB/s » 2RU with 24 Bays » 24TB raw capacity » Low-Profile (LP) enclosure 	<ul style="list-style-type: none"> » 1000+ MB/s » 4RU or Tower with 12 Bays » up to 36TB raw capacity » In-studio quiet enclosure
Aurora 24	Aurora 36
<ul style="list-style-type: none"> » 2300+ MB/s » 4RU with 24 Bays » 72TB raw capacity » Ideal for 2K workflows 	<ul style="list-style-type: none"> » 4500+ MB/s » 4RU with 36 Bays » 108TB raw capacity » Ideal for multi-stream 2K/4K workflows

Rorke Aurora RAID Video Stream Performance Chart

Video Format Criteria				Rorke RAID Storage Systems		
Video Format	Data Rate	GB Used	Hours Used	Aurora LS	Aurora 24	36
Assumes video @29.97 / film @24fps	MB/S	Per hour	Per TB	Stream Count	Stream Count	
DV / HDV 25Mb/S	3.25	13	75	45	60	75
DVCPro HD 100Mb/S	13	46	22	23	32	45
ProRes HQ	28	101	10	16	24	30
HD 1080i 8bit 4:2:2	124	448	2.25	3	8	10
HD 1080i 10bit 4:2:2	135	597	1.6	2	6	8
HD 1080P 10bit 4:4:4	248	895	1.1	2	4	6
HD film DPX 1920x1080 8Mb files	192	691	1.4	1	2	4
HD 2K film DPX 2048x1556 12Mb files	288	1037	0.96	1	2	3
HD 4K film DPX 4096x3112 48Mb files	1152	4147	0.24	—	1	2

Stream Count varies with both the number of drives and drive RPM

Rorke Galaxy Aurora: Ideal for multi-stream DPX & HD file-based workflows

Tapeless Cameras & Scanners	Red	Panasonic	Sony	ARRI	FilmLight	DFT	Lasergraphics	Cintel	Phantom	Canon
	Content Creation Applications		AVID	FCP	AJA	Blackmagic	Assimilate	Autodesk	Bluefish	MTI Film
	Quantel	Telestream	Adobe	Matrox	Pandora	Digital Vision	Grass Valley	Thompson		

*Aurora performance depends on the number of drives and drive RPM

Aurora's unique set of features and storage management tools were designed for post production workflows

Zero Impact Drive Rebuild

- » **Description:** Aurora is robust enough to process failed RAID sets in the background, during production while ensuring full bandwidth to all users on the SAN.
- » **Benefit:** Aurora's Zero Impact Drive Rebuild feature keeps your facility running at full bandwidth despite occasional drive failure. This feature not only protects your data, but also your project deadlines and budget. Aurora also manages drive rebuilds up to 6x faster than traditional hardware RAID controllers.

Real Time Initiator RTI (QoS)

- » **Description:** RTI is quality of service (QoS) performance tuning feature. RTI allows you to prioritize I/O bandwidth to specific client stations depending on their individual application requirements.
- » **Benefit:** The RTI QoS feature delivers prioritized bandwidth to systems like ingest or a critical playback workstation in order to minimize the effects of a fast file copy or editing from lower priority SAN clients.

SAN Client Naming

- » **Description:** SAN Client Naming allows to assign meaningful names to complicated World Wide Names (WWN) of Fibre Channel clients.
- » **Benefit:** Naming clients such as EditBay1, Smoke1, or FCP2 provides the foundation for simplified SAN management. Client naming makes RTI and Bandwidth graphing simpler.

Real-time Bandwidth Graphing

- » **Description:** Identify and graphically present network storage performance such as: MB/s, I/O response time and I/O request size.
- » **Benefit:** A unique storage management tool for Post Production facilities that gives users quick view of overall storage utilization. Therefore users can identify and correct bandwidth problems on the SAN.

The screenshot shows the Aurora GUI Main Page with the following sections:

- RAID Status:** A table with columns: RAID Name, Cache Size(M), RAID Level, First Slot, Device Count, RAID Size(G). One entry is shown: RAID0, 3000, 6, 0, 12, 13572.
- Configuration Status:** A table with columns: Details, Type. Entries include: Configuration and Log Files, Users, Parameters, Data Rate Statistics.
- RAID Enclosure Status:** A table with columns: Details, Type, Status. Entries include: Slots (Status: OK), Servers (Status: OK), Adapters, Power On.

Drive Performance Tracking

- » **Description:** Identify and graphically presents individual drive storage performance.
- » **Benefit:** This allows users to pro-actively identify and replace poorly performing drives in the RAID set before these drives can cause dropped frames.

