

PATENT ASSIGNMENT COVER SHEET

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EPAS ID: PAT2950514

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	ASSIGNMENT	
CONVEYING PARTY DATA		
Name		Execution Date
FUSION-IO, INC.		07/22/2014
RECEIVING PARTY DATA		
Name:	INTELLECTUAL PROPERTY HOLDINGS 2 LLC	
Street Address:	1209 ORANGE STREET	
City:	WILMINGTON	
State/Country:	DELAWARE	
Postal Code:	19801	
PROPERTY NUMBERS Total: 85		
Property Type	Number	
Patent Number:	8266496	
Application Number:	11952095	
Application Number:	11952098	
Patent Number:	8402201	
Patent Number:	8495292	
Patent Number:	8296337	
Patent Number:	8261005	
Patent Number:	8015440	
Patent Number:	8019940	
Patent Number:	7713068	
Patent Number:	7778020	
Patent Number:	7934055	
Application Number:	11952121	
Patent Number:	8019938	
Application Number:	11952124	
Patent Number:	8417774	
Patent Number:	8316277	
Patent Number:	8161353	
Patent Number:	8151082	
Patent Number:	8195912	
Patent Number:	7836226	

PATENT

Property Type	Number
Patent Number:	8074011
Patent Number:	8706968
Patent Number:	8443134
Patent Number:	8046500
Application Number:	12711113
Patent Number:	8189407
Application Number:	13053021
Patent Number:	8412904
Application Number:	13088211
Application Number:	13118237
Application Number:	13174449
Patent Number:	8412979
Patent Number:	8214591
Patent Number:	8285927
Application Number:	13227088
Patent Number:	8205015
Application Number:	13296834
Application Number:	13357465
Patent Number:	8392798
Application Number:	13456119
Patent Number:	8482993
Application Number:	13480791
Patent Number:	8601211
Patent Number:	8762658
Patent Number:	8533569
Patent Number:	8533406
Application Number:	13648009
Application Number:	13693772
Application Number:	13730602
Application Number:	13784705
Application Number:	13830652
Application Number:	13939927
Application Number:	14309751
Application Number:	60873111
Application Number:	60974470
Application Number:	61290816
Application Number:	61305496
Application Number:	61435192
Application Number:	61606253

PATENT

REEL. 033389 FRAME. 0512

Property Type	Number
Application Number:	61606755
Patent Number:	8719501
Patent Number:	8578127
Patent Number:	8601222
Patent Number:	8489817
Patent Number:	8725934
Patent Number:	8756375
Application Number:	12986117
Application Number:	13193559
Application Number:	14072697
Application Number:	14087297
Application Number:	14094121
Application Number:	61240573
Application Number:	61240966
Application Number:	61292555
Application Number:	61334532
Application Number:	61368564
Application Number:	61373271
Application Number:	61382816
Application Number:	61579627
Patent Number:	8307258
Patent Number:	8495460
Patent Number:	8738991
Application Number:	14286712
Patent Number:	8281227

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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ATTORNEY DOCKET NUMBER:	29042/1
NAME OF SUBMITTER:	JOSEPH J. HAWKINS
SIGNATURE:	/Joseph J. Hawkins/
DATE SIGNED:	07/23/2014

PATENT

REEL: 033389 FRAME: 0513

Total Attachments: 24

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ASSIGNMENT

For good and valuable consideration, the receipt of which is hereby acknowledged, Fusion-io, Inc., a Delaware corporation, with a registered address at 2711 Centerville Road, Suite 400, City of Wilmington, County of new Castle, Delaware 19808 (“**Assignor**”), does hereby assign, transfer and convey unto Intellectual Property Holdings 2 LLC, a Delaware limited liability company, with an office at 1209 Orange Street, City of Wilmington, County of New Castle, Delaware 19801 (“**Assignee**”), all of Assignor’s entire right, title and interest in and to all patents and patent applications listed in the attached Exhibit 1 (collectively “**Patent Rights**”), subject to the terms and conditions of the Confidential Purchase and Sale Agreement (the “**Agreement**”), dated as of July 22, 2014, by and between Assignor and Assignee, immediately prior to the Acceptance Time (as such term is defined in the Agreement).

In addition, Assignor agrees to and hereby does sell, assign, transfer and convey unto Assignee all rights (i) in and to causes of action and enforcement rights for the Patent Rights including all rights to pursue damages, injunctive relief and other remedies for past, present and future infringement of the Patent Rights, (ii) the right to apply (or continue prosecution) in any and all countries of the world for patents, design patents, utility models, certificates of invention or other governmental grants for the Patent Rights, including under the Paris Convention for the Protection of Industrial Property, the International Patent Cooperation Treaty, or any other convention, treaty, agreement or understanding, and (iii) the rights, if any, to revive prosecution of any abandoned Patent Rights.

Assignor also hereby authorizes the respective patent office or governmental agency in each jurisdiction to issue any and all patents or certificates of invention or equivalent which may be granted upon any of the Patent Rights in the name of Assignee, as the assignee to the entire interest therein.

The terms and conditions of this Assignment shall inure to the benefit of Assignee, its successors, assigns and other legal representatives, and shall be binding upon Assignor, its successor, assigns and other legal representatives.

IN WITNESS WHEREOF, this Assignment of Patent Rights is executed at Salt Lake County, UT
on 7/22/14.

ASSIGNOR

By:

Name:

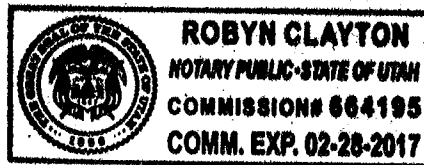
Title:

[Signature]

David Dutcher

Associate General Counsel and VP, IP

(Signature must be notarized)



Robyn Clayton

Before me,

David Dutcher

Notary Public at

State of Utah

Date:

7-22-2014

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REEL: 033389 FRAME: 0516

IN TESTIMONY WHEREOF, in accepting said Assignment, I hereunto set my hand as of the date indicated below:

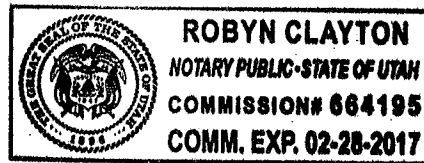
Intelligent Intellectual Property Holdings
2 LLC

July 22, 2014
Date

Dave Sampson
Signature

Name: Dave Sampson
Title: Treasurer

(Signature must be notarized)



Robyn Clayton
Before me, Dave Sampson
Notary Public at State of Utah
Date: July 22, 2014

