

ENDL TEXAS

Date: 16 February 2008
To: SNIA OSD TWG and T10 Technical Committee
From: Ralph O. Weber
Subject: Conditional Attributes Setting

Introduction

The January SNIA OSD TWG face-to-face meeting surfaced a desire to conditionally set attributes. This proposal implements that desire with minimal protocol overhead. To further grease the skids, support for the conditional setting of attributes is optional.

Revision History

r0 Initial revision

Unless otherwise indicated additions are shown in blue, deletions in ~~red-strikethrough~~, and comments in green.

Sorry for all the white space. The proposed changes look better if they start at the top of a page.

Proposed Changes in OSD-2

7.1.3 OSD attributes lists

7.1.3.1 Attributes lists overview

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The LIST TYPE field (see table 184) specifies the format of all attributes list entries in the attributes list.

Table 184 — List type values

List Type	Description	Support Requirement	Reference	Allowed Use		
				Get Attributes		Set Attributes List
				List	Response	
0h	Reserved			No	No	No
1h	Retrieve attributes for the specified OSD object or objects	Mandatory	7.1.3.2	Yes	No	No
2h - 8h	Reserved			No	No	No
9h	Retrieved attributes for the specified OSD object, or set attributes for the specified OSD object or objects	Mandatory	7.1.3.3	No	Yes	Yes
Ah	Conditionally set attributes for the specified OSD object or objects	Optional	7.1.3.n	No	No	Yes
Ah Bh - Dh	Reserved			No	No	No
Eh	Retrieved attributes for more than one OSD object	Mandatory	7.1.3.4	No	Yes	No
Fh	Obsolete					

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7.1.3.n List entry format for conditionally setting attributes for the specified OSD object

{{All of 7.1.3.n is new. Use of insertion and deletion markup suspended for the remainder of 7.1.3.n.}}

The attributes list entry format shown in table x1 is used for specifying each attribute value to be conditionally set by a SET ATTRIBUTES command (see 6.28) or equivalent command functions.

For the SET MEMBER ATTRIBUTES command (see 6.31), the list entry format shown in table x1 specifies the same attributes values to be conditionally set in all user objects in the specified collection. The retrieved attributes format for the GET MEMBER ATTRIBUTES command and SET MEMBER ATTRIBUTES command is defined in 7.1.3.4.

The ISOLATION field in the CDB (see 5.2.5) specifies the extent to which the attribute comparison and setting operations specified by this and other list entries are isolated from operations performed by other commands that are processed concurrently with this one.

Table x1 — List entry format for conditionally setting attributes for the specified OSD object

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved							
3	Reserved							
4	(MSB)	COMPARISON SUCCESS						(LSB)
5	Reserved							
6	(MSB)	SET WHEN						(LSB)
7	Reserved							
8	(MSB)	COMPARISON ATTRIBUTES PAGE						(LSB)
11	Reserved							
12	(MSB)	COMPARISON ATTRIBUTE NUMBER						(LSB)
15	Reserved							
16	(MSB)	COMPARISON VALUE LENGTH (n-9)						(LSB)
17	Reserved							
18	(MSB)	COMPARISON VALUE						(LSB)
n	Reserved							
n+1	Pad bytes (for eight-byte alignment)							
m	Reserved							
t×8	(MSB)	SET ATTRIBUTES PAGE						(LSB)
(t×8)+3	Reserved							
(t×8)+4	(MSB)	SET ATTRIBUTE NUMBER						(LSB)
(t×8)+7	Reserved							
(t×8)+8	(MSB)	SET ATTRIBUTE LENGTH (y-((t×8)+9))						(LSB)
(t×8)+9	Reserved							
(t×8)+10	(MSB)	SET ATTRIBUTE VALUE						(LSB)
y	Reserved							
y+1	Pad bytes (for eight-byte alignment)							
z	Reserved							

The COMPARISON SUCCESS field (see table x2) specifies the conditions under which the comparison described in this list entry is successful.

