505222678 12/06/2018

PATENT ASSIGNMENT COVER SHEET

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 SUBMISSION TYPE:
 NEW ASSIGNMENT

 NATURE OF CONVEYANCE:
 ASSIGNMENT

CONVEYING PARTY DATA

| Name | Execution Date |
|------------------|----------------|
| RADIA J. PERLMAN | 12/05/2018 |
| CHARLES KAUFMAN | 12/05/2018 |
| XUAN TANG | 12/06/2018 |

RECEIVING PARTY DATA

| Name: | EMC IP HOLDING COMPANY LLC | |
|----------------------------------|----------------------------|--|
| Street Address: 176 SOUTH STREET | | |
| City: | HOPKINTON | |
| State/Country: | MASSACHUSETTS | |
| Postal Code: | 01748 | |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 16208790 |

CORRESPONDENCE DATA

Fax Number: (631)393-6271

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: 112642.01

NAME OF SUBMITTER: JOSEPH B. RYAN

SIGNATURE: /joseph b. ryan/

DATE SIGNED: 12/06/2018

Total Attachments: 5

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PATENT 505222678 REEL: 047691 FRAME: 0648

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> PATENT REEL: 047691 FRAME: 0649

ASSIGNMENT

WHEREAS, we, Radia J. Perlman, Charles Kaufman and Xuan Tang, 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 CLIENT-SIDE ENCRYPTION SUPPORTING DEDUPLICATION ACROSS SINGLE OR MULTIPLE TENANTS IN A STORAGE SYSTEM the specification of which:

| [X] | States Patent Office; | en date nerewith and is about to be filed in the United |
|-----|------------------------|---|
| [] | was filed on | as U.S. Application No; |
| [] | was patented under U.S | S. Patent No on |

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, Massachusetts 01748 desires to acquire an interest therein in accordance with agreements duly entered into with us;

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, we 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 us had this assignment and sale not been made; we 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. We 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, we hereby further agree for ourselves and our 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, we 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.

IN TESTIMONY WHEREOF, we have hereunto set our hands and affixed our seals as set forth below:

| Date: /2/5/2019 | | |
|---|--|--|
| | Inventor's Signature | |
| Print full name of first inventor: | Radia J. Perlman | |
| Residence: | Redmond, Washington | |
| Citizenship: | United States of America | |
| Mailing Address: | 2872 West Lake Sammamish Parkway NE | |
| A | Redmond, Washington 98052 | |
| 1 Carol Kuhn | (name) whose residential address is | |
| was personally present and did see Radia J. Perlman (name of person signing the assignment) who is personally known to me, execute the above assignment. (signature of first witness) Signed at Ramond (A (location of witness signature) on this day 44 m/24 57 of 20/8 (date of signature) | | |
| 1 | (name) whose residential address is | |
| was personally present and did see Radia who is personally known to me, execute t | J. Perlman (name of person signing the assignment) | |
| | _ (signature of second witness) | |
| Signed at Rosello , 67 | (location of witness signature) | |
| on this day TACIASAN 579 | of 70/ 🛠 (date of vionature) | |

| Date: 12/5/2018 | Cally V. Parkma |
|--|--|
| | Inventor's Signature |
| Print full name of second inventor: | Charles Kaufman |
| Residence: | Redmond, Washington |
| Citizenship: | United States of America |
| Mailing Address: | 2872 West Lake Sammamish Parkway NE |
| | Redmond, Washington 98052 |
| 1 John Kuth | (name) whose residential address is |
| ZELE OS CARLO SALARA | man for the england, and |
| who is personally known to me, executi | ries Kaufman (name of person signing the assignment) the above assignment. (signature of first witness) |
| Signed at 1200000 (2011) | (location of witness signature) of 207 や(date of signature) |
| | (name) whose residential address is |
| was personally present and did see Chawho personally known to me, executi | SAPASA NE RANGO (VA ries Kaufman (name of person signing the assignment) the above assignment. (signature of second witness) |
| Manage Control of the | A (location of witness signature) |
| on this day December 5th | of 20/8" (date of signature) |

| Date: /2/6/2018 | | |
|---|-------------------------------------|--|
| | Inventor's Signature | |
| Print full name of third inventor: | Xuan Tang | |
| Residence: | Hopkinton, Massachusetts | |
| Citizenship: | United States of America | |
| Mailing Address: | 6 Prestwick Drive | |
| | Hopkinton, Massachusetts 01748 | |
| 1 Marion Meltlago | (name) whose residential address is | |
| 27 Haccas Daire Milville MA OLST 9 was personally present and did see Xuan Tang (name of person signing the assignment) who is personally known to me, execute the above assignment. (signature of first witness) | | |
| Signed at <u>778 South St. How MA</u> (location of witness signature) on this day <u>Dec. G.</u> of 2018. (date of signature) | | |
| On this day <u>the tall</u> | or 20118. (date or signature) | |
| | • | |
| 1 KEVIN BARRETT | (name) whose residential address is | |
| ## Control of the Control of | | |
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