

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT6843902

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
JASON TORREY	01/15/2021
GAURAV SHARMA	12/15/2020
JAMES GARVERT	12/17/2020
KEN POLITZ	12/16/2020
MANJUL MAHARISHI	12/16/2020
MARYBETH DEGEORGIS	12/16/2020
GUIDO JONJIE S. SENA JR.	12/14/2020
RECEIVING PARTY DATA	
Name:	NEUSTAR, INC.
Street Address:	21575 RIDGETOP CIRCLE
City:	STERLING
State/Country:	VIRGINIA
Postal Code:	20166
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	17247387
CORRESPONDENCE DATA	
Fax Number:	
<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>	
Phone:	2023712600
Email:	mcrowley@sternekessler.com, RHICKS@sternekessler.com, dhaars@sternekessler.com, TTOPSSecretary2@sternekessler.com
Correspondent Name:	STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
Address Line 1:	1100 NEW YORK AVENUE NW
Address Line 4:	WASHINGTON, D.C. 20005
ATTORNEY DOCKET NUMBER:	4380.1160000
NAME OF SUBMITTER:	ROSS G. HICKS
SIGNATURE:	/Ross G. Hicks, #56,374/
DATE SIGNED:	08/02/2021

Total Attachments: 21

source=Assignment-4380-1160000-02#page1.tif
source=Assignment-4380-1160000-02#page2.tif
source=Assignment-4380-1160000-02#page3.tif
source=Assignment-4380-1160000-02#page4.tif
source=Assignment-4380-1160000-02#page5.tif
source=Assignment-4380-1160000-02#page6.tif
source=Assignment-4380-1160000-02#page7.tif
source=Assignment-4380-1160000-02#page8.tif
source=Assignment-4380-1160000-02#page9.tif
source=Assignment-4380-1160000-02#page10.tif
source=Assignment-4380-1160000-02#page11.tif
source=Assignment-4380-1160000-02#page12.tif
source=Assignment-4380-1160000-02#page13.tif
source=Assignment-4380-1160000-02#page14.tif
source=Assignment-4380-1160000-02#page15.tif
source=Assignment-4380-1160000-02#page16.tif
source=Assignment-4380-1160000-02#page17.tif
source=Assignment-4380-1160000-02#page18.tif
source=Assignment-4380-1160000-02#page19.tif
source=Assignment-4380-1160000-02#page20.tif
source=Assignment-4380-1160000-02#page21.tif

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: **Gaurav SHARMA, Guido Jonjie S. SENA, Jr., Ken POLITZ, Marybeth DEGEORGIS, Manjul MAHARISHI, Jason TORREY and James GARVERT**, hereby sell and assign to **Neustar, Inc.**, a corporation formed under the laws of Virginia, whose mailing address is 21575 Ridgetop Circle, Sterling, Virginia 20166 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world,

(a) in the invention(s) known as **END-TO-END MANAGEMENT OF AUTHENTICATED COMMUNICATIONS** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 9, 2020 (also known as United States Application No. 17/247,387), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the undersigned inventors had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

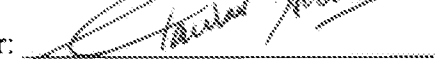
The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 26111** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 26111** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: 12/15/2020 Signature of Inventor: 
Gaurav SHARMA

Date: _____ Signature of Inventor: _____
Guido Jonjie S. SENA, Jr.

Date: _____ Signature of Inventor: _____
Ken POLITZ

Date: _____ Signature of Inventor: _____
Marybeth DEGEORGIS

Date: _____ Signature of Inventor: _____
Manjul MAHARISHI

Date: _____ Signature of Inventor: _____
Jason TORREY

Date: _____

Signature of Inventor: _____
James GARVERT

15976298__1

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: **Gaurav SHARMA, Guido Jonjie S. SENA, Jr., Ken POLITZ, Marybeth DEGEORGIS, Manjul MAHARISHI, Jason TORREY and James GARVERT**, hereby sell and assign to **Neustar, Inc.**, a corporation formed under the laws of Virginia, whose mailing address is 21575 Ridgetop Circle, Sterling, Virginia 20166 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world,

(a) in the invention(s) known as **END-TO-END MANAGEMENT OF AUTHENTICATED COMMUNICATIONS** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 9, 2020 (also known as United States Application No. 17/247,387), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the undersigned inventors had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 26111** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 26111** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: _____ Signature of Inventor: _____
Gaurav SHARMA

Date: _____ Signature of Inventor: _____
Guido Jonjie S. SENA, Jr.

Date: _____ Signature of Inventor: _____
Ken POLITZ

Date: _____ Signature of Inventor: _____
Marybeth DEGEORGIS

Date: _____ Signature of Inventor: _____
Manjul MAHARISHI

Date: _____ Signature of Inventor: _____
Jason TORREY

Date: 12/17/2020

Signature of Inventor: 
James GARVERT

15976298_1

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: **Gaurav SHARMA, Guido Jonjie S. SENA, Jr., Ken POLITZ, Marybeth DEGEORGIS, Manjul MAHARISHI, Jason TORREY and James GARVERT**, hereby sell and assign to **Neustar, Inc.**, a corporation formed under the laws of Virginia, whose mailing address is 21575 Ridgetop Circle, Sterling, Virginia 20166 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world,

(a) in the invention(s) known as **END-TO-END MANAGEMENT OF AUTHENTICATED COMMUNICATIONS** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 9, 2020 (also known as United States Application No. 17/247,387), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the undersigned inventors had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

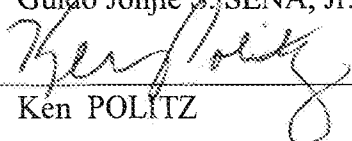
The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 26111** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 26111** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: _____ Signature of Inventor: _____
Gaurav SHARMA

Date: _____ Signature of Inventor: _____
Guido Jonjie S. SENA, Jr.