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REEL: 033389 FRAME: 0517

Exhibit 1

ASSIGNED PATENTS

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PATENT
REEL: 033389 FRAME: 0518

country	title	status	ser_no	filing_date	pub_no	pub_date	pat_no	issue_date
CA	ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN DIRECTIVE	Pending	2672035	6/5/2009				
CA	ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH-CAPACITY, NON-VOLATILE STORAGE	Abandoned	2672100	6/5/2009				
EPO	REMOTE DIRECT MEMORY ACCESS TO A SOLID-STATE STORAGE DEVICE	Abandoned	7853274.4	7/6/2009				
EP	ASMF SERVICING OBJECT REQUESTS WITHIN A STORAGE CONTROLLER	Abandoned	7865334.2	7/6/2009	EP-A-2108143	10/14/2009		
EP	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE	Issued	7865335.9	7/6/2009	WO2008070800	6/12/2008	2100214	10/30/2013
EPO	ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN DIRECTIVE	Abandoned	7865345.8	7/6/2009				
EPO	ASMF DATA STORAGE USING PROGRESSIVE RAID	Abandoned	7865346.6	7/6/2009	EP-A-2126679	12/2/2009		
EP	ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH-CAPACITY, NON-VOLATILE STORAGE	Abandoned	7867661.6	7/6/2009				
EPO	ASMF AN IN-SERVER STORAGE AREA NETWORK	Abandoned	7869018.7	7/6/2009	EP-A-2109812	10/21/2009		
EPO	ASMF A FRONT-END, DISTRIBUTED RAID	Abandoned	7869020.3	7/6/2009				
EPO	ASMF A SHARED, FRONT-END, DISTRIBUTED RAID	Abandoned	7873664.2	7/6/2009	EP-A-2126698	12/2/2009		
EPO	ASMF EFFICIENT MAPPING OF VIRTUAL AND PHYSICAL ADDRESSES	Abandoned	9729887.1	11/4/2010	2286326	1/26/2011		
EPO	ASMF COORDINATING STORAGE REQUESTS IN A MULTI-PROCESSOR/MULTI-THREAD ENVIRONMENT	Abandoned	9730535.3	11/4/2010				
EP	ASMF CONVERTING A STORAGE REQUEST INTO AN APPEND DATA STORAGE	Office Action	9731243.3	11/4/2010	2271978	12/15/2010		

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COMMAND

HK	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE; GC	Pending	10102629.3	3/12/2010	1136058	6/18/2010
HK	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE	Pending	10102630	3/12/2010		
HK	ASMF SERVICING OBJECT REQUESTS WITHIN A STORAGE CONTROLLER	Abandoned	10103632.6	4/14/2010	HK1135491	6/4/2010
HK	ASMF SERVICING OBJECT REQUESTS WITHIN A STORAGE CONTROLLER	Abandoned	10103633.5	4/14/2010	HK1135492	6/4/2010
HK	ASMF AN IN- SERVER STORAGE AREA NETWORK	Abandoned	10103636.2	4/14/2010	HK1135493	6/4/2010
HK	ASMF AN IN- SERVER STORAGE AREA NETWORK	Abandoned	10103637.1	4/14/2010	HK1135494	6/4/2010
HK	ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH- CAPACITY, NON- VOLATILE STORAGE	Abandoned	10103934.1	4/21/2010		
HK	ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH- CAPACITY, NON- VOLATILE STORAGE	Abandoned	10103935	4/21/2010		
HK	ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN	Abandoned	10104585.1	5/11/2010		
HK	ASMF DATA STORAGE USING PROGRESSIVE RAID	Abandoned	10104724.3	5/14/2010	7865347	7/16/2010
HK	ASMF DATA STORAGE USING PROGRESSIVE RAID	Abandoned	10104725.2	5/14/2010	1137071	7/16/2010
HK	ASMF A SHARED, FRONT-END, DISTRIBUTED RAID	Abandoned	10104726.1	5/14/2010	1138082	8/13/2010
HK	REMOTE DIRECT MEMORY ACCESS TO A SOLID-STATE STORAGE DEVICE	Abandoned	10104727	5/14/2010		
HK	ASMF MANAGING DATA FROM A REQUESTING DEVICE WITH AN EMPTY DATA TOKEN	Abandoned	10106128	6/21/2010		
HK	ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN DIRECTIVE	Abandoned	10106134.2	6/22/2010		

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	ASMF MANAGING COMMANDS OF SOLID-STATE STORAGE USING							
HK	BANK INTERLEAVE REMOTE DIRECT MEMORY ACCESS TO A SOLID-STATE	Abandoned	10107616.7	8/10/2010				
HK	STORAGE DEVICE ASMF DATA STORAGE USING	Abandoned	10108055.3	8/24/2010				
HK	PROGRESSIVE RAID ASMF A DEVICE SHARED BETWEEN MULTIPLE INDEPENDENT	Abandoned	10109328.2	9/29/2010	HK1142971	12/17/2010		
HK	HOSTS ASMF A SHARED, FRONT-END,	Abandoned	10109329.1	9/29/2010				
HK	DISTRIBUTED RAID ASMF MANAGING DATA USING A DATA PIPELINE	Abandoned	10109330.8	9/29/2010	HK1142972	12/7/2010		
HK	ASMF MANAGING DATA USING A DATA PIPELINE	Abandoned	10110541.1	11/12/2010	HK1144213	2/2/2011		
US	ASMF MANAGING DATA USING A DATA PIPELINE	Issued	11952091	12/6/2007	US-2008- 0141043	6/12/2008	8266496	9/11/2012
US	ASMF MANAGING COMMANDS OF SOLID-STATE STORAGE USING BANK INTERLEAVE	Pending	11952095	12/6/2007	2.01E+10	9/18/2008		
US	ASMF SERVICING OBJECT REQUESTS WITHIN A STORAGE CONTROLLER	Abandoned	11952098	12/6/2007	US-2008- 0140724	6/12/2008		
US	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE; GC	Issued	11952101	12/6/2007	2.01E+10	7/31/2008	8402201	3/19/2013
US	ASMF AN IN- SERVER STORAGE AREA NETWORK TRIM ASMF MANAGING DATA FROM A REQUESTING DEVICE WITH AN EMPTY DATA	Issued	11952106	12/6/2007	US 2008- 0140932 A1	6/12/2008	8495292	7/23/2013
US	TOKEN DIRECTIVE TRIM ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA	Issued	11952109	12/6/2007	2.01E+10	6/12/2008	8296337	10/23/2012
US	TOKEN DIRECTIVE ASMF DATA STORAGE USING	Issued	11952113	12/6/2007	2.01E+10	6/12/2008	8261005	9/4/2012
US	PROGRESSIVE RAID ASMF A FRONT- END, DISTRIBUTED	Issued	11952115	12/6/2007	US 2008- 0168304 A1	7/10/2008	8015440	9/6/2011
US	RAID Composite Backplane - Abbrev title	Issued	11952116	12/6/2007	2.01E+10	10/16/2008	8019940	9/13/2011
US	Module Pairings - abbrev title	Expired	11952118	12/6/2007	US 2008- 0225474 A1	9/18/2008	7713068	5/11/2010
US		Issued	11952119	12/6/2007	US 2008- 0137284 A1	6/12/2008	7778020	8/17/2010

