JS 44 (Rev 12/07)

# CIVIL COVER SHEET



The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM)

**I. (a) PLAINTIFFS**

RAPID MOBILE TECHNOLOGIES, INC , a Florida corporation

**(b)** County of Residence of First Listed Plaintiff Palm Beach County
(EXCEPT IN U S PLAINTIFF CASES)

**(c)** Attorney's (Firm Name, Address, and Telephone Number)
Peter G Herman, Esquire and Alexander D Brown, Esquire
Tripp Scott, Attorneys at Law
110 S E 6th Street, Suite 1500, Ft Lauderdale, FL 33301

**DEFENDANTS**

MOTOROLA, INC , a Delaware Corporation

County of Residence of First Listed Defendant Broward County
(IN U S PLAINTIFF CASES ONLY)
NOTE IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE LAND INVOLVED

Attorneys (If Known)

**II. BASIS OF JURISDICTION** (Place an "X" in One Box Only)

- ☐ 1 U S Government Plaintiff
- ☒ 3 Federal Question (U S Government Not a Party)
- ☐ 2 U S Government Defendant
- ☐ 4 Diversity (Indicate Citizenship of Parties in Item III)

**III. CITIZENSHIP OF PRINCIPAL PARTIES** (Place an "X" in One Box for Plaintiff and One Box for Defendant)
(For Diversity Cases Only)

| | PTF | DEF | | PTF | DEF |
|---|---|---|---|---|---|
| Citizen of This State | ☒ 1 | ☐ 1 | Incorporated *or* Principal Place of Business In This State | ☐ 4 | ☐ 4 |
| Citizen of Another State | ☐ 2 | ☐ 2 | Incorporated *and* Principal Place of Business In Another State | ☐ 5 | ☐ 5 |
| Citizen or Subject of a Foreign Country | ☐ 3 | ☐ 3 | Foreign Nation | ☐ 6 | ☐ 6 |

**IV. NATURE OF SUIT** (Place an "X" in One Box Only)

**CONTRACT**
- ☐ 110 Insurance
- ☐ 120 Marine
- ☐ 130 Miller Act
- ☐ 140 Negotiable Instrument
- ☐ 150 Recovery of Overpayment & Enforcement of Judgment
- ☐ 151 Medicare Act
- ☐ 152 Recovery of Defaulted Student Loans (Excl Veterans)
- ☐ 153 Recovery of Overpayment of Veteran's Benefits
- ☐ 160 Stockholders' Suits
- ☐ 190 Other Contract
- ☐ 195 Contract Product Liability
- ☐ 196 Franchise

**REAL PROPERTY**
- ☐ 210 Land Condemnation
- ☐ 220 Foreclosure
- ☐ 230 Rent Lease & Ejectment
- ☐ 240 Torts to Land
- ☐ 245 Tort Product Liability
- ☐ 290 All Other Real Property

**TORTS**

**PERSONAL INJURY**
- ☐ 310 Airplane
- ☐ 315 Airplane Product Liability
- ☐ 320 Assault, Libel & Slander
- ☐ 330 Federal Employers' Liability
- ☐ 340 Marine
- ☐ 345 Marine Product Liability
- ☐ 350 Motor Vehicle
- ☐ 355 Motor Vehicle Product Liability
- ☐ 360 Other Personal Injury

**PERSONAL INJURY**
- ☐ 362 Personal Injury - Med Malpractice
- ☐ 365 Personal Injury - Product Liability
- ☐ 368 Asbestos Personal Injury Product Liability

**PERSONAL PROPERTY**
- ☐ 370 Other Fraud
- ☐ 371 Truth in Lending
- ☐ 380 Other Personal Property Damage
- ☐ 385 Property Damage Product Liability

**CIVIL RIGHTS**
- ☐ 441 Voting
- ☐ 442 Employment
- ☐ 443 Housing/ Accommodations
- ☐ 444 Welfare
- ☐ 445 Amer w/Disabilities - Employment
- ☐ 446 Amer w/Disabilities - Other
- ☐ 440 Other Civil Rights

