



ARI-100 2U 12 Bay 3.5" HDD



ARI-103 2U 24 Bay 2.5" HDD



ARI-107 2U 48 Bay 2.5" HDD



ARI-109 4U 56 Bay 3.5" HDD

# ARI-100 SERIES

## HYBRID STORAGE ARRAYS

Meet the ARI-100 series: Hybrid storage that balances performance, capacity, and affordability. The ARI-100 series optimizes performance and protect your data with the **most complete set of virtualization features** of any SAN solution on the market today. And, maintain 99.999% uptime while sustaining **5 GB/s reads, 3.5 GB/s writes** in parallel file systems such as GPFS and Lustre. With 8TB NL SAS drive support, it is also one of the few block storage systems **capable of scaling to 2 petabytes in a 20U footprint.**

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

# ARI-100 SERIES

## HYBRID STORAGE ARRAYS

### AUTOMATIC DRIVE TIERING (optional): **2.5X IO WITH 90%/10% HDD/SSD MIX**

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.

### RAPID DRIVE REBUILDS: **RESTORE RAID SETS UP TO 5X FASTER**

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. By spreading LUNs across multiple RAID sets, RAID Inc.'s Rapid Drive Rebuild is able to recover from disk failures more quickly with minimal impact on overall system performance.

### SPIN DOWN TECHNOLOGY

The ARI-100 Series also features energy-saving drive spin-down. With the addition of drive spin-down, mixed drive type support and dual protocol interfaces, users can now combine high performance, high density primary volumes and secondary storage with different performance and energy usage profiles in the same physical unit.



### VIRTUAL DISK POOLS: **INCREASE FLEXIBILITY AND OPTIMIZATION WITH MIXED DRIVE TYPES IN ONE VERSATILE POOL**

Virtual Disk Pools decouples the LUN from being restricted to a single VDisk. A Volume's data on a given LUN can now expand across all disk drives in a pool. When capacity is added to a system, the user is also getting a performance benefit of the additional spindles. Additionally this capability provides seamless capacity expansion; data automatically reflows to new drives and IOPs scales with additional storage.

## KEY FEATURES

- ✓ Sustained Performance of 5GB/s Reads, 3.5GB/s Writes in GPFS & Lustre
- ✓ Advanced Virtualization Features
- ✓ Proven 99.999% uptime
- ✓ Automatic Drive Tiering (optional)
- ✓ Rapid Drive Rebuilds
- ✓ Drive spin-down
- ✓ Virtual Disk Pools = faster performance
- ✓ SSD Flash Cache
- ✓ Volume Copy Snapshot & Remote Replication (optional)
- ✓ Thin Provisioning
- ✓ Max Drive Support 248 HDD, SSD, NLSAS
- ✓ SED Support
- ✓ Host Options
  - (8) 16GB FC
  - (8) 12 GB SAS
  - (8) 10 GB iSCSI
- ✓ Centralized Management Interface
- ✓ Rugged Chassis
  - Nebs Level 3 Compliant
  - MIL STD 810G Compliant
- ✓ Degraded Disk Detection
- ✓ Disk Background Scrub
- ✓ Automated Provisioning tool
- ✓ Battery free cache backup

**RAIDINC.COM**  
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### ECO-FRIENDLY HYBRID STORAGE **BATTERY FREE CACHE BACKUP**

These systems have completely eliminated cache batteries, using instead super capacitors and flash memory to provide infinite cache backup during a power loss, while being environmentally friendly.

### THIN-PROVISIONING: **MINIMIZE INITIAL STORAGE EXPENDITURES**

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.

### RUGGED HYBRID STORAGE SOLUTIONS

The ARI-100 series ensure that there is no "single point of failure," and automatic failover mechanisms facilitate the highest levels of data protection, service levels and disaster recovery. All chassis are interchangeable and the rugged chassis design makes the ARI-100, ARI-103, and ARI-109 ideal hybrid storage arrays for most mobile applications with NEBS level 3 and MIL-STD 810g compliance.



