



Configuration Examples for FAS2220 Systems



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FAS2220 configuration options

The FAS2220 systems can be used in a variety of physical configurations and with different storage protocols.

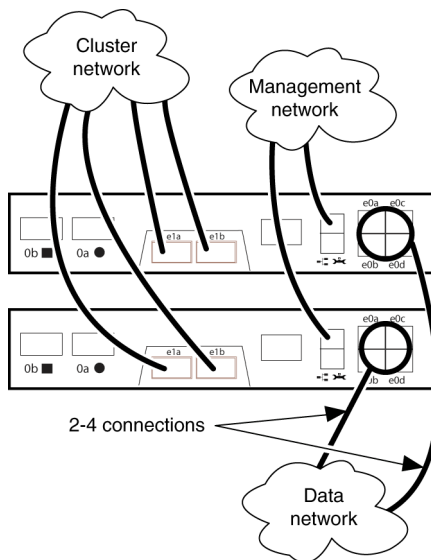
Configuration	Possible variations
Storage protocol	<ul style="list-style-type: none"> NFS, CIFS, and/or iSCSI
Mezzanine card	<ul style="list-style-type: none"> None This system can be configured without a mezzanine card. In this case, a blank with no ports takes the place of the mezzanine card in the controller module. Dual-port 10-Gb Ethernet option
Controller resiliency	<ul style="list-style-type: none"> HA pair The system has two redundant controller modules. Stand-alone configuration The system has one controller module.
Internal/external storage	<ul style="list-style-type: none"> Internal disks Internal disks in the system chassis are used. External SAS disks or tape
Disk shelf connection redundancy	<ul style="list-style-type: none"> Multipath configuration The controller has multiple connections to disks on the disk shelves. Multipath is the preferred configuration. Dual-path configuration The controller has two connections to disks on the disk shelves. Single-path configuration The disk shelves have a single connection to the controller. This configuration is not preferred but is supported on entry-level platforms.
Backup device	<p>External backup devices</p> <p>The system connects to a tape backup device.</p>

Required configuration for FAS2220 systems running clustered Data ONTAP

The FAS2220 systems support clustered Data ONTAP. This requires the 10-GbE mezzanine card to provide the connections to the cluster network unless you are operating a single-node cluster.

Switched-cluster configuration

The following example shows a FAS2220 system configured to support clustered Data ONTAP:

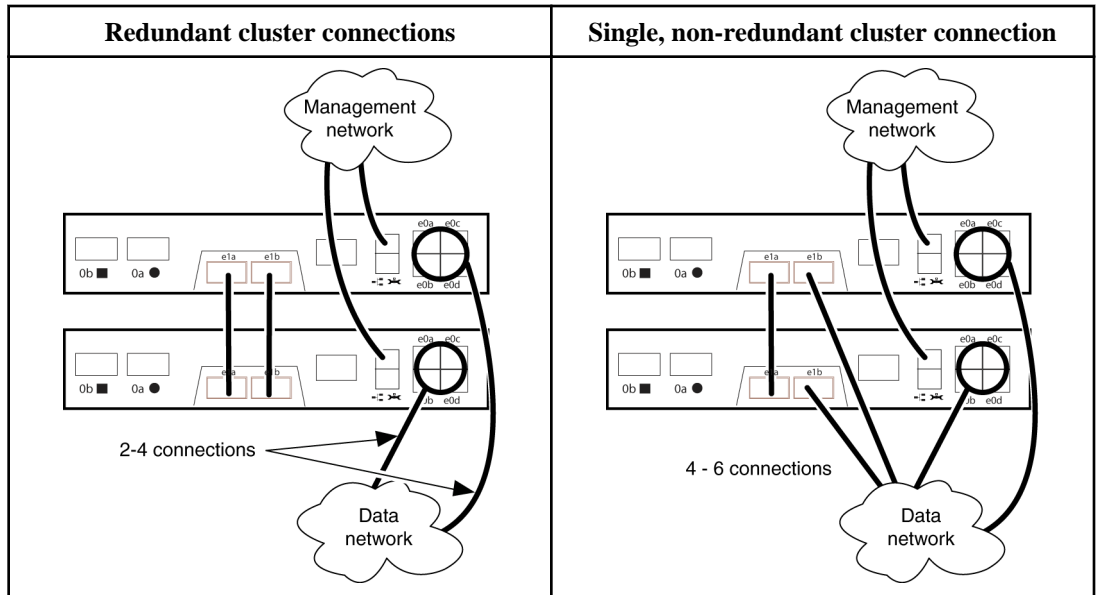


This configuration has the following requirements and options:

