

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5331137

<b>SUBMISSION TYPE:</b>	CORRECTIVE ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	Corrective Assignment to correct the ADDRESS OF RECEIVING PARTY TO: 176 SOUTH STREET previously recorded on Reel 047903 Frame 0209. Assignor(s) hereby confirms the ADDRESS CHANGE.
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
HONGPO GAO	11/19/2018
JIAN GAO	11/20/2018
GENG HAN	11/19/2018
YOUSHENG LIU	11/19/2018
SHAOQIN GONG	11/19/2018
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	EMC IP HOLDING COMPANY LLC
<b>Street Address:</b>	176 SOUTH STREET
<b>City:</b>	HOPKINTON
<b>State/Country:</b>	MASSACHUSETTS
<b>Postal Code:</b>	01748
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	16199440
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(508)366-4688
<i>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.</i>	
<b>Phone:</b>	508-616-2900
<b>Email:</b>	Docket@BainwoodHuang.com
<b>Correspondent Name:</b>	BAINWOOD, HUANG & ASSOCIATES, LLC
<b>Address Line 1:</b>	2 CONNECTOR ROAD
<b>Address Line 4:</b>	WESTBOROUGH, MASSACHUSETTS 01581
<b>ATTORNEY DOCKET NUMBER:</b>	1003-639
<b>NAME OF SUBMITTER:</b>	DAVID E. HUANG, ESQ.
<b>SIGNATURE:</b>	/David E. Huang, Reg. No. 39,229/
<b>DATE SIGNED:</b>	01/17/2019
<b>Total Attachments: 16</b>	

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source=1003-639-Executed-Assignment-Inv1#page2.tif  
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source=1003-639-Original-Coversheet#page1.tif

**ASSIGNMENT**

**WHEREAS**, I, Hongpo Gao, as the original inventor or an original joint inventor have invented an invention comprising and/or embodying certain improvements or discoveries or both as described in an application for Letters Patent of the United States entitled

**METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING STORAGE SYSTEM**

which is further identified by Attorney Docket Number 1003-639;

**WHEREAS**, EMC IP Holding Company LLC (hereinafter "ASSIGNEE"), a limited liability company organized and existing under the laws of the state of Delaware and having a usual place of business at 176 South Street, Hopkinton, MA, 01748, USA, desires to acquire an interest therein in accordance with agreements duly entered into with me;

**NOW, THEREFORE**, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, I have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns and legal representatives, the entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to said invention as described in said application, together with the entire right, title and interest in and to said application and such Letters Patent as may issue thereon; said invention, application and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by me had this assignment and sale not been made; I hereby convey to ASSIGNEE all rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. I hereby acknowledge that this assignment, being of the entire right, title and interest in and to said invention, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all such Letters Patent to ASSIGNEE for its own name as assignee of the entire right, title and interest therein;

**AND**, I hereby further agree for myself and my executors and administrators to execute upon request any other lawful documents and likewise to perform any other

lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns and legal representatives, but at its or their expense and charges, including the execution of applications for patents in foreign countries, and the execution of substitution, reissue, divisional or continuation applications and preliminary or other statements and the giving of testimony in any interference or other proceeding in which said invention or any application or patent directed thereto may be involved;

**AND**, I do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives;

**AND** I hereby authorize the attorneys at Bainwood Huang & Associates LLC to insert here in parentheses

( 16/199,440 , filed 11/26/2018 )

the application number and filing date of said application (or foreign counterpart application) to facilitate the recording or other official processing of this Assignment.

Date: 2018.11.19

Hongpo Gao  
Inventor's Signature

Legal name of inventor: Hongpo Gao  
Residence: 1-5-301, GuoFengMeiTang  
Changping District  
Beijing, 102208  
China (People's Republic)  
Mailing Address: Same as Above  
Citizenship: CN

I Xiongcheng Li (name) whose residential address is  
7/E Block D, Tsinghua Science Park, Hai'Dian, Beijing PRC  
was personally present and did see Hongpo Gao (name of person signing the  
assignment) who is personally known to me, execute the above assignment.

