

## PATENT ASSIGNMENT

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SUBMISSION TYPE:	NEW ASSIGNMENT										
NATURE OF CONVEYANCE:	ASSIGNMENT										
CONVEYING PARTY DATA											
<table border="1"> <thead> <tr> <th>Name</th> <th>Execution Date</th> </tr> </thead> <tbody> <tr> <td>Haiyang Zhang</td> <td>05/07/2013</td> </tr> <tr> <td>Shishen Liu</td> <td>05/07/2013</td> </tr> <tr> <td>Lei Huang</td> <td>05/08/2013</td> </tr> <tr> <td>Lei Wang</td> <td>05/08/2013</td> </tr> </tbody> </table>		Name	Execution Date	Haiyang Zhang	05/07/2013	Shishen Liu	05/07/2013	Lei Huang	05/08/2013	Lei Wang	05/08/2013
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RECEIVING PARTY DATA											
<table border="1"> <tr> <td>Name:</td> <td>CA, Inc.</td> </tr> <tr> <td>Street Address:</td> <td>One CA Plaza</td> </tr> <tr> <td>City:</td> <td>Islandia</td> </tr> <tr> <td>State/Country:</td> <td>NEW YORK</td> </tr> <tr> <td>Postal Code:</td> <td>11749</td> </tr> </table>		Name:	CA, Inc.	Street Address:	One CA Plaza	City:	Islandia	State/Country:	NEW YORK	Postal Code:	11749
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PROPERTY NUMBERS Total: 1											
<table border="1"> <thead> <tr> <th>Property Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Application Number:</td> <td>13890060</td> </tr> </tbody> </table>		Property Type	Number	Application Number:	13890060						
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CORRESPONDENCE DATA											
Fax Number: <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i> Phone: 612-373-6900 Email: SLW@blackhillsip.com Correspondent Name: Schwegman Lundberg & Woessner / CA, Inc. Address Line 1: P.O.Box 2938 Address Line 4: Minneapolis, MINNESOTA 55402											
ATTORNEY DOCKET NUMBER:	2586.091US1										
NAME OF SUBMITTER:	Chris Bartl										
Signature:	/Chris Bartl/										

Date:

05/08/2013

**Total Attachments: 6**

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### ASSIGNMENT

WHEREAS, Haiyang Zhang, Shishen Liu, Lei Huang and Lei Wang (hereinafter the "Undersigned") have made one or more inventions and other subject matter (hereinafter collectively referred to as the "Invention") which are described in a patent application filed on May 8, 2013, which application was assigned US patent application serial number 13/890,060, and which is titled PHYSICAL REPLICA UTILIZING REPLICA VIRTUAL STORAGE FOR COMPUTER SYSTEM.

FOR GOOD AND VALUABLE CONSIDERATION, the receipt, sufficiency, and adequacy of which are hereby acknowledged by the Undersigned, the Undersigned do hereby irrevocably and unconditionally:

CONVEY, ASSIGN, AND TRANSFER to CA, Inc. (the "Assignee"), a corporation of the State of Delaware, having a place of business at One CA Plaza, Islandia, NY 11749, the Undersigned's entire right, title, and interest for the United States and all foreign countries and jurisdictions in and to:

the Invention which is disclosed in the above-identified application or applications;

such application or applications, and all divisional, continuing (including continuation-in-part), substitute, renewal, reissue, and all other applications for a patent or patents which have been or shall be filed in the United States (including all provisional and non-provisional applications), and in all foreign countries and jurisdictions based in whole or in part on any of such Invention (including any application for a utility model or an innovation patent application);

all original and reissued patents which have been or shall be issued in the United States and all foreign countries and jurisdictions based in whole or in part on any of such Invention;

including the right to claim priority to the above-identified patent application or applications in relation to subject matter based in whole or in part on the above-identified patent application or applications and any of the foregoing including the right to file foreign applications under the provisions of any convention or treaty;

and including the right to all causes of action, remedies, and other enforcement rights related to the above-identified application or applications, including without limitation the right to sue for past, present, or future infringement, misappropriation, or violation of any and all rights related to the above-identified patent application or applications and any of the foregoing, including the right to obtain and collect damages for past, present, or future infringement;

