EMC²

TECHNICAL NOTES

Monitoring EMC® Symmetrix® Using the Solutions Enabler Event Daemon

Technical Notes

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Executive summary

The Solutions Enabler event daemon **storevntd** monitors EMC® Symmetrix® operations by detecting and reporting Symmetrix events. The event daemon continually collects Symmetrix event information in near real-time and filters the events by severity and type.

The event daemon can be configured to log events to a UNIX syslog or remote syslog server, the Windows event log, SNMP, and a file on disk. This allows storage administrators to proactively monitor the Symmetrix for a wide variety of events and to set specific alert priorities and alert levels.

Introduction

This technical note provides specific examples of using the Solutions Enabler event daemon **storevntd** to provide near real-time monitoring of event conditions within the Symmetrix.

Note: The *EMC Solutions Enabler Version 7.1 Installation Guide* provides more information on enabling and configuring the Solutions Enabler event daemon, including a list of other asynchronous event codes.

Audience

This document is intended for use by the technology professional who works in an environment with Symmetrix disk arrays. It is specifically targeted at EMC field technical staff and EMC customers who need to understand how to use the Solutions Enabler event daemon **storevntd** to monitor Symmetrix disk arrays.

Conventions used in this document

An ellipsis (`...`) on a line indicates that unnecessary command output has been removed.

```
Command syntax, output, and examples appear in the
Courier New font.
```

An asterisk (`*`) in command output indicates that unnecessary command output has been removed from within a line.

Configuring the daemon_options file

Solutions Enabler allows both individual events and categories of events to be monitored by using the event daemon.

Use of the event daemon successfully starts with the proper configuration of the daemon_options file. The file can be found in the following directory:

In UNIX:

```
/var/symapi/config
```

In Windows:

```
C:\Program Files\EMC\SYMAPI\config
```

There is a section in the file that contains parameters or reserved sections for each of the Solutions Enabler daemons, including **storevntd**.

Some of the **storevntd** options in the file can be set based on user preference, but there are a few that must be set correctly for events to be properly logged.

> **Note**: The README.daemon_options file in the directories noted previously and the *EMC Solutions Enabler Version 7.1 Installation Guide* provide details on the parameters in the daemon options file. The storevntd section of the README.daemon_options file has also been reproduced in Appendix A.

Event categories and individual events

The event daemon can be configured to log entire categories of events or to log only events with specific event codes. To see all of the supported event categories, the following command can be run:

```
# stordaemon action storevntd -cmd list -categories
 storevntd                     Event Categories
Symmetrix:
      status
      events
      array subsystem
      checksum
      diagnostic
      environmental
      device pool
      service processor
      srdf system
      srdf link
      srdfa session
      srdf consistency group
      director
      device
      disk
```

```
groups
optimizer
```

All event codes fall within a particular category. A list of the specific event codes can also be viewed from the command line.

The output shows the event code, class of the event, and the specific event details:

```
# stordaemon action storevntd -cmd list -events
 storevntd                     Supported Events:
1050,diagnostic,Diagnostic event trace triggered.
1051,diagnostic,Remote (SRDF) diagnostic event trace triggered.
1052,srdf system,Too many suspend/halt chains encountered, switching to
Adaptive Copy Write Pending Mode.
1053,array subsystem,Memory bank(s) automatically disabled due to cache error.
1054,disk,Hot Spare invoked against a disk.
1055,device,M2 mirror resynchronizing with its M1 mirror.
1056,device,M1 mirror resynchronizing with its M2 mirror.
1057,director,Disk director not responding.
1058,device,Data migration completed on all migration devices.
1059,device,Device resynchronization process started.
1060,disk,Hot Spare invoked against a remote R2 mirror disk.
...
```

There are currently 174 individual event codes.

Event categories are entered in the options file by using specific syntax as defined in the file’s comments. In the following example, there are three different entries that determine what errors are logged for which Symmetrix array.

The first entry specifies that all events related to the disk and the device categories are logged for Symmetrix 190102000.

The second entry specifies that only alerts corresponding to event code 1208 (pool utilization is now %u percent) are logged for Symmetrix 192003578. It also specifies that that a warning event will be logged when the pool becomes 60 percent utilized, a major event will be logged at 70 percent, and a critical event will be logged at 80 percent.

