

To: T10 Technical Committee  
 From: Rob Elliott, HP (elliott@hp.com) and Dennis Spicher, HP (dennis.spicher@hp.com)  
 Date: 28 February 2007  
 Subject: 07-095r0 SES-2 Cooling element Requested Speed Code of zero

**Revision history**

Revision 0 (28 February 2007) First revision

**Related documents**

ses2r15 - SCSI Enclosure Services - 2 (SES-2) revision 15

**Overview**

In the Cooling control element, there is no way for software to avoid specifying a new fan speed in the REQUESTED SPEED CODE field. If it sets the SELECT bit to one in the COMMON CONTROL field to enable access to the RQST IDENT, RQST FAIL, or RQST ON bits, it must also provide a new value for the REQUESTED SPEED CODE field.

The REQUESTED SPEED CODE field set to 000b should mean “don’t change the fan speed” rather than “reserved.”

The other plausible meaning that might be applied to 000b is “stop the fan,” since 000b means “fan stopped” in the status element. However, SES-2 has survived without that feature for 10 years. If needed, the two features could coexist as:

- a) new RQST STOP bit:
  - A) 1 = stop the fan
  - B) 0 = don't stop the fan
- b) REQUESTED SPEED CODE field:
  - A) 000b = don't change the speed
  - B) 001b - 111b = change as specified

However, this revision of this proposal does not propose that.

**Suggested changes to SES-2**

**7.3.5 Cooling element**

The Cooling element manages a fan, blower, or other cooling mechanism.

The format of the control field for a Cooling element is defined in table 69.

**Table 69 — Cooling element for control-type diagnostic pages**

Byte\Bit	7	6	5	4	3	2	1	0
0	COMMON CONTROL							
1	RQST IDENT	Reserved						
2	Reserved							
3	Rsvd	RQST FAIL	RQST ON	Reserved		REQUESTED SPEED CODE		

The COMMON CONTROL field is specified in 7.2.2.

A RQST IDENT (request identify) bit set to one specifies that the enclosure services process identify the element by a visual indication. A RQST IDENT bit set to zero specifies that the enclosure services process not identify the element by a visual indication.

A RQST FAIL (request failure indication) bit set to one specifies that that the Cooling element be identified by a visual indication that a failure is present. When the RQST FAIL bit is set to zero, the failure indication may be turned off if the indication is not also being set by the enclosure services process.

A RQST ON (request Cooling element on) bit set to one specifies that that the Cooling element be turned on or remain on. When the RQST ON bit is set to zero, the cooling element is requested to turn off or remain off.

The REQUESTED SPEED CODE field is set to specify the requested speed or rate of cooling of the fan or cooling device, as specified in table 70.

**Table 70 — REQUESTED SPEED CODE values**

Code	Description
000b	<del>Reserved</del> <a href="#">Leave fan at current speed</a>
001b	<del>Fan-at</del> <a href="#">Set fan to</a> lowest speed
010b	<del>Fan-at</del> <a href="#">Set fan to</a> second lowest speed
011b	<del>Fan-at</del> <a href="#">Set fan to</a> third lowest speed
100b	<del>Fan-at</del> <a href="#">Set fan to</a> intermediate speed
101b	<del>Fan-at</del> <a href="#">Set fan to</a> third highest speed
110b	<del>Fan-at</del> <a href="#">Set fan to</a> second highest speed
111b	<del>Fan-at</del> <a href="#">Set fan to</a> highest speed

The format of the status field for a cooling element is defined in table 71.

**Table 71 — Cooling element for status-type diagnostic pages**

Byte\Bit	7	6	5	4	3	2	1	0
0	COMMON STATUS							
1	IDENT	Reserved				(MSB)		
2	ACTUAL FAN SPEED (LSB)							
3	Rsvd	FAIL	RQSTED ON	OFF	Rsvd	ACTUAL SPEED CODE		

The COMMON STATUS field is specified in 7.2.3.

An IDENT (identify) bit set to one indicates that the enclosure services process is currently identifying the element by a visual indication because the RQST IDENT bit was set to one in the control-type diagnostic page. An IDENT bit set to zero indicates that the enclosure services process is not currently identifying the element by a visual indication based on the RQST IDENT bit in the control-type diagnostic page, or a visual indication is not implemented.

The ACTUAL FAN SPEED field indicates the actual fan speed in revolutions per minute (RPM) when multiplied by a factor of 10 (e.g., 000h indicates 0 rpm and 7FFh indicates 20 470 rpm).

A FAIL bit set to one indicates that the failure indication is on or has been turned on. If there are no additional failures detected by the enclosure, setting the RQST FAIL control bit to zero shall cause the FAIL bit to be set to zero.

A RQSTED ON (requested on) bit set to one indicates that the cooling element has been manually turned on or has been requested to be turned on by setting the RQST ON control bit to one. The RQSTED ON bit is set to zero when the RQST ON control bit is set to zero.

An OFF bit set to one indicates the cooling element is not providing cooling. The OFF bit shall be set to one if the RQST ON control bit is set to zero to request the cooling element be turned off. The OFF bit shall be set to

one if the cooling element is turned off manually. The OFF bit shall be set to one if a failure has caused the cooling element to stop operating. An OFF bit set to zero indicates the cooling element is operating.

The ACTUAL SPEED CODE field indicates the actual speed or rate of cooling of the fan or cooling device, as defined in table 72.

**Table 72 — ACTUAL SPEED CODE values**

<b>Code</b>	<b>Description</b>
000b	Fan stopped
001b	Fan at lowest speed
010b	Fan at second lowest speed
011b	Fan at third lowest speed
100b	Fan at intermediate speed
101b	Fan at third highest speed
110b	Fan at second highest speed
111b	Fan at highest speed