### 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").

### CENTRALIZED MANAGEMENT INTERFACE: **HIGH DENSITY, HYBRID STORAGE MADE EASY**

ARI virtualization hybrid storage arrays are easy to configure and manage with our intuitive web based interface, which provides storage setup and monitoring without the need for host-based software. All Auto-pooling technology automatically creates all storage pools and management tasks are streamlined. Our GUI saves time with configuration and installation wizards, and schedulers. Check out a [demo!](#)

### REMOTE REPLICATION (OPTIONAL): **DECREASE BACKUP TIMES**

Equipped with remote replication software, RAID Inc.'s ARI-100 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.

### VOLUMECOPY AND SNAPSHOT (OPTIONAL)

The ARI-100 series data protection and disaster recovery solution has optional licensing of SnapShot and VolumeCopy data protection software. With up to 1000 snapshots capability, the ARI-100 series offers necessary protection for business critical applications such as email, databases, and file sharing. With this capability, the ARI-100 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.

### OTHER FEATURES:

Degraded Disk Detection, Automated Provisioning Tool, Disk Background Scrub, SSD Flash Cache

## ARI-100 Series Technical Specifications: Features

	ARI-100 (2U 12 Bay)	ARI-103 (2U 24 Bay)	ARI-107 (2U 48 Bay)	ARI-109 (4U 56 Bay)
<b>HOSTS</b>				
<b>External Ports</b>	4 per controller/8 maximum	4 per controller/8 maximum	4 per controller/8 maximum	4 per controller/8 maximum
<b>Fibre Channel</b>				
<b>Host speed</b>	16Gb Fibre Channel	16Gb Fibre Channel	16Gb Fibre Channel	16Gb Fibre Channel
<b>Interface type</b>	SFP+	SFP+	SFP+	SFP+
<b>iSCSI</b>				
<b>Initiators</b>	10Gb NIC or 1Gb, 10Gb iSCSI	10Gb NIC or 1Gb, 10Gb iSCSI	10Gb NIC or 10Gb iSCSI	10Gb NIC or 10Gb iSCSI
<b>Interface type</b>	SFP+	SFP+	SFP+	SFP+
<b>SAS</b>				
<b>Initiators</b>	12Gb, 6Gb SAS 3.0	12Gb, 6Gb SAS 3.0	12Gb SAS 2.0	12Gb SAS 2.0
<b>Interface type</b>	Mini-SAS HD (8643/8644)	Mini-SAS HD (8643/8644)	Mini-SAS (8643/8644)	Mini-SAS (8643/8644)
<b>DRIVE SUPPORT</b>				
	3.5" & 2.5" HDD, SAS/NLSAS/SSD	2.5" HDD, SAS/NLSAS/SSD	2.5" HDD, SAS/NLSAS/SSD	3.5" & 2.5" HDD, SAS/NLSAS/SSD
