

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5986246

<b>SUBMISSION TYPE:</b>	CORRECTIVE ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	Corrective Assignment to correct the APPLICATION NUMBER OF APPLICATION previously recorded on Reel 046284 Frame 0107. Assignor(s) hereby confirms the CORRECT APPLICATION NUMBER IS 16/022,267.
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
GAGAN CHOUDHURY	06/11/2018
KATHLEEN MEIER-HELLSTERN	06/11/2018
ALVIN GODDARD	06/11/2018
NARAYAN PADI	06/11/2018
SIMON TSE	06/11/2018
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	AT&T INTELLECTUAL PROPERTY I, L.P.
<b>Street Address:</b>	754 PEACHTREE STREET
<b>Internal Address:</b>	SUITE 7C
<b>City:</b>	ATLANTA
<b>State/Country:</b>	GEORGIA
<b>Postal Code:</b>	30308
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	16022267
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(215)568-3439
<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>	2155683100
<b>Email:</b>	assignments@bakerlaw.com
<b>Correspondent Name:</b>	BAKER HOSTETLER LLP
<b>Address Line 1:</b>	2929 ARCH STREET
<b>Address Line 2:</b>	CIRA CENTER, 12TH FLOOR
<b>Address Line 4:</b>	PHILADELPHIA, PENNSYLVANIA 19104
<b>ATTORNEY DOCKET NUMBER:</b>	2017-1511/101900.002156
<b>NAME OF SUBMITTER:</b>	MARYANN DEVINE
<b>SIGNATURE:</b>	/MARYANN DEVINE/

PATENT

DATE SIGNED:	02/27/2020
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**Total Attachments: 14**

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## UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND  
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

JULY 9, 2018

PTAS

BAKER HOSTETTLER LLP  
2929 ARCH STREET  
CIRA CENTRE, 12TH FLOOR  
PHILADELPHIA, PA 19104

**504992785**

### UNITED STATES PATENT AND TRADEMARK OFFICE NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT RECORDATION BRANCH OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE ASSIGNMENT RECORDATION BRANCH AT 571-272-3350. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT RECORDATION BRANCH, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 07/06/2018

REEL/FRAME: 046284/0107  
NUMBER OF PAGES: 12

BRIEF: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

DOCKET NUMBER: 2017-1511/101900.002156

ASSIGNOR:

CHOUDHURY, GAGAN

DOC DATE: 06/11/2018

ASSIGNOR:

MEIER-HELLSTERN, KATHLEEN

DOC DATE: 06/11/2018

ASSIGNOR:

GODDARD, ALVIN

DOC DATE: 06/11/2018

ASSIGNOR:

PADI, NARAYAN

DOC DATE: 06/11/2018

ASSIGNOR:

TSE, SIMON

DOC DATE: 06/11/2018

ASSIGNEE:

AT&T INTELLECTUAL PROPERTY I, L.P.  
675 WEST PEACHTREE STREET, NW  
ATLANTA, GEORGIA 30308

APPLICATION NUMBER: 16022276  
PATENT NUMBER:  
TITLE: MEMORY COMMAND INTERLEAVING

FILING DATE:  
ISSUE DATE:

ASSIGNMENT RECORDATION BRANCH  
PUBLIC RECORDS DIVISION

**PATENT ASSIGNMENT COVER SHEET**

Electronic Version v1.1  
Stylesheet Version v1.2

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT												
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT												
<b>CONVEYING PARTY DATA</b>													
<table border="1"><thead><tr><th>Name</th><th>Execution Date</th></tr></thead><tbody><tr><td>GAGAN CHOUDHURY</td><td>06/11/2018</td></tr><tr><td>KATHLEEN MEIER-HELLSTERN</td><td>06/11/2018</td></tr><tr><td>ALVIN GODDARD</td><td>06/11/2018</td></tr><tr><td>NARAYAN PADI</td><td>06/11/2018</td></tr><tr><td>SIMON TSE</td><td>06/11/2018</td></tr></tbody></table>	Name	Execution Date	GAGAN CHOUDHURY	06/11/2018	KATHLEEN MEIER-HELLSTERN	06/11/2018	ALVIN GODDARD	06/11/2018	NARAYAN PADI	06/11/2018	SIMON TSE	06/11/2018	
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<table border="1"><tr><td><b>Name:</b></td><td>AT&amp;T INTELLECTUAL PROPERTY I, L.P.</td></tr><tr><td><b>Street Address:</b></td><td>675 WEST PEACHTREE STREET, NW</td></tr><tr><td><b>City:</b></td><td>ATLANTA</td></tr><tr><td><b>State/Country:</b></td><td>GEORGIA</td></tr><tr><td><b>Postal Code:</b></td><td>30308</td></tr></table>	<b>Name:</b>	AT&T INTELLECTUAL PROPERTY I, L.P.	<b>Street Address:</b>	675 WEST PEACHTREE STREET, NW	<b>City:</b>	ATLANTA	<b>State/Country:</b>	GEORGIA	<b>Postal Code:</b>	30308			
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<b>Fax Number:</b> (215)568-3439 <b>Phone:</b> 2155683100 <b>Email:</b> assignments@bakerlaw.com <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>Correspondent Name:</b> BAKER HOSTETLER LLP <b>Address Line 1:</b> 2929 ARCH STREET <b>Address Line 2:</b> CIRA CENTRE, 12TH FLOOR <b>Address Line 4:</b> PHILADELPHIA, PENNSYLVANIA 19104													
<b>ATTORNEY DOCKET NUMBER:</b>	2017-1511/101900.002156												
<b>NAME OF SUBMITTER:</b>	OUIDA M. HOWARD												
<b>Signature:</b>	/Ouida M. Howard/												