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US	ASMF A SHARED, FRONT-END, DISTRIBUTED RAID	Issued	11952120	12/6/2007	US 2008-0256292 A1	10/16/2008	7934055	4/26/2011
US	ASMF A DEVICE SHARED BETWEEN MULTIPLE INDEPENDENT HOSTS	Pending	11952121	12/6/2007	2.01E+10	7/31/2008		
US	ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH-CAPACITY, NON-VOLATILE STORAGE	Issued	11952123	12/6/2007			8019938	9/13/2011
US	REMOTE DIRECT MEMORY ACCESS TO A SOLID-STATE STORAGE DEVICE	Abandoned	11952124	12/6/2007	20080313364 A1	12/18/2008		
US	ASMF A RECONFIGURABLE BASEBOARD MANAGEMENT CONTROLLER	Issued	12001065	12/6/2007	US 2008-0313312 A1	12/18/2008	8417774	4/9/2013
US	No Gap in Protection	Issued	12098427	4/5/2008	US 2009-0150744 A1	6/11/2009	8316277	11/20/2012
US	ASMF VALIDATING THAT A CORRECT DATA SEGMENT IS READ FROM A DATA STORAGE DEVICE	Issued	12098431	4/6/2008	US 2010-0031000 A1	2/4/2010	8161353	4/17/2012
US	ASMF CONVERTING A STORAGE REQUEST INTO AN APPEND DATA STORAGE COMMAND	Issued	12098433	4/6/2008	US 2009-0150605 A1	6/11/2009	8151082	4/3/2012
US	ASMF EFFICIENT MAPPING OF VIRTUAL AND PHYSICAL ADDRESSES	Issued	12098434	4/6/2008	2.01E+10	6/11/2009	8195912	6/5/2012
US	ASMF COORDINATING STORAGE REQUESTS IN A MULTI-PROCESSOR/MULTI-THREAD ENVIRONMENT	Issued	12098435	4/6/2008	2.01E+10	9/3/2009	7836226	11/16/2010
US	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE, GC, groomer	Issued	12273532	11/18/2008	2.01E+10	5/14/2009	8074011	12/6/2011
US	ASMF data block usage information synchronization for a non-volatile storage volume	Office Action	12711113	2/23/2010	2.01E+10	8/19/2010		
US	ASMF REDUNDANT WRITE CACHING	Issued	12847952	7/30/2010	US-2011-0022801	1/27/2011	8706968	4/22/2014
US	Graceful Cache Degrade	Issued	12885285	9/17/2010	US 2011-0047437 A1	2/24/2011	8443134	5/14/2013
US	ASMF COORDINATING STORAGE REQUESTS IN A MULTI-PROCESSOR/MULTI-	Issued	12900336	10/7/2010	20110029496 A1	2/3/2011	8046500	10/25/2011

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THREAD
ENVIRONMENT

US	ASMF BIASING DATA IN A SOLID- STATE STORAGE DEVICE	Issued	12981394	12/29/2010	US 2011- 0157992 A1	6/30/2011	8189407	5/29/2012
US	ASMF A SHARED, FRONT-END, DISTRIBUTED RAID	Abandoned	13053021	3/21/2011				
US	ASMF A SHARED, FRONT-END, DISTRIBUTED RAID	Issued	13075000	3/29/2011	US 2011- 0179225 A1	7/21/2011	8412904	4/2/2013
US	ASMF DESTAGING CACHED DATA TRIM ASMF MANAGING DATA FROM A REQUESTING DEVICE WITH AN EMPTY DATA	Pending	13088211	4/15/2011	2.01E+10	10/20/2011		
US	TOKEN DIRECTIVE ASMF SERVICING OBJECT REQUESTS WITHIN A STORAGE CONTROLLER	Abandoned	13118237	5/27/2011	2.01E+10	10/13/2011		
US	ASMF DATA STORAGE USING PROGRESSIVE RAID	Abandoned	13174449	6/30/2011	US 2011- 0258512 A1	10/20/2011		
US	ASMF A FRONT- END, DISTRIBUTED RAID	Issued	13182315	7/13/2011	2.01E+10	7/12/2012	8412979	4/2/2013
US	ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH- CAPACITY, NON- VOLATILE STORAGE	Issued	13204436	8/5/2011	2.01E+10	12/1/2011	8214591	7/3/2012
US	ASMF REFERENCING DATA BLOCK USAGE INFORMATION BY WAY OF AN INTERFACE	Issued	13204551	8/5/2011	2.01E+10	11/24/2011	8285927	10/9/2012
US	ASMF COORDINATING STORAGE REQUESTS IN A MULTI- PROCESSOR/MULTI- THREAD ENVIRONMENT	Abandoned	13227088	9/7/2011	2.01E+12	3/7/2013		
US	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE, GC groomer APPARATUS, SYSTEM, AND METHOD FOR MANAGING CONTENTS OF A CACHE	Issued	13235114	9/16/2011	20120005443 A1	1/5/2012	8205015	6/19/2012
US	ASMF VALIDATING THAT A CORRECT DATA SEGMENT IS READ FROM A DATA STORAGE	Pending	13296834	11/15/2011	2.01E+10	3/8/2012		
US		Pending	13357465	1/24/2012	US20120124294- A1	5/17/2012		
US		Issued	13442638	4/9/2012	US-2012- 0203980	8/9/2012	8392798	3/5/2013

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DEVICE

	ASMF COORDINATING STORAGE REQUESTS IN A MULTI- PROCESSOR/MULTI- THREAD							
US	ENVIRONMENT	Pending	13456119	4/25/2012	2.01E+10	8/16/2012		
US	ASMF BIASING DATA IN A SOLID- STATE STORAGE DEVICE	Issued	13461628	5/1/2012	US-2012- 0215961	8/23/2012	8482993	7/9/2013
US	Apparatus, System, and Method for Efficient Mapping of Virtual and Physical Addresses	Abandoned	13480791	5/25/2012	2.01E+10	9/13/2012		
US	STORAGE SYSTEM WITH FRONT-END CONTROLLER	Issued	13488301	6/4/2012	2.01E+10	3/14/2013	8601211	12/3/2013
US	PTRIM, APPARATUS, SYSTEM, AND METHOD FOR MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA	Issued	13566471	8/3/2012	2.01E+10	12/27/2012	8762658	6/24/2014
US	TOKEN DIRECTIVE ASMF MANAGING DATA USING A DATA PIPELINE	Issued	13600077	8/30/2012	US 2012- 0324311	12/20/2012	8533569	9/10/2013
US	TRIM ASMF Identifying Data that is No Longer in Use	Issued	13607486	9/7/2012	2.01E+10	1/24/2013	8533406	9/10/2013
US	ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH- CAPACITY, NON- VOLATILE STORAGE	Office Action	13648009	10/9/2012	2.01E+10	4/18/2013		
US	ASM for Log Storage	Office Action	13693772	12/4/2012	2.01E+10	7/18/2013		
US	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE; GC	Pending	13730602	12/28/2012	2.01E+10	5/16/2013		
US	Adaptive IOPS N- channels vertical codeword VCW SYSTEMS AND METHODS FOR ADAPTIVE ERROR- CORRECTION	Pending	13784705	3/4/2013	2.01E+10	7/11/2013		
US	CODING	Pending	13830652	3/14/2013	2013-0205183	8/8/2013		
US	ASMF AN IN- SERVER STORAGE AREA NETWORK	Pending	13939927	7/11/2013	2.01E+10	11/14/2013		
US	TRIM ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA	Pending	14309751	6/19/2014				
US	TOKEN DIRECTIVE	Pending						

