RAID INCORPORATED

DATA SHEET

STORAGE: ARI-400 SERIES
Designed for High Performance Applications

ARI-400 2U 12 Bay

ARI-403 2U 24 Bay

ARI-409 5U 84 Bay

ARI-450 2U 24 Bay (AFA)

ARI-400 SERIES

STORAGE ARRAYS

Meet the ARI-400 series: ARI-400 Series of storage products is designed for all purpose high performance applications and high demands of all parallel file systems including Spectrum Scale and Lustre. Foundation, distributed erasure coding technology, ensures the best data protection designed for HDD, hybrid, and all flash arrays. There are four versions in the series: 2U 12-Bay, 2U 24-Bay Hybrid, 2U 24-Bay Flash, and a 5U 84-Bay. 5.7GB/s Writes, 7GB/s Reads and also sustain 450,000 IOPs making this series ideal for any high performance computing Big Data or cloud applications.

The ARI-100 Series is ideal for any high performance applications where budget AND performance are key.

ARI-400 SERIES

STORAGE ARRAYS

ENHANCED PERFORMANCE:
Storage system leverages patent cache technology that instantly and simultaneously mirrors cache between RAID controllers, leading to significant performance improvements over traditional implementations.

AUTOMATIC DRIVE TIERING (OPTIONAL):
This technology overcomes the two major limitations found in most tiered storage systems today by (1) automating the migration of data, and (2) migrating data in real-time. The system virtualizes both the SSDs and HDDs at the sub-LUN level using 4 MB pages distributed across multiple RAID sets. Intelligent Tiering algorithms then continuously monitor I/O access patterns and automatically move Hot Data to the SSDs to maximize I/O operations and; therefore, improve performance of the aggregate application workload.

VIRTUAL DISK POOLS:
Rebuild of conventional (Linear) storage requires that the entire VDisk is rebuilt prior to returning the VDisk (and thus the Volumes on the VDisk) to a fault tolerant state. The rebuild operates at the VDisk level and has no knowledge of Volumes or customer data contained therein.

FOUNDATION (DECLUSTERED RAID):
Declustered RAID data protection with high performance I/O. Fastest rebuild times. No spares. Eliminates enclosure geometry restrictions. Allows mixed drive sizes and easy capacity expansion. Up to 128 drives per disk group. Works with SSD and HDD disk groups.

REMOTE REPLICATION:
Equipped with remote replication software, RAID Inc.'s ARI-400 series provides the easiest array-to-array remote replication solution on the market today, enabling disaster recovery protection and business continuity with support for up to 1000 snapshots per storage array. By providing centralized, array-level replication, Remote Replication offloads backup operations from critical application servers, and aids IT managers in complying with regulations such as the HIPAA and Sarbanes-Oxley acts.

THIN-PROVISIONING:
The increase in the volume and velocity of high density data can cause storage costs to exceed available budgets without some prudent provisioning. With the ARI's Thin Provisioning feature, IT managers can dedicate available storage space to volumes only when actually needed and add storage capacity transparently to any application, also as needed. Thin Provisioning enables LUN (volume) size to be configured independently of physical disk space and supports LUNs up to 128 TB.

SELF-ENCRYPTING DRIVES:
SED drives provide instant data destruction via cryptographic erase. In normal use, you do not need to maintain authentication keys (otherwise known as credentials or passwords) in order to access the drive's data. The SED will encrypt data being written to the drive and decrypt data being read from it, all without requiring an authentication key from the owner. Available in 1.2TB small form factor (2.5") or 4 TB large form factor (3.5").

VOLUMECOPY AND SNAPSHOT (OPTIONAL):
With up to 1000 snapshots capability, the ARI-400 series offers necessary protection for business critical applications such as email, databases, and file sharing. With this capability, the ARI-400 series instantly takes volume snapshots, creating point-in-time backups that can be used to instantly restore your data after a system failure. In addition, VolumeCopy protects against disk failures

KEY FEATURES

- ✓ 5.7GB/s Reads, 7GB/s Writes
- ✓ Advanced Virtualization Features
- ✓ Proven 99.999% uptime
- ✓ Automatic Drive Tiering (optional)
- ✓ Declustered RAID
- ✓ Fastest Drive Rebuild Times
- ✓ Virtual Disk Pools = Faster
- ✓ SSD Flash Cache
- ✓ VolumeCopy, SnapShot & Remote Replication (optional)
- ✓ Thin Provisioning
- ✓ Max Drive Support 336 HDD, SSD, NLSAS
- ✓ SED & FIPS-2 Support
- ✓ Host Options
  - (8) 16GB FC
  - (8) 12 GB SAS
  - (8) 10 GB iSCSI
- ✓ Degraded Disk Detection
- ✓ Disk Background Scrub
- ✓ Battery Free Backup
- ✓ Automated Provisioning Tool

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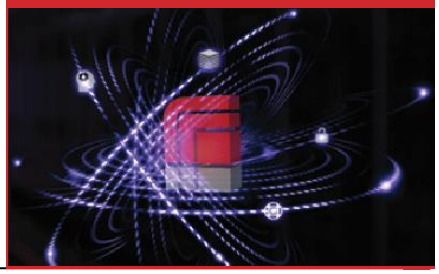