**Date:**

07/06/2018

**Total Attachments: 10**

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**RECEIPT INFORMATION****EPAS ID:** PAT5039533**Receipt Date:** 07/06/2018

Assignment

Docket No. 2017-1511

ASSIGNMENT

WHEREAS I, **Gagan Choudhury** residing at **2 Sheldon Drive, Jackson, New Jersey 08527** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled "**MULTI-LAYER SYSTEM SELF-OPTIMIZATION**," having AT&T Docket No. **2017-1511**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a **Partnership** organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, NW, Atlanta, Georgia 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

This Assignment may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and such counterparts together shall constitute one and the same instrument. A facsimile copy of this Assignment, or any form of an electronic copy of this Assignment, including the signature pages hereto, shall be deemed to be an original.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 11 day of JUNE, 2018.

Gagan Kal Choudhury  
Gagan Choudhury

State of NJ

County of Monmouth

On this 11 day of June, 2018, before me a Notary Public in and for the above County and State, personally appeared GAGAN L CHAUDHURY, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

Carmela Patuto  
Notary Public

My Commission Expires: \_\_\_\_\_

CARMELA PATUTO  
NOTARY PUBLIC OF NEW JERSEY  
Comm. # 50071763  
My Commission Expires 11/13/2022





Assignment

Docket No. 2017-1511

ASSIGNMENT

WHEREAS I, **Kathleen Meier-Hellstern** residing at **17 Evans Drive, Cranbury, New Jersey 08512** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled "**MULTI-LAYER SYSTEM SELF-OPTIMIZATION**," having AT&T Docket No. **2017-1511**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a Partnership organized and existing under the laws of Nevada and having an address at **675 West Peachtree Street, NW, Atlanta, Georgia 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

This Assignment may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and such counterparts together shall constitute one and the same instrument. A facsimile copy of this Assignment, or any form of an electronic copy of this Assignment, including the signature pages hereto, shall be deemed to be an original.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 11 day of June, 2018.

  
Kathleen Meier-Hellstern

State of NJ )

County of Monmouth )

On this 11 day of June, 2018, before me a Notary Public in and for the above County and State, personally appeared Kathleen Meier-Hellstern and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

  
Notary Public

My Commission Expires: \_\_\_\_\_

CARMELA PATUTO  
NOTARY PUBLIC OF NEW JERSEY  
Comm. # 50071763  
My Commission Expires 11/13/2022

Assignment

Docket No. 2017-1511

ASSIGNMENT

WHEREAS I, **Alvin Goddard** residing at **145 Providence Boulevard, Kendall Park, New Jersey 08824** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled "**MULTI-LAYER SYSTEM SELF-OPTIMIZATION,**" having AT&T Docket No. **2017-1511**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a Partnership organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, NW, Atlanta, Georgia 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

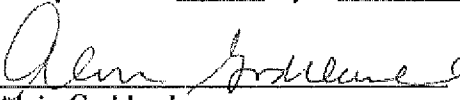
AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

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IN TESTIMONY WHEREOF, I have hereunto set my hand this 11 day of June, 2018.

