



This document is for reference by storage administrators and technical support personnel to help troubleshoot issues in R/Evolution storage systems.

When an event occurs in a storage system, an event message is recorded in the system’s event log and—depending on the system’s event notification settings—may also be sent to users and host-based applications.

Each event has a number (code) that identifies the type of event that occurred, and can have one of the following severities:

- **Critical.** Alerts you that the system or a vdisk has a failure that requires *immediate* attention.
- **Warning.** Warns you that the system or a vdisk has a problem that you should correct as soon as possible.
- **Informational.** Informs you that either a change was made to the system or a problem occurred that the system corrected; no action is required.

An event may result from one or more errors, each of which has an *error code*. Error codes are outside the scope of this guide.

The following table describes the events that can occur during operation for all R/Evolution models. Events are listed in order by event code. Any actions recommended in response to the event are specified in the last column.

**Table 1** Event descriptions and recommended actions

Code	Severity	Description	Recommended action
1	Warning	A disk in the specified vdisk failed. The vdisk is online but not fault tolerant. If a spare is present the controller automatically uses the spare to reconstruct the vdisk.	<ul style="list-style-type: none"><li>• See <a href="#">Table 2</a> on page 19.</li><li>• If dynamic spares is enabled, replace the failed disk. The system automatically reconstructs the vdisk.</li><li>• If dynamic spares is disabled and no spare is available, replace the failed disk and add it as a vdisk spare to the critical vdisk.</li></ul>
3	Critical	The specified vdisk is offline. If a spare is present the controller automatically uses the spare to reconstruct the vdisk.	If no spare is available, replace the failed disk and add it as a vdisk spare to the critical vdisk.
4	Informational	A disk had an uncorrectable error and the controller reassigned the block.	Monitor the error trend and whether the number of errors approaches the total number of bad-block replacements available.
6	Informational or Warning	Vdisk creation status. This event is logged as informational if creation immediately failed, was canceled by the user, or succeeded. This event is logged as a warning if creation failed during initialization.	If logged as a warning, contact technical support.
7	Critical	In a testing environment, a controller diagnostic failed and reports a product-specific diagnostic code.	Perform failure analysis.

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
8	Warning	A disk in a vdisk failed and the vdisk changed to a critical or offline state. If a spare is present the controller automatically uses the spare to reconstruct the vdisk.	<ul style="list-style-type: none"> <li>See <a href="#">Table 2</a> on page 19.</li> <li>If dynamic spares is enabled, replace the failed disk. The system automatically reconstructs the vdisk.</li> <li>If dynamic spares is disabled and no spare is available, replace the failed disk and add it as a vdisk spare to the critical vdisk.</li> </ul> <p>When the problem is resolved, event 9 is logged.</p>
9	Informational	A spare disk has been used in a critical vdisk to bring the vdisk back to a fault-tolerant state. Vdisk reconstruction starts automatically.  This event indicates that a problem reported by event 8 is resolved.	No action required.
16	Informational	A global spare has been added.	No action required.
18	Informational or Warning	Vdisk reconstruction status. This event is logged as informational if reconstruction succeeded, or as a warning if reconstruction failed.	<p>If logged as a warning, determine whether the reconstruction failed due to a disk problem and whether replacing that disk will enable reconstruction to start and complete without further errors.</p> <p>If you're unable to do this, contact technical support.</p>
19	Informational	A rescan has completed.	No action required.
20	Informational	A firmware update has completed.	No action required.
21	Informational or Warning	Vdisk verification has completed. This event is logged as informational if the command fails immediately, succeeds, or is aborted by the user; or a warning if the operation fails during verification.	If logged as a warning, contact technical support.
23	Informational	Vdisk creation has started.	No action required.
24	Informational	The assigned LUN for this volume has changed.	No action required.
25	Informational	The statistics for the specified vdisk have been reset.	No action required.
27	Informational	Cache parameters have been changed for the specified vdisk.	No action required.
28	Informational	Controller parameters have been changed. This event is logged when general configuration changes are made; for example, utility priority, remote notification settings, user interface passwords, and management port IP values. This event is <i>not</i> logged when changes are made to vdisk or volume configuration.	No action required.