- The 10-GbE mezzanine card is required in each controller module.
All four 10-GbE ports (the e1a and e1b ports on both controllers) are required for cluster-network connections.
- Either two or four of the onboard GbE ports are used for the data network connections.
- The Remote Management port (marked with a wrench icon) is used for the management network connections.
This port also allows access to the Service Processor.
- This configuration supports NFS, CIFS, and iSCSI protocols as shown in other configuration examples.
- This configuration can be used with SAS storage only.

Two-node switchless-cluster configuration

The following examples show a FAS2220 system configured to support clustered Data ONTAP with either redundant back-to-back cluster connections or a single-cluster connection. This configuration is referred to as a two-node switchless cluster. The redundant configuration is recommended.

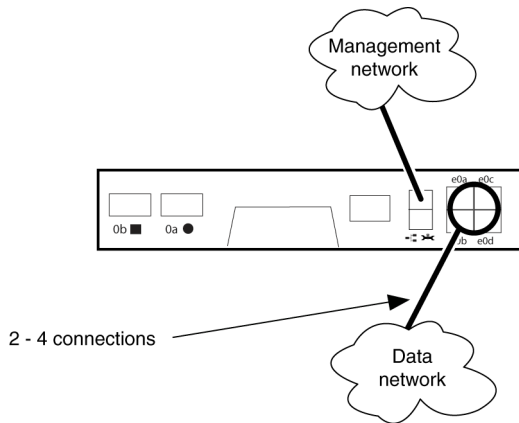


This configuration has the following requirements and options:

- The 10-GbE mezzanine card is required in each controller module.
All four 10-GbE ports (the e1a and e1b ports on both controllers) are required for fully redundant cluster connections. The cluster ports are directly connected without a switch.
- **Note:** A configuration using a single 10-GbE port on each controller is supported to allow use of the e1b ports for data, but this does not provide a redundant connection in the event of a cable or port failure.
- Two or four of the onboard GbE ports are used for the data network connections.
- The Remote Management port (marked with a wrench icon) is used for the management network connections.
This port also allows access to the Service Processor.
- This configuration supports NFS, CIFS, and iSCSI protocols as shown in other configuration examples.
- This configuration can be used with SAS storage only.

Single-node cluster configuration

The following example shows a single FAS2220 node configured to support clustered Data ONTAP.

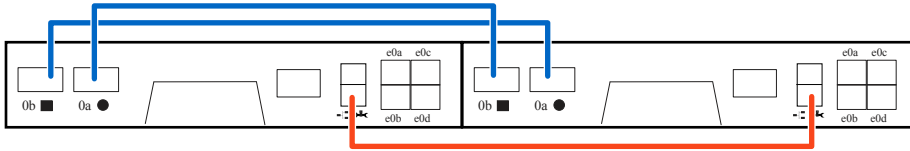




This configuration has the following requirements and options:

- This configuration does not require the 10-GbE mezzanine card.
Because this is a single-node configuration, if the system is configured with the 10-GbE mezzanine card, the ports can be used for data connections.
- Either two or four of the onboard GbE ports are used for the data network connections.
- The Remote Management port (marked with a wrench icon) is used for the management network connections.
This port also allows access to the Service Processor.
- This configuration supports NFS, CIFS, and iSCSI protocols as shown in other configuration examples.

Example 1: HA pair with no external disk shelves

The FAS2220 systems can be configured as an HA pair with no external disk drives.

