



3ware® 9690SA  
SAS/SATA RAID  
Controller

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Installation Guide

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## Book Descriptions:

### 3ware 9690 manual

Using an incorrect cable can result in drives that are not detected. These cables have multilane cable plug connectors on each end Figure 6. Figure 6. If you are uncomfortable opening a computer system and conforming to standard ESD electrostatic discharge practices, you should have a computer technician perform the installation. Replacing the heat sink will alter thermal characteristics and cooling requirements and may cause the controller to fail. Replacing the factory-installed heat sink will void the warranty. The onboard heat sink collects heat, and must have adequate airflow in order to disburse it. It is important that the cables do not obstruct the air flow or prevent proper ventilation of the system. If your enclosure is low-profile, unscrew the full height bracket from the 3ware 9690SA RAID controller and replace it with the included low-profile bracket, using the same screws. If appropriate, set the PM2 power management jumper on the disk drives, to enable staggered spinup. Save this screw; it will be used to secure the 3ware 9690SA RAID controller after you have seated it in the slot. Position the card in the PCI Express slot so that the contacts will mate with the grooves in the slot, and all pins make proper contact with the PCI Express slot pins when pushed into place. Check that the 3ware RAID controller's metal bracket covers the hole in the case and secure the bracket with the screw that was used to secure the filler bracket in step 5. Insert the SFF8088 cable plug connector into the multilane external connector of the controller. When the plug is inserted correctly, you will feel it click into place. The user guide is included on the 3ware CD that came with your controller. When used with the 3ware 9690SA RAID controller, the BBU control module is mounted on the RAID controller and the battery pack is installed on a remote battery board. If you have a 9690SA8E the location of the control module post hole will be different. <http://www.thermcom.cz/userfiles/dcr--dvd101-manual.xml>

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Remove the screw head from the plastic post on the BBU control module and set it aside you will reattach it soon. Figure 11. The battery can be mounted in 3 different positions, as marked on the board see Figure 14. Use the position that will make it easiest to connect the battery power cable to the BBU control module on the 3ware RAID controller. Press down on the top of the battery module to free the clip on the bottom of the module. While pressing down on the top of the battery module, lift out the bottom of the battery module slightly. AMCC also offers tollfree 1 800 8406055 or 1 858 535 6517 direct phone support during normal business hours. This publication may be copied or reproduced for reference purposes only. All other purposes require the express written consent of AMCC, 215 Moffett Park Drive, Sunnyvale, CA 94089. Chapter Description 1 Getting Started Overview of the 3ware RAID controller and important safety factors to keep in mind during installation 2 Installing Your 3ware How to install your 3ware RAID controller RAID Controller 3 Installing a Battery How to install and maintain a BBU Backup Unit The following additional documentation is available for your 3ware RAID These cables have multilane cable plug connectors on each end Figure 6. Figure 6. Multilane Cable Serial ATA SFF8087 SFF8088 to SFF8088 Multilane cables For use with the 9690SA8E and 9690SA4I4E 3ware RAID con In order to use enclosure support services, such as locating a drive by blinking an LED or notificati The 3ware 9690SA RAID controller card should be installed by technically qualified persons. If you are uncomfortable opening a computer system and conforming to standard ESD electrostatic discharge practices, you should have a computer t High voltages may be found inside computer equipment. Before installing any of the hardware in this package or removing the protective covers of any computer equipment, turn off

power switches and disconnect power cords. <http://kredoteka.ru/uploads/dcr-trv900-ntsc-manual.xml>