AUTHORIZE AND REQUEST the issuing authority to issue any and all United States and foreign patents granted on such Invention to the Assignee;

AUTHORIZE AND REQUEST that any attorney associated with U.S. Patent and Trademark Office (USPTO) Customer No. 105104 may (directly or through his/her designee) delete, insert, or alter any information related to the above-identified patent application or applications or any of the foregoing, after execution of this Assignment;

WARRANT AND COVENANT that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been or shall be made to others by the Undersigned, and that the full right to convey the same as herein expressed is possessed by the Undersigned;

COVENANT, that when requested and without compensation, but at the expense of the Assignee, in order to carry out in good faith the intent and purpose of this Assignment, the Undersigned shall (1) execute all provisional, non-provisional, divisional, continuing (including continuation-in-part), substitute, renewal, reissue, and all other patent applications for the Invention; (2) execute all rightful oaths, declarations, assignments, powers of attorney and other papers for the Invention; (3) communicate to the Assignee all facts known to the Undersigned relating to the Invention and the history thereof; (4) cooperate with the Assignee in any interference, reexamination, reissue, opposition, dispute, or litigation involving any of the applications or patents for the Invention; and (5) take such further actions as the Assignee shall reasonably consider necessary or desirable for vesting title to such Invention in the Assignee, or for securing, maintaining and enforcing proper patent protection for the Invention;

COVENANT, that should any provision of this agreement be held unenforceable by an authority of competent jurisdiction, such a ruling shall not affect the validity and enforceability of the remaining provisions. To the extent that any such provision is found to be unenforceable, the Undersigned, when requested and without compensation shall act in good faith to substitute for such provision a new provision with content and purpose as close as possible to the provision deemed unenforceable.

THIS AGREEMENT IS TO BE BINDING on the heirs, assigns, representatives, and successors of the Undersigned, and is to extend to the benefit of the successors, assigns, and nominees of the Assignee.

AGREED as of the date of my signature below:

Assignment

Assignor: Haiyang Zhang et al.

Title: PHYSICAL REPLICAS UTILIZING REPLICA VIRTUAL STORAGE FOR COMPUTER SYSTEM

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Docket No: 2586 091 US1

Client Ref. No. 0820130011

Assignor:

(Signature): Zhang Haiyang 张海洋

Name: Haiyang Zhang

City/State: Beijing, China

Date: 2013/5/7

Assignment

Assignors: Hanyang Zhang et al.

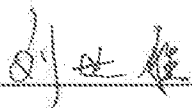
Title: PHYSICAL REPLICA UTILIZING REPLICA VIRTUAL STORAGE FOR COMPUTER SYSTEM

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Docket No. 2586 091US1

Client Ref. No. US20130911

Assignor:

(Signature): 

Name: Shishen Liu

City/State: Beijing, China

Date: 2013/5/7

Assignment

Assignors: Haiyang Zhang et al.

Title: PHYSICAL REPLICA UTILIZING REPLICA VIRTUAL STORAGE FOR COMPUTER SYSTEM

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Docket No. 2586-091US1

Client Ref. No. US20130911

Assignor:

(Signature):



Name: Lei Huang

City/State: Beijing, China

Date:

2013/5/8

Assignment

Assignors: Haiyang Zhang et al.

Title: PHYSICAL REPLICA UTILIZING REPLICA VIRTUAL STORAGE FOR COMPUTER SYSTEM

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Docket No: 2586.091US1

Client Ref. No. US20130011

Assignor:

(Signature):

Name: Lei Wang

City/State: Beijing, China

Date:

2/3/5/9