**PRISONER PETITIONS**
- ☐ 510 Motions to Vacate Sentence

**Habeas Corpus:**
- ☐ 530 General
- ☐ 535 Death Penalty
- ☐ 540 Mandamus & Other
- ☐ 550 Civil Rights
- ☐ 555 Prison Condition

**FORFEITURE/PENALTY**
- ☐ 610 Agriculture
- ☐ 620 Other Food & Drug
- ☐ 625 Drug Related Seizure of Property 21 USC 881
- ☐ 630 Liquor Laws
- ☐ 640 R R & Truck
- ☐ 650 Airline Regs
- ☐ 660 Occupational Safety/Health
- ☐ 690 Other

**LABOR**
- ☐ 710 Fair Labor Standards Act
- ☐ 720 Labor/Mgmt Relations
- ☐ 730 Labor/Mgmt Reporting & Disclosure Act
- ☐ 740 Railway Labor Act
- ☐ 790 Other Labor Litigation
- ☐ 791 Empl Ret Inc Security Act

**IMMIGRATION**
- ☐ 462 Naturalization Application
- ☐ 463 Habeas Corpus - Alien Detainee
- ☐ 465 Other Immigration Actions

**BANKRUPTCY**
- ☐ 422 Appeal 28 USC 158
- ☐ 423 Withdrawal 28 USC 157

**PROPERTY RIGHTS**
- ☐ 820 Copyrights
- ☒ 830 Patent
- ☐ 840 Trademark

**SOCIAL SECURITY**
- ☐ 861 HIA (1395ff)
- ☐ 862 Black Lung (923)
- ☐ 863 DIWC/DIWW (405(g))
- ☐ 864 SSID Title XVI
- ☐ 865 RSI (405(g))

**FEDERAL TAX SUITS**
- ☐ 870 Taxes (U S Plaintiff or Defendant)
- ☐ 871 IRS—Third Party 26 USC 7609

**OTHER STATUTES**
- ☐ 400 State Reapportionment
- ☐ 410 Antitrust
- ☐ 430 Banks and Banking
- ☐ 450 Commerce
- ☐ 460 Deportation
- ☐ 470 Racketeer Influenced and Corrupt Organizations
- ☐ 480 Consumer Credit
- ☐ 490 Cable/Sat TV
- ☐ 810 Selective Service
- ☐ 850 Securities/Commodities/ Exchange
- ☐ 875 Customer Challenge 12 USC 3410
- ☐ 890 Other Statutory Actions
- ☐ 891 Agricultural Acts
- ☐ 892 Economic Stabilization Act
- ☐ 893 Environmental Matters
- ☐ 894 Energy Allocation Act
- ☐ 895 Freedom of Information Act
- ☐ 900Appeal of Fee Determination Under Equal Access to Justice
- ☐ 950 Constitutionality of State Statutes

**V. ORIGIN** (Place an "X" in One Box Only)

☒ 1 Original Proceeding ☐ 2 Removed from State Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from another district (specify) ☐ 6 Multidistrict Litigation ☐ 7 Appeal to District Judge from Magistrate Judgement

**VI. CAUSE OF ACTION**

Cite the U S Civil Statute under which you are filing **(Do not cite jurisdictional statutes unless diversity)**
35 U S C §§ 271, et. seq.
Brief description of cause
Willful Patent Infringement

**VII. REQUESTED IN COMPLAINT:**

☐ CHECK IF THIS IS A **CLASS ACTION** UNDER F R C P 23

**DEMAND $**

CHECK YES only if demanded in complaint
**JURY DEMAND:** ☒ Yes ☐ No

**VIII. RELATED CASE(S) IF ANY** (See instructions)

JUDGE DOCKET NUMBER

DATE
12.23.10

SIGNATURE OF ATTORNEY OF RECORD

**FOR OFFICE USE ONLY**

RECEIPT # AMOUNT APPLYING IFP JUDGE MAG JUDGE

# INSTRUCTIONS FOR ATTORNEYS COMPLETING CIVIL COVER SHEET FORM JS 44

## Authority For Civil Cover Sheet

The JS 44 civil cover sheet and the information contained herein neither replaces nor supplements the filings and service of pleading or other papers as required by law, except as provided by local rules of court This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet Consequently, a civil cover sheet is submitted to the Clerk of Court for each civil complaint filed The attorney filing a case should complete the form as follows