Xiongcheng Li (signature of first witness)  
Signed at 7/E, Block D, Tsinghua Science Park, Hai'Dian, Beijing PRC (location of witness signature)  
on this day 11/21 of 20 18. (date of signature)

I Chun Ma (name) whose residential address is  
77, Block D, Tsinghua Science Park, Haidian District, Beijing  
was personally present and did see Hongpo Gao (name of person signing the  
assignment) who is personally known to me, execute the above assignment.

Chun Ma (signature of second witness)  
Signed at 77, Block D, Tsinghua Science Park, Haidian District, Beijing (location of witness signature)  
on this day 11/22 of 20 18. (date of signature)

**ASSIGNMENT**

**WHEREAS**, I, Jian Gao, as the original inventor or an original joint inventor have invented an invention comprising and/or embodying certain improvements or discoveries or both as described in an application for Letters Patent of the United States entitled

**METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING STORAGE SYSTEM**

which is further identified by Attorney Docket Number 1003-639;

**WHEREAS**, EMC IP Holding Company LLC (hereinafter "ASSIGNEE"), a limited liability company organized and existing under the laws of the state of Delaware and having a usual place of business at 176 South Street, Hopkinton, MA, 01748, USA, desires to acquire an interest therein in accordance with agreements duly entered into with me;

**NOW, THEREFORE**, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, I have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns and legal representatives, the entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to said invention as described in said application, together with the entire right, title and interest in and to said application and such Letters Patent as may issue thereon; said invention, application and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by me had this assignment and sale not been made; I hereby convey to ASSIGNEE all rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. I hereby acknowledge that this assignment, being of the entire right, title and interest in and to said invention, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all such Letters Patent to ASSIGNEE for its own name as assignee of the entire right, title and interest therein;

**AND**, I hereby further agree for myself and my executors and administrators to execute upon request any other lawful documents and likewise to perform any other

lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns and legal representatives, but at its or their expense and charges, including the execution of applications for patents in foreign countries, and the execution of substitution, reissue, divisional or continuation applications and preliminary or other statements and the giving of testimony in any interference or other proceeding in which said invention or any application or patent directed thereto may be involved;

**AND**, I do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives;

**AND** I hereby authorize the attorneys at Bainwood Huang & Associates LLC to insert here in parentheses

( 16/199,440 , filed 11/26/2018 )

the application number and filing date of said application (or foreign counterpart application) to facilitate the recording or other official processing of this Assignment.

Date: 2018, 11, 20

[Handwritten Signature]  
Inventor's Signature

Legal name of inventor: Jian Gao  
Residence: 3-1-705, Lianhuahe Bei Street 11  
Xicheng District  
Beijing, 100000  
China (People's Republic)  
Mailing Address: Same as Above  
Citizenship: CN

I Xiongcheng Li (name) whose residential address is  
7/F, Block D, Tsinghua Science Park, Haidian, Beijing PRC  
was personally present and did see Jian Gao (name of person signing the assignment)  
who is personally known to me, execute the above assignment.

Xiongcheng Li (signature of first witness)

Signed at 7/F, Block D, Tsinghua Science Park, Haidian, Beijing PRC (location of witness signature)

on this day 11/21 of 2018. (date of signature)

I Chuan Ma (name) whose residential address is  
77, Block D, Tsinghua Science Park, Haidian District, Beijing  
was personally present and did see Jian Gao (name of person signing the assignment)  
who is personally known to me, execute the above assignment.

Chuan Ma (signature of second witness)

Signed at 77, Block D, Tsinghua Science Park, Haidian District, Beijing (location of witness signature)

on this day 11/22 of 2018. (date of signature)



**ASSIGNMENT**

**WHEREAS**, I, Geng Han, as the original inventor or an original joint inventor have invented an invention comprising and/or embodying certain improvements or discoveries or both as described in an application for Letters Patent of the United States entitled

**METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING STORAGE SYSTEM**

which is further identified by Attorney Docket Number 1003-639;

**WHEREAS**, EMC IP Holding Company LLC (hereinafter "ASSIGNEE"), a limited liability company organized and existing under the laws of the state of Delaware and having a usual place of business at 176 South Street, Hopkinton, MA, 01748, USA, desires to acquire an interest therein in accordance with agreements duly entered into with me;