<b>DRIVE EXPANSION</b>				
	(1 RAID, 7 JBOD), 96 DRIVES	(1 RAID, 7 JBOD) 192 DRIVES	(1 RAID, 3 JBOD), 192 DRIVES	Expandable to 248 DRIVES
<b>HIGH-AVAILABILITY FEATURES</b>				
	Redundant Hot-Swap Controllers	Redundant Hot-Swap Controllers	Redundant Hot-Swap Controllers	Redundant Hot-Swap Controllers
	Redundant Hot-Swap Disk, Fans, Power	Redundant Hot-Swap Disk, Fans, Power	Redundant Hot-Swap Disk, Fans, Power	Redundant Hot-Swap Disk, Fans, Power
	Dual Power Cords	Dual Power Cords	Dual Power Cords	Dual Power Cords
	Hot Standby Spare	Hot Standby Spare	Hot Standby Spare	Hot Standby Spare
	Automatic Failover	Automatic Failover	Automatic Failover	Automatic Failover
	Multi-Path Support	Multi-Path Support	Multi-Path Support	Multi-Path Support
<b>PROTOCOLS AND STANDARDS</b>				
<b>IP (RFC, 894, 1092)</b>	SCSI-2 and SCSI-3	SCSI-2 and SCSI-3	SCSI-2 and SCSI-3	SCSI-2 and SCSI-3
<b>RAID Levels supported</b>	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
<b>SYSTEM CONFIGURATION</b>				
<b>Cache Memory</b>	6GB per controller	6GB per controller	6GB per controller	6GB per controller
<b>Virtual disks per system</b>	32	32	32	32
<b>Volumes per system</b>	1024	1024	1024	1024
<b>Mirrored Cache</b>	Yes	Yes	Yes	Yes
<b>Supercapacitor Cache Backup</b>	Yes	Yes	Yes	Yes
<b>Cache Backup to Flash</b>	Yes - Non-volatile	Yes - Non-volatile	Yes - Non-volatile	Yes - Non-volatile
<b>MANAGEMENT</b>				
<b>Interface types</b>	10/100/1000 Ethernet, Mini USB	10/100/1000 Ethernet, Mini USB	10/100/1000 Ethernet, Mini USB	10/100/1000 Ethernet, Mini USB
<b>Protocols supported</b>	SNMP, SSL, SSH, SMTP, SMI-S Provider, HTTP(S)	SNMP, SSL, SSH, SMTP, SMI-S Provider, HTTP(S)	SNMP, SSL, SSH, SMTP, SMI-S Provider, HTTP(S)	SNMP, SSL, SSH, SMTP, SMI-S Provider, HTTP(S)
<b>Management Consoles</b>	WEB GUI, CLI	WEB GUI, CLI	WEB GUI, CLI	WEB GUI, CLI
<b>Management Software</b>	RAIDar 2.0	RAIDar 2.0	RAIDar 2.0	RAIDar 2.0
<b>Remote Diagnostics</b>				
<b>Non-disruptive Updates</b>				
<b>Volume Expansion</b>				
<b>COMPLIANCE AND STANDARDS</b>				
	NEBS Level 3, MIL SPEC 810G IP (RFC, 894, 1092) SCSI-2 AND SCSI-3	NEBS Level 3, MIL SPEC 810G IP (RFC, 894, 1092) SCSI-2 AND SCSI-3		NEBS Level 3, MIL SPEC 810G IP (RFC, 894, 1092) SCSI-2 AND SCSI-3