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
31	Informational	A global or vdisk spare was deleted.	No action required.
32	Informational	Vdisk verification has started.	No action required.
33	Informational	Controller time/date has been changed. This event is logged before the change happens so the event timestamp shows the "old" time. (May appear often if NTP is enabled.)	No action required.
34	Informational	Controller has been restored to factory defaults.	For an FC controller, restart it to make the default loop ID take effect.
37	Informational	Vdisk reconstruction has started.	Look for event 18.
39	Warning	The sensors monitored a temperature or voltage in the warning range.	<ul style="list-style-type: none"> <li>• Check that the storage system's fans are running.</li> <li>• Check that the ambient temperature is not too warm. The enclosure operating range is 41–104° F (5–40° C).</li> <li>• Check for any obstructions to the airflow.</li> <li>• If none of the above explanations apply, replace the controller FRU that reported the error.</li> </ul> <p>When the problem is fixed, event 47 is logged.</p>
40	Critical	The sensors monitored a temperature or voltage in the failure range.	<ul style="list-style-type: none"> <li>• Check that the storage system's fans are running.</li> <li>• Check that the ambient temperature is not too warm. The enclosure operating range is 41–104° F (5–40° C).</li> <li>• Check for any obstructions to the airflow.</li> <li>• If none of the above explanations apply, replace the controller FRU that reported the error.</li> </ul> <p>When the problem is fixed, event 47 is logged.</p>
41	Informational	A vdisk spare has been added.	No action required.
43	Informational	A vdisk has been deleted.	No action required.
44	Warning	The controller contains dirty cache data for the specified volume but the corresponding disks are not online.	<ul style="list-style-type: none"> <li>• Determine the reason that the disks are not online.</li> <li>• If an enclosure is down, determine corrective action.</li> <li>• If the vdisk is no longer needed, you can clear the orphan data; this will result in lost data.</li> <li>• If the volume is missing and was not intentionally removed, contact technical support.</li> </ul>