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US	First filed provisional	Expired	60873111	12/6/2006				
US	2nd Provisional Filed	Expired	60974470	9/22/2007				
US	ASMF BIASING DATA IN A SOLID- STATE STORAGE DEVICE	Expired	61290816	12/29/2009				
US	ASMF BIASING DATA IN A SOLID- STATE STORAGE DEVICE	Expired	61305496	2/17/2010				
US	ASMF DESTAGING CACHED DATA	Expired	61435192	1/21/2011				
US	Increase READ IOPS N-channels vertical ECC	Expired	61606253	3/2/2012				
US	Increase READ IOPS N-channels vertical ECC	Expired	61606755	3/5/2012				
JP	ASMF AN IN- SERVER STORAGE AREA NETWORK ASMF CONVERTING A STORAGE REQUEST INTO AN APPEND DATA STORAGE	Abandoned	2009540483	6/6/2009	2010-515116	5/6/2010		
JP	COMMAND ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE	Issued	2011504112	10/6/2010	2011-517820	6/16/2011	5431453	12/13/2013
CN	ASMF MANAGING DATA FROM A REQUESTING DEVICE WITH AN EMPTY DATA TOKEN DIRECTIVE TRIM	Pending	200780050969.8	8/6/2009				
CN	ASMF SOLID-STATE STORAGE AS CACHE FOR HIG-CAPACITY, NON-VOLATILE STORAGE	Issued	200780050970.0	8/6/2009			ZL 200780050970.0	3/13/2013
CN	ASMF MANAGING DATA USING A DATA PIPELINE ASMF A FRONT- END, DISTRIBUTED RAID	Issued	200780050973.4	8/6/2009	CN101622606A	1/6/2010	ZL 200780050973.4	4/9/2014
CN	REMOTE DIRECT MEMORY ACCESS TO A SOLID-STATE STORAGE DEVICE	Abandoned	200780050974.9	8/6/2009	CN 101715575A	5/26/2010		
CN	ASMF AN IN- SERVER STORAGE AREA NETWORK ASMF A SHARED, FRONT-END, DISTRIBUTED RAID	Abandoned	200780050982.3	8/6/2009				
CN	ASMF MANAGING COMMANDS OF SOLID-STATE STORAGE USING BANK INTERLEAVE	Abandoned	200780050983.8	8/6/2009				
CN		Abandoned	200780050989.5	8/6/2009	101622595A	1/6/2010		
CN		Issued	200780051010.6	8/6/2009	CN101689131A	3/31/2010	ZL 200780051010.6	3/20/2013
CN		Pending	200780051027.1	8/6/2009				

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CN	ASMF SERVICING OBJECT REQUESTS WITHIN A STORAGE CONTROLLER ASMF VALIDATING THAT A CORRECT DATA SEGMENT IS READ FROM A DATA STORAGE DEVICE	Office Action	200780051034.1	8/6/2009	CN 101636712A	1/27/2010
CN	ASMF COORDINATING STORAGE REQUESTS IN A MULTI- PROCESSOR/MULTI- THREAD ENVIRONMENT	Abandoned	200980121047.0	12/6/2010	CN 102084360 A	6/1/2011
CN	ASMF MANAGING DATA USING A DATA PIPELINE	Abandoned	200980121143.5	12/6/2010		
CN	ASMF CONVERTING A STORAGE REQUEST INTO AN APPEND DATA STORAGE COMMAND	Abandoned	200980121155.8	12/6/2010	CN 102084343 A	6/1/2011
CN	ASMF A DEVICE SHARED BETWEEN MULTIPLE INDEPENDENT HOSTS	Pending	200980121161.3	12/6/2010	CN 102084332	6/1/2011
CN	ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN	Abandoned	201080050430.4	8/6/2009		
KR	DIRECTIVE ASMF MANAGING COMMANDS OF SOLID-STATE STORAGE USING	Abandoned	10-2009-7014054	7/6/2009		
KR	BANK INTERLEAVE ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH- CAPACITY, NON- VOLATILE STORAGE	Office Action	10-2009-7014055	7/6/2009		
KR	ASMF A FRONT- END, DISTRIBUTED RAID	Abandoned	10-2009-7014058	7/6/2009		
KR	ASMF MANAGING DATA USING A DATA PIPELINE	Abandoned	10-2009-7014064	7/6/2009		
KR	ASMF DATA STORAGE USING PROGRESSIVE RAID	Abandoned	10-2009-7014065	7/6/2009		
KR	ASMF EFFICIENT MAPPING OF VIRTUAL AND PHYSICAL ADDRESSES	Abandoned	10-2009-7014067	7/6/2009		
KR	ASMF CONVERTING A STORAGE REQUEST INTO AN APPEND DATA STORAGE COMMAND	Pending	10-2010-7024893	11/4/2010		
KR		Pending	10-2010-7024894	11/4/2010		

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	ASMF COORDINATING STORAGE REQUESTS IN A MULTI- PROCESSOR/MULTI- THREAD							
KR	ENVIRONMENT ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN	Abandoned	10-2010-7024895	11/4/2010				
CN	DIRECTIVE ASMF DATA STORAGE USING	Abandoned	2007800501020.X	8/6/2009				
CN	PROGRESSIVE RAID ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH- CAPACITY, NON- VOLATILE STORAGE	Abandoned	200780050972.X	8/6/2009	CN101689130A	3/31/2010		
JP	ASMF MANAGING DATA FROM A REQUESTING DEVICE WITH AN EMPTY DATA TOKEN	Issued	2009-540309	6/6/2009	2.01E+09	4/22/2010	5523835	4/18/2014
JP	DIRECTIVE ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN	Abandoned	2009-540484	6/6/2009				
JP	DIRECTIVE ASMF EFFICIENT MAPPING OF VIRTUAL AND PHYSICAL	Pending	2009-540489	6/6/2009				
CN	ADDRESSES No Gap in	Abandoned	200980121088.X	12/6/2010	1.02E+08	6/1/2011		
JP	Protection ASMF EFFICIENT MAPPING OF VIRTUAL AND PHYSICAL	Abandoned	2011-503238	10/5/2010	2011-516984	5/26/2011		
JP	ADDRESSES ASMF COORDINATING STORAGE REQUESTS IN A MULTI- PROCESSOR/MULTI- THREAD	Abandoned	2011-504097	10/6/2010	2011-518380	6/23/2011		
JP	ENVIRONMENT ASMF VALIDATING THAT A CORRECT DATA SEGMENT IS READ FROM A DATA STORAGE DEVICE	Abandoned	2011-504100	10/6/2010				
JP	ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA TOKEN	Abandoned	2011-504104	10/6/2010	2011-518381	6/23/2011		
IN	DIRECTIVE ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH-	Pending	3892CHENP2009	7/3/2009				
IN		Abandoned	3894CHENP2009	7/3/2009				