Date: 12/16/20 Signature of Inventor: 
Ken POLITZ

Date: _____ Signature of Inventor: _____
Marybeth DEGEORGIS

Date: _____ Signature of Inventor: _____
Manjul MAHARISHI

Date: _____ Signature of Inventor: _____
Jason TORREY

Date: _____ Signature of Inventor: _____
James GARVERT

15976298_1

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: **Gaurav SHARMA, Guido Jonjie S. SENA, Jr., Ken POLITZ, Marybeth DEGEORGIS, Manjul MAHARISHI, Jason TORREY and James GARVERT**, hereby sell and assign to **Neustar, Inc.**, a corporation formed under the laws of Virginia, whose mailing address is 21575 Ridgetop Circle, Sterling, Virginia 20166 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world,

(a) in the invention(s) known as **END-TO-END MANAGEMENT OF AUTHENTICATED COMMUNICATIONS** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 9, 2020 (also known as United States Application No. 17/247,387), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the undersigned inventors had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 26111** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 26111** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: _____ Signature of Inventor: _____
Gaurav SHARMA

Date: _____ Signature of Inventor: _____
Guido Jonjie S. SENA, Jr.

Date: _____ Signature of Inventor: _____
Ken POLITZ

Date: _____ Signature of Inventor: _____
Marybeth DEGEORGIS

Date: 12/16/20 Signature of Inventor: Manjul Maharishi
Manjul MAHARISHI

Date: _____ Signature of Inventor: _____
Jason TORREY

Date: _____

Signature of Inventor: _____
James GARVERT

15976298_1

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: **Gaurav SHARMA, Guido Jonjie S. SENA, Jr., Ken POLITZ, Marybeth DEGEORGIS, Manjul MAHARISHI, Jason TORREY and James GARVERT**, hereby sell and assign to **Neustar, Inc.**, a corporation formed under the laws of Virginia, whose mailing address is 21575 Ridgetop Circle, Sterling, Virginia 20166 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world,

(a) in the invention(s) known as **END-TO-END MANAGEMENT OF AUTHENTICATED COMMUNICATIONS** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 9, 2020 (also known as United States Application No. 17/247,387), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the undersigned inventors had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 26111** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 26111** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: _____ Signature of Inventor: _____
Gaurav SHARMA

Date: _____ Signature of Inventor: _____
Guido Jonjie S. SENA, Jr.

Date: _____ Signature of Inventor: _____
Ken POLITZ

Date: 12/16/2020 Signature of Inventor: Marybeth C. Degeorgis
Marybeth DEGEORGIS

Date: _____ Signature of Inventor: _____
Manjul MAHARISHI

Date: _____ Signature of Inventor: _____
Jason TORREY

Date: _____

Signature of Inventor: _____
James GARVERT

15976298_1

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: Gaurav SHARMA, Guido Jonjie S. SENA, Jr., Ken POLITZ, Marybeth DEGEORGIS, Manjul MAHARISHI, Jason TORREY and James GARVERT, hereby sell and assign to Neustar, Inc., a corporation formed under the laws of Virginia, whose mailing address is 21575 Ridgetop Circle, Sterling, Virginia 20166 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world.

(a) in the invention(s) known as **END-TO-END MANAGEMENT OF AUTHENTICATED COMMUNICATIONS** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 9, 2020 (also known as United States Application No. 17/247,387), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the undersigned inventors had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 26111** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 26111** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: _____ Signature of Inventor: _____

Gaurav SHARMA

Date: 12/14/2020

Signature of Inventor: _____

Guido Jonjé S. SENA, Jr.

Date: _____

Signature of Inventor: _____

Ken POLITZ

Date: _____

Signature of Inventor: _____

Marybeth DEGEORGIS

Date: _____

Signature of Inventor: _____

Manjul MAHARISHI

Date: _____

Signature of Inventor: _____

Jason TORREY

Date: _____

Signature of Inventor: _____
James GARVERT

15976298.1

ASSIGNMENT

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: **Gaurav SHARMA, Guido Jonjie S. SENA, Jr., Ken POLITZ, Marybeth DEGEORGIS, Manjul MAHARISHI, Jason TORREY and James GARVERT**, hereby sell and assign to **Neustar, Inc.**, a corporation formed under the laws of Virginia, whose mailing address is 21575 Ridgeway Circle, Sterling, Virginia 20166 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world,

(a) in the invention(s) known as **END-TO-END MANAGEMENT OF AUTHENTICATED COMMUNICATIONS** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 9, 2020 (also known as United States Application No. 17/247,387), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the undersigned inventors had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 26111** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 26111** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: _____ Signature of Inventor: _____
Gaurav SHARMA

Date: _____ Signature of Inventor: _____
Guido Jonjie S. SENA, Jr.

Date: _____ Signature of Inventor: _____
Ken POLITZ

Date: _____ Signature of Inventor: _____
Marybeth DEGEORGIS

Date: _____ Signature of Inventor: _____
Manjul MAHARISHI

Date: 1/15/2021 Signature of Inventor: Jason Torrey
Jason TORREY

Date: _____ Signature of Inventor: _____
James GARVERT

15976298_1