Do not reconnect the power cords until the hardware is installed and the system cover is closed. Protecting Equipment and Data Heat Sink Warning. Do not replace the fan. The onboard heat sink collects heat, and must have adequate airflow in order to disburse it. It is important that the cables do not obstruct the air flow or prevent proper ventilation of the system. Selecting the Slot in Which to Install the Controller Consider these factors when deciding on the slot. For details, see "Chapter 3. Installing a Battery Backup Unit". Turn off power to the computer and disconnect the power cord from the outlet. 2 Make sure you are properly grounded. For details about safety precautions, see page 8. 3 Open the computer case according to the manufacturer's instructions. 4 Locate the PCI Express slot you want to use for the 3ware 9690SA RAID controller. For a discussion of which slot to use, If in doubt about what slots you have, check the documentation for your motherboard. Do NOT use a PCI or PCIX slot. 8 Check that the 3ware RAID controller's metal bracket covers the hole in the case and secure the Internal Connectors. The 9690SA8I, 9690SA8IF, 9690SA4I, and 9690SA4I4E controller cards have internal connectors and use the SFF8087 cable. Insert the SFF8087 cable plug into the multilane connector on the controller. When the cable is inserted correctly, you will feel it click into place. Figure 10. Insert the SFF8088 cable plug connector into the multilane external connector of the controller. When the plug is inserted correctly, you will feel it click into place. Figure 10. Connecting a Multilane Cable with an SFF8088 Connector to the 9690SA8E Controller. Connect the Cables to Backplanes. After installing your 3ware RAID controller. Finishing Up the RAID Controller Installation. After you have installed the controller in the computer and attached appropriate cables to the controller and drives, complete the following steps to complete the hardware installation. Connect Battery.

It provides controller, logical unit and drive. User can set the focus to a logical unit can be a one-tier, two-tier, or three-tier. RAID1 and RAID5 are examples of two-tier units and RAID10 and RAID50 are examples of three-tier units. Each port can be attached to a single disk drive. On a controller such as the 9650SE with a multilane serial port connector, one. On the 9690SA and 9750 controllers, connections. The 9690SA controller. A vport indicates the ID of a drive, whether. For dual-ported drives, although. This is because the drive is. Therefore, unless otherwise. Note. The primary command syntax. The following is a summary of the Messages, and descriptions and examples are presented for each object message. For these, the command. For the former please see Features sections. Messages are commands. It may be a read operation such as for the. Attributes are either Boolean Attributes or Named Attributes. Value of a Boolean. Value of named attributes are. Note that the. MIGRATING, MIGRATEPAUSED, RECOVERY, INOPERABLE, and UNKNOWN. As example. For more information. This command is active in. Recall that messages or. The concept is similar to being in a particular location in a file system and. The hostname is the name of. With current releases, the. Rescanning the controller will clear the error status. Thus, unlike the older display, the. Moreover, if there are no. Summary would show an empty summary consisting of only the header. See other show subcommands below. Release 9.5.1 or earlier. Release 9.5.2 or later. In the unit summary of the. For example. An invalid attribute will terminate the loop. Possible attributes are achip, allunitstatus, autocarve. 9550SX and higher, Connections. If the ondegrade. If the ondegrade policy is off, a unit cache policy. If the policy is on, all. Each volume can be treated as an individual disk with its own file system. The default carve size is 2 TB.

For 32bit OS users, it is recommended to keep the policy on unless users. Display will also show the default Running Average, and ext for Extended Drive Statistics. More detailed. See Shell Object Messages for more on. Not. Optimal definition. By default the host. Specifying One or more ports can be specified. Multiple. For example. The following. At the most bottom layer. N number of disks per group are used to form the RAID5 layer. These. RAID5 arrays are then integrated into a RAID0. This attribute allows. Valid values. However given 12 disks, specifying 3 will create four RAID5 under the