The third entry specifies that all events in the array subsystem and the environmental categories are logged from all Symmetrix arrays seen by this host:

```
storevntd:log_symmetrix_events = sid=000190102000,disk,device ;\
                                 sid=000192003578,1208,thresh_critical=80,
thresh_major=70, thresh_warn=60 ;\
                                 array subsystem,environmental
```

Setting a log target

Up to four log targets can be set to receive alerts:

- file — Events are written to a file on disk.
- snmp — Events are mapped into SNMP traps and sent to a specified host running an SNMP trap client.
- system — Events are written to the event log (Windows) or the local syslog service (UNIX or Linux).
- syslog — Events are sent directly to a remote syslog server, bypassing any local syslog service.

When multiple targets are specified, each target should be separated by a space.

For example, to set the log targets to send SNMP traps to a network management host and to also log to the local host syslog, the log_event_targets parameter would be set as follows:

```
storevntd:log_event_targets = snmp system
```

Setting the SNMP trap client

If one of the log targets is a host that has an application that can receive SNMP traps, the snmp_trap_client_registration parameter must be set to identify the server on the LAN as well as the port, filter, and state.

The format of the entry is IP_address,port,filter,state, with no spaces. Filter represents the trap sending filtering levels as defined in the fcmgmt MIB and state represents the startup row state in the trap_client_registration table in the fcmgmt MIB. In this example, filtering is set to 10 meaning that all messages will be logged and the startup row state is active. It can also be set to inactive:

```
storevntd:snmp_trap_client_registration = 192.168.1.7, 162,10,ACTIVE \
```

If multiple entries are required, each must be on its own line, delineated with a backward slash (\) on the preceding line.

This parameter can be changed and reloaded when the event daemon is running by entering the following command:

```
stordaemon action storevntd -cmd reload
```

Note: An example of monitoring by using SNMP traps is shown in the section called *Monitoring Virtual Provisioning by using event codes* starting on page 8.

Understanding the poll interval

The symm_poll_interval parameter in the daemon_options file controls how often the daemon polls the Symmetrix for events:

```
# Parameter                    symm_poll_interval
#
# Meaning:                     How often, in seconds, to poll Symmetrix arrays
#                              for events that need to be delivered.
#
# Allowed Values:              A number of seconds.
#
# Default Value                60

# storevntd:symm_poll_interval = 300
```

In the preceding example, the parameter is commented out, which leaves the poll interval at a default of 60 seconds. This means that the daemon polls the Symmetrix for errors every minute.

Note: The event daemon looks for state changes in the Symmetrix. If the poll interval is set to 60 seconds, the poller that checks for state changes is kicked off every minute. If, for example, a user switches a port offline and then switches the port online again within the same 60 second window, the event daemon does not notice a state change. In that situation, instead of logging an offline and online event, the daemon does not log any events at all.

General event monitoring by using event categories

The Solutions Enabler event daemon gives the user a considerable amount of flexibility in configuring a system that allows storage and systems administrators to be notified of events that occur within the Symmetrix. Using event categories is the simplest way to set up these alerts.

Example of event daemon logging

In the following example, an alert category called status is set in the log_symmetrix_events entry for Symmetrix 192601197:

```
storevntd:log_symmetrix_events = sid=000192601197, status
```

These events are set to log to a local file called Symm_1197_Events:

```
storevntd:log_event_targets = file

storevntd:log_event_file_name = Symm_1197_Events
```

To see a list of specific event codes that are logged as part of these categories, the output of the `stordaemon action storevntd -cmd list –events` command can be viewed:

```
# stordaemon action storevntd -cmd list -events | grep ,status,
1200,status,Device state has changed to [Not Present | Unknown | Online |
Write Disabled | Offline |Failed].
1201,status,Array state has changed to [Not Present | Unknown | Online | Write
Disabled | Offline | Failed].
1202,status,Director state has changed to [Not Present | Unknown | Online |
Write Disabled | Offline | Failed].
1203,status,Port state has changed to [Not Present | Unknown | Online | Write
Disabled | Offline | Failed].
1204,status,Disk state has changed to [Not Present | Unknown | Online | Write
Disabled | Offline | Failed].
1205,status,Device configuration has changed
1206,status,%s Pool state has changed to [Not Present | Unknown | Online |
Write Disabled | Offline| Failed].
1207,status,%s Pool configuration has changed.
1208,status,%s Pool utilization is now %u percent.
1209,status,Symmetrix External Lock has been %s.
1210,status,Hot Spare %s.
1215,status,Port configuration has changed
1216,status,%s Pool device state has changed.
1230,status,Array configuration has changed.
1231,status,Device Masking database has changed.
1232,status,Access Control definitions have changed.
1234,status,Snap session created, activated or deleted.
1235,status,BCV device pairing has changed.
1233,status,Dynamic RDF operation performed on device.
1236,status,HPUX device identifier has changed.
1237,status,Device Name has changed.
1238,status,Device Nice Name has changed.
1239,status,OpenVMS device identifier has changed.
1280,status,Cache Partitioning configuration has changed.
1281,status,Dynamic Mapping configuration for a device has changed.
1282,status,Meta configuration for a device has changed.
```

