Visibility of Media in Element Discussion

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Discussion questions for T10 SMC-3 Working Group

Background

- Volumes located in elements have attributes that move with the volume

- A method is needed to report the volume attributes for applications

- Current proposals for reporting element attributes address by element number

- SMC-3 working group has expressed a desire to have similar commands for all commands that report attributes

Address Volumes By Element?

- Commands to report element attributes address the elements by an element number

- The volumes reside in elements

- Addressing by element is the most familiar method
  - Similar to proposed commands for element attributes
  - Similar to existing Read Element Status
  - Natural for firmware implementation in medium changers

Issues with Element Based Addressing

- Attributes move with the media.
  - If element based addressing is used it must be updated frequently or tracked
- Applications reference media using 'Handles'
  - User applied names
  - User applied barcodes
  - Manufacturer or drive applied medium identifier
  - Application applied medium identifier
- Users reference media using 'Handles'
- Element number is only needed for physical access

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Addressing By Volume Handle

- Most medium changers support handles for the volumes.

- Handles have varying levels of uniqueness.
    - Medium Identifier may be world wide unique
    - Barcode may be unique for a given medium changer

- A command that allows addressing volumes could report a set of attributes that are fixed for the volume.
    - Only need to issue the command once

- May be similar to commands for reporting element attributes but use different addressing mechanism.
    - Could support addressing by element or handle

Similar to "Send Volume Tag"

- The closest other command in SMC-2 is the "Send Volume Tag" and "Request Volume Element Address" command pair

  – Elements are addressed by a barcode

  – Information about matching elements is returned in the Request Volume Element Address data

- The Send Volume Tag and Request Volume Element Address commands could be extended to report other attributes

Issues with extending Send Volume Tag

- Not at all similar to any known proposals for reporting element attributes

- Paired command requiring a "send" and "receive" is more complex to implement and use

- Request Volume Element Address return data uses existing "Read Element Status" pages
  - The existing RES pages are not sufficient to carry the information desired for this command
  - Return data format would need extensive modification or existing RES return data would need extended to carry additional attributes

- Working group has expressed a desire to not extend existing RES return data.

Issues With Creating a New Command

- Obvious handles (Barcode, Media ID) will not fit into a CDB

- Traditional solution would be a paired command set with some of the same issues as Send/Receive Volume Tag

  – Additional issues for multi-initiator environments
    - This command may be used frequently, possibly even for polling, so matching command and return data is necessary
    - No simple method to "link" the initial command and the command to retrieve the results

- Any handle solution would have to be unique within a device

  – Barcodes may not be unique
  – Some technologies do not support unique media identifiers

Possible New Short Handle

- The medium changer could generate a new handle that will be uniquely identify a volume within the medium changer

- The handle could be made to fit in a CDB

- New command similar to "Report Element Information" (06-272) could return the handle for a given element

- Future commands could request the data for the volume by using the handle

Questions

- Should the Send Volume Tag and Report Volume Element Address commands be extended or should a new command using page codes be proposed?

- Should a new command allow addressing by both element address and volume handle?

  – Requires "short" generated handle

- A new command using a handle may require a method to send one of the common handles and get back the medium changer handle

  – Possible extension to Send/Receive Volume Tag

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