RAID0 By default CLI will inform the OS. One application of this feature is to avoid Enabling the write cache increases performance at No caching is recommended when no BBU or UPS If a BBU or UPS is not installed, to avoid possibility of data loss in the event of suddenThe rdcachebasic For more details on this. For the 9650SE, For other 9000 series controllers Keep in mind however, that That is, for For the spare unit, drive queueing is not meaningful and the qpolicy cannot The following table illustrates the supported No space is allowed within the string. If user likesUser can change the name of the unit This is a feature for 9000 or above series ofThe values should beZero 0 is an invalid LUN Note that thereRapid RAID Recovery can speed up the rebuild This feature allows for expedited bootup time in the event of an unclean Setting it to rebuild applies the If the policy is set to disable, then Also, once disabled, that setting could not be In addition. Rapid RAID Recovery is not supported over migration. Any newly found units or drives will be listed.Default is to inform If a failure suchThis command allows theThis command can then expediteDCBs intrasaction flag as we are going down. Subsequently a recommendation is given to the user followed by a prompt to continue. Once the user decides to proceed, the image will be downloaded to the controller.

However, a reboot is required for the new image to take effect. Before you update the firmware,With it the warning message is suppressed, as Compatibility checks are not bypassed. If the These events are kept in a finite queue inside. These events reflect messages of varying severity levels. The levels range The default Likewise, the older the event The order of the messages could be With this the most recent AEN message Note that some characters might not be printable or rendered correctly humanIt reports a list of phys with related information The Device Type column indicates whether There are three Link Speed The current link speed for phy1 is 3.0 Gpbs, and the link control setting isMoreover, the only changeableTo change the link speed, see the. To see information for an individualFor each activity, up to 7 tasks can be registered, Background tasks have Rebuilds can be started manually Scheduled rebuilds will take This command shows the current rebuild task rate of the The advanced Verify Task Schedule provides RAID1 involves checking that both drives contain the exact data. On RAID5 and. RAID6, the parity information is used to verify data integrity. RAID10 and 50 On the 9000 series, For the 9650SE and newer controllers, if the basic Verify Task Schedule is This command shows the current verify task rate of the For each activity, up to 7 tasks can be registered, known Background tasks have attributes of The SMART selftest instructs the controller to check certain SMART supported thresholdsThis command will fail if no empty slot is available. In that case,In that case, Simply specify a weekly day and time and make sure For more information. Features section of this document. This command will fail if no empty slot Otherwise, no firmware initiated or manually started rebuild tasks would run. Otherwise, no firmware initiated or manually started verify tasks would run.

When enabled, only registered or scheduled tasks Setting this value to Conversely setting this value to 1 implies The Adaptive The Low Latency setting has been described above. Accordingly, the converse is also true. When enabled, only registered or scheduled Setting this value to 5 Conversely setting this value to 1 implies For more information, see the command Release 9.5.2 or later. Setting verify to advanced enables the Verify Tasks Schedule, which Setting verify toFor more information, see This command allows you to offset this condition by setting the rebuild mode to low The Adaptive The Low Latency setting has been described above. When enabled, the selftest task will beIf the policyFor example, given a spin up policy of 2, the controller will spin up two disksThe amount of timeThese statistics can be helpful when When the AutoCarving policy is ON, any unit larger than the carvesize This feature is useful for For a 5 TB array, two 2 TB volumes This feature worksAfter the drives are inserted or reinserted to Please note that the command takes longer to complete for ports that do not have This command applies to This command applies to If the AutoCarving policy Verifying, Initializing, or Migrating. As a result, an added For example The process of either. Verifying, Initializing, or Migrating is at 70% and it is a paused process. Currently, The unit is also in the paused An invalid attribute will terminate the loop. Possible attributes are

initialize status, name 9000 series, qpolicy 9550SX If the queue Some drives For example, when a spare becomes a true unit in migration, it would adopt. Thus, this command does not show the If set to ON, the LEDs of the drive slots associated with the specified unit would The state of the read cache could be either basic, intelligent, or. For more information This policy can be all, rebuild, or disable. For more information Exporting a unit will instruct As such the unit can later be imported Default is to inform the OS.