**I. (a) Plaintiffs-Defendants.** Enter names (last, first, middle initial) of plaintiff and defendant If the plaintiff or defendant is a government agency, use only the full name or standard abbreviations If the plaintiff or defendant is an official within a government agency, identify first the agency and then the official, giving both name and title

(b) County of Residence For each civil case filed, except U S plaintiff cases, enter the name of the county where the first listed plaintiff resides at the time of filing In U S plaintiff cases, enter the name of the county in which the first listed defendant resides at the time of filing (NOTE: In land condemnation cases, the county of residence of the "defendant" is the location of the tract of land involved )

(c) Attorneys Enter the firm name, address, telephone number, and attorney of record If there are several attorneys, list them on an attachment, noting in this section "(see attachment)"

**II. Jurisdiction** The basis of jurisdiction is set forth under Rule 8(a), F R C P , which requires that jurisdictions be shown in pleadings Place an "X" in one of the boxes If there is more than one basis of jurisdiction, precedence is given in the order shown below

United States plaintiff (1) Jurisdiction based on 28 U S C 1345 and 1348 Suits by agencies and officers of the United States are included here.

United States defendant (2) When the plaintiff is suing the United States, its officers or agencies, place an "X" in this box

Federal question (3) This refers to suits under 28 U S C 1331, where jurisdiction arises under the Constitution of the United States, an amendment to the Constitution, an act of Congress or a treaty of the United States In cases where the U S is a party, the U S plaintiff or defendant code takes precedence, and box 1 or 2 should be marked

Diversity of citizenship (4) This refers to suits under 28 U S C 1332, where parties are citizens of different states. When Box 4 is checked, the citizenship of the different parties must be checked (See Section III below, federal question actions take precedence over diversity cases )

**III. Residence (citizenship) of Principal Parties.** This section of the JS 44 is to be completed if diversity of citizenship was indicated above Mark this section for each principal party

**IV. Nature of Suit** Place an "X" in the appropriate box If the nature of suit cannot be determined, be sure the cause of action, in Section VI below, is sufficient to enable the deputy clerk or the statistical clerks in the Administrative Office to determine the nature of suit If the cause fits more than one nature of suit, select the most definitive

**V. Origin** Place an "X" in one of the seven boxes

Original Proceedings (1) Cases which originate in the United States district courts

Removed from State Court (2) Proceedings initiated in state courts may be removed to the district courts under Title 28 U S C , Section 1441 When the petition for removal is granted, check this box

Remanded from Appellate Court (3) Check this box for cases remanded to the district court for further action Use the date of remand as the filing date

Reinstated or Reopened (4) Check this box for cases reinstated or reopened in the district court Use the reopening date as the filing date

Transferred from Another District (5) For cases transferred under Title 28 U S C Section 1404(a) Do not use this for within district transfers or multidistrict litigation transfers

Multidistrict Litigation (6) Check this box when a multidistrict case is transferred into the district under authority of Title 28 U S C Section 1407 When this box is checked, do not check (5) above

Appeal to District Judge from Magistrate Judgment. (7) Check this box for an appeal from a magistrate judge's decision

**VI. Cause of Action** Report the civil statute directly related to the cause of action and give a brief description of the cause **Do not cite jurisdictional statutes unless diversity** Example. U S Civil Statute 47 USC 553
Brief Description Unauthorized reception of cable service

**VII. Requested in Complaint** Class Action Place an "X" in this box if you are filing a class action under Rule 23, F R Cv P

Demand In this space enter the dollar amount (in thousands of dollars) being demanded or indicate other demand such as a preliminary injunction

Jury Demand Check the appropriate box to indicate whether or not a jury is being demanded

**VIII. Related Cases** This section of the JS 44 is used to reference related pending cases if any If there are related pending cases, insert the docket numbers and the corresponding judge names for such cases

**Date and Attorney Signature** Date and sign the civil cover sheet

AO 440 (Rev 12/09) Summons in a Civil Action

# UNITED STATES DISTRICT COURT

for the

SOUTHERN DISTRICT OF FLORID

RAPID MOBILE TECHNOLOGIES, INC , a Florida Corporation,

*Plaintiff*

v.