Table x2 — COMPARISON SUCCESS field (Sheet 1 of 3)

Value	Description
0000h	The comparison is never successful.
0001h	The comparison is always successful.
0010h	The comparison is successful if the specified comparison attribute's ^a value identically matches the COMPARISON VALUE field in length and contents.
0011h	The comparison is successful if the specified comparison attribute's ^a value does not match the COMPARISON VALUE field in either length or contents.
0012h	The comparison is successful if the length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field.
0013h	The comparison is successful if the length of specified comparison attribute ^a does not match contents of the COMPARISON VALUE LENGTH field.
0014h	The comparison is successful if the length of specified comparison attribute ^a is greater than contents of the COMPARISON VALUE LENGTH field and all the bytes in the COMPARISON VALUE field match the first comparison value length bytes of the specified comparison attribute.
0015h	The comparison is successful if the length of specified comparison attribute ^a is greater than contents of the COMPARISON VALUE LENGTH field and the bytes in the COMPARISON VALUE field do not match the first comparison value length bytes of the specified comparison attribute.
0016h	The comparison is successful if the length of specified comparison attribute ^a is less than contents of the COMPARISON VALUE LENGTH field and all the bytes in the comparison attribute's value match the first attribute length bytes in the COMPARISON VALUE field.
0017h	The comparison is successful if the length of specified comparison attribute ^a is less than contents of the COMPARISON VALUE LENGTH field and the bytes in the comparison attribute's value do not match the first attribute length bytes in the COMPARISON VALUE field.
^a The comparison attribute is specified by the contents of the COMPARISON ATTRIBUTES PAGE field and the COMPARISON ATTRIBUTE NUMBER field.	

Table x2 — COMPARISON SUCCESS field (Sheet 2 of 3)

Value	Description
0040h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is arithmetically greater than the COMPARISON VALUE field contents in unsigned arithmetic.
0041h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is not arithmetically greater than the COMPARISON VALUE field contents in unsigned arithmetic.
0042h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is arithmetically less than the COMPARISON VALUE field contents in unsigned arithmetic.
0043h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is not arithmetically less than the COMPARISON VALUE field contents in unsigned arithmetic.
0048h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is arithmetically greater than the COMPARISON VALUE field contents in signed, two's complement arithmetic.
0049h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is not arithmetically greater than the COMPARISON VALUE field contents in signed, two's complement arithmetic.
004Ah	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is arithmetically less than the COMPARISON VALUE field contents in signed, two's complement arithmetic.
004Bh	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The specified comparison attribute's value is not arithmetically less than the COMPARISON VALUE field contents in signed, two's complement arithmetic.
^a The comparison attribute is specified by the contents of the COMPARISON ATTRIBUTES PAGE field and the COMPARISON ATTRIBUTE NUMBER field.	

Table x2 — COMPARISON SUCCESS field (Sheet 3 of 3)

Value	Description
0050h	The comparison is successful if the specified comparison attribute's ^a value is byte-by-byte arithmetically greater than the COMPARISON VALUE field contents (e.g., a case-sensitive character string comparison) that stops on the first byte in which an inequality is found.
0051h	The comparison is successful if the specified comparison attribute's ^a value is not byte-by-byte arithmetically greater than the COMPARISON VALUE field contents (e.g., a case-sensitive character string comparison) that stops on the first byte in which an inequality is found.
0052h	The comparison is successful if the specified comparison attribute's ^a value is byte-by-byte arithmetically less than the COMPARISON VALUE field contents (e.g., a case-sensitive character string comparison) that stops on the first byte in which an inequality is found.
0053h	The comparison is successful if the specified comparison attribute's ^a value is not byte-by-byte arithmetically less than the COMPARISON VALUE field contents (e.g., a case-sensitive character string comparison) that stops on the first byte in which an inequality is found.
0110h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The result of a bit-wise XOR of the specified comparison attribute's value and the COMPARISON VALUE field contents is not zero.
0111h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The result of a bit-wise XOR of the specified comparison attribute's value and the COMPARISON VALUE field contents is zero.
0114h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The result of a bit-wise AND of the specified comparison attribute's value and the COMPARISON VALUE field contents is not zero.
0115h	The comparison is successful if: <ul style="list-style-type: none"> a) The length of specified comparison attribute ^a matches contents of the COMPARISON VALUE LENGTH field; and b) The result of a bit-wise AND of the specified comparison attribute's value and the COMPARISON VALUE field contents is zero.
All other values	Reserved
^a The comparison attribute is specified by the contents of the COMPARISON ATTRIBUTES PAGE field and the COMPARISON ATTRIBUTE NUMBER field.	