## ARI-100 Series Technical Specifications: Detailed Specifications

	ARI-100 (2U 12 Bay)	ARI-103 (2U 24 Bay)	ARI-107 (2U 48 Bay)	ARI-109 (4U 56 Bay)
<b>POWER REQUIREMENTS - AC INPUT</b>				
<b>Input Power Requirements</b>	100-240VAC 50/60Hz	100-240VAC 50/60Hz	100-240VAC 50/60Hz	200-240VAC 50/60Hz;6-5A (1200W)
<b>Max Input Power</b>	375W maximum continuous	400W maximum continuous	640W maximum continuous	1200W maximum continuous
<b>Heat Dissipation</b>	1488 BTUs/hour Bronze Rated - high efficiency 82% @ 20% load 86% @ 80% load 85% @ 100% load	1488 BTUs/hour Bronze Rated - high efficiency 82% @ 20% load 86% @ 80% load 85% @ 100% load	2245 BTUs/hour Gold Rated - high efficiency 75% @ 10% load 88% @ 20% load 92% @ 50% load 88% @ 100% load	4095 BTUs/hour PLATINUM RATED (230VAC) VERY HIGH EFFICIENCY 82 percent @ 10 percent load 90 percent @ 20 percent load 94 percent @ 50 percent load 91 percent @ 100 percent load
<b>POWER REQUIREMENTS - DC INPUT</b>				
<b>Voltage</b>	-39 to -72VDC, -48/-60V nominal	-39 to -72VDC, -48/-60V nominal		-48 to -60VDC at 25-20A (1200W)
<b>Max Input Power</b>	500W maximum continuous	500W maximum continuous		1200W maximum continuous
<b>Heat Dissipation</b>	1706 BTU/hour	1706 BTU/hour		4095 BTUs/hour GOLD RATED (-54VDC) HIGH EFFICIENCY 80 percent @ 10 percent load 88% percent @ 20 percent load 92% percent @ 50 percent load 88% percent @ 100 percent load
<b>TEMPERATURE AND HUMIDITY RANGES</b>				
<b>Operating temperature</b>	41°F to 104°F (5°C to 40°C)	41°F to 104°F (5°C to 40°C)	5°C to 35°C. Data Center Environmental Conditions are required	5°C to 40°C (41°F to 104°F) @ 1829m (6000ft)
<b>Shipping temperature</b>	-40°F to 158°F (-40°C to 70°C) Note: Derate 2°C for every km, up to 3000 meters	-40°F to 158°F (-40°C to 70°C) Note: Derate 2°C for every km, up to 3000 meters	-23°F to 158°F (-5°C to 70°C) Note: Derate 2°C for every km, up to 3000 meters	-40°C to 70°C (-40°F to 158°F) Note: De-rate 2°C for every km, up to 3000 meters
<b>Operating humidity</b>	10% to 90% RH @ 104°F (40°C), noncondensing	10% to 90% RH @ 104°F (40°C), noncondensing	10% to 90%RH @ 35°C, noncondensing	10% to 90% RH @ 40°C (104°F), non-condensing
<b>Non-operating humidity</b>	Up to 93% RH @ 104°F (40°C), noncondensing	Up to 93% RH @ 104°F (40°C), noncondensing	Up to 93%RH @ 35°C, noncondensing	Up to 93% RH @ 40°C
<b>Sound power</b>	LWAd=6,75 B	LWAd=6,75 B		
<b>Sound pressure</b>	LpAm - 55dB	LpAm - 55dB		
<b>SHOCK AND VIBRATION</b>				
<b>Shock, Operational</b>	3G's for 10 ms, half sine	3G's for 10 ms, half sine	3G's for 11 ms half-sine, 5 pulses each direction, rail mounted	3G's for 11 ms
<b>Shock, Non-operational</b>	10G 11ms, half sine	10G 11ms, half sine	10Gs 11ms, half sine	1" drop to hard unyielding surface per NEBS GR-63-CORE Unpackaged Equipment Shock Criteria (4.3.2)
<b>Vibration, Operational</b>	5Hz to 500Hz, 0.21Grms flat spectrum	5Hz to 500Hz, 0.21Grms flat spectrum	5Hz to 500Hz, 0.14 G rms flat spectrum, test time 36 minutes. Rail mounted	5Hz to 500Hz, 0.1436Grms
<b>Vibration, Non-operational</b>	3-365-3Hz, 1.22 Grms, z-axis, 0.85 Grms, X&Y axis shaped spectrum	3-365-3Hz, 1.22 Grms, z-axis, 0.85 Grms, X&Y axis shaped spectrum	3-365-3Hz, 1.22 Grms, z-axis, test time 30 minutes. Direct mount	3-365-3Hz, 1.22 Grms, z-axis, test time 30 minutes. Direct mount
