



US008943234B1

(12) **United States Patent**
Voorhees et al.

(10) **Patent No.:** **US 8,943,234 B1**
(45) **Date of Patent:** **Jan. 27, 2015**

(54) **MULTI-PROTOCOL STORAGE CONTROLLER**

(71) Applicant: **LSI Corporation**, San Jose, CA (US)

(72) Inventors: **William W. Voorhees**, Colorado Springs, CO (US); **William K. Petty**, Colorado Springs, CO (US); **Eugene Saghi**, Colorado Springs, CO (US)

(73) Assignee: **LSI Corporation**, Milpitas, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/964,670**

(22) Filed: **Aug. 12, 2013**

Related U.S. Application Data

(60) Provisional application No. 61/862,361, filed on Aug. 5, 2013.

(51) **Int. Cl.**
G06F 3/00 (2006.01)
G06F 3/06 (2006.01)

(52) **U.S. Cl.**
CPC **G06F 3/0653** (2013.01); **G06F 3/0604** (2013.01); **G06F 3/0671** (2013.01)
USPC **710/17**

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,917,682 B2	3/2011	Bakthavathsalam	
8,447,892 B1	5/2013	Felton et al.	
2005/0015532 A1	1/2005	Beckett et al.	
2005/0138191 A1*	6/2005	Seto et al.	709/230
2007/0226360 A1*	9/2007	Gupta et al.	709/230
2012/0166701 A1	6/2012	Oh et al.	
2013/0232376 A1*	9/2013	Cudak et al.	710/5

* cited by examiner

Primary Examiner — Idriss N Alrobaye

Assistant Examiner — Dayton Lewis-Taylor

(74) *Attorney, Agent, or Firm* — Duft Bornsen & Fettig LLP; Gregory T. Fettig

(57) **ABSTRACT**

Systems and methods presented herein provide for coupling a storage controller to a plurality of different storage device types. One embodiment of the storage controller includes an interface operable to communicatively couple to a storage device. The storage controller also includes a processor operable to select between hardware protocol detection of the storage device and firmware protocol detection of the storage device, and to detect a protocol of the storage device when the storage device communicatively couples to the interface according to the selected protocol detection. The storage controller then selects a protocol to process input/output requests from a host based on the detected protocol of the storage device.

19 Claims, 7 Drawing Sheets