The SET WHEN field (see table x3) specifies the conditions under which the specified attribute shall be set to the specified value.

Table x3 — SET WHEN field

Value	Description
0000h	No attribute is set.
0001h	The specified attribute is always set to the specified value ^a .
0010h	The specified attribute is set to the specified value ^a if the comparison specified by this list entry is successful.
0011h	The specified attribute is set to the specified value ^a if the comparison specified by this list entry is successful and the comparison specified by the previous list entry ^b in this list is successful.
0012h	The specified attribute is set to the specified value ^a if the comparison specified by this list entry is successful and the comparisons specified by the previous two list entries ^b in this list are successful.
0017h	The specified attribute is set to the specified value ^a if the comparison specified by this list entry is successful and the comparisons specified by all previous list entries ^b in this list are successful.
0019h	The specified attribute is set to the specified value ^a if the comparison specified by this list entry is successful and the comparison specified by the previous list entry ^b in this list is not successful.
001Ah	The specified attribute is set to the specified value ^a if the comparison specified by this list entry is successful and the comparisons specified by the previous two list entries ^b in this list are not successful.
001Fh	The specified attribute is set to the specified value ^a if the comparison specified by this list entry is successful and the comparisons specified by all previous list entries ^b in this list are not successful.
All other values	Reserved
^a The SET ATTRIBUTES PAGE field and the SET ATTRIBUTE NUMBER field specify the attribute to be set, if any. The SET ATTRIBUTE LENGTH field and the SET ATTRIBUTE VALUE field specify the value to which the specified attribute is to be set, if any. ^b If a previous list entry is not present in this list, the comparison for that list entry shall be treated as not successful.	

The COMPARISON ATTRIBUTES PAGE field specifies the page number of the attribute value on which the specified comparison, if any, is to be performed.

The COMPARISON ATTRIBUTE NUMBER field specifies the attribute number within the attributes page specified by the COMPARISON ATTRIBUTES PAGE field of the attribute value on which the specified comparison, if any, is to be performed.

The COMPARISON VALUE LENGTH field specifies the length COMPARISON VALUE field in bytes.

The COMPARISON VALUE field specifies the value to which the comparison attribute is compared (see table x2).

The SET ATTRIBUTES PAGE field shall begin on a byte that is a multiple of eight. Depending on the comparison value length, zero to seven bytes containing zeros shall be added before the SET ATTRIBUTES PAGE field to meet the length requirement.

The SET ATTRIBUTES PAGE field specifies the page number of the attribute value, if any, to be set.

The SET ATTRIBUTE NUMBER field specifies the attribute number within the attributes page specified by the SET ATTRIBUTES PAGE field of the attribute value, if any, to be set.

The SET ATTRIBUTE LENGTH field specifies the length in bytes of the attribute value, if any, to be set. The effects of the SET ATTRIBUTE LENGTH field on the setting of attributes are described in 4.8.3.

The SET ATTRIBUTE VALUE field specifies the attribute value, if any, to be set.

The list entry length shall be a multiple of eight bytes. Depending on the attribute length, zero to seven bytes containing zeros shall be added at the end of the list entry to meet the length requirement.

If the COMPARISON ATTRIBUTES PAGE field, COMPARISON ATTRIBUTE NUMBER field, SET ATTRIBUTES PAGE field, or SET ATTRIBUTE NUMBER field contains FFFF FFFFh for a set command function, the command shall be terminated with a CHECK CONDITION status, with the sense key set to ILLEGAL REQUEST and the additional sense code set to INVALID FIELD IN CDB.