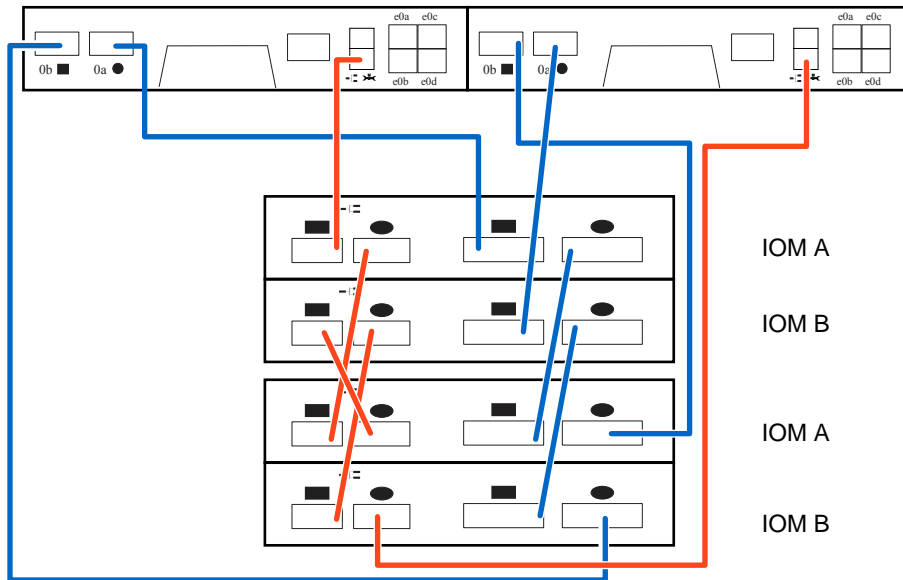




	The red cables are Ethernet ACP connections.
	The blue cables are SAS disk shelf connections.

Configuration details	Configuration used
Storage protocol	NFS, CIFS, and/or iSCSI
Controller resiliency	HA pair
Internal/external storage	Internal only
Disk shelf connection redundancy	Multipath HA Note: This is the recommended configuration. If the external cables are not used, the internal drives have single-path connectivity. Such a configuration is supported but not recommended.
Backup device	None

Example 2: HA pair with external SAS shelves

The FAS2220 systems can be configured as an HA pair with external SAS disk shelves.



	The red cables are Ethernet ACP connections.
	The blue cables are SAS disk shelf connections.

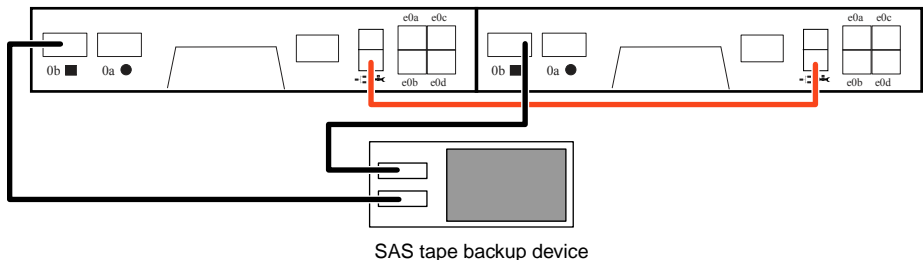
Configuration details	Configuration used
Storage protocol	NFS, CIFS, iSCSI
Controller resiliency	HA pair
External storage	External SAS disk shelves
Disk shelf connection redundancy	Multipath HA
Backup device	None



If you have SSD shelves

If you have SAS disk shelves with SSDs, the shelves with the SSDs should be the last shelves in the stack and connect to the 0b port on each controller. This allows the SSD drives to have the shortest possible SAS path to the controller.

Example 3: HA pair with SAS tape backup

The FAS2220 systems can be configured as an HA pair with an external SAS tape backup device.