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	CAPACITY, NON-VOLATILE STORAGE					
PCT	ASMF SERVICING OBJECT REQUESTS WITHIN A STORAGE CONTROLLER	Expired	PCT/US07/086687	12/6/2007		
PCT	ASMF REDUNDANT WRITE CACHING	Abandoned	PCT/US11/46005	7/29/2011	WO 2012/016209	2/2/2012
PCT	ASMF AN IN-SERVER STORAGE AREA NETWORK	Expired	PCT/US2007/086690	12/6/2007	WO2008070802	10/9/2008
PCT	Module Pairings - abbrev title	Expired	PCTUS2007025054	12/6/2007	WO2008070175	6/12/2008
PCT	ASMF A RECONFIGURABLE BASEBOARD MANAGEMENT CONTROLLER APPARATUS, SYSTEM, AND METHOD FOR MANAGING DATA USING A DATA PIPELINE	Expired	PCTUS2007086683	12/6/2007	WO2008070796	6/12/2008
PCT	APPARATUS, SYSTEM, AND METHOD FOR DATA STORAGE USING PROGRESSIVE RAID Composite Backplane - Abbrev title	Expired	PCTUS2007086702	12/6/2007	WO2008070812	6/12/2008
PCT	ASMF A SHARED, FRONT-END, DISTRIBUTED RAID Module Pairings - abbrev title	Expired	PCTUS2007086704	12/6/2007	WO2008070814	6/12/2008
PCT	APPARATUS, SYSTEM, AND METHOD FOR ENSURING DATA VALIDITY IN A DATA STORAGE PROCESS	Expired	PCTUS2009039572	4/4/2009	WO2009124304	10/8/2009
PCT	ASMF VALIDATING THAT A CORRECT DATA SEGMENT IS READ FROM A DATA STORAGE DEVICE	Expired	PCTUS2009039626	4/6/2009	WO2009126562	10/15/2009
PCT	ASMF CONVERTING A STORAGE REQUEST INTO AN APPEND DATA STORAGE COMMAND	Expired	PCTUS2009039673	4/6/2009	WO 2009126581	10/15/2009
PCT	REMOTE DIRECT MEMORY ACCESS TO A SOLID-STATE STORAGE DEVICE	Expired	US2007025048	12/6/2007	WO2008070172	12/6/2008
PCT	ASMF A DEVICE SHARED BETWEEN MULTIPLE INDEPENDENT HOSTS	Expired	US2007025050	12/6/2008	WO2008070174	12/6/2008

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	TRIM ASMF MANAGING DATA FROM A REQUESTING DEVICE WITH AN EMPTY DATA							
PCT	TOKEN DIRECTIVE TRIM ASMF MANAGING DATA IN A STORAGE DEVICE WITH AN EMPTY DATA	Expired	US2007086691	12/6/2007	WO2008070803	12/6/2008		
PCT	TOKEN DIRECTIVE ASMF A FRONT- END, DISTRIBUTED	Expired	US2007086701	12/6/2007	WO2008070811	12/6/2008		
PCT	RAID ASMF SOLID-STATE STORAGE AS CACHE FOR HIGH- CAPACITY, NON- VOLATILE STORAGE	Expired	US2007086703		WO2008070813	12/6/2008		
PCT	ASMF MANAGING COMMANDS OF SOLID-STATE STORAGE USING BANK INTERLEAVE	Expired	US200725049	12/6/2007	WO2008070173	12/6/2008		
PCT	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE; GC	Expired	US200786686	12/6/2007	WO2008070798	12/6/2008		
PCT	ASMF STORAGE SPACE RECOVERY IN SOLID-STATE STORAGE; GC	Expired	US200786688	12/6/2007	WO2008070800	12/6/2008		
PCT	ASMF COORDINATING STORAGE REQUESTS IN A MULTI- PROCESSOR/MULTI- THREAD	Expired	US2009039570	4/4/2009	WO2009126542			
PCT	ENVIRONMENT ASMF data block usage information synchronization for a non-volatile storage volume	Expired	US2009039618	4/6/2009	WO2009126557	10/15/2009		
PCT	ASMF CACHING DATA ON A SOLID- STATE STORAGE DEVICE	Expired	US2011025885	2/23/2011	WO2011106394	9/1/2011		
EP	ASM for Allocating Storage	Pending	10816043.3	9/8/2010	2476055	7/18/2012		
EP	ASMF CACHING DATA ON A SOLID- STATE STORAGE DEVICE	Pending	10816110	9/9/2010	2476079			
US	ASM for Allocating Storage	Issued	12877971	9/8/2010	2.01E+10	3/17/2011	8719501	5/6/2014
US	ASMF A VIRTUAL STORAGE LAYER / DirectFS	Issued	12879004	9/9/2010	2.01E+10	3/10/2011	8578127	11/5/2013
US	ASMF CONDITIONAL AND ATOMIC STORAGE OPERATIONS	Office Action	12986117	1/6/2011	2.01E+10	1/12/2012		
US	Atomic Writes	Issued	13107820	5/13/2011	2.01E+10	12/1/2011	8601222	12/3/2013
US	ASMF CACHING	Pending	13193559	7/28/2011	2.01E+10	2/2/2012		
US		Issued	13209007	8/12/2011	US-2012-	8/16/2012	8489817	7/16/2013