To test if the appropriate events are being logged, an SRDF director is taken offline:

```
# symcfg -RA 8H offline -sid 97 -nop

A director 'Offline' operation execution is
in progress for Symmetrix unit '000192601197'. Please wait...


The director 'Offline' operation successfully executed for
Symmetrix Unit '000192601197'.
```

After waiting longer than the polling interval, the director is turned on again:

```
# symcfg -RA 8H online -sid 97 -nop

A director 'Online' operation execution is
in progress for Symmetrix unit '000192601197'. Please wait...


The director 'Online' operation successfully executed for
Symmetrix Unit '000192601197'.
```

Both events have been written to the log file:

```
# pwd
/var/symapi/log

# cat Symm_1197_Events-20091217.log
[fmt=evt] [evtid=1250] [date=2009-12-17T13:27:27] [sev=info]  = Base Daemon
detected a change in Symmetrix topology.
[fmt=evt] [evtid=1203] [date=2009-12-17T13:36:34] [symid=000192601197]
[Port=RE-8H:0] [sev=major]  =  Port state has changed to Offline.
[fmt=evt] [evtid=1202] [date=2009-12-17T13:36:34] [symid=000192601197]
[Director=RE-8H] [sev=major] = Director state has changed to Offline.
[fmt=evt] [evtid=1201] [date=2009-12-17T13:36:34] [symid=000192601197]
[sev=warning]  = Array state has changed to Online [Degraded].
[fmt=evt] [evtid=1250] [date=2009-12-17T13:42:34] [sev=info]  = Base Daemon
detected a change in Symmetrix topology.
[fmt=evt] [evtid=1203] [date=2009-12-17T13:45:46] [symid=000192601197]
[Port=RE-8H:0] [sev=normal] = Port state has changed to Online.
[fmt=evt] [evtid=1202] [date=2009-12-17T13:45:46] [symid=000192601197]
[Director=RE-8H] [sev=normal]  = Director state has changed to Online.
[fmt=evt] [evtid=1201] [date=2009-12-17T13:45:46] [symid=000192601197]
[sev=normal]  = Array state has changed to Online.
```

Monitoring Virtual Provisioning by using event codes

In an EMC Virtual Provisioning™ environment, monitoring thin pools and their used and free capacity is one of the most critical tasks for the storage administrator. It is vital that thin pools contain available data device capacity to avoid a *pool full* condition. A pool full condition is when thin devices that are bound to an oversubscribed thin pool have free capacity but the underlying thin pool is full. The reaction of hosts to a pool full condition varies and is documented in the Host Connectivity guides that EMC publishes for each open systems platform.

The Virtual Provisioning events that can be monitored by the event daemon are as follows:

- 1111 — Save or data device pool is full.
- 1206 — Pool state has changed to [Not Present | Unknown | Online | Write Disabled | Offline| Failed].
- 1207 — Pool configuration has changed.
- 1208 — Pool utilization is now %u percent.
- 1212 — Thin device is now %u percent allocated.
- 1213 — Thin device is now %u percent used.
- 1216 — Pool device state has changed.

Monitoring storage pools

Event codes 1111, 1206, 1207, 1208, and 1216 should be included in the daemon_options file in order to fully monitor Virtual Provisioning thin pools. Codes 1111, 1206, 1207, and 1216 display changes in state, so no additional configuration settings are required. However, code 1208 displays a percentage value threshold and values that correspond to varying severities. The following is an example of a log_symmetrix_events entry in the daemon_options file that contains these events. If multiple entries are required, each entry must be on its own line, delineated with a backward slash (\) on the preceding line:

```
storevntd:log_symmetrix_events=sid=000190102000,1111, 1206,1207,1216 ;\

sid=000190102000,1208,thresh_critical=80,thresh_major=70, thresh_warn=60
```

With this configuration, when the following storage pool utilizations are surpassed, messages will be triggered:

- A warning event would be logged when 60 percent of the pool's enabled capacity has been used.
- A major event would be logged when the 70 percent threshold is crossed.
- A critical event would be logged when the pool's utilization rises above 80 percent.