The quiet option is for noninteractive mode. Units that are currently in use or mounted Deleting a unit not only remove the Ports or disks associated with this In another words, once Default is to inform This is a destructive command and should be Units that are currently in use or mounted During rebuild, bad sectors on the source disk will cause the rebuild to fail. You can allow for the operation to continue via ignore ECC. Rebuild process is This feature is intended for model 7000 and 8000 Model 9000 has an onboard scheduler where rebuild operations can be scheduled If the allocated schedule windows is This feature For earlier controller models, This improves read access times for applications such as a database that Read cache may be disabled without This new feature includes a typical read ahead caching method, which is used For example, the By loading a larger set of data This can be helpful with applications that are Performance benefits of read ahead In addition, Cache setting. If set to ON, Setting overwrite ECC to on means ignore ECC. This feature only applies to No space is allowed within the string. If user likes to use some special characters It is users responsibility to give unique This feature only applies to 9000 models. If the queue policy is Some drives For example, when a Rapid RAID Recovery can speed up the rebuild process, and it can speed up This feature allows for Setting this The following description about the settings When user sets storsave to protect, it means When user sets the storsave BBU is installed and enabled; Otherwise, will be flushed to disk only, and For example, a valid number The destination unit must use all source. Unspecified parameters are assigned default values stripe size of 64K, write If the source unit is of type. RAID1 and the destination unit is of type single, the diskspecifier of the In this case, A fourdrive RAID5 unit can migrate to a fourdrive.

RAID0, but a fourdrive RAID0 unit cannot migrate to a fourdrive RAID5, without One or more ports. For example Recall that a RAID50 is a multitier RAID5 layer. These RAID5 arrays are then integrated into a RAID0. This option Valid values are 3, The following table By default CLI will inform the OS. One application By default the cache is enabled. Unless there is a BBU or UPS installed, to You can continue Once the migration is finished, a reboot For secondary storage, depending For instructions, Making any physical changes to the Following those are After which example outputs showing the In this example, In addition, the status of the newly specified disk Single to a RAID1, initiated by the following commands Western Digital disk with status OK and is a part of unit u5. This is a list of the possible One or many attributes can be requested. Invalid Possible attributes are status, model, Its intended use is not for determining the Note the difference The LED of the drive slot associated with the specified port would blink if the The capacity in GB is computed based Therefore, a request The type in the command specifies which The options are either inst for. Instantaneous, ra for Running Average, lct for Long Command Times, More detailed information regarding these statistics and the Drive. Performance Monitor is available in the Features section under Drive. Performance Monitor. You can import or reintroduce the port Use noscan to bypass informing the OS of this The quiet option is for the noninteractive Drives, which are part of a redundant Nonredundant drives, If set to ON, the LED of the drive slot associated with the specified port would The optional type in the command specifies which set of statistics data would be Command Times, and ext for Extended Drive Statistics. More detailed information If no type is Monitor in the Features section.

This command presents a summary report on the The Device column There are three Link Speed columns Supported Note that the Supported and Enabled values are not changeable. The Control The default This command sets the link speed The unit of link speed is in gigabits per second Gbps.

The default is auto. The commands in this Both voltage and temperature BBU board. One or many attributes can be requested. Invalid attribute willPossible values are It may take up to 24 hours to complete. During the test, the BBU is not capable of backup operation and the writeIf the test is completed withIf a Fault, Failed or an Error occurs during the test, the write cache remains at theThe charging is started automatically During the charging, the BBU is not capable Once charging is completedAt this state, the BBU is not capable of backup We recommend you to replace theAt this state, the BBU is not capable of backupWe recommend you to replace theAt this state, the BBU is not capable of backupWe recommend you to replace theThe status can be OK, HIGH, LOW, TOOHIGH, and TOLOW. The HIGH and LOW are in warning range. TOOHIGHThe status can be. OK, HIGH, LOW, TOOHIGH, and TOLOW. The HIGH and LOW are in warning range. TOOHIGH and TOLOW are out of the operating range and need to be concerned. The test may take up to 24 hoursThe performance of all units under theOnce the test Event Notifications about the status of the test operation. The controller will utilize BBU The controller ignores the In another words, despiteThe enclosure element object messages are The subsectionsFor systems with the 9650SE controller or CCU enclosure, simply drop the prepended One or many An invalid attribute will terminate the loop.