**NOW, THEREFORE**, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, I have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns and legal representatives, the entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to said invention as described in said application, together with the entire right, title and interest in and to said application and such Letters Patent as may issue thereon; said invention, application and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by me had this assignment and sale not been made; I hereby convey to ASSIGNEE all rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. I hereby acknowledge that this assignment, being of the entire right, title and interest in and to said invention, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all such Letters Patent to ASSIGNEE for its own name as assignee of the entire right, title and interest therein;

**AND**, I hereby further agree for myself and my executors and administrators to execute upon request any other lawful documents and likewise to perform any other

lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns and legal representatives, but at its or their expense and charges, including the execution of applications for patents in foreign countries, and the execution of substitution, reissue, divisional or continuation applications and preliminary or other statements and the giving of testimony in any interference or other proceeding in which said invention or any application or patent directed thereto may be involved;

**AND**, I do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives;

**AND** I hereby authorize the attorneys at Bainwood Huang & Associates LLC to insert here in parentheses

( 16/199,440 , filed 11/26/2018 )

the application number and filing date of said application (or foreign counterpart application) to facilitate the recording or other official processing of this Assignment.

Date: 2018.11.19

Geng Han

Inventor's Signature

Legal name of inventor: Geng Han  
Residence: 1-601, Building 2, Zone 1, ShangDiDongLi  
Haidian District  
Beijing, 10010  
China (People's Republic)  
Mailing Address: Same as Above  
Citizenship: CN

I Xiongcheng Li (name) whose residential address is  
7/F, Block D, Tsinghua Science Park, Haidian, Beijing PRC  
was personally present and did see Geng Han (name of person signing the  
assignment) who is personally known to me, execute the above assignment.

Xiongcheng Li (signature of first witness)

Signed at 7/F, Block D, Tsinghua Science Park, Haidian, Beijing PRC (location of witness signature)

on this day 11/21 of 2018. (date of signature)

I Chuan Ma (name) whose residential address is  
77, Block D, Tsinghua Science Park, Haidian District, Beijing  
was personally present and did see Geng Han (name of person signing the  
assignment) who is personally known to me, execute the above assignment.

Chuan Ma (signature of second witness)

Signed at 77, Block D, Tsinghua Science Park, Haidian District, Beijing (location of witness signature)

on this day 11/22 of 2018. (date of signature)

**ASSIGNMENT**

**WHEREAS**, I, Yousheng Liu, as the original inventor or an original joint inventor have invented an invention comprising and/or embodying certain improvements or discoveries or both as described in an application for Letters Patent of the United States entitled

**METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING STORAGE SYSTEM**

which is further identified by Attorney Docket Number 1003-639;

**WHEREAS**, EMC IP Holding Company LLC (hereinafter "ASSIGNEE"), a limited liability company organized and existing under the laws of the state of Delaware and having a usual place of business at 176 South Street, Hopkinton, MA, 01748, USA, desires to acquire an interest therein in accordance with agreements duly entered into with me;

**NOW, THEREFORE**, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, I have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns and legal representatives, the entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to said invention as described in said application, together with the entire right, title and interest in and to said application and such Letters Patent as may issue thereon; said invention, application and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by me had this assignment and sale not been made; I hereby convey to ASSIGNEE all rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. I hereby acknowledge that this assignment, being of the entire right, title and interest in and to said invention, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all such Letters Patent to ASSIGNEE for its own name as assignee of the entire right, title and interest therein;

**AND**, I hereby further agree for myself and my executors and administrators to execute upon request any other lawful documents and likewise to perform any other

lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns and legal representatives, but at its or their expense and charges, including the execution of applications for patents in foreign countries, and the execution of substitution, reissue, divisional or continuation applications and preliminary or other statements and the giving of testimony in any interference or other proceeding in which said invention or any application or patent directed thereto may be involved;

**AND**, I do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives;

**AND** I hereby authorize the attorneys at Bainwood Huang & Associates LLC to insert here in parentheses

( 16/199,440 , filed 11/26/2018 )

the application number and filing date of said application (or foreign counterpart application) to facilitate the recording or other official processing of this Assignment.