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	DATA				0210041			
US	Atomic Writes II NON-VOLATILE	Issued	13335922	12/22/2011	2.01E+10	6/27/2013	8725934	5/13/2014
US	CACHE	Issued	13931897	6/29/2013	US-2013- 0297880	11/7/2013	8756375	6/17/2014
US	ASM for Allocating Storage	Pending	14072697	11/5/2013		9/9/2009		
US	ASMF A VIRTUAL STORAGE LAYER / - Atomic Write - DIV ASMF	Pending	14087297	11/22/2013	US-2014- 0189216-A1	7/3/2014		
US	CONDITIONAL AND ATOMIC STORAGE OPERATIONS	Pending	14094121	12/2/2013	2014-0101376	4/10/2014		
US	ASMF CACHING DATA ON A SOLID- STATE STORAGE	Expired	61240573	9/8/2009				
US	DEVICE	Expired	61240966	9/9/2009				
US	ASM for Allocating Storage	Expired	61240966	9/9/2009				
US	file system for virtualized solid- state storage	Expired	61292555	1/6/2010				
US	ASMF							
US	CONDITIONAL AND ATOMIC STORAGE OPERATIONS	Expired	61334532	5/13/2010				
US	Atomic Writes	Expired	61368564	7/28/2010				
US	ASMF CACHING	Expired	61373271	8/12/2010				
US	DATA	Expired	61382816	9/14/2010				
US	Atomic Writes	Expired	61579627	12/22/2011				
JP	Atomic Writes II ASM for Allocating Storage	Pending	2012528912	9/9/2010				
JP	ASMF CACHING DATA ON A SOLID- STATE STORAGE							
CN	DEVICE	Pending	201080050301.5	9/8/2010	1.03E+08	9/26/2012		
CN	ASM for a Device Shared Between Multiple							
CN	Independent Hosts	Pending	201080050430.4	9/9/2010				
CN	ASMF CACHING DATA ON A SOLID- STATE STORAGE							
KR	DEVICE	Pending	1020127006053.0	9/8/2010				
KR	ASM for Allocating Storage	Pending	1020127009023.0	9/9/2010	1.02E+12	3/13/2013		
KR	ASMF CACHING DATA ON A SOLID- STATE STORAGE							
JP	DEVICE	Pending	10-2012-7006053	9/8/2010				
PCT	Allocation/thin provisioning	Expired	PCT/US10/048325	9/9/2010				
PCT	ASMF							
PCT	CONDITIONAL AND ATOMIC STORAGE OPERATIONS	Abandoned	PCT/US11/036539	5/13/2011	WO20110143628	11/17/2011		
PCT	Atomic Writes	Expired	PCT/US11/45801	7/28/2011	WO2012/016089			
PCT	ASMF CACHING				WO			
PCT	DATA	Abandoned	US11/47659	8/12/2011	2012/021847	2/16/2012		
PCT	ASMF CACHING DATA ON A SOLID- STATE STORAGE							
PCT	DEVICE	Expired	US2010048174	9/8/2010	WO2011031796	3/17/2011		

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US	ASMF RECONFIGURING AN ARRAY TO OPERATE WITH LESS STORAGE ELEMENTS	Issued	12468040	5/18/2009	US 2010- 0293439 A1	11/18/2010	8307258	11/6/2012
US	ASMF RECONFIGURING AN ARRAY TO OPERATE WITH LESS STORAGE ELEMENTS	Issued	13645353	10/4/2012	US 2013- 0036327	2/7/2013	8495460	7/23/2013
US	ASMF RECONFIGURING AN ARRAY OF STORAGE ELEMENTS	Issued	13907479	5/31/2013	2.01E+10	4/3/2014	8738991	5/27/2014
US	ASMF RECONFIGURING AN ARRAY OF STORAGE ELEMENTS	Pending	14286712	5/23/2014				
PCT	ASMF RECONFIGURING AN ARRAY TO OPERATE WITH LESS STORAGE ELEMENTS	Expired	PCTUS1035318	5/18/2010	WO2010135368	11/25/2010		
US	ASM TO INCREASE DATA INTEGRITY IN A REDUNDANT STORAGE SYSTEM - parity substitution APPARATUS, SYSTEM, AND METHOD TO INCREASE DATA INTEGRITY IN A REDUNDANT	Issued	12468041	5/18/2009	US 2010- 0293440 A1	11/18/2010	8281227	10/2/2012
US	STORAGE SYSTEM ASM TO INCREASE DATA INTEGRITY IN A REDUNDANT	Allowed Issue fee paid	13321484	11/18/2011	US20120131413	5/24/2010		
PCT	STORAGE SYSTEM APPARATUS, SYSTEM, AND METHOD FOR MANAGING OUT- OF-SERVICE	Expired	PCTUS2010035320	5/18/2010				
US	CONDITIONS, adaptive APPARATUS, SYSTEM, AND METHOD FOR MANAGING OUT- OF-SERVICE	Office Action	13354215	1/19/2012	2.01E+10	1/17/2013		
US	CONDITIONS APPARATUS, SYSTEM, AND METHOD FOR MANAGING OUT- OF-SERVICE	Expired	61434362	1/19/2011				
PCT	CONDITIONS Persistent TRIM,	Abandoned	US201221914	1/19/2012	WO2012100087	7/26/2012		
US	PTRIM, exists	Abandoned	13330554	12/19/2011	2.01E+10	9/20/2012		
US	Persistent TRIM - exists	Pending	14045605	10/3/2013				
US	Persistent TRIM	Expired	61424585	12/17/2010				

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US	Persistent TRIM	Expired	61425167	12/20/2010				
PCT	Persistent TRIM Systems and Methods for Managing file deduplication - FLD	Abandoned	US201165927	12/19/2011	2.01E+09	6/21/2012		
US	IOVDI	Pending	13750904	1/25/2013	2013-0198459	8/1/2013		
US	Systems and Methods for Managing file deduplication - FLD	Pending	14245893	4/4/2014				
US	IOVDI	Expired	61591822	1/27/2012				
US	Systems and Methods for Managing I/O operations - CFS	Expired	61946708	2/28/2014				
US	Managing I/O operations - CFS	Allowed	13028149	2/15/2011	2.01E+10	8/16/2012		
PCT	Managing Input/Output Operations-VLUN	Expired	US201225295	2/15/2012	WO2012112710	8/23/2012		
US	Managing Input/Output Operations- VLUN	Pending	13192365	7/27/2011	2.01E+10	11/29/2012		
US	Managing Input/Output Operations-VLUN	Expired	61489230	5/23/2011				
PCT	Managing Input/Output Operations-VLUN	Abandoned	US201239189	5/23/2012	WO2012162420	11/29/2012		
US	Persistent TRIM II APPARATUS, SYSTEM, AND METHOD FOR DETECTING AND REPLACING FAILED DATA STORAGE	Abandoned	61625585	4/17/2012				
DE	ASMFS DETECTING AND REPLACING FAILED DATA	Issued	9747781.4	12/16/2010			2297742	7/24/2013
EP	STORAGE APPARATUS, SYSTEM, AND METHOD TO INCREASE DATA INTEGRITY IN A REDUNDANT STORAGE SYSTEM	Expired	9747781.4	12/16/2010	2297742	2/23/2011	2297742	7/24/2013
FR	APPARATUS, SYSTEM, AND METHOD FOR DETECTING AND REPLACING FAILED DATA STORAGE	Issued	9747781.4	12/16/2010			2297742	7/24/2013
GB	ASMFS DETECTING AND REPLACING FAILED DATA	Issued	9747781.4	12/16/2010			2297742	7/24/2013
HK	STORAGE - FLASHBACK ASMFS DETECTING AND REPLACING FAILED DATA	Abandoned	12100295.8	1/11/2012	1160289A	8/10/2012		
US	STORAGE	Issued	12467914	5/18/2009	US 2009- 0287956 A1	11/19/2009	8195978	6/5/2012
US	STORAGE	Issued	13466845	5/8/2012	US-2012- 0221924	8/30/2012	8412978	4/2/2013