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
45	Informational	A communication failure has occurred between the controller and an EMP.	No action required.
47	Informational	An error detected by the sensors has been cleared. This event indicates that a problem reported by event 39 or 40 is resolved.	No action required.
48	Informational	The vdisk name has been changed.	No action required.
49	Informational	A lengthy SCSI maintenance command has completed. Output indicates whether it completed successfully or a failure occurred. (Typically appears after disk firmware update.)	No action required.
52	Informational	Vdisk expansion has started.	This operation can take days to complete. When complete, event 53 is logged.
53	Informational or Warning	This event is logged as informational when a vdisk expansion has completed or a RAID morph operation is canceled by the user. This event is logged as a warning if the RAID morph operation fails.	If logged as a warning and the expansion failed because of a disk problem, replace that disk, reconstruct if necessary, and then retry the expansion.
55	Warning	A SMART event occurred on the specified disk.	Impending disk failure. See <a href="#">Table 2</a> on page 19.
56	Informational	The SC has been restarted.	No action required.
58	Warning or Informational	A disk or other SCSI device (such as an EMP) detected an error. This event is logged as a warning for serious errors such as parity or disk hardware failure, and as informational for other errors.	If logged as a warning that a disk or an expansion module is bad, replace the specified device.
59	Warning or Informational	The controller detected an error while communicating with the specified SCSI device. The error was detected by the controller, not the disk. This event is logged as a warning for parity errors, and as informational for other errors.	If logged as a warning that a disk or an expansion module is bad, replace the specified device.
60	Informational	A disk channel was reset from another initiator or target.	No action required.
61	Critical	A serious error, which might indicate hardware failure, occurred while communicating on the specified disk channel. The controller will attempt to recover.	<ul style="list-style-type: none"> <li>• If the controller recovers, no action is required.</li> <li>• View other logged events to determine other action to take. If you can't resolve the problem, contact technical support.</li> </ul>
62	Informational	A spare disk has failed.	Replace the failed disk.
65	Critical	An uncorrectable ECC error occurred on the buffer memory on startup. The controller is automatically restarted and its cache data is restored from the partner controller's cache.	Replace the controller module.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
67	Informational	The controller has identified a new disk or group of disks that constitute a vdisk and has taken ownership of the vdisk. This can happen when disks containing data have been inserted from another enclosure. This event only applies to non-Active-Active controllers.	You may need to clear the disks' metadata if you want to reuse them in one or more new vdisks.
68	Informational	Controller is in a shut-down state.	No action required.
69	Critical	Enclosure reported a general failure.	Check the controller module or expansion module for problems such as not being fully inserted, and for bad cables. If you can't resolve the problem, contact technical support.
71	Informational	The controller has started or completed failing over.	No action required.
72	Informational	(Active-active environment) After failover, recovery has started or has completed.	No action required.
73	Informational	(Active-active environment) The two controllers are communicating with each other and cache redundancy is enabled.	No action required.
74	Informational	The FC loop ID for the specified vdisk was changed to be consistent with the IDs of other vdisks. This can occur when disks containing a vdisk are inserted from an enclosure having a different FC loop ID.  This event is also logged by the new owning controller after vdisk ownership is changed.	No action required.
75	Informational	The specified volume's LUN has been unassigned because it conflicts with LUNs assigned to other volumes. This can happen when disks containing data for a mapped volume have been inserted from another enclosure.	If you want hosts to access the volume data on the inserted disks, map the volume with a different LUN.
76	Informational	The controller is using default configuration settings. This event occurs on the first power up, and might occur after a firmware update.	If you have just performed a firmware update and your system requires special configuration settings, you must make those configuration changes before your system will operate as before.
77	Informational	The cache was initialized as a result of power up or failover.	No action required.
78	Warning	The controller could not use an assigned spare for a vdisk because the spare's capacity is too small. This occurs when a vdisk's status becomes critical and all global spares are too small or (if dynamic spares are enabled) all disks are too small.	Replace existing spares or add spares with enough capacity to replace the smallest disk in the vdisk. The vdisk size is limited by its disk with the least capacity.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
79	Informational	The trust vdisk operation has completed successfully.	No action required.
80	Informational	The controller has modified mode parameters on one or more disks.	No action required.
81	Informational	The current controller has unkilld the partner controller. The other controller will restart.	No action required.
83	Informational	The partner controller is changing state (shutting down or restarting).	No action required.
84	Warning	In an active-active configuration, the current controller has forced the partner controller to fail over for the specified reason.	Save the log files and contact technical support. A service technician can determine errors from the logs.
86	Informational	The FC host port or disk parameters have been changed.	No action required.
87	Warning	The mirrored configuration retrieved by this controller from the partner controller has bad cyclic redundancy check (CRC). The local flash configuration will be used instead.	The mirrored configuration is corrupted. Configuration data on the two controllers may be out of sync. Clear configuration may be needed to fully recover from this.
88	Warning	The mirrored configuration retrieved by this controller from the partner controller is corrupt. The local flash configuration will be used instead.	The mirrored configuration is corrupted. Configuration data on the two controllers may be out of sync. Clear configuration may be needed to fully recover from this.
89	Warning	The mirrored configuration retrieved by this controller from the partner controller has a configuration level that is too high for the firmware in this controller to process. The local flash configuration will be used instead.	This likely indicates that the current controller has down-level firmware. Update the firmware on the down-level controller. Both controllers should have the same firmware versions.  When the problem is fixed, event 20 is logged.
90	Informational	The partner controller does not have a mirrored configuration image for the current controller, so the current controller's local flash configuration is being used. This event is expected if the other controller is new or its configuration has been cleared.	No action required.
91	Critical	In a testing environment, the diagnostic that checks hardware reset signals between controllers in Active-Active mode failed.	Perform failure analysis.
95	Critical	Both controllers in an active-active configuration have the same serial number. Non-unique serial numbers can cause system problems; for example, vdisk ownership and WWNs are determined by serial number.	Contact technical support. A service technician must examine both controller serial numbers and change at least one of them.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
96	Informational	Pending configuration changes that take effect at startup were ignored because customer data might be present in cache.	If the requested configuration changes did not occur, make the changes again and then use a user-interface command to shut down or restart the controller.
100	Informational	During active-active operation, an event (potential error) occurred while communicating with the EMP, which reports SES data.	No action required.
101	Informational	An update of EMP data has been triggered. This event is for internal use only.	No action required.
103	Informational	Volume name change is complete.	No action required.
104	Informational	Volume size change is complete.	No action required.
105	Informational	Volume LUN change is complete.	No action required.
106	Informational	A volume has been added.	No action required.
107	Critical	The controller experienced the specified critical error. In a non-redundant configuration the controller will be restarted automatically. In an active-active configuration the surviving controller will kill the controller that experienced the critical error.	Contact technical support. A service technician can use the debug log to determine the problem.
108	Informational	A volume has been deleted.	No action required.
109	Informational	The statistics for the specified vdisk have been reset.	No action required.
110	Informational	Ownership of the specified vdisk has been given to the other controller.	No action required.
111	Informational	The link for the specified host port is up. This event indicates that a problem reported by event 112 is resolved.	No action required.
112	Informational or Warning	The link for the specified host port is down. This event is logged as informational for expected link-down events that happen during controller startup. This event is logged as a warning for unexpected link-down events.	Look for corresponding event 111 and monitor excessive transitions indicating a host-connectivity or switch problem. If more than 8 transitions occur per hour, contact technical support.
113	Informational	The link for the specified disk channel port is up. This event indicates that a problem reported by event 114 is resolved.	No action required.
114	Informational	The link for the specified disk channel port is down.	Look for corresponding event 113 and monitor excessive transitions indicating disk problems. If more than 8 transitions occur per hour, contact technical support.

