

## PATENT ASSIGNMENT

Electronic Version v1.1  
 Stylesheet Version v1.1

| 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>Henrique Andrade</td> <td>04/21/2013</td> </tr> <tr> <td>Bugra Gedik</td> <td>04/12/2013</td> </tr> <tr> <td>Kirsten W. Hildrum</td> <td>04/15/2013</td> </tr> <tr> <td>Rohit M. Khandekar</td> <td>04/15/2013</td> </tr> <tr> <td>Sujay S. Parekh</td> <td>04/15/2013</td> </tr> <tr> <td>Deepak Rajan</td> <td>04/15/2013</td> </tr> <tr> <td>Joel L. Wolf</td> <td>04/11/2013</td> </tr> <tr> <td>Kun-Lung Wu</td> <td>04/16/2013</td> </tr> </tbody> </table> |                                             | Name          | Execution Date                              | Henrique Andrade    | 04/21/2013       | Bugra Gedik | 04/12/2013 | Kirsten W. Hildrum | 04/15/2013 | Rohit M. Khandekar | 04/15/2013 | Sujay S. Parekh | 04/15/2013 | Deepak Rajan | 04/15/2013 | Joel L. Wolf | 04/11/2013 | Kun-Lung Wu | 04/16/2013 |
| Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Execution Date                              |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Henrique Andrade                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 04/21/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Bugra Gedik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 04/12/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Kirsten W. Hildrum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 04/15/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Rohit M. Khandekar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 04/15/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Sujay S. Parekh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 04/15/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Deepak Rajan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 04/15/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Joel L. Wolf                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 04/11/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Kun-Lung Wu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 04/16/2013                                  |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| RECEIVING PARTY DATA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| <table border="1"> <tr> <td>Name:</td> <td>International Business Machines Corporation</td> </tr> <tr> <td>Street Address:</td> <td>New Orchard Road</td> </tr> <tr> <td>City:</td> <td>Armonk</td> </tr> <tr> <td>State/Country:</td> <td>NEW YORK</td> </tr> <tr> <td>Postal Code:</td> <td>10504</td> </tr> </table>                                                                                                                                                                                                                                                 |                                             | Name:         | International Business Machines Corporation | Street Address:     | New Orchard Road | City:       | Armonk     | State/Country:     | NEW YORK   | Postal Code:       | 10504      |                 |            |              |            |              |            |             |            |
| Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | International Business Machines Corporation |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Street Address:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | New Orchard Road                            |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| City:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Armonk                                      |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| State/Country:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | NEW YORK                                    |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Postal Code:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10504                                       |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| 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>13871251</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                               |                                             | Property Type | Number                                      | Application Number: | 13871251         |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Property Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Number                                      |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| Application Number:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 13871251                                    |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| CORRESPONDENCE DATA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                             |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |
| <p>Fax Number: 2032556570<br/> <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i></p> <p>Phone: 2032556560<br/>       Email: car@rml-law.com<br/>       Correspondent Name: Michael J. Cooper<br/>       Address Line 1: 1300 Post Road, Suite 205<br/>       Address Line 2: Ryan, Mason &amp; Lewis, LLP<br/>       Address Line 4: Fairfield, CONNECTICUT 06824</p>                                                                                                                                                                |                                             |               |                                             |                     |                  |             |            |                    |            |                    |            |                 |            |              |            |              |            |             |            |

|                                                                                                                                                                                                                                                                                                                                                                                    |                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| ATTORNEY DOCKET NUMBER:                                                                                                                                                                                                                                                                                                                                                            | YOR920090033US2                                            |
| NAME OF SUBMITTER:                                                                                                                                                                                                                                                                                                                                                                 | Michael J. Cooper                                          |
| Signature:                                                                                                                                                                                                                                                                                                                                                                         | /Michael J. Cooper/                                        |
| Date:                                                                                                                                                                                                                                                                                                                                                                              | 04/26/2013                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                    | This document serves as an Oath/Declaration (37 CFR 1.63). |
| <p><b>Total Attachments: 6</b></p> <p>source=YOR920090033US2_FiledAssignment#page1.tif</p> <p>source=YOR920090033US2_FiledAssignment#page2.tif</p> <p>source=YOR920090033US2_FiledAssignment#page3.tif</p> <p>source=YOR920090033US2_FiledAssignment#page4.tif</p> <p>source=YOR920090033US2_FiledAssignment#page5.tif</p> <p>source=YOR920090033US2_FiledAssignment#page6.tif</p> |                                                            |

# **RECORDATION FORM COVER SHEET PATENTS ONLY**

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

**1. Name of conveying party(ies):**

**Henrique Andrade, Bugra Gedik, Kirsten W. Hildrum, Rohit M. Khandekar, Sujay S. Parekh, Deepak Rajan, Joel L. Wolf, Kun-Lung Wu**  
Additional name(s) of conveying party(ies) attached?