MOTOROLA, INC , a Delaware Corporation,

*Defendant*

Civil Action No.

## SUMMONS IN A CIVIL ACTION

To: *(Defendant's name and address)*

MOTOROLA, INC.
c/o Registered Agent
CT CORPORATION SYSTEM
1200 S PINE ISLAND ROAD
PLANTATION FL 33324 US

A lawsuit has been filed against you.

Within 21 days after service of this summons on you (not counting the day you received it) — or 60 days if you are the United States or a United States agency, or an officer or employee of the United States described in Fed. R. Civ. P 12 (a)(2) or (3) — you must serve on the plaintiff an answer to the attached complaint or a motion under Rule 12 of the Federal Rules of Civil Procedure The answer or motion must be served on the plaintiff or plaintiff's attorney, whose name and address are

Peter G Herman, Esquire
Alexander D Brown, Esquire
*Tripp Scott, Attorneys at Law*
110 S E 6th Street, Suite 1500
Ft Lauderdale, FL 33301

If you fail to respond, judgment by default will be entered against you for the relief demanded in the complaint. You also must file your answer or motion with the court.

*CLERK OF COURT*

Date: _____

_____
*Signature of Clerk or Deputy Clerk*

Civil Action No.

**PROOF OF SERVICE**

***(This section should not be filed with the court unless required by Fed. R. Civ. P. 4 (l))***

This summons for *(name of individual and title, if any)* _____

was received by me on *(date)* _____ .

❒ I personally served the summons on the individual at *(place)* _____

_____ on *(date)* _____ ; or

❒ I left the summons at the individual's residence or usual place of abode with *(name)* _____

_____ , a person of suitable age and discretion who resides there,

on *(date)* _____ , and mailed a copy to the individual's last known address; or

❒ I served the summons on *(name of individual)* _____ , who is

designated by law to accept service of process on behalf of *(name of organization)* _____

_____ on *(date)* _____ , or

❒ I returned the summons unexecuted because _____ ; or

❒ Other *(specify)*

.

My fees are $ _____ for travel and $ _____ for services, for a total of $ 0 00 .

I declare under penalty of perjury that this information is true.

Date: _____

_____

*Server's signature*

_____

*Printed name and title*

_____

*Server's address*

Additional information regarding attempted service, etc:

**UNITED STATES DISTRICT COURT**
**SOUTHERN DISTRICT OF FLORIDA**

RAPID MOBILE TECHNOLOGIES, INC.,
a Florida Corporation,

Plaintiff,

v.

MOTOROLA, INC.,
a Delaware Corporation,

Defendant.
_____/

**COMPLAINT FOR WILLFUL PATENT INFRINGEMENT**

Plaintiff, RAPID MOBILE TECHNOLOGIES, INC., a Florida corporation, by and through the undersigned, hereby files this Complaint for Willful Patent Infringement against MOTOROLA, INC., a Delaware Corporation, and, in so doing, states as follows:

**JURISDICTION, VENUE AND THE PARTIES**

1. This is an action brought pursuant to the Patent Laws of the United States, 35 U.S.C. §§ 271, *et. seq*.

2. This Court has original jurisdiction pursuant to Title 28, United States Code, Section 1331, as this case involves a federal question arising under the Constitution, laws or treaties of the United States.

3. At all times material hereto, RAPID MOBILE TECHNOLOGIES, INC., a Florida corporation (hereinafter "RAPID MOBILE"), had its principle address located in Palm Beach County, Florida.

4. At all times material hereto, MOTOROLA, INC., a Delaware Corporation (hereinafter "MOTOROLA"), was engaged in the conduct of interstate commerce, and regularly

conducted business in this judicial district and, indeed, was registered with the Florida Department of State, Division of Corporations, as a Foreign Profit Corporation. Further, MOTOROLA has a place of business located at 8000 West Sunrise Boulevard, Plantation, Florida 33322, in Broward County, Florida.