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
116	Critical	After a recovery, the partner controller was killed while mirroring write-back data to the current controller. The current controller restarted to avoid losing the data in the partner controller's cache, but if the other controller does not restart successfully, the data will be lost.	To determine if data might have been lost, check whether this event was immediately followed by restart event 56, closely followed by failover event 71 (specifying p1=1).
118	Informational	Cache parameters have been changed for the specified vdisk.	No action required.
127	Warning	The controller has detected an invalid disk dual-port connection. This event indicates that a controller host port is connected to an expansion port, instead of to a port on a host or a switch.	Disconnect the host port and expansion port from each other and connect them to the proper devices.
136	Warning	Errors detected on the specified disk channel have caused the storage system to mark the channel as degraded.	Determine the source of the errors on the specified disk channel and replace the faulty hardware.  When the problem is fixed, event 189 is logged.
139	Informational	The MC has powered up or restarted.	No action required.
140	Informational	The MC is about to restart.	No action required.
141	Informational	The IP address has been changed in the MC. (Normally occurs during power up or failover recovery.)	No action required.
152	Informational or Warning	The MC has not sent a command to the SC for an interval that exceeds the MC communication timeout, and may have failed. This is sometimes referred to as a "LAN not talking" error. This event is logged as informational when the SC has not received communication from the MC for 160 seconds. If communication is restored in less than 15 minutes, event 153 is logged. If the SC has not received communication from the MC for 15 minutes, this event is logged as a warning, the SC restarts the MC, and event 156 is logged.	<ul style="list-style-type: none"> <li>• If the controller that is logging this event can communicate with the MC, monitor the error trend. If the error occurs more than twice per hour, contact technical support.</li> <li>• If the controller that is logging this event cannot communicate with the MC within 25 minutes, replace the controller module.</li> </ul>
153	Informational	The MC has re-established communication with the SC.	No action required.
154	Informational	New software has been loaded on the MC.	No action required.
155	Informational	New loader software has been loaded on the MC.	No action required.
156	Informational	The MC has been restarted from the SC.	If this event occurs more than twice per hour, contact technical support.
157	Critical	A failure occurred when trying to write to the SC flash chip.	Replace the controller module.



**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
158	Informational	A correctable ECC error occurred in the CPU memory.	No action required.
160	Warning	The EMP enclosures are not configured correctly. All enclosure EMPs on that channel are disabled.	Check that EMP enclosures are configured correctly and issue a rescan.
161	Informational	One or more enclosures do not have a valid path to an EMP. All enclosure EMPs are disabled.	Contact technical support to resolve this configuration problem.
162	Warning	<p>The host WWNs (node and port) previously presented by this controller module in this system are unknown. This event has two possible causes:</p> <ul style="list-style-type: none"> <li>• One or both controller modules have been replaced or moved while the system was powered off.</li> <li>• One or both controller modules have had their flash configuration cleared (this is where the previously used WWNs are stored).</li> </ul> <p>The controller module recovers from this situation by generating a WWN based on its own serial number.</p>	If the controller was replaced or someone reprogrammed its FRU ID data, verify the WWN information for this controller module on all hosts that access it.
163	Warning	<p>The host WWNs (node and port) previously presented by an offline controller module in this system are unknown.</p> <p>This event has two possible causes:</p> <ul style="list-style-type: none"> <li>• The online controller module reporting the event was replaced or moved while the system was powered off.</li> <li>• The online controller module had its flash configuration (where previously used WWNs are stored) cleared.</li> </ul> <p>The online controller module recovers from this situation by generating a WWN for the other controller module based on its own serial number.</p>	If the controller was replaced or someone reprogrammed its FRU ID data, verify the WWN information for the other controller module on all hosts that access it.
166	Warning	The RAID metadata level of the two controllers does not match. Usually, the controller at the higher firmware level can read metadata written by a controller at a lower firmware level. The reverse is typically not true. Therefore, if the controller at the higher firmware level failed, the surviving controller at the lower firmware level cannot read the metadata on disks that have failed over.	If this occurs after a firmware update, it indicates that the metadata format changed, which is rare. Update the controller with the lower firmware level to match the firmware level on the other controller.

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
167	Warning	A diagnostic test at controller bootup detected an abnormal operation, which might require a power cycle to correct.	Contact technical support.
168	Critical, Warning or Informational	The specified SES alert condition was detected in the enclosure indicated. Critical severity is reported if one of the power supplies in an enclosure has no power supplied to it or if a hardware failure is detected.	Most voltage and temperature errors and warnings relate to the power supply module; see <a href="#">Table 3</a> on page 20. If this is logged as a critical event and there is no problem with the power source, the indicated FRU has probably failed and should be replaced.  When the problem is resolved, event 169 is logged.
169	Informational	The specified SES alert condition has been cleared in the enclosure indicated.	This event is generated when the problem that caused event 168 is cleared.
170	Informational	The last rescan indicates that the specified enclosure was added to the system.	No action required.
171	Informational	The last rescan indicates that the specified enclosure was removed from the system.	No action required.
172	Warning	The specified vdisk has been quarantined because not all of its disks are available. There are not enough disks to be fault tolerant. The partial vdisk will be held in quarantine until it becomes fault tolerant.	<ul style="list-style-type: none"> <li>• Ensure that all disks are latched into their slots and have power.</li> <li>• During quarantine, the vdisk is not visible to the host. If after latching disks into their slots and powering up the vdisk, the vdisk is still quarantined, you can manually remove the vdisk from quarantine so that the host can see the vdisk. The vdisk is still critical.</li> <li>• If disks have failed, replace them.</li> </ul> <p>When the vdisk has been removed from quarantine, event 173 is logged.</p>
173	Informational	The specified vdisk has been removed from quarantine.	No action required.
174	Informational	A device firmware update has completed.	
175	Informational	An Ethernet link has changed status (up/down).	<ul style="list-style-type: none"> <li>• Monitor the error trend. If this error occurs more than 8 times per hour, contact technical support.</li> <li>• If the controller that is logging this event cannot communicate with the MC within 25 minutes, replace the controller module.</li> </ul>
176	Informational	The error statistics for the specified disk have been reset.	No action required.
177	Informational	The cache data for a missing volume was purged.	No action required.

