

BLOCK STORAGE: ARI-100 SERIES
Hybrid Storage with Advanced Virtualization Features



ARI-100 2U 12 Bay 3.5" HDD



ARI-107 2U 48 Bay 2.5" HDD



ARI-103 2U 24 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.

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.

Advantages

- Sustained performance of 5GB/s Reads, 3.5GB/s writes in GPFS & Lustre
- Advanced Virtualization Features
- Proven 99.999% uptime
- Automatic drive tiering (optional)
- 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) 12GB SAS, (8) 10GB iSCSI
- Rugged chassis: Nebs level 3 compliant, MIL STD 810G compliant
- Degraded disk detection
- Disk background scrub
- Automated provisioning tool
- Battery free cache backup

ARI-100 SERIES (CONT'D)

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

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: 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.

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 4TB large form factor (3.5").

BLOCK STORAGE: ARI-100 SERIES
Hybrid Storage with Advanced Virtualization Features**ARI-100 SERIES (CONT'D)****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

BLOCK STORAGE: ARI-100 SERIES Hybrid Storage with Advanced Virtualization Features

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)
HOSTS				
External Ports	4 per controller/8 maximum	4 per controller/8 maximum	4 per controller/8 maximum	4 per controller/8 maximum
Fibre Channel				
Host speed	16Gb Fibre Channel	16Gb Fibre Channel	16Gb Fibre Channel	16Gb Fibre Channel
Interface type	SFP+	SFP+	SFP+	SFP+
iSCSI				
Initiators	10Gb NIC or 1Gb, 10Gb iSCSI	10Gb NIC or 1Gb, 10Gb iSCSI	10Gb NIC or 10Gb iSCSI	10Gb NIC or 10Gb iSCSI
Interface type	SFP+	SFP+	SFP+	SFP+
SAS				
Initiators	12Gb, 6Gb SAS 3.0	12Gb, 6Gb SAS 3.0	12Gb SAS 2.0	12Gb SAS 2.0
Interface type	Mini-SAS HD (8643/8644)	Mini-SAS HD (8643/8644)	Mini-SAS HD (8643/8644)	Mini-SAS HD (8643/8644)
DRIVE SUPPORT				
	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
DRIVE EXPANSION				
	(1 RAID, 7 JBOD), 96 DRIVES	(1 RAID, 7 JBOD), 192 DRIVES	(1 RAID, 3 JBOD), 192 DRIVES	Expandable to 248 DRIVES
HIGH-AVAILABILITY FEATURES				
	Redundant Hot-Swap Controllers Redundant Hot-Swap Disk, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support	Redundant Hot-Swap Controllers Redundant Hot-Swap Disk, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support	Redundant Hot-Swap Controllers Redundant Hot-Swap Disk, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support	Redundant Hot-Swap Controllers Redundant Hot-Swap Disk, Fans, Power Dual Power Cords Hot Standby Spare Automatic Failover Multi-Path Support
PROTOCOLS AND STANDARDS				
IP (RFC, 894, 1092)	SCSI-2 and SCSI-3	SCSI-2 and SCSI-3	SCSI-2 and SCSI-3	SCSI-2 and SCSI-3
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				
Cache Memory	6GB per controller	6GB per controller	6GB per controller	6GB per controller
Virtual disks per system	32	32	32	32
Volumes per system	1024	1024	1024	1024
Mirrored Cache	Yes	Yes	Yes	Yes
Supercapacitator	Yes	Yes	Yes	Yes
Cache Backup				
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, 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)
Management Consoles	WEB GUI, CLI	WEB GUI, CLI	WEB GUI, CLI	WEB GUI, CLI
Management Software	RAIDar 2.0	RAIDar 2.0	RAIDar 2.0	RAIDar 2.0
Remote Diagnostics				
Non-disruptive Updates				
Volume Expansion				
COMPLIANCE AND STANDARDS				
	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: Features

