Setting Up Your Dell PowerVault MD3460/3860i/3860f/3060e Storage Array

Racking Your Storage Enclosure

Notes, Cautions, and Warnings

A **NOTE** indicates important information that helps you make better use of your computer.

A **CAUTION:** indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

A **WARNING** indicates a potential for property damage, personal injury, or death.

WARNING: Before you set up and operate your Dell PowerVault system, review the safety instructions that shipped with your system.
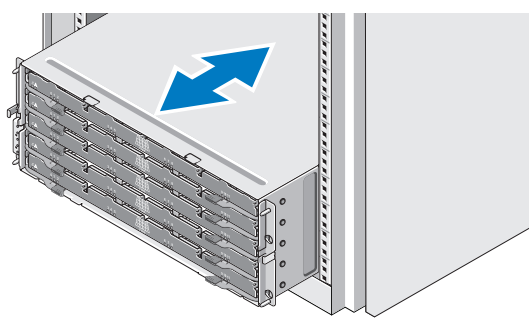
Verify Storage Array Components

Your system is shipped with RAID controller modules, power supplies, and fan components already installed in the enclosure. Make sure that all components are properly seated and are not dislodged and/or damaged during shipping.

Install the Enclosure in a Rack

The storage enclosure requires a compatible rack and a rack installation kit. For information about installing the rails for the storage enclosure, see the rack installation instructions that shipped with your enclosure.
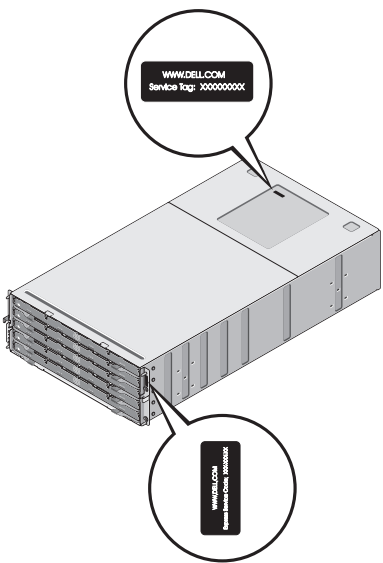
WARNING: Do not plug the enclosure into a standard power outlet. Your storage array is shipped with two IEC C19 to C20 jumper cords. Plug the C19 plug into the array's power supplies and the C20 plug into the power distribution unit (PDU) in the rack cabinet. For power redundancy, split the power connections from each enclosure into separate PDUs and connect the PDUs to external power receptacles on different circuits. The enclosure accepts only 200 V to 240 V input sources.

WARNING: Do not install physical disks in the enclosure before racking. This will add substantial weight to the enclosure and make lifting and racking the enclosure unsafe. For more information, see the rack installation instructions shipped with your enclosure.
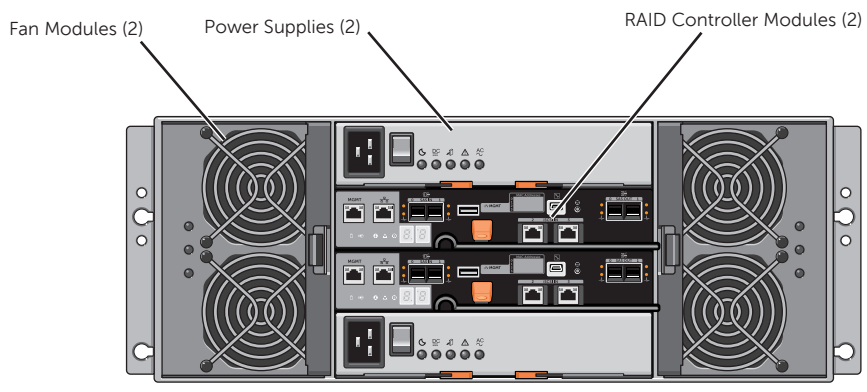
Locate Your System Service Tag

Your system is identified by a unique Express Service Code and Service Tag. This information is used by Dell to route support calls to the appropriate personnel.

About the Storage Enclosure

The MD Series Dense Storage Enclosure is a five-drawer, 60-physical disk chassis (4U) managed by either two RAID controller modules or enclosure management modules (EMMs).

NOTE: A single RAID controller or an EMM configuration is not supported.