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
181	Informational	Advanced Network Interface Structure was set. The MC configuration has been changed.	No action required.
182	Informational	All busses have been paused. I/O will not be performed on the disks until all busses are unpaused.	<ul style="list-style-type: none"> <li>• If this event occurs in relation to disk firmware update, no action is required. When the condition is cleared, event 183 is logged.</li> <li>• If this event occurs and you are not performing disk firmware update, contact technical support.</li> </ul>
183	Informational	All busses have been unpaused, meaning that I/O can resume. An unpaused initiates a rescan, which is also logged.  This event indicates that a problem reported by event 182 is resolved.	
185	Informational	An EMP write command has completed.	No action required.
186	Informational	Enclosure parameters have been set.	No action required.
187	Informational	The write-back cache has been enabled due to a super-capacitor state change.	Look for event 188.
188	Informational	Write-back cache has been disabled due to a super-capacitor state change.	If event 187 is not logged within a reasonable amount of time, contact technical support.
189	Informational	A disk channel that was previously degraded or failed is now healthy.	No action required.
190–201	Informational	Includes component-specific environmental indicator events generated by the auto-write-through feature when an environmental change occurs. If an auto-write-through-trigger condition has been met, write-back cache is disabled and event 188 is also logged. Once the fault is resolved, event 187 is logged to indicate that write-back mode has been restored.	<p>If a positive event is not logged within a reasonable period after a negative event, contact technical support.</p> <p>For example, if event 198 is not soon followed by event 199, the PSU might require service.</p>
202	Informational	An auto-write-through-trigger condition has been cleared, causing write-back cache to be re-enabled. The environmental change is also logged. (See events 190–200 and 241 and 242.)	No action required.
203	Warning	An environmental change occurred that allows write-back cache to be enabled, but the auto-write-back preference is not set.  The environmental change is also logged. (See events 190–200.)	Manually enable write-back cache.
204	Warning or Informational	This event is generated by the hardware flush firmware whenever the boot processing firmware needs to inform the user about something.	Contact technical support. Send the log file to the service technician for further diagnosis.