	ARI-100 (2U 12 Bay)	ARI-103 (2U 24 Bay)	ARI-107 (2U 48 Bay)	ARI-109 (4U 56 Bay)
POWER REQUIREMENTS – AC INPUT				
Input Power Requirements	100-240VAC 50/60Hz	100-240VAC 50/60Hz	100-240VAC 50/60Hz	200-240VAC 50/60Hz;6-5A (1200W)
Max Input Power	375W maximum continuous	400W maximum continuous	640W maximum continuous	1200W maximum continuous
Heat Dissipation	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% @ 10% load 90% @ 20% load 94% @ 50% load 91% @ 100% load
POWER REQUIREMENTS – DC INPUT				
Voltage	-39 to -72VDC, -48/-60V nominal	-39 to -72VDC, -48/-60V nominal		-48 to -60VDC at 25-20A (1200W)
Max Input Power	500W maximum continuous	500W maximum continuous		1200W maximum continuous
Heat Dissipation	1706 BTUs/hour	1706 BTUs/hour		4095 BTUs/hour Gold Rated (-54VDC) high efficiency 80% @ 10% load 88% @ 20% load 92% @ 50% load 88% @ 100% load
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)	5°C to 35°C Data Center	5°C to 40°C (41°F to 104°F) @ 1829m (6000ft)
Shipping Temperature	Note: Derate 2°C for every km, up to 3000 meters	Note: Derate 2°C for every km, up to 3000 meters	-23° to 158°F (-5°C to 70°C)	Note: Derate 2°C for every km, up to 3000 meters
Operating Humidity	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), noncondensing
Non-operating Humidity	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	10% to 90% RH @ 40°C
Sound Power	LWAd=6,75 B	LWAd=6,75 B		
Sound Pressure	L pAm – 55dB	L pAm – 55dB		
SHOCK AND VIBRATION				
Shock, Operational	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
Shock, Non-operational	10G 11 ms, half sine	10G 11 ms, half sine	10Gs 11 ms, half sine	1" drop to hard unyielding surface per NEBS GR-63-CORE Unpackaged Equipment Shock Criteria (4.3.2)
Vibration, Operational	5Hz to 500Hz, 0.21Grms flat spectrum	5Hz to 500Hz, 0.21Grms flat spectrum	5Hz to 500Hz, 0.14Grms flat spectrum, test time 36 min. Rail mounted.	5Hz to 500Hz, 0.1436Grms
Vibration, Non-Operational	3-365-3Hz, 1.22Grms, z-axis, 0.85 Grms, X&Y axis shaped spectrum	3-365-3Hz, 1.22Grms, z-axis, 0.85 Grms, X&Y axis shaped spectrum	3-365-3Hz, 1.22Grms, z-axis, 0.85 Grms, test time 30 min. Direct mount.	3-365-3Hz, 1.22Grms, z-axis, 0.85 Grms, test time 30 min. Direct mount.
REGULATORY				
Safety	UL 60950-1, 1 ST EDITION (USA) CAN/CSA-C22.2 No. 60950-1 (CN) EN 60-950-1 (European Union) IEC 60950-1 (International) IEC 60950-1 (GS Mark,Germany)	UL 60950-1, 1 ST EDITION (USA) CAN/CSA-C22.2 No. 60950-1 (CN) EN 60-950-1 (European Union) IEC 60950-1 (GS Mark,Germany) CCC Mark (China PRC)	UL 60950-1, 1 ST EDITION (USA) CAN/CSA-C22.2 No. 60950-1 (CN) EN 60-950-1 (European Union) IEC 60950-1 (International) IEC 60950-1 (GS Mark,Germany)	UL 60950-1, 2nd EDITION (USA) CAN/CSA-C22.2 No. 60950-1 (CN) EN 60-950-1 (European Union) IEC 60950-1 (GS Mark,Germany) CCC Mark (Power supplies only China PRC)
Electromagnetic Compatibility				
Emissions	CFR 47 Part 15 Subpart B Class A (US) ICES-003 Class A (CN) 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 (CN) EN 55-022 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)
Harmonics	EN61000-3-2 (EU)	EN61000-3-2 (EU)	EN61000-3-2 (EU)	EN61000-3-2 (EU)
Flicker	EN 61000-3-3 (EU)	EN 61000-3-3 (EU)	EN 61000-3-3 (EU)	EN 61000-3-3 (EU)
Immunity	EN 55024 (EU) EN 300 386 (EUTelco) KN 24 (S. Korea)	EN 55024 (EU) EN 300 386 (EUTelco) KN 24 (S. Korea)	EN 55024 (EU) GOST R 51318.24 (Russia)	EN 55024 (EU) GOST R 51318.22 (Russia, Kazakhstan, And Belarus) KN 24 (S. Korea)
RoHS and WEEE	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
Country Approvals	U.S., CN, EU, Australia/New Zealand, Japan, China (PRC), Russia, Mexico, Germany, S. Korea, Taiwan, India	U.S., CN, EU, Australia/New Zealand, Japan, China (PRC), Russia, Mexico, Germany, S. Korea, Taiwan, India	U.S., CN, EU, Australia/New Zealand, Japan, China (PRC), Russia, Mexico, Germany, S. Korea, Taiwan, India	U.S., CN, EU, Australia/New Zealand, Japan, China (PRC), Russia, Mexico, Germany, S. Korea, Taiwan, India