Date: 2018.11.19

Liu Yousheng  
Inventor's Signature

Legal name of inventor: Yousheng Liu  
Residence: Qiangyuan Road  
Daxing District  
Beijing, 102600  
China (People's Republic)  
Mailing Address: Same as Above  
Citizenship: CN

I Xiongcheng Li (name) whose residential address is  
7/F, Block D, Tsinghua Science Park, Haidian, Beijing PRC  
was personally present and did see Yousheng Liu (name of person signing the  
assignment) who is personally known to me, execute the above assignment.

Xiongcheng Li (signature of first witness)  
Signed at 7/F, Block D, Tsinghua Science Park, Haidian, Beijing PRC (location of witness signature)  
on this day 11/21 of 2018. (date of signature)

I Chuan Ma (name) whose residential address is  
77, Block D, Tsinghua Science Park, Haidian District, Beijing  
was personally present and did see Yousheng Liu (name of person signing the  
assignment) who is personally known to me, execute the above assignment.

Chuan Ma (signature of second witness)  
Signed at 77, Block D, Tsinghua Science Park, Haidian District, Beijing (location of witness signature)  
on this day 11/22 of 2018. (date of signature)

**ASSIGNMENT**

**WHEREAS**, I, Shaoqin Gong, as the original inventor or an original joint inventor have invented an invention comprising and/or embodying certain improvements or discoveries or both as described in an application for Letters Patent of the United States entitled

**METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING STORAGE SYSTEM**

which is further identified by Attorney Docket Number 1003-639;

**WHEREAS**, EMC IP Holding Company LLC (hereinafter "ASSIGNEE"), a limited liability company organized and existing under the laws of the state of Delaware and having a usual place of business at 176 South Street, Hopkinton, MA, 01748, USA, desires to acquire an interest therein in accordance with agreements duly entered into with me;

**NOW, THEREFORE**, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, I have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns and legal representatives, the entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to said invention as described in said application, together with the entire right, title and interest in and to said application and such Letters Patent as may issue thereon; said invention, application and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by me had this assignment and sale not been made; I hereby convey to ASSIGNEE all rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. I hereby acknowledge that this assignment, being of the entire right, title and interest in and to said invention, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all such Letters Patent to ASSIGNEE for its own name as assignee of the entire right, title and interest therein;

**AND**, I hereby further agree for myself and my executors and administrators to execute upon request any other lawful documents and likewise to perform any other

lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns and legal representatives, but at its or their expense and charges, including the execution of applications for patents in foreign countries, and the execution of substitution, reissue, divisional or continuation applications and preliminary or other statements and the giving of testimony in any interference or other proceeding in which said invention or any application or patent directed thereto may be involved;

**AND**, I do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives;

**AND** I hereby authorize the attorneys at Bainwood Huang & Associates LLC to insert here in parentheses

( 16/199,440 , filed 11/26/2018 )

the application number and filing date of said application (or foreign counterpart application) to facilitate the recording or other official processing of this Assignment.





## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5309425

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
HONGPO GAO	11/19/2018
JIAN GAO	11/20/2018
GENG HAN	11/19/2018
YOUSHENG LIU	11/19/2018
SHAOQIN GONG	11/19/2018
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	EMC IP HOLDING COMPANY LLC
<b>Street Address:</b>	176
<b>City:</b>	HOPKINTON
<b>State/Country:</b>	MASSACHUSETTS
<b>Postal Code:</b>	01748
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	16199440
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(508)366-4688
<i>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.</i>	
<b>Phone:</b>	508-616-2900
<b>Email:</b>	Docket@BainwoodHuang.com
<b>Correspondent Name:</b>	BAINWOOD, HUANG & ASSOCIATES, LLC
<b>Address Line 1:</b>	2 CONNECTOR ROAD
<b>Address Line 4:</b>	WESTBOROUGH, MASSACHUSETTS 01581
<b>ATTORNEY DOCKET NUMBER:</b>	1003-639
<b>NAME OF SUBMITTER:</b>	DAVID E. HUANG, ESQ.
<b>SIGNATURE:</b>	/David E. Huang, Reg. No. 39,229/
<b>DATE SIGNED:</b>	01/04/2019
<b>Total Attachments: 15</b>	
source=1003-639-Executed-Assignment-Inv1#page1.tif	