ARI-400 Series Technical Specifications: Features

	ARI-400 (2U 12 Bay)	ARI-403 (2U 24 Bay)	ARI-409 (5U 84 Bay)	ARI-450 (2U 24 Bay AFA)
HOSTS				
External Ports	8 per system	8 per system	8 per system	8 per system
Fibre Channel				
Host speed	16Gb, 8Gb Fibre Channel	16Gb, 8Gb Fibre Channel	16Gb, 8Gb Fibre Channel	16Gb, 8Gb Fibre Channel
Interface type	SFP+	SFP+	SFP+	SFP+
iSCSI				
Initiators	10Gb iSCSI	10Gb iSCSI	10Gb iSCSI	10Gb iSCSI
Interface type	SFP+	SFP+	SFP+	SFP+
SAS				
Initiators	12Gb, 6Gb SAS	12Gb, 6Gb SAS	12Gb, 6Gb SAS	12Gb, 6Gb SAS
Interface type	HD Mini-SAS	HD Mini-SAS	HD Mini-SAS	HD Mini-SAS
DRIVE SUPPORT				
	3.5" SAS	2.5" SFF & 3.5" SAS	Nearline SAS	SATA SSD, SAS SSD
DRIVE EXPANSION				
	144 DRIVES	144 DRIVES	336 DRIVES	96 DRIVES
HIGH-AVAILABILITY FEATURES				
	Redundant Hot-Swap Controllers Redundant Hot-Swap Disks, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support	Redundant Hot-Swap Controllers Redundant Hot-Swap Disks, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support	Redundant Hot-Swap Controllers Redundant Hot-Swap Disks, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support	Redundant Hot-Swap Controllers Redundant Hot-Swap Devices, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support
PROTOCOLS AND STANDARDS				
IP (RFC, 894, 1092)				
RAID Levels supported	0, 1, 3, 5, 6, 10 and 50	0, 1, 3, 5, 6, 10 and 50	0, 1, 3, 5, 6, 10 and 50	0, 1, 3, 5, 6, 10 and 50
SYSTEM CONFIGURATION				
System Memory	16GB per controller 32GB total	16GB per controller 32GB total	16GB per controller 32GB total	16GB per controller 32GB total
Volumes per system	1024	1024	1024	1024
Mirrored Cache	Yes	Yes	Yes	Yes
Supercapacitator Cache Backup	Yes	Yes	Yes	Yes
Cache Backup to Flash	Yes - Non-volatile	Yes - Non-volatile	Yes - Non-volatile	Yes - Non-volatile
MANAGEMENT				
Interface types	10/100/1000 Ethernet, Mini USB	10/100/1000 Ethernet, Mini USB	10/100/1000 Ethernet, Mini USB	10/100/1000 Ethernet, Mini USB
Protocols supported	SNMP, SSL, SSH, SMTP, HTTP(S)	SNMP, SSL, SSH, SMTP, HTTP(S)	SNMP, SSL, SSH, SMTP, HTTP(S)	SNMP, SSL, SSH, SMTP, HTTP(S)
Management Consoles	WEB GUI, CLI	WEB GUI, CLI	WEB GUI, CLI	WEB GUI, CLI
Management Software	RAIDar 2.0, Remote Diagnostics, Non-disruptive Updates, Volume Expansion	RAIDar 2.0, Remote Diagnostics, Non-disruptive Updates, Volume Expansion	RAIDar 2.0, Remote Diagnostics, Non-disruptive Updates, Volume Expansion	RAIDar 2.0, Remote Diagnostics, Non-disruptive Updates, Volume Expansion
DIMENSIONS				
Height	88.9mm (3.5") 2 EIA units	88.9mm (3.5") 2 EIA units	8.75 in / 222.3 mm	3.46 in / 87.9 mm
Width	483mm (19") IEC rack compliant	483mm (19") IEC rack compliant	17.5 in / 444.5 mm 19.01 in / 483 mm with ear mounts	17.44 in / 443 mm 19.01 in / 483 mm with ear mounts
Depth	630mm (24.8")	630mm (24.8")	38.63 in / 981 mm	24.8 in / 630 mm
Weight	26kg (57.2lb) with drives	24kg (53lb) with drives	180 lb / 82 kg RBOD weight 298 lb / 135 kg RBOD weight with drives 175 lb / 80 kg EBOD weight 287 lb / 130 kg EBOD weight with drives	38 lb / 17 kg 66 lb / 30 kg with drives