<b>REGULATORY</b>				
<b>Safety</b>	UL 60950-1, 1st edition (USA) CAN/CSA-C22.2 No.60950-1 (Canada) EN 60950-1 (European Union) IEC 60950-1 (International) EN 60950-1 (GS Mark,Germany) CCC Mark China PRC	UL 60950-1, 1st edition (USA) CAN/CSA-C22.2 No.60950-1 (Canada) EN 60950-1 (European Union) IEC 60950-1 (International) EN 60950-1 (GS Mark,Germany) CCC Mark China PRC	UL 60950-1, 1st edition (USA) CAN/CSA-C22.2 No.60950-1 (Canada) EN 60950-1 (European Union) IEC 60950-1 (International) EN 60950-1 (GS Mark,Germany) CCC Mark (China PRC)	UL 60950-1, 2nd edition (United States) CAN/CSA-C22.2 No.60950-1 (Canada) EN 60950-1 (European Union) IEC 60950-1 (International) EN 60950-1 (GS Mark, Germany) CCC Mark (Power supplies only - China PRC)
<b>Electromagnetic Compatibility Emissions</b>	CFR 47 Part 15 Subpart B Class A(U.S.A.)ICES-003 Class A (Canada)EN 55022 Class A (EU)EN 300 386 Class A (EU Telco)AS/NZS CISPR 22 Class A (Australia,New Zealand)VCCI Class A (Japan)GOST R 51318.22 Class A (Russia)KN 22 Class A (S. Korea)CNS 13438 Class A (Taiwan)	CFR 47 Part 15 Subpart B Class A(U.S.A.)ICES-003 Class A (Canada)EN 55022 Class A (EU)EN 300 386 Class A (EU Telco)AS/NZS CISPR 22 Class A (Australia,New Zealand)VCCI Class A (Japan)GOST R 51318.22 Class A (Russia)KN 22 Class A (S. Korea)CNS 13438 Class A (Taiwan)	CFR 47 Part 15 Subpart B Class A(U.S.A.)ICES-003 Class A (Canada)EN 55022 Class A (EU)AS/NZS CISPR 22 Class A (Australia, New Zealand)VCCI Class A (Japan)GOST R 51318.22 Class A (Russia)KN 22 Class A (S. Korea)CNS 13438 Class A (Taiwan)	CFR 47 Part 15 Subpart B Class A (United States) ICES-003 Class A (Canada) EN 55022 Class A (EU) AS/NZS CISPR 22 Class A (Australia, New Zealand) VCCI Class A (Japan) GOST R 5138.22 Class A (Russia, Kazakhstan, and Belarus) KN 22 Class A (S. Korea) CNS 13438 Class A (Taiwan)
<b>Harmonics Flicker Immunity</b>	EN61000-3-2 (EU) EN 61000-3-3 (EU) EN 55024 (EU) EN 300 386 (EU Telco) GOST R 51318.24 (Russia) KN 24 (S. Korea)	EN61000-3-2 (EU) EN 61000-3-3 (EU) EN 55024 (EU) EN 300 386 (EU Telco) GOST R 51318.24 (Russia) KN 24 (S. Korea)	EN61000-3-2 (EU) EN 61000-3-3 (EU) EN 55024 (EU) GOST R 51318.24 (Russia) KN 24 (S. Korea)	EN61000-3-2 (EU) EN 61000-3-3 (EU) EN 55024 (EU) GOST R 5138.22 (Russia, Kazakhstan, and Belarus) KN 24 (S. Korea)
<b>RoHS and WEEE</b>	RoHS-6/6 Compliance, China RoHS, WEEE	RoHS-6/6 Compliance, China RoHS, WEEE	RoHS-6/6 Compliance, China RoHS, WEEE	RoHS-6/6 Compliance, China RoHS, WEEE
<b>Country Approvals</b>	United States, Canada, European Union (EU), Australia/New Zealand, Japan, China (PRC), Russia, Mexico, Germany, South Korea, Taiwan , India	United States, Canada, European Union (EU), Australia/New Zealand, Japan, China (PRC), Russia, Mexico, Germany, South Korea, Taiwan , India	United States, Canada, European Union (EU), Australia/New Zealand, Japan, China (PRC) , Russia, Mexico, Germany, South Korea, Taiwan, India	United States, Canada, European Union (EU), Australia/New Zealand, Japan, China (PRC), Russia, Kazakhstan, Belarus, Mexico, Germany, South Korea, Taiwan