Fan Modules (2)   Power Supplies (2)   RAID Controller Modules (2)

Expansion Enclosure Management Modules

You can expand the storage capacity of your array by daisy chaining up to two expansion enclosures (maximum of 180 physical disks). Each 4U expansion enclosure added must contain two MD3060e EMMs.
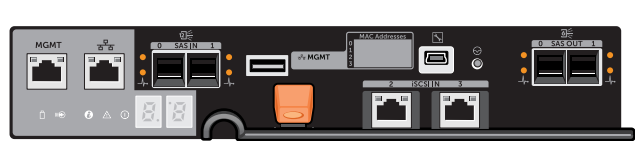
Enclosure Management Module

RAID Controller Modules

The MD Series Dense Storage Enclosure supports four different types of RAID controllers. The RAID controllers installed in an enclosure must be identical.

Mixing of RAID controllers is not supported.

16 Gbps Fiber Channel RAID Controller Module

10 Gbps iSCSI RAID Controller Module

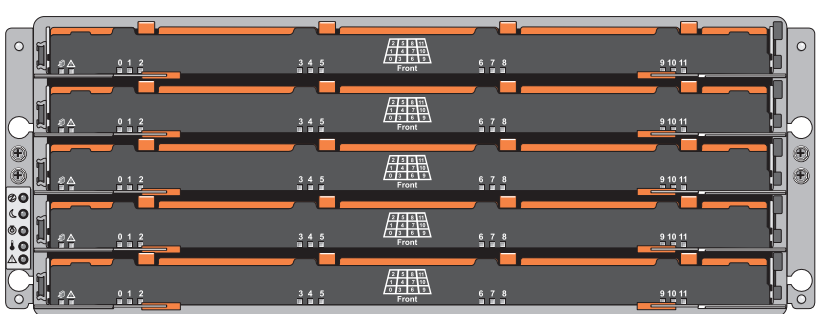12 Gbps SAS RAID Controller Module

Physical-Disk Drawers

The MD Series Dense Storage Enclosure contains five physical-disk drawers accessible from the front of the enclosure. Each drawer holds up to 12 physical disks.

To open a drawer:
1. Flip both latches outward.
2. Pull the drawer out.

NOTE: When a drawer is opened, the enclosure cooling fan RPM increases significantly to ensure optimal airflow. This is normal and does not indicate a problem.

MD Series Dense Enclosure

CAUTION: If a drawer is not completely inserted into the enclosure, other drawers will be locked. Do not force a drawer open as it may damage the physical disk or the drawer itself.

To close a drawer:
1. Push the drawer into the enclosure until the release latch clicks into place.
2. Close the latches on each side of the drawer.
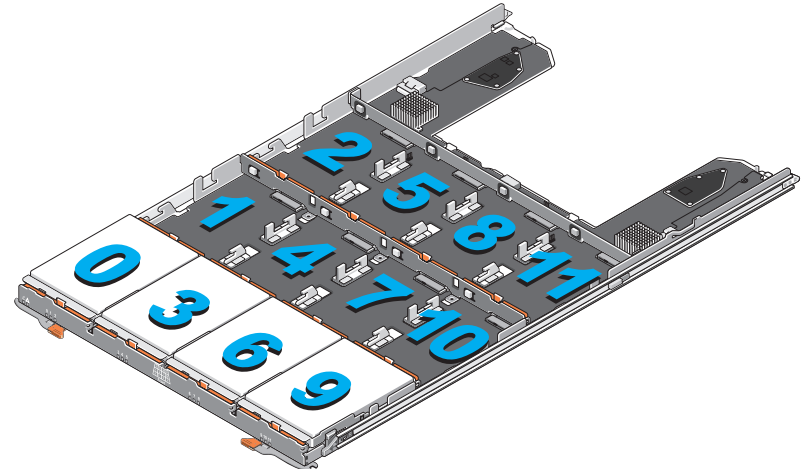
The drawer is pushed in and closed completely.

Installing Physical Disks

Physical-Disk Carriers

Physical disks are preinstalled in their carriers and shipped separately in anti-static packaging. For information on installing and removing the physical disks from the physical-disk carriers, see your system's Owner's Manual at **dell.com/powervaultmanuals**.