ARI-400 Series Technical Specifications: Detailed Specifications

	ARI-400 (2U 12 Bay)	ARI-403 (2U 24 Bay)	ARI-409 (5U 84 Bay)	ARI-450 (2U 24 Bay AFA)
POWER REQUIREMENTS - AC INPUT				
Input Power Requirements			200-240VAC 50-60Hz	100-200VAC 50/60Hz
Max Input Power			1047W maximum continuous	346W maximum continuous
Heat Dissipation			3572 BTUs/hour Platinum rated power supplies	1181 BTUs/hour Gold rated power supplies
POWER REQUIREMENTS - DC INPUT				
Voltage	100-240V AC	100-240V AC	200-240VAC 50-60Hz	100-200VAC 50/60Hz
Max Input Power			1047W maximum continuous	346W maximum continuous
Heat Dissipation			3572 BTUs/hour	1181 BTUs/hour
TEMPERATURE AND HUMIDITY RANGES				
Operating temperature	41°F to 104°F (5°C to 40°C)	41°F to 104°F (5°C to 40°C)	RBOD: 5oC to 35oC (41oF to 95oF) EBOD: 5oC to 40oC (41oF to 104oF)	RBOD: 5oC to 35oC (41oF to 95oF) EBOD: 5oC to 40oC (41oF to 104oF)
Shipping temperature			-40oC to +70oC (-40oF to +158oF)	-40oC to +70oC (-40oF to +158oF)
Operating humidity	20% to 80% non-condensing	20% to 80% non-condensing	20% to 80% non-condensing	20% to 80% non-condensing
Non-operating humidity			5% to 100% non-precipitating	5% to 100% non-precipitating
Sound power	≤LWAd 6.5Bels (re 1pW) @ 23ºC ambient	≤LWAd 6.5Bels (re 1pW) @ 23ºC ambient	<LWAd 6.6 Bels (re 1 pW) @ 23oC	
Sound pressure				
SHOCK AND VIBRATION				
Shock, Operational	5g 10ms half sine	5g 10ms half sine	5.0 g, 10 ms, ½ sine pulses, Y-axis	5.0 g, 10 ms, ½ sine pulses, Y-axis
Shock, Non-operational	30g 10ms half sine	30g 10ms half sine	30.0 g, 10 ms, ½ sine pulses (Z-axis); 20.0 g, 10 ms, ½ sine pulses (X- and Y-axes)	30.0 g, 10 ms, ½ sine pulses
Vibration, Operational	Random 0.21g RMS	Random 0.21g RMS	0.21 Grms 5 Hz to 500 Hz random	0.21 Grms 5 Hz to 500 Hz random
Vibration, Non-operational	Random 1.04g RMS	Random 1.04g RMS	1.04 Grms 2 Hz to 200 Hz random	1.04 Grms 2 Hz to 200 Hz random
REGULATORY				
Safety	UL 60950-1 (USA & Canada) EN 60950-1 (European Union) IEC 60950-1 (International)	UL 60950-1 (USA & Canada) EN 60950-1 (European Union) IEC 60950-1 (International)	UL 60950-1 (United States) CAN/CSA-C22.2 No.60950-1-07 (Canada) EN 60950-1 (European Union) IEC 60950-1 (International) CCC (China PRC – CCC Power Supplies) BIS (India – BIS Power Supplies)	UL 60950-1 (United States) CAN/CSA-C22.2 No.60950-1-07 (Canada) EN 60950-1 (European Union) IEC 60950-1 (International) CCC (China PRC – CCC Power Supplies) BIS (India – BIS Power Supplies)
Electromagnetic Compatibility				
Emissions	CFR 47 Part15, subpart B, class A; CES/NMB-003 Class A (North America) EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3 (Europe)	CFR 47 Part15, subpart B, class A; CES/NMB-003 Class A (North America) EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3 (Europe)	FCC CFR 47 Part 15 Subpart B Class A (United States) ICES/NMB-003 Class A (Canada) EN 55022/EN 55032:2012 Class A (EU) AS/NZS CISPR 22/CISPR 32 Class A (Australia/New Zealand) VCCI Class A (Japan) KN 22/KN 32 Class A (S. Korea) CNS 13438 Class A (Taiwan)	FCC CFR 47 Part 15 Subpart B Class A (United States) ICES/NMB-003 Class A (Canada) EN 55022/EN 55032:2012 Class A (EU) AS/NZS CISPR 22/CISPR 32 Class A (Australia/New Zealand) VCCI Class A (Japan) KN 22/KN 32 Class A (S. Korea) CNS 13438 Class A (Taiwan)
Harmonics			EN 61000-3-2 (EU)	EN 61000-3-2 (EU)
Flicker			EN 61000-3-3 (EU)	EN 61000-3-3 (EU)
Immunity			EN 55024 (EU) KN 24/KN 35 (S. Korea)	EN 55024 (EU) KN 24/KN 35 (S. Korea)
RoHS and WEEE				
			RoHS Directive (2011/65/EU), WEEE Directive (2012/19/EU)	RoHS Directive (2011/65/EU), WEEE Directive (2012/19/EU)
Country Approvals				
	North America, Europe, China, Taiwan, Korea, Japan, Australia/New Zealand	North America, Europe, China, Taiwan, Korea, Japan, Australia/New Zealand	Australia/New Zealand, Canada, China, European Union, Japan, South Korea, Taiwan, United States	Australia/New Zealand, Canada, China, European Union, Japan, South Korea, Taiwan, United States