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
205	Informational	The specified volume has been mapped or unmapped.	No action required.
206	Informational	Vdisk scrub has started. The scrub checks disks in the vdisk for the following types of errors: <ul style="list-style-type: none"> <li>• Parity and mirror errors for a RAID 1, 3, 5, 6, 10, or 50 vdisk</li> <li>• Medium errors for a RAID 0 or non-RAID vdisk</li> </ul> When the scrub is complete, event 207 is logged.	No action required.
207	Informational or Critical	Vdisk scrub has completed. This event is logged as informational if the scrub found no errors or was aborted by a user. This event is logged as critical if a disk has unfixed errors.	If logged as critical, contact technical support. Data may be at risk.
210	Informational	All snapshot volumes have been deleted.	No action required.
211	Informational or Warning	The SAS topology has changed; components were added or removed. The message specifies the number of elements in the SAS map, the number of expanders detected, the number of expansion levels on the native (local controller) side and on the partner (partner controller) side, and the number of device PHYs. This event is logged as informational anytime the number of SAS expanders change. This event is logged as a warning if no elements are detected in the SAS map.	If the event is logged as a warning, perform a rescan to repopulate the SAS map. If a rescan does not resolve the problem, then shut down and restart both controllers. If the problem persists, contact technical support.
212	Informational	All master volumes have been deleted.	No action required.
213	Informational	A standard volume has been converted to a master volume or a master volume has been converted to a standard volume.	No action required.
214	Informational	The creation of snapshots is complete. The number of snapshots is specified.	No action required.
215	Informational	A previously created batch of snapshots is now committed and ready for use. The number of snapshots is specified.	No action required.
217	Critical	A super-capacitor failure has occurred on the controller.	Replace the controller module. A service technician must replace the super-capacitor pack in the controller reporting this event.
218	Warning	The super-capacitor pack is near end of life.	Replace the controller module. A service technician must replace the super-capacitor pack in the controller reporting this event.
219	Informational	Utility priority has changed.	No action required.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
220	Informational	Master volume rollback operation has started.	No action required.
221	Informational	Snapshot reset is completed.	No action required.
222	Informational	Setting of the policy for the snap pool is complete. Policy is the action to be taken when the snap pool hits the threshold level.	No action required.
223	Informational	The threshold level for the snap pool has been set. Each snap pool has three policy levels that notify you when the snap pool is reaching decreasing capacity. Each policy level has an associated policy that specifies system behavior when the threshold is reached.	No action required.
224	Informational	A background master volume rollback operation has completed.	No action required.
225	Critical	A copy-on-write failure occurred when copying data from the specified master volume to a snapshot.  Due to a problem accessing the snap pool, the write operation could not be completed to the disk. Data is left in cache.	Delete all snapshots for the master volume and then convert the master volume to a standard volume.
226	Critical	A background master volume rollback failed to start due to inability to initialize the snap pool. All rollback is in a suspended state.	Make sure the snap pool and the vdisk on which this volume exists are online. Restart the rollback operation.
227	Critical	Failure to execute rollback for a particular portion of the master volume.	Restart the rollback operation.
228	Critical	Background rollback for a master volume failed to end due to inability to initialize the snap pool. All rollback is in a suspended state.	Make sure the snap pool and the vdisk on which this volume exists are online. Restart the rollback operation.
229	Warning	The snap pool has reached the snap pool warning threshold.	The user can set up the policy for the snap pool.
230	Warning	The snap pool has reached the snap pool error threshold.  The system will take the action set up in the policy. Default is to delete the oldest snapshot.	You can expand the snap pool or delete snapshots.
231	Critical	The snap pool has reached the snap pool critical threshold.  The system will take the action set up in the policy. Default is to delete all snapshots on the snap pool.	If the policy is to halt writes, then you must free up space on the snap pool master, or convert the master volume to a standard volume in order to resume operations.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
232	Warning	The maximum number of enclosures allowed for the current configuration has been exceeded.	The platform does not support the number of enclosures that are configured. The firmware has removed the enclosure indicated by this event from its configuration.
233	Warning	The specified disk type is invalid and not allowed in the current configuration.	One or more disks are not allowed for this platform. They have been removed from the configuration. Replace the disallowed disks with ones that are supported.
234	Critical	The specified snap pool is unrecoverable and can therefore no longer be used.	All the snapshots associated with this snap pool are invalid and the user may want to delete them. However, the data on the master volume can be recovered by converting it to a standard volume.
235	Informational	A non-disk SCSI device, such as an EMP or partner controller, has reported a check condition.	No action required.
236	Informational	A special shutdown operation has started.	No action required.
237	Informational	A firmware update has started and is in progress.	No action required.
238	Warning	An attempt to write license data failed due to an invalid license.	Check the license for what is allowed for the platform, make corrections as appropriate, and reinstall. If the license is invalid, the write will fail.
239	Warning	A timeout has occurred while flushing the CompactFlash.	Cycle power and restart the system. If the error persists, save the log files and contact a service technician.
240	Warning	A failure has occurred while flushing the CompactFlash.	Cycle power and restart the system. If the error persists, save the log files and contact a service technician.
241– 242	Informational	CompactFlash status events generated by the auto-write-through feature whenever an environmental change occurs. If an auto-write-through-trigger condition has been met, write-back cache is disabled.	No action required.
243	Informational	A new RAID enclosure has been detected. This happens when a controller FRU is moved from one enclosure to another and the enclosure detects that the midplane WWN is different from the WWN it has in its local flash.	No action required.
245	Informational	An existing disk channel target device is not responding to SCSI discovery commands.	Check the indicated target device for bad hardware or bad cable, then initiate a rescan.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
246	Warning	The coin battery is either not present, or it is not properly seated, or it has reached end of life. The battery is a battery backup for the real-time (date/time) clock. In the event of a power failure, the date and time will revert to January 1, 1970 00:00:00.	The coin battery is in the controller module. A service technician must replace or reseat the battery.
247	Warning	The FRU-ID EEPROM for the specified field replaceable unit (FRU) cannot be read; FRU-ID data might not be programmed. FRU-ID data includes the worldwide name, SCSI ID, and branding information.	A service technician can reprogram FRU-ID data.
248	Informational	A valid feature license was successfully installed. See event 249 for details about each licensed feature.	No action required.
249	Informational	After a valid license is installed, this event is logged for each licensed feature to show the new license value for that feature. The event specifies whether the feature is licensed, whether the license is temporary, and whether the temporary license is expired.	No action required.
250	Warning	A license could not be installed (license is invalid).	Check license parameters against what is allowed for the platform and recreate the license using valid parameters, then reinstall.  Review the readme file that came with the license.
251	Warning	A volume-copy operation has started for the specified source volume.	If the source volume is a master volume, you can remount it. If the source volume is a snapshot, do not remount it until the copy is complete (as indicated by event 268).
252	Informational	Snapshot write data on the specified master volume has been deleted.	No action required.
256	Informational	The specified snapshot has been created but not committed. A commit action is required before the snapshot can be used.	No action required.
257	Informational	The specified snapshot has been created and committed.	No action required.
258	Informational	The specified snapshot has been committed and is ready for use.	No action required.
259	Informational	In-band CAPI commands have been disabled.	No action required.
260	Informational	In-band CAPI commands have been enabled.	No action required.
261	Informational	In-band SES commands have been disabled.	No action required.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
262	Informational	In-band SES commands have been enabled.	No action required.
263	Warning	The specified disk spare is missing. It was either removed or is not responding.	Replace the specified disk.
264	Informational	The link speed of the port bypass circuit and interconnect mode has been set to the default.	No action required.
265	Informational	Port bypass circuits currently use the service port, which may limit the link speed or interconnect mode support.	Perform a system-level shutdown and restart. Note that this will cause all data to be unavailable for about 1 minute.
266	Informational	A volume-copy operation for the specified master volume has been aborted.	No action required.
267	Critical	While cleaning up resources in metadata at the end of a background rollback process, the firmware found at least one error and suspended the process for the specified volume.	Make sure that disks and vdisks associated with the rollback are OK and then retry the rollback.
268	Informational	A background volume-copy operation for the specified master volume completed.	No action required.
269	Informational	A partner firmware update operation has started. This operation is used to copy firmware from one controller to the other to bring both controllers up to the same version of firmware.	No action required.
270	Warning	There is a problem reading or writing the persistent IP data from the FRU-ID SEEPROM, or if invalid data is read from the FRU-ID SEEPROM.	Check the IP settings (including iSCSI host channel IP data for an iSCSI system), and update them if they are incorrect.
271	Informational	System could not get a valid serial number from the controller's FRU-ID SEEPROM, either because it couldn't read the FRU-ID data, or because the data on it isn't valid or hasn't been programmed. Therefore, the MAC address is derived by using the controller's serial number from flash. This event is only logged one time during bootup.	No action required.
272	Informational	Expansion of the specified snap pool has started.	No action required.
273	Informational	Fault isolation has been enabled or disabled for the specified enclosure and controller within that enclosure.	No action required.