Physical Disk Installation Guidelines

- To maintain proper airflow, install physicals disks from left to right and front to back in each drawer.
- A minimum of four disks must be installed in each drawer, filling slots 0, 3, 6, and 9 respectively.
- Keep all drawers closed unless you need to access the physical disks. The storage array operates n\ormally with a drawer open, but it is designed for optimal cooling with all drawers closed.
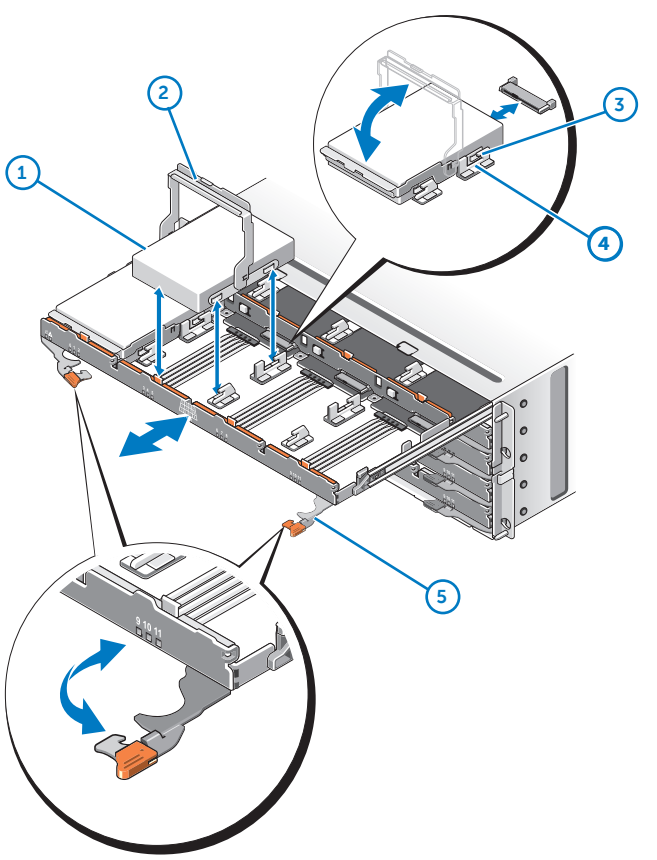
To install a physical disk into a drawer:

1. Rotate the physical disk carrier handle upward to the vertical position.
2. Align the two raised buttons on the disk carrier with the notches on the physical-disk drawer.

CAUTION: Do not install disks randomly. Fill disk slots 0, 3, 6, and 9 first.

3. Lower the physical disk into the drawer slot.
4. Rotate the physical disk carrier handle downward until the physical disk is properly seated in the connector and the physical-disk carrier handle snaps into place.

CAUTION: Check that the disk is not raised up at the back of the drawer slot, which would indicate that it is not properly seated. Closing the drawer with an improperly seated disk will damage both the drawer and the physical disk.

5. Close the physical-disk drawer.

1. physical disk
2. physical-disk carrier handle
3. notches on physical-disk drawers
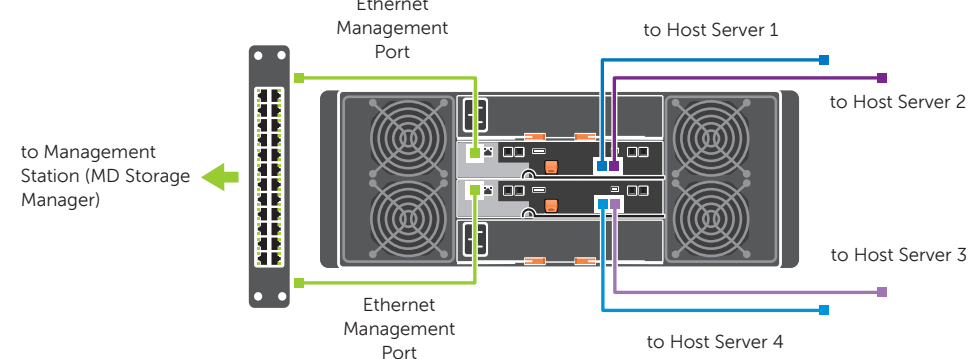4. buttons on disk carrier
5. drawer latches (2)