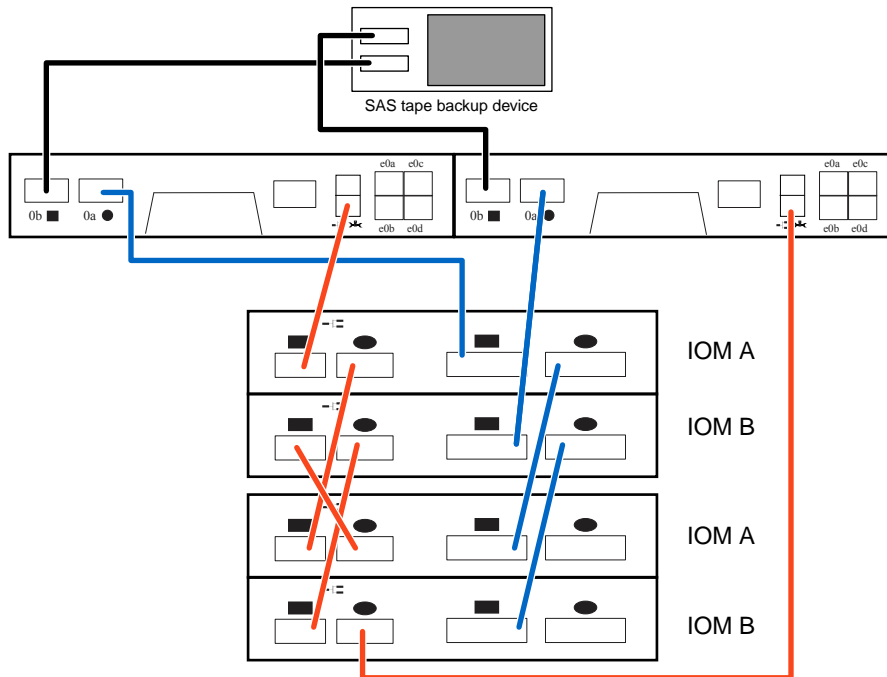





	The red cables are Ethernet ACP connections.
	The black cables are SAS tape drive connections.

Configuration details	Configuration used
Storage protocol	NFS, CIFS, and/or iSCSI
Controller resiliency	HA pair
External storage	Internal only
Disk shelf connection redundancy	n/a
Backup device	SAS tape backup device

Example 4: HA pair with external SAS shelves and tape backup

The FAS2220 systems can be configured as an HA pair connected to external SAS disk shelves and a SAS tape backup device.



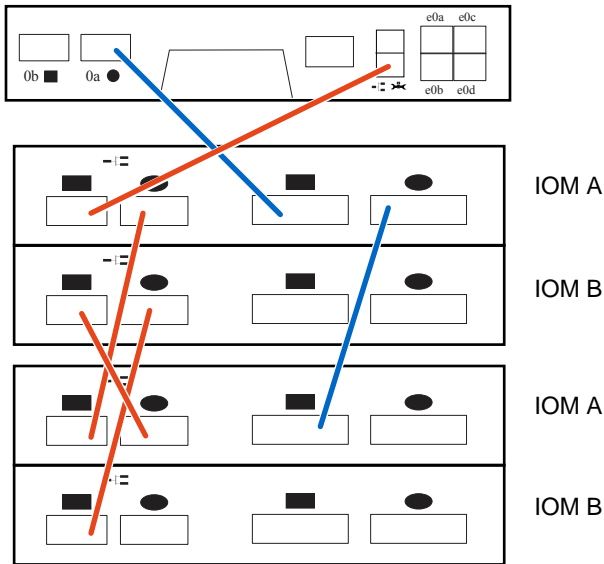
	The red cables are Ethernet ACP connections.
	The blue cables are SAS disk shelf connections.
	The black cables are SAS tape drive connections.



Configuration details	Configuration used
Storage protocol	NFS, CIFS, iSCSI
Controller resiliency	HA pair
External storage	External SAS
Disk shelf connection redundancy	Single-path
Backup device	Single-path SAS tape backup device

Example 5: Stand-alone controller with SAS shelves (single-path)

The FAS2220 systems can be configured as stand-alone controllers with an external stack of SAS disk shelves, with single-path connectivity. Although the single-path connections provide less resiliency than a dual-path configuration, Data ONTAP does not display the intermittent alert messages that appear when a dual-path configuration is used.

Note: This configuration is not recommended for shelves with SSDs.