  
Alvin Goddard

State of NJ

County of Monmouth

On this 11 day of June, 2018, before me a Notary Public in and for the above County and State, personally appeared Alvin Goddard, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

  
Notary Public

My Commission Expires: \_\_\_\_\_

CARMELA PATUTO  
NOTARY PUBLIC OF NEW JERSEY  
Comm. # 50071763  
My Commission Expires 11/13/2022

Assignment

Docket No. 2017-1511

ASSIGNMENT

WHEREAS I, **Narayan Padi** residing at **65 Montain Avenue, Cedar Knolls, New Jersey 07927** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled **"MULTI-LAYER SYSTEM SELF-OPTIMIZATION,"** having AT&T Docket No. **2017-1511**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a Partnership organized and existing under the laws of Nevada and having an address at **675 West Peachtree Street, NW, Atlanta, Georgia 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

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AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;


AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

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IN TESTIMONY WHEREOF, I have hereunto set my hand this 11<sup>th</sup> day of June, 2018.

  
Narayan Padi

State of NJ

County of Monmouth

On this 11 day of June, 2018, before me a Notary Public in and for the above County and State, personally appeared Narayan Padi, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.



Notary Public

My Commission Expires:

CARMELA PATUTO  
NOTARY PUBLIC OF NEW JERSEY  
Comm. # 50071763  
My Commission Expires 11/13/2022

Assignment

Docket No. 2017-1511

ASSIGNMENT

WHEREAS I, **Simon Tse** residing at **25 Ashley Drive, Holmdel, New Jersey 07733** hereafter referred to as Assignor, am listed as an inventor on a patent application entitled **"MULTI-LAYER SYSTEM SELF-OPTIMIZATION,"** having AT&T Docket No. **2017-1511**, the patent application to be filed in the United States Patent & Trademark Office; and

WHEREAS, **AT&T Intellectual Property I, L.P.**, a Partnership organized and existing under the laws of **Nevada** and having an address at **675 West Peachtree Street, NW, Atlanta, Georgia 30308** (hereinafter referred to as Assignee), desires to acquire the entire right, title and interest for the United States of America and elsewhere throughout the world in and to said invention and the patent application identified above, including any and all divisions and continuations thereof and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereto;

NOW THEREFORE, be it known that for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration the receipt of which from Assignee is hereby acknowledged, I, as Assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the Assignee, its lawful successors and assigns, my entire right, title, and interest in and to this invention and this non-provisional application, and all divisions, substitutions, and continuations thereof; and all Letters Patent of the United States which may be granted thereon, and all reexaminations and reissues thereof; and all rights to claim priority on the basis of the above provisional application (if any), as well as all rights to claim priority on the basis of this application; and all applications for Letters Patent which may hereafter be filed for this invention in any foreign country and all Letters Patent which may be granted on this invention in any foreign country, including certificates of inventions, utility models, industrial design protection, design patent protection, and other governmental grants or issuances; and all extensions, renewals, prolongations, and reissues thereof; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term and terms for all such patents;

AND, I HEREBY authorize and request the Commissioner of Patents and Trademarks of the United States and any official of any foreign country whose duty it is to issue patents on applications as described above, to issue all Letters Patent for this invention to Assignee, its successors and assigns, in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any assignment, sale, license, agreement, or encumbrance in conflict with this Assignment;

AND, I HEREBY further covenant and agree, for the Assignor and the Assignor's legal representatives, that I will, without further consideration, communicate with Assignee, its successors and assigns, any facts known to us respecting this invention; assist the Assignee in the prosecution of the patent application identified above; assist in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; testify in any interference, litigation, or other legal proceeding; sign all lawful papers when called upon to do so; execute and deliver any and all papers that may be necessary or desirable to perfect the title to this invention in said Assignee, its successors or assigns; execute all divisional, continuation, and reissue applications; make all rightful oaths and generally do everything possible to aid Assignee, to obtain and enforce proper patent protection for this invention in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the Assignee; and hereby instruct, and further covenant and agree to bind our heirs, legal representatives, and assigns, to do same, without compensation, but at the expense of Assignee or its representatives.

AND, I HEREBY consent that a copy of this assignment shall be deemed a full legal and formal equivalent of any document which may be required in any country in proof of the right of **AT&T Intellectual Property I, L.P.** to apply for patent or other form of protection for said inventions and to claim the aforesaid benefit of the right of priority.

This Assignment may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, and such counterparts together shall constitute one and the same instrument. A facsimile copy of this Assignment, or any form of an electronic copy of this Assignment, including the signature pages hereto, shall be deemed to be an original.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 11 day of June, 2018.

Simon Tse  
Simon Tse

State of NJ

County of Monmouth

On this 11 day of June, 2018, before me a Notary Public in and for the above County and State, personally appeared SIMON TSE, and acknowledged the execution of the foregoing assignment as his/her free act and deed for the purpose herein set forth.

Carmela Patuto  
Notary Public

My Commission Expires: \_\_\_\_\_

CARMELA PATUTO  
NOTARY PUBLIC OF NEW JERSEY  
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