Cabling Your Storage Array and Expansion Enclosure

The MD Series Dense enclosure supports a number of non-redundant (single path) or redundant (dual path) configurations, depending on your storage array model.
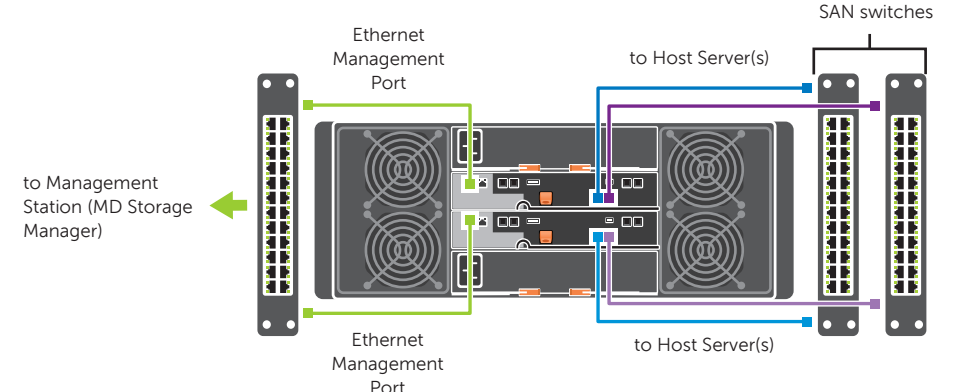
For SAS and iSCSI storage arrays, see the corresponding Deployment Guides. For Fibre Channel storage arrays, see *Configuring Fibre Channel With Dell MD3800f/3820f/MD3860f Series Storage Arrays* at **dell.com/powervaultmanuals**.

The following sample configurations illustrate basic host server to storage array cabling concepts. Port availability depends on your MD Series model.

Direct-Attached, Non-Redundant Cabling

SAN-Attached, Redundant Cabling

SAN-Attached Configuration

A supported switch zoning topology is required to deploy the MD3660f Fibre Channel storage array. See *Configuring Fibre Channel With Dell MD3800f/3820f/MD3860f Series Storage Arrays* at **dell.com/powervaultmanuals**.

For highest throughput, all network components (switch, router, host NIC or cable connection) must support the highest storage array data speed.
For example, connecting a 10 Gbps iSCSI storage array to a host server using a 1Gbps network switch will reduce overall throughput.

Cabling Guidelines

- Always cable your storage array in a powered-down state.
- For Fibre Channel storage arrays, always use a Dell-supported Small Form-factor Pluggable (SFP) transceiver, see the *Dell PowerVault Support Matrix* at **dell.com/powervaultmanuals**.
- Make sure you understand data availability and failover requirements for your configuration before cabling the storage array.
- Only use Dell MD3060e expansion enclosure to expand the capacity of your storage array.

Cabling Your MD3060e Expansion Enclosure

To add capacity to your RAID storage array, you can daisy chain up to two 4U enclosures with SAS-based MD3060e EMMs installed in place of the RAID controller modules. This configuration offers a maximum of 180 physical disks in your storage array with Premium Feature activation.

To connect the MD3060e-based expansion enclosure to your MD Series Dense RAID storage array:
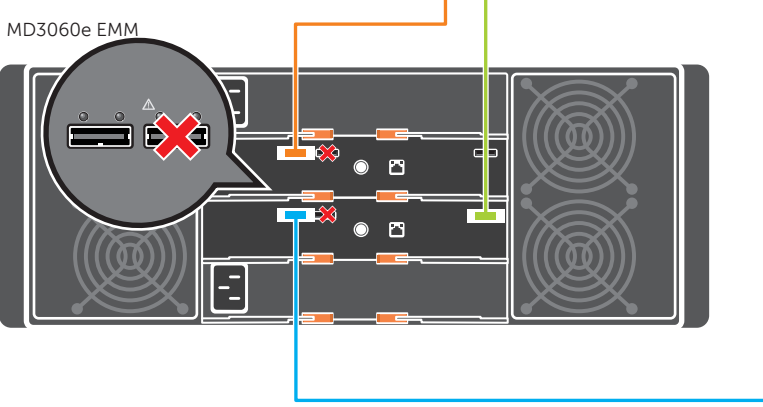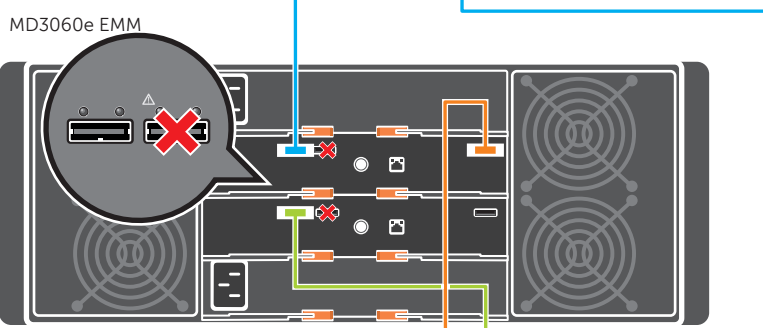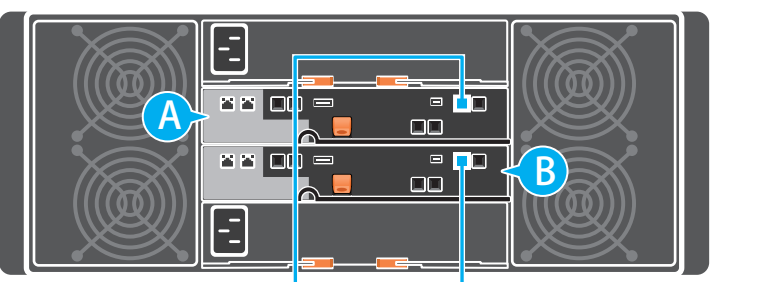1. Connect a supported SAS cable to the SAS OUT port on the MD Series Dense storage array.
2. Connect the other end of the SAS cable to SAS port 1 on the MD3060e EMM as shown in the following figure.
3. To add a second MD3060e expansion enclosure, daisy chain it to the first expansion enclosure as shown in the figure.