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REEL: 033389 FRAME: 0532

US	ASMF DETECTING AND REPLACING FAILED DATA STORAGE - FLASHBACK	Expired	61054055	5/16/2008				
JP	ASMF DETECTING AND REPLACING FAILED DATA STORAGE	Issued	2011509798	11/16/2010	2011-521397	7/21/2011	5220185	3/15/2013
CN	ASMF DETECTING AND REPLACING FAILED DATA STORAGE	Abandoned	200980128013.4	1/17/2011	CN 102124527 A	7/13/2011		
KR	ASMF DETECTING AND REPLACING FAILED DATA STORAGE	Abandoned	1020107028363.0	12/16/2010	1.02E+12	5/13/2011		
PCT	ASMF DETECTING AND REPLACING FAILED DATA STORAGE Apparatus, System and Method for Determining a Configuration Parameter for Solid- State Storage	Expired	PCTUS2009044414	5/18/2009	WO 2009/140700	11/19/2009		
EP	Media ASMF USING MLC SOLID-STATE STORAGE AS SLC SOLID-STATE	Office Action	12176826.1	7/18/2012	2549482A	1/23/2013		
US	STORAGE SMLC ASMF DETERMINING A READ VOLTAGE THRESHOLD FOR SOLID-STATE STORAGE MEDIA	Issued	12724401	3/15/2010	US 2010- 0235715 A1	9/16/2010	8261158	9/4/2012
US	whiten ASMF USING MLC SOLID-STATE STORAGE AS SLC SOLID-STATE	Issued	13015458	1/27/2011	US 2011- 0182119 A1	7/28/2011	8315092	11/20/2012
US	STORAGE ASMF PROACTIVE VOLTAGE THRESHOLD FOR SOLID-STATE STORAGE MEDIA	Issued	13175637	7/1/2011	US 2012- 0173827 A1	7/5/2012	8266503	9/11/2012
US	VTM open loop APPARATUS, SYSTEM, AND METHOD FOR USING MULTI-LEVEL CELL SOLID-STATE STORAGE AS SINGLE-LEVEL CELL SOLID-STATE	Issued	13189402	7/22/2011	US-2012- 0203951	8/9/2012	8380915	2/19/2013
US	STORAGE APPARATUS, SYSTEM, AND METHOD FOR USING MULTI-LEVEL CELL SOLID-STATE STORAGE AS REDUCED-LEVEL CELL SOLID-STATE	Issued	13531240	6/22/2012			8443259	5/14/2013
US	STORAGE	Issued	13609527	9/11/2012	US 2013- 0003457 A1	1/3/2013	8527841	9/3/2013

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US	ASMF DETERMINING A READ VOLTAGE THRESHOLD FOR SOLID-STATE STORAGE MEDIA REDUCED LEVEL CELL MODE FOR NON-VOLATILE MEMORY	Issued	13719045	12/18/2012	US-2013- 0132652	5/23/2013	8661184	2/25/2014
US	CONFIGURING STORAGE CELLS	Pending	14016203	9/2/2013	US-2014- 0059406	2/27/2014		
US	MANAGING NON- VOLATILE MEDIA	Allowed	14067323	10/30/2013	US-2014- 0056068	2/27/2014		
US	ASMF USING MLC SOLID-STATE STORAGE AS SLC SOLID-STATE STORAGE SMLC	Allowed	14106566	12/13/2013	US-2014- 0108891	4/17/2014		
US	ASMF DETERMINING A READ VOLTAGE THRESHOLD FOR SOLID-STATE STORAGE MEDIA	Expired	61160258	3/13/2009				
US	ASMF DETERMINING A READ VOLTAGE THRESHOLD FOR SOLID-STATE STORAGE MEDIA	Expired	61298861	1/27/2010				
US	Apparatus, System, and Method for Determining a Configuration Parameter for Solid- State Storage Media	Expired	61305205	2/17/2010				
CN	Apparatus, System and Method for Determining a Configuration Parameter for Solid- State Storage Media	Pending	201210252569.8	7/20/2012	102890621 A	1/23/2013		
KR	Apparatus, System and Method for Determining a Configuration Parameter for Solid- State Storage Media	Office Action	2012-0080003	7/23/2012	2013-12062	1/31/2013		
JP	Apparatus, System and Method for Determining a Configuration Parameter for Solid- State Storage Media	Office Action	2012-161748	7/20/2012	2013-025821	2/4/2013		
PCT	ASMF DETERMINING A READ VOLTAGE THRESHOLD FOR SOLID-STATE STORAGE MEDIA APPARATUS, SYSTEM, AND METHOD FOR MANAGING CONTENTS OF A CACHE	Expired	PCT/US11/22786	1/27/2011	WO 2011/094454	8/4/2011		
US	APPARATUS, SYSTEM, AND METHOD FOR MANAGING CONTENTS OF A	Office Action	13406287	2/27/2012	US-2012- 0221774	8/30/2012		
US	MANAGING CONTENTS OF A	Office Action	13776389	2/25/2013	US-2013- 0166831	6/27/2013		

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CACHE

US	APPARATUS, SYSTEM, AND METHOD FOR MANAGING CONTENTS OF A CACHE	Allowed Issue fee paid	13776406	2/25/2013	US-2013- 0166816	6/27/2013		
US	APPARATUS, SYSTEM, AND METHOD FOR MANAGING CONTENTS OF A CACHE	Expired	61446889	2/25/2011				
PCT	APPARATUS, SYSTEM, AND METHOD FOR MANAGING CONTENTS OF A CACHE	Abandoned	PCT/US12/26790	2/27/2012	WO 2012/116369	3/14/2013		
PCT	ASMF DESTAGING CACHED DATA	Abandoned	PCT/US12/22244	1/23/2012	WO2012/100257	10/4/2012		
US	APPARATUS, SYSTEM, AND METHOD FOR AN INTERFACE BETWEEN A MEMORY CONTROLLER AND A NON-VOLATILE MEMORY CONTROLLER USING A COMMAND PROTOCOL	Issued	13248006	9/28/2011	US 2012- 0079174 A1	3/29/2012	8688899	4/1/2014
US	A NON-VOLATILE MEMORY INTERFACE	Pending	14231437	3/31/2014				
US	Direct Attached VSL	Expired	61387400	9/28/2010				
PCT	Direct Attached VSL ASM FOR CONDITIONAL AND ATOMIC STORAGE OPERATIONS	Abandoned	PCT/US11/53792	9/28/2011	WO 2012/050934	4/19/2012		
EP	passing Atomics to backing stores through cache	Pending	11813216.6	1/30/2013				
US	ASM FOR CONDITIONAL AND ATOMIC STORAGE OPERATIONS	Pending	13837628	3/15/2013	2.01E+10	8/8/2013		
CN	Closed loop Groomer scheduling - GC	Pending	201180037001.8	1/28/2013				
US	Closed loop Groomer scheduling	Issued	13267811	10/6/2011	US 2013- 0024641	1/24/2013	8671249	3/11/2014
US	DirectCache	Expired	61510974	7/22/2011				
US	Eviction Algorithm Log-based Cache	Pending Office	13362959	1/31/2012				
US	Eviction Algorithm Log-based Cache	Action	13362973	1/31/2012	2.01E+10			
US	Eviction Algorithm DirectCache	Expired	61438182	1/31/2011				
US	Eviction Algorithm	Expired	61438194	1/31/2011				
PCT	Log-based Cache	Abandoned	PCT/US12/23373	1/31/2012	WO2012/106362	9/27/2012		