Note: Each threshold event is logged only once at the time that the threshold is crossed. If the pool utilization percentage drops below 60 percent again, possibly due to additional data devices being added to the pool, an event of normal severity is logged.

Thin device monitoring

Thin devices can be monitored by the percent that the devices are allocated or by the percent used (written). Thresholds can be set to log events of varying severity at different percentage levels. The following is an example of an entry in the daemon_options file for these events:

```
storevntd:log_symmetrix_events=sid=000190102000,1212,thresh_critical=80,
                                         thresh_major=65,thresh_warn=50 ;\

sid=000190102000,1213,thresh_critical=80,thresh_major=65, thresh_warn=50 ;
```

In the previous example:

- A warning event is logged when the percent allocated or percent used of the thin device exceeds 50 percent
- A major event logs when that percentage value exceeds 65 percent
- A critical event is logged when the threshold exceeds 80 percent

As with the previous example, events are logged only when the threshold is crossed. If the percent allocated or written drops below 50 percent, possibly by expanding a thin device meta, an event of normal severity is logged.

Example of event daemon logging with Virtual Provisioning

SNMP, system, and file are set as log_event_targets so the events are sent as SNMP traps and logged as messages in both the local host syslog and a named file:

```
storevntd:log_event_targets = snmp system file
```

All seven Virtual Provisioning event codes are added to the log_symmetrix_events entry. Event codes that do not require setting thresholds can be added in a single entry:

```
storevntd:log_symmetrix_events = sid=000192601197,1111,1206,1207,1216 ;\
```

The event codes that require thresholds to be set are typed on a separate line. In the following example, the alerts will be logged at 60, 70, and 80 percent:

```
sid=000192601197,1208,1212,1213,thresh_critical=80,thresh_major=70,thresh_warn
=60
```

The local log where the events are written is called VP_events:

```
storevntd:log_event_file_name = VP_events
```

The IP address, port, trap filtering levels, and startup row state are also set for the host that runs the trap client:

```
storevntd:snmp_trap_client_registration =   10.243.136.204,162,10,ACTIVE
```

The following pool is currently 55 percent full:

```
# symcfg show -pool licoa_058 -thin -detail -all -sid 97

Symmetrix ID: 000192601197

Symmetrix ID                  : 000192601197
Pool Name                     : licoa_058
Pool Type                     : Thin
Dev Emulation                 : FBA
Dev Configuration             : RAID-6(6+2)
Pool State                    : Enabled
# of Devices in Pool          :   6
# of Enabled Devices in Pool  :   6
Max. Subscription Percent     : None

Enabled Devices(6):
  {
   ------------------------------------------------------
   Sym         Total      Alloc       Free Full  Device
   Dev        Tracks     Tracks     Tracks  (%)  State
   ------------------------------------------------------
   01F2        69024      42936      26088   62  Enabled
   01F3        69024      33876      35148   49  Enabled
   01F4        69024      34344      34680   49  Enabled
   01F5        69024      33948      35076   49  Enabled
   02D8        69024      43032      25992   62  Enabled
   02D9        69024      42780      26244   61  Enabled
          ---------- ---------- ---------- ----
   Tracks     414144     230916     183228   55
  }
```

After writing more data to the thin devices, the pool is now 85 percent full. Several of the thin devices have filled beyond the 60 percent, which is the threshold set for warning alerts:

```
# symcfg show -pool licoa_058 -thin -detail -all -sid 97

Symmetrix ID: 000192601197

Symmetrix ID                  : 000192601197
Pool Name                     : licoa_058
Pool Type                     : Thin
Dev Emulation                 : FBA
Dev Configuration             : RAID-6(6+2)
Pool State                    : Enabled
# of Devices in Pool          :   6
# of Enabled Devices in Pool  :   6
Max. Subscription Percent     : None
```

```
Enabled Devices(6):
  {
   ------------------------------------------------------
   Sym         Total      Alloc       Free Full  Device
   Dev        Tracks     Tracks     Tracks  (%)  State
   ------------------------------------------------------
   01F2        69024      65856       3168   95  Enabled
   01F3        69024      51168      17856   74  Enabled
   01F4        69024      52200      16824   75  Enabled
   01F5        69024      52092      16932   75  Enabled
   02D8        69024      66036       2988   95  Enabled
   02D9        69024      65712       3312   95  Enabled
          ---------- ---------- ---------- ----
   Tracks     414144     353064      61080   85
  }

Thin Devices(8):
  {
   ------------------------------------------------------------------------
                       Pool          Pool              Pool
   Sym          Total  Subs        Allocated         Written
   Dev         Tracks   (%)     Tracks   (%)     Tracks   (%)  Status
   ------------------------------------------------------------------------
   02E4         69030    17      48540    12      47527    11  Bound
   02E5         69030    17      44268    11      43236    10  Bound
   02E6         69030    17      44808    11      43634    11  Bound
   02E7         69030    17      36012     9      34832     8  Bound
   02E8         69030    17      51804    13      50829    12  Bound
   02E9         69030    17      43032    10      41875    10  Bound
   02EA         69030    17      48756    12      47635    12  Bound
   02EB         69030    17      35844     9      34671     8  Bound
           ---------- ----- ---------- ----- ---------- -----
   Tracks      552240   133     353064    85     344239    83
  }
```