⚠ **CAUTION:** Do not connect the SAS cable to SAS port 2 on the EMM.

⚠ **CAUTION:** Like the RAID storage arrays, physical-disk slots 0, 3, 6, and 9 must be populated first.

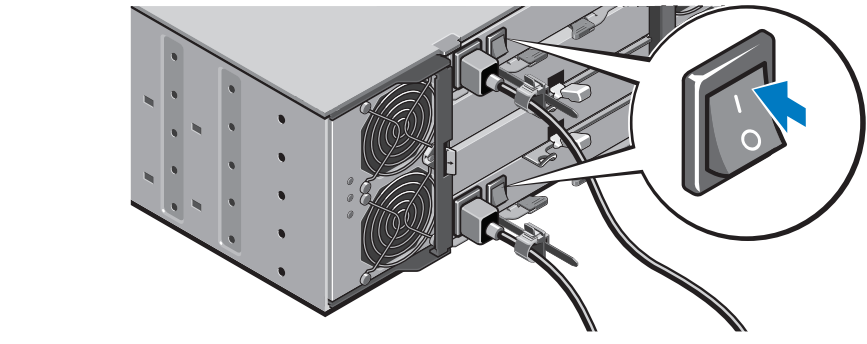**NOTE**: A maximum of two expansion enclosures are supported for a total of three enclosures.

Powering on the Storage Array

⚠ **WARNING: Do not plug the enclosure into a standard power outlet. Your storage array is shipped with two IEC C19 to C20 jumper cords. Plug the C19 plug into the array's power supplies and the C20 plug into the power distribution unit (PDU) in the rack cabinet. For power redundancy, split the power connections from each enclosure into separate PDUs and connect the PDUs to external power receptacles on different circuits. The enclosure accepts only 200 V to 240 V input sources.**

Follow these steps to power on your storage array:

1. Turn on any network switches, routers, or other standalone components.
2. Power on the MD3060e expansion enclosures, if applicable.
   NOTE: Wait for the enclosure status LED to turn blue before proceeding to the next step.
3. Power on the MD Series Dense storage array.
   NOTE: Wait for the storage array status LED to turn blue before attempting to discover or manage the array.

Installing MD Storage Manager

The Dell PowerVault MD Series Resource DVD contains software and drivers for both Linux and Microsoft Windows operating systems. The DVD also contains MD Storage Manager, a graphically based utility, which is used to configure, manage, and monitor the storage array and expansion enclosures.

NOTE: If you are configuring an iSCSI storage array, use the MD Configuration Utility (MDCU) to set up iSCSI host ports and create iSCSI sessions. When you first reboot the system after the host installation of MDSM, MDCU will be lauched automatically.

To install MD Storage Manager:
1. Insert the PowerVault MD Series Resource DVD into the local drive of the management or the host system.
2. If the installer does not launch automatically, go to the root directory on the DVD (or downloaded installer ISO) and double-click **md_launcher.exe** (for Windows) or use auto run (for Linux).
3. Select **Install MD Storage Software**.