Possible For the new syntax, this command is not very useful, since the controller that the This command Status column lists the status of each slot, the VPort column shows the Status column lists the status of each fan, the State column shows if the fan If the image is valid a subsequent message will indicate It identifies the target SEP expander in the With it the warning message, version check, and The image will initiate the download immediately. Only expander models in this list are supported. Please refer to. Click on the Data and Interoperability tab, and then click on the 3ware. Interoperability Information link to check if your expander is supported. For example, be sure to unmount any mounted Before you update the firmware, it isIn the example, it If a slot has been inserted with a drive and no If the slot is empty the The port that is correlated to the slot is If no device is found in that slot, this column The next column shows whether the specified slot has Likewise, for Slot Identify. If supported, setting it to ON will blink the LED of the For example Likewise, for If supported, setting it to ON will blink The possible status values are OK, OVERWARNING, OVERFAIL, UNDERWARNING, UNDERFAIL, where OVER denotes overtemperature and UNDER denotes undertemperature. If supported, setting it to. ON will blink the LED associated with the specified temperature element. The possible status values are OK, FAIL, NOTINSTALLED, and OFF. The voltage In either case. OVER means over the set threshold of the voltage or current. Likewise, for If supported, setting it to ON The possible The status values The possible It provides It also gives you In the case where a known In this case, the alarm This is because the unmute In effect, for The alarm is turned on by firmware when Setting the alarm To silence the alarm you may set the state of the The difference between using Online help providesFor Read Cache Basic use rdcachebasic.For Read Cache Basic use rdcachebasic.

Help does not extend to theFor Read Cache Basic use rdcachebasic. Typical output looks like It provides reports on Controllers, Units and Drives. See the Shell Object Messages section for more on show. See the Shell Object Messages section for more. See the Shell Object Messages section for more. See the Shell Object Messages section for more. Note where ON is indicated, OFF Properties, click on the Advanced tab. Then click on the Environment Windows and read by CLI upon system startup, after which CLI will stop logging To display it in. Windows Explorer, enter c:\ProgramData in the location field at the top To make the folder permanently visible, select Also, some of these features The purpose of this section is to provide an encapsulated view of selectedSyntax section of this document. While some commands contain similar or Those that do not is likelyIn any case, the explanations are The running The long command Finally, the extendedAt this time, the only setting that the user can change is enable or disableThe portbased show commands provide The portbased set command clears the While these

commands require the specification of The command Following the If the setting If the setting is OFF, the same table layout is Thus, when the drive performance monitor is OFF, the data For example For example For example For example For example In the display Note that for For example The default thus effectively clears Also, some statistics. Attempting to clear these will return an error. For example For example To clear the For example Effectively this feature RAID5, RAID6, RAID10 and RAID50. This feature is not supported over migration.

This configuration may be Rapid RAID Recovery policy will apply to rebuild, initialize, and verify tasks at Please note that once this attribute is set for the unit, the policy setting As a result, if you issue the To turn off the message and promptCreating a RAID5 As a result an extra query hasIf the user confirms, The first volumeThis featureRAID10, RAID5, RAID50, RAID6 and Single. If autocarve has been set to ON, then the sizes of For example, if the carvesize Note the while the last specified carved size With v0 onlyWith vol, up to four LUNThe input of size is an integer in The maximum Selftest in the RAID system. It performs data integrity checks on an array For a RAID1 array, for example, the verification The Verify functionParticularly the scheduled time windows of A scheduled time window, The Schedule contains a default set of verifyThe sections below describe this in more detail. The Autoverify setting letsSchedule when it is set to ON. If a verify process has started and the verify Again, firmware makes its decision autonomously The following is the set of commands associated with this Syntax section of this document. Thus it is important to note their interactions. The following table summarizes the setting parameters and corresponding system Verify is supported on 9650SE and 9690SA controllers. In such systems, to set Please note that this systemWe will delete timeslot3. Will be initialized first before verified. It describes the Advanced Verify with respect to when scheduled verify tasks may execute, the. Basic Verify feature was introduced to provide a more simplistic verify But supplies the Generally, this is supported in the 9650SE, 9690SA and 9750 It describes the On success, 0 is returned. On failure 1 is returned. For example, firmware. PCB, PCHIP and similar information have been removed from the info summary report, The intent isIf such action is needed, use the rebuild scheduling to handle it.