Trace I/O Command Tracking

- » **Description:** Identify and graphically present every I/O command that an Aurora will process.
- » **Benefit:** A unique technical set up and trouble shooting feature. This allows engineers to monitor, trace and tune the Aurora storage system for post production applications.

LUN Naming

- » **Description:** LUN Naming allows users to assign meaningful names to RAID partitions.
- » **Benefit:** Naming LUNs such as Aurora1, Aurora2 enables simplified SAN management. LUN Naming makes SAN set-up, SAN troubleshooting and Bandwidth graphing simpler.

Get Your Facility Into HyperDrive

Today's professional Media and Entertainment (M&E) content creators and broadcasters work with increasingly higher definition formats such as HD, 2K, 4K, and 8K, as well as with extreme drive latency-intensive file-formats such as DPX and VFX. These users are challenged to find a cost effective system with guaranteed storage performance that will support real-time file-based workflows, concurrent user access, and higher multi-stream ingest rates. Conventional SAN solutions are simply not up to the task.



HyperDrive™ is an innovative, high-bandwidth storage solution that integrates Rorke's Aurora RAID platform with Falconstor's HyperFS SAN file system. HyperDrive meets the challenges of sharing content between today's demanding post production hardware and applications by offering remarkable storage area network performance and scalability. HyperDrive does this by providing concurrent high-speed file access to heterogeneous clients across a global name space. The result is affordable cross-platform storage for Mac, Windows and Linux users while delivering sustained performance required by multi-stream HD and DPX workflows.

Designed specifically for storing, accessing, and sharing media in collaborative workgroup environments, HyperDrive integrates seamlessly into the post production process. Our file locking storage solution supports accurate delivery of multiple reader or writer real-time high-resolution content without dropped frames.

Using the HyperFS solution, SAN software is no longer a bottleneck. All applications and systems that are part of the workflow will enjoy concurrent, real-time performance by harnessing the full potential of hardware and SAN speeds. HyperFS can tap the full power of InfiniBand, 10GbE, Fibre Channel (FC), and iSCSI connectivity together with Rorke's Aurora RAID systems.

Ideal for a multi-suite, SAN-based DI, 3D or 2K/4K collaboration.

- » Massive scalability supports up to 144PB of storage
- » Aggregate multiple Rorke Aurora systems to increase both storage capacity and performance with the HyperDrive file system
- » Unify SAN, NAS and Archive under a single global namespace
- » Separate MDS Metadata Server hardware may not be required, depending on your configuration
- » Efficiently allocate block or file level storage with the proper performance to all users including graphics, editing, rendering, DI, color correction and archive
- » Application Tested: Assimilate, Autodesk, DaVinci, Digital Vision, Iridas as well as NLE Systems
- » Supports Microsoft Windows, Linux, and Mac OSX client
- » Comprehensive data protection

High Performance Low Latency File System

- » **Description:** HyperFS is optimized for long, sequential files with minimal network overhead. File locking allows one writer and multiple readers.
- » **Benefit:** Meets performance needs for HD, 2K, 4K, 8K, and 3D deployments. Delivers up to >6GB/sec meeting the most demanding workflow and streaming needs. Capable of supporting thousands of SD simultaneous video streams and hundreds of HD streams. Achieves up to 90% of underlying hardware wire speeds.

Single Global Name Space

- » **Description:** Combined repository and consolidation of various storage seen by all SAN clients as a single drive letter or mount point
- » **Benefit:** Up to 144 PBytes of scalability of various storage systems. High speed, low speed, new and legacy storage can be brought into the SAN, configured as aggregated capacity and performance or for tiered storage infrastructure.

Dynamically Grow Capacity and Performance

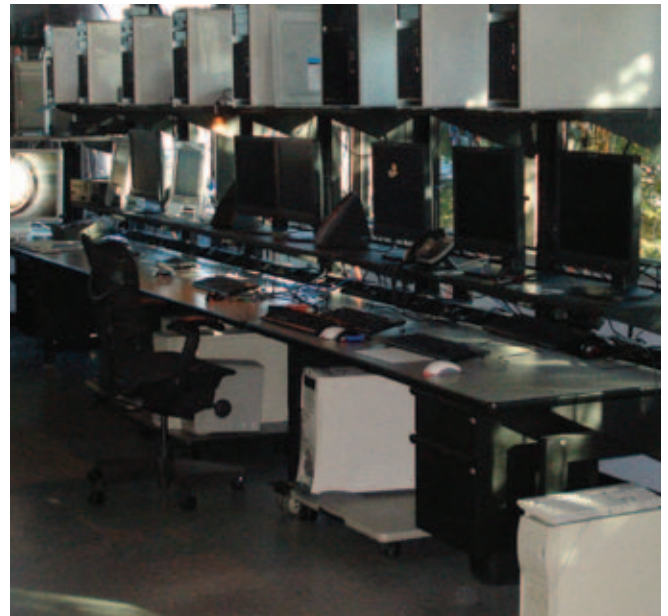
- » **Description:** Non-disruption addition of file system storage adds SAN performance and capacity without interrupting workflow I/O
- » **Benefit:** Allows SAN clients to add Auroras to existing SANs to improve performance and capacities with zero down time