The installation wizard allows you to choose **Management Station** or **Host Installation**. You can choose both. You must, however, install the host-based storage agent and multipath drivers on each host server accessing the storage array.

Review the Readme File

A **readme.txt** file is included in the Resource DVD root directory. It contains the latest updates, fixes, and other information applicable to your storage array.
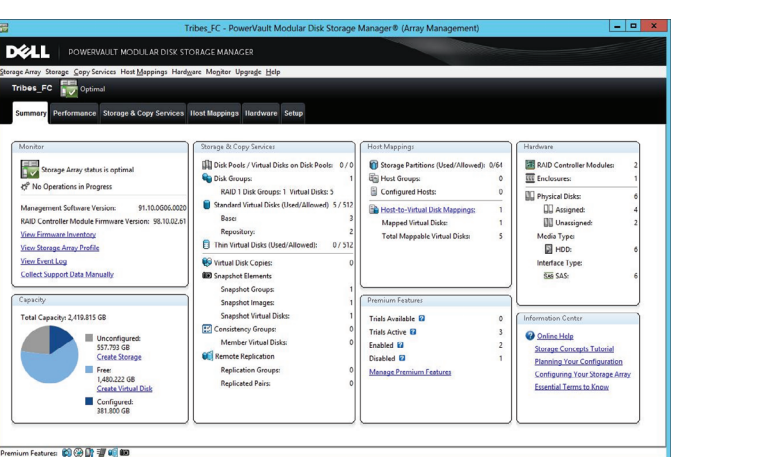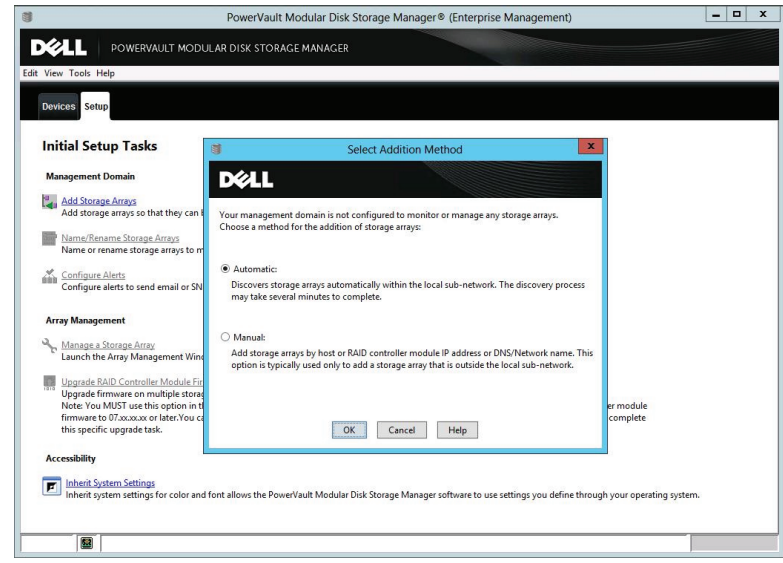
Discovering and Managing Your Storage Array

To discover your storage array, you must be connected to the Ethernet management port (either on the same subnet or through a configured network switch) on your RAID controller module. To run management operations, you must be connected to both RAID controller modules through a fully configured Ethernet management port.

NOTE: For best throughput, it is recommended that you use out-of-band management.

Starting MD Storage Manager

To launch MD Storage Manager:

Select **Start → Programs → Dell → MD Storage Manager**.
The **Enterprise Management Window** (EMW) displays host servers and storage arrays automatically discovered in your local subnet.

Discovering Your Storage Array

1. In the EMW, click **Setup**.
2. Select **Add Storage Array**.
3. Choose either **Automatic** or **Manual** discovery.
   NOTE: Automatic discovery discovers all storage arrays in your local subnet. Manual discovery prompts you to add storage arrays by IP address or network name.
4. Click **OK**.
5. Double-click the discovered storage array.
   The **Array Management Window** is displayed.

Using the Automatic Configuration Wizard

The **Automatic Configuration Wizard** allows you to create multiple disk groups, disk pools, virtual disks, and hot spare physical disks with the same attributes.

To start the wizard, select **Storage Array → Configuration → Automatic → Disk Pools** or **Disk Groups**.

Manually Configuring Storage Space

To manually configure your storage, select **Storage → Virtual Disk → Create**.

Follow the instructions on your screen to create the virtual disk space.

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