5. This action arises as a result of the infringing conduct of MOTOROLA, which implicates interstate commerce.

6. Venue is proper in the Southern District of Florida pursuant to Title 28, United States Code, Section 1391(b) and (c) as Defendant "resides" in this judicial district, as the term "reside" is interpreted under Chapter 87, United States Code, and because a substantial part of the events giving rise to the infringement claims at issue occurred within this judicial district. Venue is also appropriate pursuant to Title 28, United States Code, Section 1400(b), which provides, in part, that "[a]ny civil action for patent infringement may be brought in the judicial district where the defendant resides".

7. All conditions precedent have been met, waived, or satisfied to bring this lawsuit.

## GENERAL ALLEGATIONS

8. In 2002, Edwin A. Hernandez, PhD, the Chief Executive Officer and President of RAPID MOBILE, was a doctoral candidate graduate student at the University of Florida (hereinafter the "University")

9. Leading up to 2002, and in that year, Dr. Hernandez was aware of the consuming and expensive tasks borne by mobile and wireless companies in connection with the testing and configurations of their respective mobile devices.

10. Intrigued by this reality, and studying the academic field of engineering in connection with his doctoral candidacy at the University, Dr. Hernandez began working on a

solution to this problem. Ultimately, through research efforts sponsored by the University, Dr. Hernandez conceived of a method and system that would utilize both hardware and software components to model and test various mobile network configurations and scenarios. Perfected, this invention significantly reduces the time and expense previously expended by mobile and wireless companies in connection with the testing and configurations of their respective mobile devices.

11. Thereafter, on or about August 12, 2002, Dr. Hernandez presented his conceived of invention to the University's patent office. Together with Abdelsalam A. Helal, then an employee of the University, Dr. Hernandez continued to perfect the characteristics of his invention.

12. On July 31, 2003, Dr. Hernandez, through the University's patent office, filed a provisional patent application with the United States Patent and Trademark Office ("USPTO").

13. On August 2, 2004, Dr. Hernandez, again through the University, filed a formal patent application with the USPTO, under application number 10/909,588, in which he and Dr. Helal were identified as co-inventors of the invention in suit.

14. Meanwhile, in and around November 2003, after successfully completing his doctoral program at the University, Dr. Hernandez was hired by MOTOROLA as an engineer. Dr. Hernandez worked for MOTOROLA at its Plantation, Florida office.

15. On or about November 17, 2003, prior to commencing his employment with MOTOROLA, Dr. Hernandez entered into a written employment agreement through which he disclosed the 10/909,588 patent application that was then pending before the USPTO. A copy of the referenced employment agreement is attached hereto as **Exhibit "A".**

16. In response to an apparent high level of interest in his invention, following the commencement of his employment there were several instances in which Dr. Hernandez disclosed the nature and substance of his invention to MOTOROLA.

17. Indeed, in mid-October 2006, Dr. Hernandez exchanged correspondences with MOTOROLA executives wherein he provided MOTOROLA with an actual copy of his pending patent application. Conversations between MOTOROLA and Dr. Hernandez regarding Dr. Hernandez's invention continued following this exchange.

18. Ultimately, on June 12, 2007, the United States of America issued the patent over Dr. Hernandez's invention under United States Patent No. 7,231,330 ("the '330 Patent"). As a result of an assignment from Dr. Hernandez and Dr. Helal, the '330 Patent was issued to the University. A copy of the '330 Patent is attached hereto as **Exhibit "B".**

19. Dr. Hernandez thereafter advised MOTOROLA of the issued '330 Patent.

20. On December 14, 2009, Dr. Hernandez, acting as the CEO and President of RAPID MOBILE, entered into an exclusive licensing agreement relative to the '330 Patent with the University. Amongst other privileges, said exclusive licensing agreement provides RAPID MOBILE with the exclusive right to practice, market and license the invention claimed through the '330 Patent. The exclusive licensing agreement also provides RAPID MOBILE with the right to police and enforce the parameters of the '330 Patent through any legal means, including, but not limited to, though the filing of a patent infringement lawsuit such as the instant one.