**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
274	Informational	A PHY has been disabled.	Look for corresponding event 275. Contact technical support if either: <ul style="list-style-type: none"> <li>• Event 274 event occurs for an ingress or egress PHY and event 275 doesn't occur.</li> <li>• The system transitions between 274 and 275 more than 8 times per hour.</li> </ul>
275	Informational	A PHY has been enabled.	No action required.
298	Warning	The controller's real-time clock (RTC) settings might be invalid after an unexpected power loss.	Check the system date and time. If either is incorrect, set them to the correct date and time.  Also look for event 246 and take appropriate action.
299	Informational	The controller's real-time clock (RTC) settings were recovered after an unexpected power loss.	No action required.
300	Informational	CPU frequency has been adjusted to high.	No action required.
301	Informational	CPU frequency has been adjusted to low.	No action required.
302	Informational	DDR memory clock has been adjusted to high.	No action required.
303	Informational	DDR memory clock has been adjusted to low.	No action required.
304	Informational	The controller has detected I <sup>2</sup> C errors that may have been fully recovered. This event is logged as informational to note an existence of previous I <sup>2</sup> C errors.	No action required.
305	Informational	A serial number in SC flash memory is invalid. The valid serial number will be recovered automatically.	No action required.
306	Informational	An old serial number in SC flash memory has been updated to a new serial number.	
307	Critical	A temperature sensor on a controller FRU detected an over-temperature condition that caused the controller to shut down.	Check that the storage system's fans are running.  Check that the ambient temperature is not too warm. The enclosure operating range is 41–104° F (5–40° C).  Check for any obstructions to the airflow.  If none of the above explanations apply, replace the controller FRU that reported the error.
308	Informational	The default host port speed has changed from 4 Gbit/sec to 2 Gbit/sec because the controller module's HIM has a Broadcom PBC.	No action required.

**Table 1** Event descriptions and recommended actions (continued)

<b>Code</b>	<b>Severity</b>	<b>Description</b>	<b>Recommended action</b>
309	Informational	Normally when the MC is started, the IP data is obtained from the SEEPROM where it is persisted. If the system is unable to write it to the SEEPROM the last time it changed, a flag is set in flash memory. This flag is set during startup, and if set, this event is logged and the IP data that is in flash memory is used. The only time that this would not be the correct IP data would be if the controller board was swapped and then whatever data is on the board's flash memory is used.	No action required.
310	Informational	After a rescan, the controller completed back-end discovery and initialization of enclosure data.	No action required.
311	Informational	An iSCSI ping operation completed. The event specifies the number of pings that passed and the number that failed.	If the ping operation failed, check connectivity between the storage system and the remote host.
313	Critical	An I/O module is down and will not be automatically restarted. This only applies when the other SC goes down.	The SC needs service or replacement.
314	Critical	A FRU has failed or is not operating correctly. This event follows some other FRU specific event indicating a problem.	Examine the specified FRU to determine whether it needs to be replaced.
315	Critical	The controller module is incompatible with the enclosure. The controller will automatically shut down. If two incompatible controllers are inserted at the same time, or booted at the same time, one controller will crash and the other will hang. This behavior is expected and prevents data loss.	Move the controller module to a compatible enclosure.
316	Informational or Warning	The temporary license for a feature is about to expire or has expired. This event is logged as informational while the number of days remaining in the trial period is greater than zero. This event is logged as a warning when the trial period expires.	To continue using the feature after the trial period, purchase a permanent license.
322	Warning	The controller has an older SC version than the version used to create the CHAP authentication database in the controller's flash memory.  The CHAP database cannot be read or updated. However, new records can be added, which will replace the existing database with a new database using the latest known version number.	Upgrade to an SC version that is current for the indicated database version. <ul style="list-style-type: none"> <li>• If no records were added, the database becomes accessible and remains intact.</li> <li>• If records were added, the database becomes accessible but contains only the new records.</li> </ul>