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	Eviction Algorithm							
	Input/Output (I/O)							
	Virtualization							
US	System	Issued	12751543	3/31/2010	2.01E+10	2/3/2011	8412860	4/2/2013
	Communicating							
	between Host							
	Computers and							
	Peripheral							
	Resources in an I/O							
	Virtualization							
US	System	Issued	12790920	5/31/2010	2.01E+10	3/3/2011	8521915	8/27/2013
	Assignment of							
	Resources in an I/O							
	Virtualization							
US	System	Issued	12790921	5/31/2010	2.01E+10	5/19/2011	8732349	5/20/2014
	Input/Output (I/O)							
	Virtualization							
US	System	Expired	61165772	4/1/2009				
	Communicating							
	between Host							
	Computers and							
	Peripheral							
	Resources in an I/O							
	Virtualization							
US	System	Expired	61234972	8/18/2009				
	Assignment of							
	Resources in an I/O							
	Virtualization							
US	System	Expired	61262416	11/18/2009				
	COMMUNICATING							
	BETWEEN HOST							
	COMPUTERS AND							
	PERIPHERAL							
	RESOURCES IN AN							
	INPUT/OUTPUT							
	(I/O)							
	VIRTUALIZATION							
CN	SYSTEM	Pending	2.0108E+11	4/18/2012				
	Input/Output (I/O)							
	Virtualization							
PCT	System	Expired	PCT/US10/29433	3/31/2010	WO2010114910	10/7/2010		
	COMMUNICATING							
	BETWEEN HOST							
	COMPUTERS AND							
	PERIPHERAL							
	RESOURCES IN AN							
	INPUT/OUTPUT							
	(I/O)							
	VIRTUALIZATION							
PCT	SYSTEM	Expired	PCT/US10/45730	8/17/2010	WO2011022375	2/24/2011		
	SYSTEMS AND							
	METHODS FOR A							
	FILE-LEVEL CACHE -							
US	FLK	Pending	13287998	11/2/2011	2.01E+10	8/16/2012		
	SYSTEMS AND							
	METHODS FOR A							
	MULTI-LEVEL							
US	CACHE - MLC	Pending	13288005	11/2/2011	2.01E+10	8/16/2012		
	Systems and							
	Methods for							
	Managing Data I/O							
US	operations - FLK	Expired	61521676	8/9/2011				
	Systems and							
	Methods for a File-							
PCT	Level Cache	Expired	2012050194	8/9/2012	2.01E+09	2/14/2013		
	Cache Admission							
US	Control	Issued	13349417	1/12/2012	2.01E+10		8782344	7/15/2014
US	Systems and	Pending	13774874	2/22/2013	2013/0185475	7/18/2013		

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	Methods for Cache Profiling Systems and Methods for Cooperative Cache Management					
US	Cache Admission Control	Pending	13774881	2/22/2013	2.01E+10	7/18/2013
PCT	fadvice team direct	Pending	PCT/US12/021094	1/12/2012	WO2013105960	7/18/2013
US	cache dc	Expired	61576980	12/16/2011		
US	Managing Multiple Sets of Metadata Systems, Methods, and Apparatus for a Virtual Machine	Pending	13840418	3/15/2013		
US	Cache, nic2nic, nic-to-nic	Pending	13541659	7/3/2012	2014/0012940	1/9/2014
US	Systems, Methods, and Apparatus for a Virtual Machine					
US	Cache, nic2nic, nic-to-nic	Pending	13687979	11/28/2012	2014/0013059	1/9/2014
US	Disk optimized Cache Warming - directcache	Pending	13829152	3/14/2013	2014-0101389	4/10/2014
US	DISK-OPTIMIZED WARMING OF A MEMORY CACHE	Expired	61711120	10/8/2012		
US	Systems, Methods and Interfaces for Vector					
US	Input/Output Operations	Pending	13725728	12/21/2012	2013-0166855	6/27/2013
US	Composite Vectored Atomic Storage Operations	Expired	61625475	4/17/2012		
US	Composite Vectored Atomic Storage Operations					
US	AW	Expired	61637155	4/23/2012		
US	Annotated Atomic Write	Pending	14230844	3/31/2014		
US	Annotated AWâ€™ writing atomic writes across N devices	Expired	61865565	8/13/2013		
US	SYSTEMS AND METHODS FOR STORAGE					
US	COMPRESSION	Pending	61943900	2/24/2014		
US	Systems, Methods, and Interfaces for Managing Persistent Data of Atomic Storage					
US	Operations	Pending	13539235	6/29/2012	2014/0006685	1/2/2014
US	SYSTEMS AND METHODS FOR STORAGE					
US	CONSISTENCY	Pending	14303419	6/12/2014		
US	SYSTEMS AND METHODS FOR STORAGE					
US	CONSISTENCY	Expired	61858812	7/26/2013		
US	Write Touch Counts	Pending	13832843	3/15/2013		
US	Atomic Write across logical/physical storage devices	Pending	14298791	6/6/2014		

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US	Atomic Write across logical/physical storage devices	Expired	61892962	10/18/2013
US	Atomics Via Clone/Merge Operations	Pending	14313933	6/24/2014
US	Atomics Via Clone/Merge Operations	Expired	61861314	8/1/2013
US	Systems and Methods for Cache Endurance (HEC)	Pending	14098281	12/5/2013
US	Systems and Methods for a High Endurance Cache	Expired	61733540	12/5/2012
US	Redo Log for CFS	Pending	13837210	3/15/2013
US	Dynamic Reservations	Pending	14333365	7/16/2014
US	Dynamic Reservations	Pending	61893024	10/18/2013
US	Systems and Methods for Storage Collision Management (Range Move/Key- Value)	Pending	61881861	9/24/2013
US	Log running on Log - interaction Virtual Log Defrager	Pending	14075951	11/8/2013
US	AutoCache	Pending	14332696	7/16/2014
US	AutoCache	Expired	62017128	6/25/2014

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