21. During Dr. Hernandez's employment, MOTOROLA was made aware of his relationship with RAPID MOBILE and the exclusive rights to the '330 Patent held by RAPID MOBILE.

22. On January 26, 2010, following additional discussions between Dr. Hernandez and MOTOROLA executives concerning the subject matter of the '330 Patent, MOTOROLA Director Chin P. Wong advised Dr. Hernandez that MOTOROLA was using the invention claimed in the '330 Patent. Mr. Wong invited Dr. Hernandez to view the system implemented by MOTOROLA at its Plantation, Florida office.

23. On January 28, 2010, Mr. Wong escorted Dr. Hernandez to the location where the subject system was implemented, and provided Dr. Hernandez access to the same. During the meeting, Dr. Hernandez was able to conclude that the system established by MOTOROLA was that which he invented and is claimed in the '330 Patent. At that same time, Mr. Wong advised Dr. Hernandez that the invention had proven successful to MOTOROLA.

24. Following the January 28, 2010 meeting with Mr. Wong, Dr. Hernandez again advised MOTOROLA of RAPID MOBILE's rights to the '330 Patent, and notified MOTOROLA that he considered their conduct (*i.e.*, using the system shown to him by Mr. Wong) to constitute literal infringement of the claims of the '330 Patent.

25. Additionally, on February 17, 2010, RAPID MOBILE corresponded in written fashion with MOTOROLA and offered a license to use the invention claimed in the '330 Patent. A copy of said correspondence is attached hereto as **Exhibit "C".**

26. On March 1, 2010, RAPID MOBILE also engaged in a telephone conference with Edward Jay Fung and Chang Chu, both MOTOROLA executives, concerning a potential license of the '330 Patent to MOTOROLA. Dr. Hernandez was not a party to this particular communication. In connection with this meeting, RAPID MOBILE forwarded a copy of the actual '330 Patent document, along with an informational pamphlet describing the invention, to Fung and Chu.

27. Amongst other things, during the March 1, 2010 telephone conference, Mr. Chu acknowledged that MOTOROLA implemented a system that effectively performs in the manner described in the '330 Patent, but denied infringement. It was also alleged by MOTOROLA at this juncture that "several companies" were using the technology claimed in the '330 Patent; MOTOROLA to date has not identified any of the "several companies."

28. Following the March 1, 2010 telephone conference, Fung and Chu immediately confronted Dr. Hernandez at MOTOROLA offices in Plantation, Florida, and accused Dr. Hernandez of trying to sue the company. Mr. Fung asked that Dr. Hernandez not sue the company, and promised that a licensing deal of the '330 Patent would be worked out between MOTOROLA and RAPID MOBILE.

29. Sometime thereafter, upon following up with Fung and Chu concerning the March 1, 2010 conversation, Dr. Hernandez was instructed to direct all communications to MOTOROLA's legal department.

30. Accordingly, on April 12, 2010, having received no substantive follow-up communication from MOTOROLA on the issue, RAPID MOBILE communicated with MOTOROLA's Senior Intellectual Property Attorney. A copy of said correspondence is attached hereto as **Exhibit "D".**

31. Through the April 12, 2010 correspondence, RAPID MOBILE again advised MOTOROLA of its infringing conduct, and again offered it a license of the '330 Patent.

32. On April 30, 2010, MOTOROLA responded to RAPID MOBILE advising that it was not interested in licensing the '330 Patent.

33. On June 11, 2010, MOTOROLA having failed to address its actions, and choosing, instead, to ignore the claims of the '330 Patent, Dr. Hernandez communicated directly

with MOTOROLA's Senior Intellectual Property Attorney. In this instance, demand was made again that MOTOROLA recognize the rights under the '330 Patent and either cease using the aforementioned infringing or enter into a licensing agreement with RAPID MOBILE so that its use would be permitted and authorized.

34. By July 1, 2010, in response to the June 11, 2010 correspondence, Dr. Hernandez was placed on administrative leave by MOTOROLA and advised that he was under internal "investigation." On that same date Dr. Hernandez was abruptly stripped of his access to MOTOROLA offices, files and computers.