Supports Standard OS Clients

- » **Description:** Allows sharing of files across different client OS's
- » **Benefit:** No special conversion software is needed among SAN users. Supports up to 800 simultaneous accesses per file system and clients can concurrently access data sharing amongst heterogeneous clients.

Built-In MDS NAS Function

- » **Description:** MDS allows FC SAN data to be shared by LAN clients without special drivers or software
- » **Benefit:** This saves the cost and overhead of a SAN Gateway server and has the potential to share all or partial SAN data with LAN clients.



4096 LUNs / Massive Concurrent File Systems

- » **Description:** 16 concurrent File Systems and up to 4096 LUNs
- » **Benefit:** Allows for the most variation in file systems creation and usage and gives the typical M&E client a large number of storage segments if needed. This adds to the users ability to have unrestricted SAN flexibility.

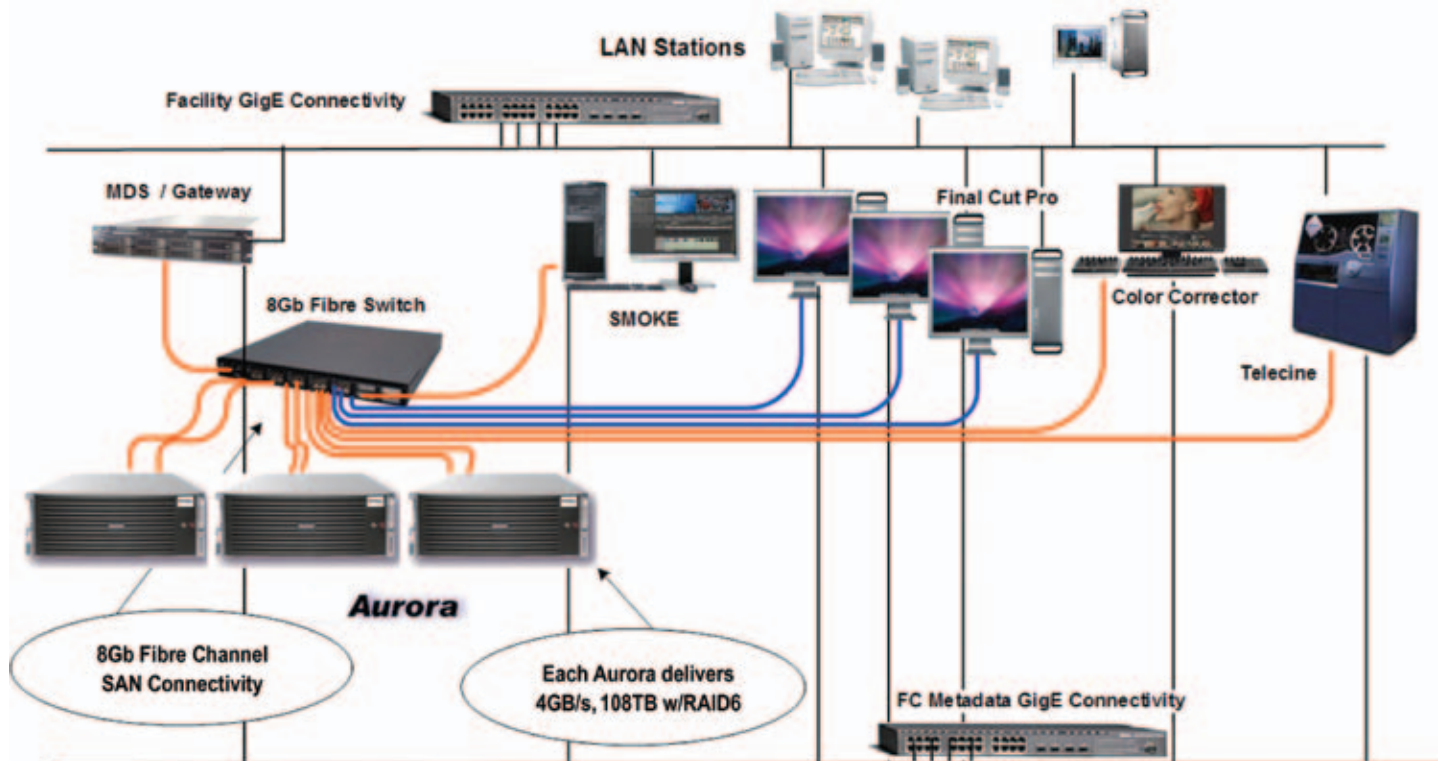
File Level Fault Isolation (FLFI) and Striping