The BTA offers structured, elearning, facetoface, labs and training, delivered by worldclass trainers, tailored to the knowledgebase of the attendees from beginner up to expert. The 3ware 9690SA delivers accelerated SAS performance and the flexibility of internal and external connectivity.Remote access is also available. This publication may be copied or reproduced for reference purposes only. All other purposes require the express written consent of AMCC, 215 Moffett Park Drive, Sunnyvale, CA 94089. The 3ware logo, 3BM, MultiLane, StorSave, StorSwitch, StreamFusion, and R5 Fusion are all trademarks of AMCC. PowerPC and the PowerPC logo are trademarks of International Business Machines Corporation. All other trademarks herein are property of their respective owners. Disclaimer While every attempt is made to make this document as accurate as possible, AMCC assumes no responsibility for errors or omissions in this document, nor does AMCC make any commitment to update the information contained herein. The following additional documentation is available for your 3ware RAID controller on the CD that came with your controller. Online help is also available when you are using 3DM 2 3ware Disk Manager.One of the following 3ware 9690 SA RAID controller cards 9690SA8E two external 4x wide ports 9690SA8I two internal 4x wide ports 9690SA4I4E one internal 4x wide port and one external 4x wide port.Using an incorrect cable can result in drives that are not detected. The appropriate cables are included with your controller. If you must replace a cable, see the list of available cables and associated part numbers at. One external Multilane One internal Multilane connector Heat Sinks BBU connector and hole I 2 C connector Multilane S A T A breakout cable SFF8087 for direct connection to S A T A drives from internal connectors.Windows XP, Windows Server 2003 32bit and 64bit x86, Windows Vista 32bit and 64bit x86. Red Hat Linux, 32bit and 64bit x86.

SuSE Linux, 32bit and 64bit x86. Fedora Core, 32bit and 64bit x86.Adequate power supply for driv

es 3DM 2 3ware Disk Manager, a browserbased application used to configure and maintain RAID units, requires one of the following browsers. Internet Explorer 5.5 and later Mozilla Firefox 1.2 and later Netscape 7 and later. Konquerer 3.5.1 and later In addition. JavaScript must be enabled. Cookies must be enabled For best viewing, screen resolution should be 1024 x 768 or greater, with 16bit color or greater. Safety Information To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read this information and observe all warnings and precautions in this guide before installing or maintaining your computer. The 3ware 9690SA RAID controller card should be installed by technically qualified persons. If you are uncomfortable opening a computer system and conforming to standard ESD electrostatic discharge practices, you should have a computer technician perform the installation. Site Selection The product is designed to operate as a component to a computer system. The environment that is provided for the system must be. Clean, dry, and free of airborne particles other than normal room dust. During an electrical storm, we recommend disconnecting all phone, network, and power cables. Provided with a properly grounded wall outlet. Provided a product main power disconnect or sufficient space to access the power supply cords, because they serve as the products main power disconnect. Personal Safety When Installing the 9690SA RAID Controller in Your Computer Protecting Equipment and Data Warning. High voltages may be found inside computer equipment. Before installing any of the hardware in this package or removing the protective covers of any computer equipment, turn off power switches and disconnect power cords. Do not reconnect the power cords until the hardware is installed and the system cover is closed. Heat Sink Warning.