The following events have been logged to the error file:

```
 # pwd
/var/symapi/log

# cat VP_events-20091216.log
[fmt=evt] [evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e4] [sev=major]  =Thin Device is now 70 percent allocated.
[fmt=evt] [evtid=1213] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e4] [sev=warning]= Thin Device is now 65 percent used.
[fmt=evt] [evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e5] [sev=warning]= Thin Device is now 60 percent allocated.
[fmt=evt] [evtid=1213] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e5] [sev=warning]= Thin Device is now 60 percent used.
[fmt=evt] [evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e6] [sev=warning]= Thin Device is now 65 percent allocated.
[fmt=evt] [evtid=1213] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e6] [sev=warning]= Thin Device is now 60 percent used.
[fmt=evt] [evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e8] [sev=major]  =Thin Device is now 75 percent allocated.
```

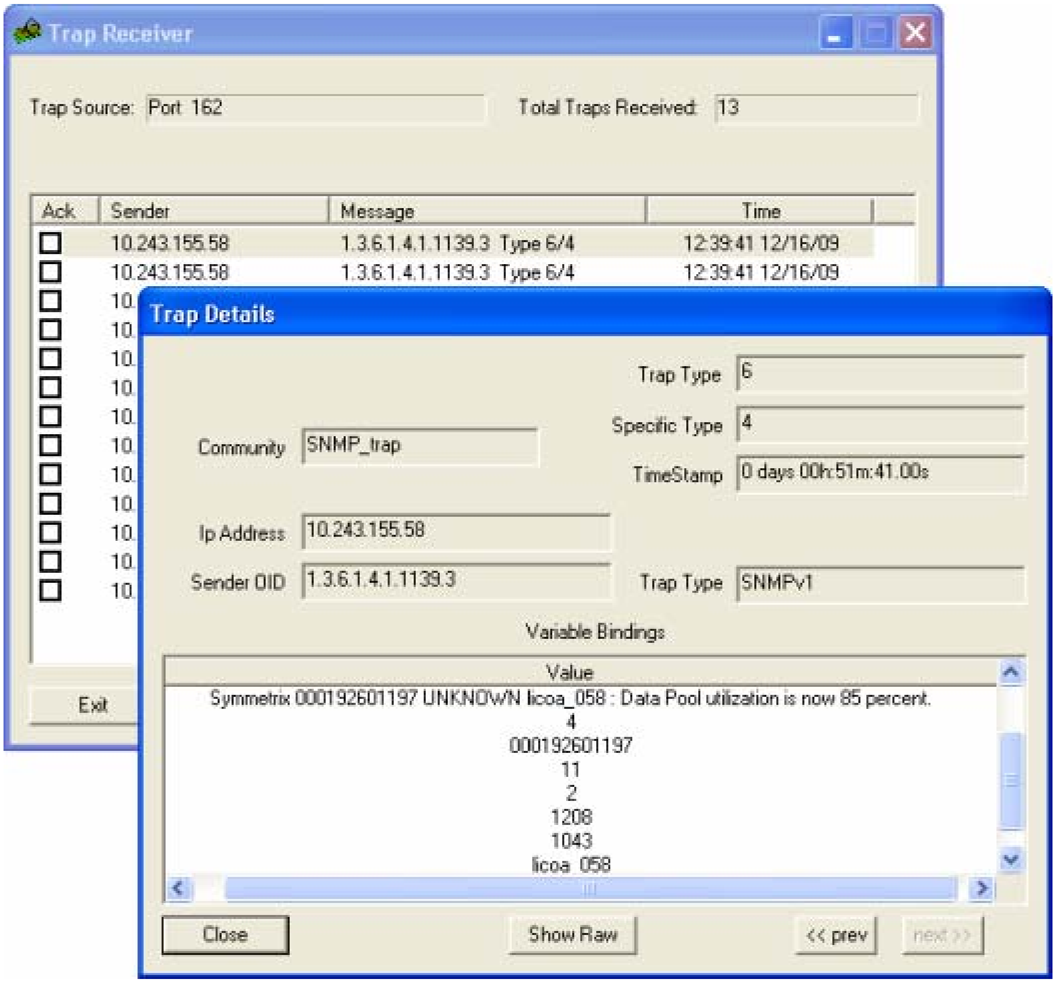
```
[fmt=evt] [evtid=1213] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02e8] [sev=major]  =Thin Device is now 70 percent used.
[fmt=evt] [evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02ea] [sev=major]  =Thin Device is now 70 percent allocated.
[fmt=evt] [evtid=1213] [date=2009-12-16T12:42:15] [symid=000192601197]
[Device=02ea] [sev=warning]= Thin Device is now 65 percent used.
[fmt=evt] [evtid=1208] [date=2009-12-16T12:42:15] [symid=000192601197]
[TPDataPool=licoa_058] [sev=critical]  = Data Pool utilization is now 85
percent.
```

