ONFI Technical Errata

Errata ID	**002**
Affected Spec Ver.	**ONFI 2.0, 2.1, 2.2**
Corrected Spec Ver.	

Submission info

Name	Company	Date
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For multiple LUN read sequences, if a Change Read Column or Change Read Column Enhanced is issued to one LUN then all LUNs read from subsequently need to have their column address specified with one of these commands. This erratum clarifies this requirement.

Description of the specification technical flaw

Modify the last paragraph of section 3.1.3 (Multiple LUN Operation Restrictions) as shown:

When the host has issued Read Page commands to multiple LUNs at the same time, the host shall issue Read Status Enhanced before reading data from either LUN. This ensures that only the LUN selected by the Read Status Enhanced command responds to a data output cycle after being put in data output mode with a 00h command, and thus avoiding bus contention. If the host issues a Change Read Column (Enhanced) for any LUN that Read Page commands are outstanding for, then the host shall issue a Change Read Column (Enhanced) prior to transferring data from any subsequent LUN that is part of the multiple LUN read sequence. An example sequence is shown below:

1) Read Page command issued to LUN 0
2) Read Page command issued to LUN 1
3) Read Status Enhanced selects LUN 0
4) Change Read Column (Enhanced) issued to LUN 0 (if needed by host)
5) Data transferred from LUN 0
6) Read Status Enhanced selects LUN 1
7) Change Read Column (Enhanced) issued to LUN 1 (required if action 4 taken)
8) Data transferred from LUN 1

The host may substitute Change Read Column Enhanced for the Read Status Enhanced / Change Read Column sequence if all LUNs are not busy.

Modify the third paragraph of section 5.12 (Read Status and Read Status Enhanced required usage) as shown:

When the host has issued Read Page commands to multiple LUNs at the same time, the host shall issue Read Status Enhanced before reading data from either LUN. Read Status Enhanced causes LUNs that are not selected to turn off their output buffers. This ensures that only the LUN selected by the Read Status Enhanced commands responds to a subsequent toggle of the RE# input signal after data output is selected with the 00h command. Refer to section 3.1.3 for additional requirements if a Change Read Column (Enhanced) command is used as part of a multiple LUN read sequence.

Modify the T_Idle_Rd state of section 7.1.3 as shown:

7.1.3 Idle Read states

T_Idle_Rd	Wait for read request (data or status) or other action. tReturnState set to T_Idle_Rd.	
1. WP# signal transitioned	→	T_Idle_WP_Transition
2. LUN indicates its SR[6] value transitioned	→	T_Idle_RB_Transition
3. Read request received and tbStatusOut set to TRUE	→	T_Idle_Rd_Status
4. Read request received and (tLastCmd set to 90h or EEh)	→	T_Idle_Rd_XferByte
5. Read request received and (tLastCmd set to ECh or EDh)	→	T_Idle_Rd_LunByte
6. Read request received and tbStatus78hReq set to FALSE[1]	→	T_Idle_Rd_LunData
7. Command cycle 05h (Change Read Column) received and tbChgCol set to TRUE	→	T_CR_Execute[2]
8. Command cycle 06h (Change Read Column Enhanced) received and tbChgColEnh set to TRUE	→	T_CRE_Execute[2]
9. Command cycle of 31h received and tbStatus78hReq set to FALSE	→	T_Idle_Rd_CacheCmd
10. Command cycle of 3Fh received and tLastCmd set to 31h and tbStatus78hReq set to FALSE	→	T_Idle_Rd_CacheCmd
11. Command cycle received	→	T_Cmd_Decode

NOTE:
1. When tbStatus78hReq is set to TRUE, a Read Status Enhanced (78h) command followed by a 00h command shall be issued by the host prior to reading data from a particular LUN.
2. If there are reads outstanding on other LUNs for this target, a Change Read Column (Enhanced) shall be issued before transferring data. Refer to section 3.1.3 that describes multiple LUN operation restrictions.

Disposition log

11/2/2009	Erratum captured.
1/14/2010	Erratum ratified.

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