Yes X No

**2. Name and address of receiving party(ies)**

**Name: International Business Machines Corporation**

**Internal Address:**

**Street Address: New Orchard Road**

**City: Armonk State: NY ZIP: 10504**

Additional name(s) & address(es) attached? Yes X No

**3. Nature of conveyance:**

X Assignment Merger  
Security Agreement Change of Name  
Other

**Execution Date: April 21, 2013, April 12, 2013, April 15, 2013, April 15, 2013, April 15, 2013, April 15, 2013, April 11, 2013, April 16, 2013**

**4. Application number(s) or patent number(s):**

If this document is being filed together with a new application, the execution date of the application is:

**A. Patent Application No.(s) 13/871,251 Filed April 26, 2013**

**B. Patent No.(s)**

Additional numbers attached? Yes X No

**5. Name and address of party to whom correspondence concerning document should be mailed:**

**Name: Michael J. Cooper**  
**Internal Address: Ryan, Mason & Lewis, LLP**  
**Street Address: 1300 Post Road, Suite 205**  
**City: Fairfield State: CT ZIP: 06824**

**6. Total number of applications and patents involved: 1**

**7. Total Fee (37 CFR 3.41)..... \$ 40.00**

Enclosed

X Authorized to be charged to deposit account

**8. Deposit account number 50-0510**

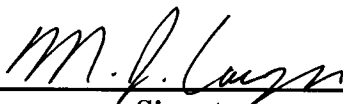
**DO NOT USE THIS SPACE**

**9. Statement and signature.**

*To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.*

**Michael J. Cooper**

**Reg. No. 57,749**

  
**Signature**

**April 26, 2013**

**Date**

Total number of pages including cover sheet, attachments, and document: 6

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**YOR920090033US2**

**PATENT  
REEL: 030298 FRAME: 0802**

**DECLARATION (37 C.F.R. 1.63) FOR UTILITY PATENT APPLICATION USING AN  
APPLICATION DATA SHEET (37 C.F.R. 1.76) AND ASSIGNMENT**

Title of Invention: **PARTITIONING OPERATOR FLOW GRAPHS**

As a below named inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

☐ United States application or PCT international application number \_\_\_\_\_  
filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR Section 1.56.

Whereas, the undersigned inventor(s) has/have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the IBM Docket Number provided above in the header of this document;

Whereas, International Business Machines Corporation, a corporation of New York having a place of business at Armonk, New York (herein referred to as "IBM"), desires to acquire, and each undersigned inventor desires to grant to IBM, the entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, each undersigned inventor ("ASSIGNOR") hereby sells or has sold, assigns or has assigned, and otherwise transfers or has transferred to IBM (the "ASSIGNEE"), its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, each undersigned inventor hereby authorizes and requests the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to IBM, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by IBM, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by the undersigned had this Assignment not been made; and each undersigned inventor agrees to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in IBM, its successors, legal representatives, and assigns, whenever requested by IBM, its successors, legal representatives, or assigns.

Each undersigned inventor acknowledges their prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to IBM and is unaware of any reason why they may not have the full and unencumbered right to sell, assign, and transfer the rights hereby sold, assigned, and transferred, and has not executed, and will not execute, any document or instrument in conflict herewith. Each undersigned inventor also hereby grants IBM, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent Application Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

(1) Legal Name of Inventor: **Henrique Andrade**

Signature: Henrique Andrade Date: 04/21/13

(2) Legal Name of Inventor: **Bugra Gedik**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(3) Legal Name of Inventor: **Kirsten W. Hildrum**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(4) Legal Name of Inventor: **Rohit M. Khandekar**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(5) Legal Name of Inventor: **Sujay S. Parekh**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

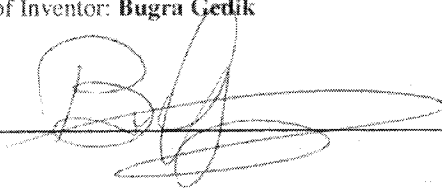
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I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

(1) Legal Name of Inventor: **Henrique Andrade**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(2) Legal Name of Inventor: **Bugra Gedik**

Signature:  \_\_\_\_\_ Date: 04/12/2013

(3) Legal Name of Inventor: **Kirsten W. Hildrum**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(4) Legal Name of Inventor: **Rohit M. Khandekar**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(5) Legal Name of Inventor: **Sujay S. Parekh**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Each undersigned inventor acknowledges their prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to IBM and is unaware of any reason why they may not have the full and unencumbered right to sell, assign, and transfer the rights hereby sold, assigned, and transferred, and has not executed, and will not execute, any document or instrument in conflict herewith. Each undersigned inventor also hereby grants IBM, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent Application Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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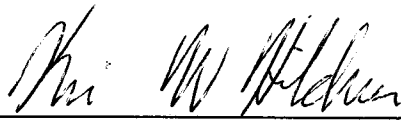
(1) Legal Name of Inventor: **Henrique Andrade**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(2) Legal Name of Inventor: **Bugra Gedik**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

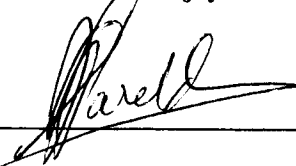
(3) Legal Name of Inventor: **Kirsten W. Hildrum**

Signature:  Date: April 15, 2013

(4) Legal Name of Inventor: **Rohit M. Khandekar**

Signature:  Date: April 15, 2013

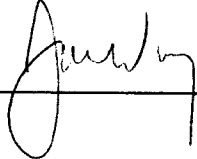
(5) Legal Name of Inventor: **Sujay S. Parekh**

Signature:  Date: April 15, 2013

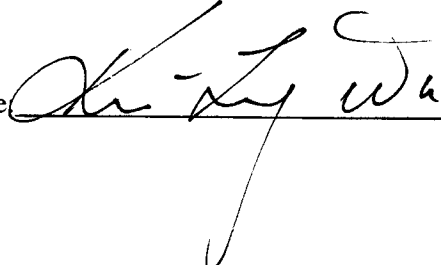
(6) Legal Name of Inventor: **Deepak Rajan**

Signature:  Date: 4/15/2013

(7) Legal Name of Inventor: **Joel L. Wolf**

Signature:  Date: 4/11/13

(8) Legal Name of Inventor: **Kun-Lung Wu**

Signature:  Date: 04/16/2013