Events have also been logged to the local syslog:

```
# dmesg
...
Dec 16 12:42:15 LicoA058 storevntd[27893]: [ID 702911 user.error] [fmt=evt]
[evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197] [Device=02e4]
[sev=major]  = Thin Device is now 70 percent allocated.
Dec 16 12:42:15 LicoA058 storevntd[27893]: [ID 702911 user.error] [fmt=evt]
[evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197] [Device=02e8]
[sev=major]  = Thin Device is now 75 percent allocated.
Dec 16 12:42:15 LicoA058 storevntd[27893]: [ID 702911 user.error] [fmt=evt]
[evtid=1213] [date=2009-12-16T12:42:15] [symid=000192601197] [Device=02e8]
[sev=major]  = Thin Device is now 70 percent used.
Dec 16 12:42:15 LicoA058 storevntd[27893]: [ID 702911 user.error] [fmt=evt]
[evtid=1212] [date=2009-12-16T12:42:15] [symid=000192601197] [Device=02ea]
[sev=major]  = Thin Device is now 70 percent allocated.
Dec 16 12:42:15 LicoA058 storevntd[27893]: [ID 702911 user.error] [fmt=evt]
[evtid=1208] [date=2009-12-16T12:42:15] [symid=000192601197]
[TPDataPool=licoa_058] [sev=critical]  = Data Pool utilization is now 85
percent.
...
```

Note: In the previous example, the local syslog contains only errors of major severity and above. This is due to host syslog configuration settings. It is important to ensure that the expected error levels are logged in the host syslog.

A trap client that runs on a local host also receives the alerts. The following figure shows the list of alerts that were received along with details of the selected alert showing that pool utilization has exceeded 85 percent:



Trap Source: Port 162

Total Traps Received: 13

Ack	Sender	Message	Time
□	10.243.155.58	1.3.6.1.4.1.1139.3 Type 6/4	12:39:41 12/16/09
□	10.243.155.58	1.3.6.1.4.1.1139.3 Type 6/4	12:39:41 12/16/09
□	10.		
□	10.		
□	10.		
□	10.		
□	10.		
□	10.		
□	10.		
□	10.		
□	10.		
□	10.		
□	10.		

Trap Type: 6

Specific Type: 4

Community: SNMP_trap

TimeStamp: 0 days 00h:51m:41.00s

Ip Address: 10.243.155.58

Sender OID: 1.3.6.1.4.1.1139.3

Trap Type: SNMPv1

Variable Bindings

```
Value
Symmetrix 000192601197 UNKNOWN licoa_058 : Data Pool utilization is now 85 percent.
4
000192601197
11
2
1208
1043
licoa_058
```

Appendix A: storevntd section of the daemon_options file

The following section is taken from the README.daemon_options file in one of the following directories:

In UNIX:

```
/var/symapi/config
```

In Windows:

```
C:\Program Files\EMC\SYMAPI\config
```

```
##############################################################################
##
### storevntd [Event Daemon] notes
###
###     This daemon acts as the clearing house for Solutions Enabler events
###     on a host.
###     Refer to the storevntd(3) man page for additional details.
##############################################################################
##
#
# Parameter             symm_poll_interval
#
# Allowed values:       A number of seconds.
#
# Default value:        60
#
# Description:          Specifies how often, in seconds, to poll Symmetrix
#                       arrays for events that need to be delivered.
#
# storevntd:symm_poll_interval = 300
#-----------------------------------------------------------------------------
-
#
# Parameter             event_listen_port
#
# Allowed values:       An IP port number.
#
# Default value:        0 - means to let the OS pick an unused port
#
# Description:          Which IP port to use when listening for events being
#                       forwarded from remote hosts.  By default, an unused
#                       port picked by the OS is used.  This option might
#                       be needed if the presence of a firewall requires
#                       the use of a particular port.
#
# storevntd:event_listen_port = 2222
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_targets
#
# Allowed values:       One or more (space separated) of: snmp, file, system,
#                       syslog
```

```
#
# Default value:        none
#
# Description:          Controls whether events should be automatically
logged.
#                       One or more of the following may be supplied:
#                       file: Events are written to a file on disk.
#                       snmp: Events are mapped into SNMP traps.
#                       system: Events are written to the Event Log (Windows)
#                               or the local syslog service (otherwise).
#                       syslog: Events are sent directly to a remote syslog
#                               server, bypassing any local syslog service.
#
#                       Some of these possible targets can be configured by
#                       options that are described below.
#
# storevntd:log_event_targets = snmp file
#-----------------------------------------------------------------------------
-
#
# Parameter             log_symmetrix_events
#
# Allowed values:       see above
#
# Default value:        No events are logged.
#
# Description:          Specifies events that are to be automatically logged.
#                       Refer to the log_event_targets option above.
#                       This option consists of a records separated by a
#                       semicolon. Typically, each record will be placed on a
#                       line by itself. Each of these records in turn consists
#                       of a number of comma-separated fields.
#
#                       [sid=nnnnn,] CAT[, ...] [,ignore] [,tgt=xxx]
#
#                       sid=nnnnnnnnnnnn
#                       Specifies a Symmetrix ID. By default, all known
#                       Symmetrix arrays will be monitored.
#
#                       CAT
#                       Specifies the event(s) to be monitored. This can
#                       be either the name of an event category or a
#                       numerical event ID. This is the only field that is
#                       required. One or more values (comma separated)
#                       may be present.
#
#                       Supported categories are:
#                       status
#                       events
#                       array subsystem
#                       checksum
#                       diagnostic
#                       environmental
#                       device pool
#                       service processor
#                       srdf system
#                       srdfa session
#                       srdf consistency group
#                       director
#                       device
#                       disk
#
#                       comp=xxxx
#                       "comp=aaa,bbb,ccc"
#                       Certain events apply to specific sub-components
#                       within the array: a device (4 digit hexadecimal),
#                       disk, pool. This field specifies that only
#                       events for the specified component (or components)
#                       should be delivered.  If more than one component
#                       is being present, the entire field must be enclosed
#                       in double quotes. e.g.: "comp=0004,0010,0100"
#
#                       thresh_critical=nn
#                       thresh_major=nn (equivalent to:  thresh=nn)
#                       thresh_warn=nn
#                       thresh_info=nn
#                       Certain events correspond to numerical quantities
#                       of some sort.  A threshold is associated with
#                       each severity level, and an event is generated
#                       at that severity when the event's value exceeds
#                       the associated threshold.  These fields can be
#                       used to override the default threshold values
#                       controlling when an event is delivered.
#
#                       One example of this is the event that indicates the
#                       percentage of space used for a pool. These fields
#                       can be set to control when events are to be generated.
#                       e.g.: thresh_critical=96, thresh_major=80,
#                       thresh_warn=60
#
#                       ignore
#                       If present, these event(s) are not to be logged -
#                       even if they are matched by a different record.
#                       tgt=xxx
#                       If present, these event(s) are sent to only the
#                       specified target - which must be one of:
#                       snmp, file, system, syslog.
#                       The specified target must also be present in the
#                       default target list given by the log_event_targets
#                       option.
#
# storevntd:log_symmetrix_events = sid=111111111111, disk, device ;\
#                       sid=222222222222, device pool ;\
#                       sid=333333333333, device, "comp=0101,0102,0104" ;\
#                       array subsystem , tgt=file
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_file_name
#
# Allowed values:       file name, without any suffix
#
# Default value:        events
#
```

```
# Description:          For event logging to a file (log_event_targets
#                       contains 'file'): the base name of the file that is
#                       used. This file is created within the standard log
#                       file directory.
#                       UNIX:     /var/symapi/log
#                       Windows:  c:\\Program Files\\EMC\\SYMAPI\\log
#                       Depending on the setting of the log_event_file_type
#                       option, a suffix will added to this name.
#
# storevntd:log_event_file_name = my_event_file
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_file_type
#
# Allowed values:       dated | wrap
#
# Default value:         wrap
#
# Description:          For event logging to a file
#                       (log_event_targets contains 'file'):
#                       the type of log file that is used.
#                       Two styles are supported:
#                       wrap: Two log files are maintained: ????.log0 and
#                       and ????.log1. Logging alternates between
#                       these -- switching to the other file each time
#                       the maximum size specified by the log_event_file_size
#                       parameter is reached.  The modified time on the
#                       files can be used to determine the "current" one.
#
#                       dated: A separate log file is used for each day:
#                       ????-YYYYMMDD.log. (e.g.: events-200411
#                       There are no limits on how large these files
#                       can become.
#
# storevntd:log_event_file_type = dated
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_file_size
#
# Allowed values:       A number, in KB
#
# Default value:        1000 (1000-KB)
#
# Description:          Specifies how large each log file is allowed to grow
#                       before wrapping to the alternate file.
#                       This option is for event logging to a file
#                       (log_event_targets contains 'file'):
#                       if log_event_file_type == wrap.
#
# storevntd:log_event_file_size = 5000
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_file_retention
#
```