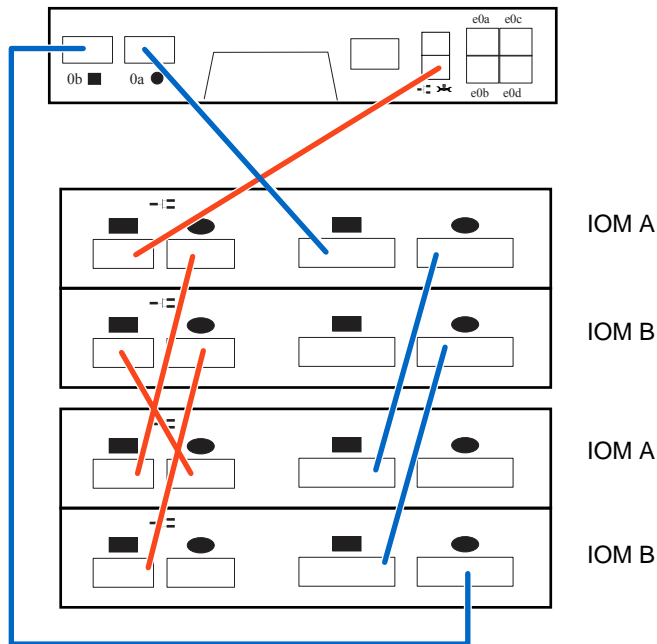
	The red cables are Ethernet ACP connections.
	The blue cables are SAS disk shelf connections.



Configuration details	Configuration used
Storage protocol	NFS, CIFS, iSCSI
Controller resiliency	Stand-alone
External storage	External SAS disk shelves
Disk shelf connection redundancy	Single-path
Backup device	None

Example 6: Stand-alone controller with SAS shelves (dual-path)

The FAS2220 system can be configured as a stand-alone controller with dual-path connectivity to external SAS storage. This configuration provides more resiliency than the single-path configuration, but Data ONTAP displays intermittent alert messages that the system is in a mixed-path configuration.

Note: The dual-path configuration is not recommended for shelves with SSDs. However, if you have SAS disk shelves with SSDs, the shelves with the SSDs should be the last shelves in the stack and connect to the 0b port on each controller. This allows the SSD drives to have the shortest possible SAS path to the controller.



	The red cables are Ethernet ACP connections.
	The blue cables are SAS disk shelf connections.

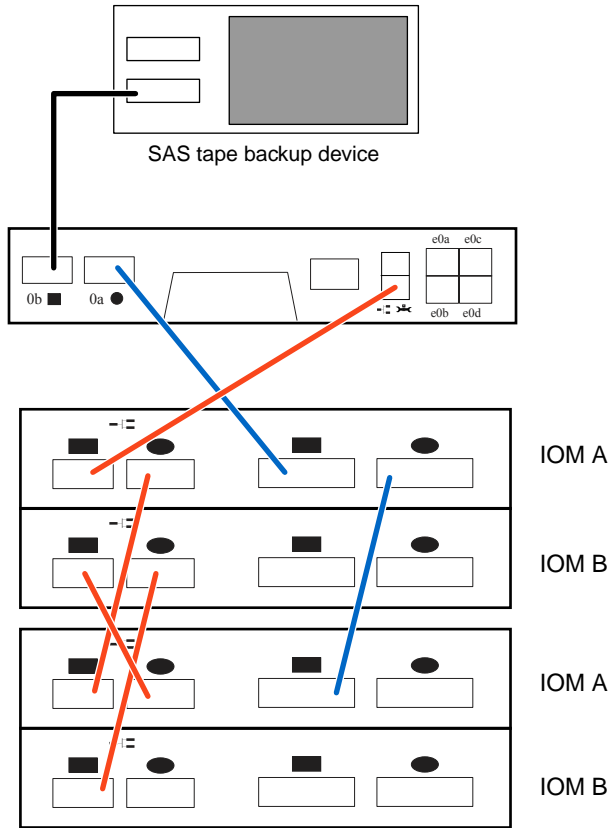
Configuration details	Configuration used
Storage protocol	NFS, CIFS, iSCSI
Controller resiliency	Stand-alone
External storage	External SAS disk shelves




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Configuration details	Configuration used
Disk shelf connection redundancy	Dual-path
Backup device	None

Example 7: Stand-alone controller with SAS shelves (single-path) and tape backup

The FAS2220 system can be configured as a stand-alone controller with single-path connections to a stack of SAS disk shelves and a SAS tape backup device.



	The red cables are Ethernet ACP connections.
	The blue cables are SAS disk shelf connections.
	The black cables are SAS tape drive connections.

Configuration details	Configuration used
Storage protocol	NFS, CIFS, iSCSI
Controller resiliency	Stand-alone

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Configuration details	Configuration used
External storage	External SAS disk shelves
Disk shelf connection redundancy	Single-path
Backup device	SAS tape backup device

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