- » **Description:** Multiple allocation sizes and data placement
- » **Benefit:** Performance optimization per application or workflow demand requirement. Map volume groups data placement to file size of workflow application for optimal performance.

Sophisticated File Grouping Methods

- » **Description:** Multiple Volume Groups and Affinity support are used to give you more granular storage separation
- » **Benefit:** Multiple Volume Groups gives the SAN client flexibility to collect LUNs with different allocation and data placement characteristics to meet various application workloads. Affinity support ties specific files/objects, folders, or mount points to specific volume groups and tunes seamlessly to optimal workflow applications

Typical HyperDrive SAN Configuration



Cable Legend

- Fibre Channel High Bandwidth
- Fibre Channel with RTI / QoS enabled
- Standard GbE Ethernet

HyperDrive Specifications

- » Maximum capacity.....144PB per file system
- » Maximum number of file systems...16 per MDS
- » Maximum file size.....32TB
- » Maximum number of files.....Tens of billions
depending on file size
- » Maximum number of LUNs.....4096
- » Maximum number of clients.....Largest installed > 800
- » POSIX compliance.....Compliant for file semantics
and file locking
- » NFS support.....NFS version 3.x, 2.x
- » MDS OS support.....Red Hat Enterprise Linux
- » HA features.....Active/standby metadata
Servers, Metadata
Journaling, Active/standby
NAS (NFS and C)
- » SAN technology support.....FC, iSCSI, InfiniBand
- » Client OS support.....Microsoft Windows 32 & 64
bit (XP/2003/2008/Vista/7),
Red Hat Enterprise Linux,
CentOSLinux, Mac OS X
10.5.x – 32-bit (Leopard),
Mac OS X 10.6.x – 64-bit,
32-bit (Snow Leopard)

Corporate Overview

As of 2010 Rorke celebrated its 25th anniversary. In June 2010 Rorke became part Avnet, Inc. Avnet is well regarded as one of the largest storage, server and component distributors in the world.

The unique relationship between Rorke and Avnet drives multiple benefits for our customers such as:

- » Global footprint with direct access to over 500 product lines
- » Direct access to our supplier partner's support and engineering team
- » \$20B World class buying power
- » Wide range of technical, product, OS and application certifications

Thanks to our customers, Rorke Data continues to grow. We have recently relocated to a new facility, doubling our system integration, R&D, and interoperability capability. We also enhanced our company's ISO 9001 quality-control procedures and added a state-of-the-art call center. As an Avnet Company, Rorke will invest even more in R&D, support infrastructure and logistics.



Professional Services

World Class Integration Facility

Rorke's new state-of-the-art facility doubles our system integration and interoperability capability.

Our team of technical personnel, including Integration Teams, Solution Architects, and Field Engineers work together to provide custom configurations, proof of concept, and pre-staging of complex systems. These same teams manage installation services and pre and post sales support.

- » ESD compliant integration facility
- » 3-shift manufacturing capability
- » ISO 9001:2008 Certification
- » ISO 13485:2003 Certification
- » Custom integration services
- » Technical pre-sales consulting
- » Support Engineers with broadcast and post application knowledge
- » Custom work instruction development
- » Interoperability testing and certification services

Global Service and Support

Rorke Data's Engineering Services Division provides a single point of contact for a wide range of maintenance and support services.

- » 24x7 on site maintenance contracts
- » Call center for global 24x7 response
- » Installation and training services
- » Multiple warehouse and manufacturing facilities
- » Experienced, Certified field engineers
- » Call escalation procedures
- » Service and repair portal
- » Supportforce application for service event tracking
- » Extended parts and replacement warranties

Rorke has over 10,000 Storage Solutions in production today, customers include:





Integrated Storage Solutions for Media & Entertainment

» www.rorke.com

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