**Table 1** Event descriptions and recommended actions (continued)

Code	Severity	Description	Recommended action
352	Informational	EC assert data or stack-dump data is accessible.	No action required.
353	Informational	EC assert data and stack-dump data have been cleared.	No action required.
354	Informational or Warning	SAS topology has changed on a host port. For example, the SAS cable connecting a controller host port to a host has been disconnected. This event is logged as informational for a topology change where at least one PHY goes "up." This event is logged as a warning for a topology change where at least one PHY goes "down."	No action required.
355	Warning	The faceplate's debug button was found to be stuck in the On position during boot up.	If the button remains stuck, replace the controller module.
358	Warning or Critical	At least one SAS drive channel PHY is down. This event is logged as a warning if not all PHYs are down. This event is logged as critical if all PHYs are down.	Analyze the event log to determine the cause and extent of the problem. If you are unable to do so, contact technical support.
359	Informational	All initiator PHYs that were down are now up (have recovered).	No action required.
412	Warning	One disk in the specified RAID-6 vdisk failed. The vdisk is operational with Degraded health and status FTDN (fault tolerant with a down disk).	Replace the down disk with a spare so the system can start reconstructing the vdisk.

As referred to in [Table 1](#), the following table lists disk- error conditions and recommended actions.

**Table 2** Disk error conditions and recommended actions

Status	Recommended action
The status of the vdisk that originally had the failed disk status is Good. A global or vdisk (dedicated) spare has been successfully integrated into the vdisk and the replacement disk can be assigned as either a global spare or a vdisk spare.	Use RAIDar to assign the new disk as either a global spare or a vdisk spare.
The status of the disk just installed is LEFTOVER.	All of the member disks in a vdisk contain metadata in the first sectors. The storage system uses the metadata to identify vdisk members after restarting or replacing enclosures.  Use RAIDar to clear the metadata if you have a disk that was previously a member of a vdisk. After you clear the metadata, you can use the disk in a vdisk or as a spare.
If the status of the vdisk that originally had the failed disk status is FATAL FAIL, two or more disks have failed.	All data in the vdisk is lost. Use the RAIDar Trust Vdisk function to attempt to bring the vdisk back online.

**Table 2** Disk error conditions and recommended actions

Status	Recommended action
The status of the vdisk that originally had the failed disk status is DRV ABSENT or INCOMPLETE. These status indicators only occur when the enclosure is initially powered up. DRV ABSENT indicates that one disk is bad. INCOMPLETE indicates that two or more disks are bad.	Make sure the enclosures and associated data host were powered on in this order: first the drive enclosures, then the controller enclosure, then the data host. If the power-on sequence was correct, locate and replace the additional failed disks.
The status of the vdisk that originally had the failed disk indicates that the vdisk is being rebuilt.	Wait for the vdisk to complete its operation.
The status of the vdisk that originally had the failed disk is DRV FAILED.	If this status occurs after you replace a defective disk with a known good disk, the enclosure midplane might have experienced a failure. Replace the enclosure.

As referred to in [Table 1](#), the following table lists power supply module faults and recommended actions.

**Table 3** Power supply faults and recommended actions

Fault	Recommended action
Power supply fan warning or failure, or power supply warning or failure. Event code 168.	<ul style="list-style-type: none"> <li>• Check that all of the fans are working using RAIDar.</li> <li>• Make sure that no slots are left open for more than 2 minutes. If you need to replace a module, leave the old module in place until you have the replacement, or use a blank cover to close the slot. Leaving a slot open negatively affects the airflow and might cause the unit to overheat.</li> <li>• Make sure that the controller modules are properly seated in their slots and that their latches are locked.</li> </ul>
Power supply module status is listed as failed or you receive a voltage event notification. Event code 168.	<ul style="list-style-type: none"> <li>• Check that the switch on each power supply module is turned on.</li> <li>• Check that the power cables are firmly plugged into both power supply and into an appropriate electrical outlet.</li> <li>• Replace the power supply module.</li> </ul>
Power LED is off.	Same as above.
DC Voltage/Fan Fault/Service Required LED is on.	Replace the power supply module.

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