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# Allowed values:       A number of days, greater than zero.
#
# Default value:        3 (days)
#
# Description:          Indicates that log files more than this many days old
#                       will be automatically deleted.
#                       This option is for event logging to a file
#                       (log_event_targets contains 'file'):
#                       if log_event_file_type == dated.
#
# storevntd:log_event_file_retention = 5
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_file_perms
#
# Allowed values:       n | rw | r
#
# Default value:        r
#
# Description:          Specifies the permissions to be applied to
#                       new log files that are created.
#                       This option is for event logging to a file
#                       (log_event_targets contains 'file'). Possible values:
#
#                       rw: Anyone can read or write.
#                        r: The owner (root) can read/write, others can read.
#                        n: The owner can read/write, no one else can access.
#
# storevntd:log_event_file_perms = r
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_syslog_host
#
# Allowed values:       A host name or IP address.
#
# Default value:        None - a value is required.
#
# Description:          Specifies the host on which the remote syslog server
#                       is running. This option is for event logging to syslog
#                       (log_event_targets contains 'syslog').
#
# storevntd:log_event_syslog_host = jupiter or 10.4.12.34
#-----------------------------------------------------------------------------
-
#
# Parameter             log_event_syslog_port
#
# Allowed values:       A decimal port number.
#
# Default value:        514
#
# Description:          Specifies the port to which the remote syslog
#                       server is listening. This option is for event logging
#                       to syslog (log_event_targets contains 'syslog').
#
```

```
#
# storevntd:log_event_syslog_port = 1234
#-----------------------------------------------------------------------------
-
#
# Parameter              snmp_trap_client_registration
#
# Allowed values:        IP,port,filter,state - with no spaces
#
# Default value:         none
#
# Description:           Provides a list of target IPs and ports to send
#                        SNMP traps to, when the log_event_targets option
#                        specifies snmp.
#
#                        Format is: IP,port,filter,state, where filter
#                        represents the trap sending filtering levels
#                        as defined in the fcmgmt MIB, and state
#                        represents the start up row state in the
#                        trap_client_registration table in the fcmgmt MIB.
#
#                        Multiple entries should be on their own line,
#                        delineated with a backslash (\) character
#                        on the preceding line.
#
#                        This parameter can be changed and reloaded
#                        while the event daemon is running, with the
#                        CLI stordaemon action storevntd -cmd reload.
#
# storevntd:snmp_trap_client_registration =  11.22.33.44,10,ACTIVE \
#                                             55.66.77.88,162,10,ACTIVE
#-----------------------------------------------------------------------------
-
#
# Parameter              snmp_management_url
#
# Allowed values:        <ip|DNS host name><:port>
#
# Default value:         none
#
# Description:           Provides launch capability of a management
application,
#                        such as SMC or ECC, from within a third party
#                        management framework.
#
#                        This parameter can be changed and reloaded
#                        while the event daemon is running, with the
#                        CLI stordaemon action storevntd -cmd reload
#
# storevntd:snmp_management_url=local:7070
#
```

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