35. On July 15, 2010, Dr. Hernandez was terminated from his employment with MOTOROLA.

36. Following its termination of Dr. Hernandez, MOTOROLA has continued to blatantly, intentionally and willfully refuse to respond to the charges of infringement.

37. Thus, being unable to convince MOTOROLA to cease its infringing conduct, RAPID MOBILE was thereafter required to retain the undersigned counsel to pursue its interests in this matter, and is obligated to pay the undersigned a reasonable attorneys' fee for their services, and to reimburse the undersigned for any costs incurred in connection with said representation.

38. This lawsuit followed.

**COUNT I:**
**TEMPORARY AND PERMANENT INJUNCTIVE RELIEF**

39. Plaintiff realleges and revers paragraphs one (1) through thirty-eight (38) as if fully set forth herein.

40. This is an action for temporary and permanent injunctive relief pursuant to Title 35, United States Code, Section 283, of the United States Patent Act.

41. Said section provides that this Court may "grant injunctions in accordance with the principles of equity to prevent the violations of any right secured by patent, on such terms as the court deems reasonable."

42. As alluded to in more detail above, MOTOROLA has infringed, and continues to infringe, on the '330 Patent.

43. Despite repeated demands, MOTOROLA continues to infringe the claims of the '330 Patent.

44. Such refusal to honor Plaintiff's exclusive patent rights has caused, and will continue to cause, irreparable harm. Each day that Plaintiff is deprived of its earned intellectual property rights causes irreparable injury.

45. Plaintiff has no adequate remedy at law, especially because the property at issue is intellectual property and patented work that is being deprived.

46. There is no remedy at law that can fully compensate Plaintiff for the deprivation of said patent rights, and, in light of the facts of this case, there is a substantial likelihood that Plaintiff will succeed on the merits of the instant case.

WHEREFORE, Plaintiff RAPID MOBILE TECHNOLOGIES, INC., a Florida corporation, by and through the undersigned, hereby respectfully requests that the Court enter a temporary and permanent injunction enjoining Defendant MOTOROLA, INC., a Delaware Corporation, and all those in active concert and participation with MOTOROLA, INC., from using, making, selling, marketing, distributing, transferring, or otherwise infringing on the claims of the '330 Patent as more fully set forth above, together with costs, attorneys' fees, and such other and further relief as this Court deems just and proper.

**COUNT II:**
**WILLFUL PATENT INFRINGEMENT**

47. Plaintiff realleges and revers paragraphs one (1) through thirty-eight (38) as if fully set forth herein.

48. This is an action for patent infringement pursuant to Title 35, United States Code, Section 271, of the United States Patent Act.

49. As more fully set forth above, MOTOROLA has infringed, and continues to infringe, the claims of the '330 Patent by, *at least*, making and using infringing technology

50. All such infringing conduct of MOTOROLA has occurred and was committed by MOTOROLA in a willful manner, irrespective of and despite repeated demands that MOTOROLA immediately cease its infringing conduct and recognize the rights under the '330 Patent.

51. MOTOROLA's actions have been committed and performed in a willful, knowing and bad faith manner.

52. MOTOROLA's actions have caused, and continue to cause, irreparable harm to Plaintiff to which there is no adequate remedy at law.

WHEREFORE, Plaintiff RAPID MOBILE TECHNOLOGIES, INC., a Florida corporation, by and through the undersigned, hereby respectfully demands judgment against Defendant MOTOROLA, INC., a Delaware Corporation, for the full amount of damages sustained, including, but not limited to, any and all remedies available pursuant to the Patent Laws of the United States, 35 U.S.C. §§ 271, *et. seq.*, which included, but are not limited to, a reasonable royalty award, disgorgement of the profits received by Defendants, treble damages, costs, pre and post judgment interest at the maximum allowable rate, attorneys' fees, and such other and further relief this Court deems just and proper.

**DEMAND FOR JURY TRIAL**

Plaintiff RAPID MOBILE TECHNOLOGIES, INC., a Florida corporation, hereby demands trial by jury of all issues so triable as a matter of law.

**Dated this 23rd day of December, 2010.**

Respectfully Submitted,

/s/ Alexander D. Brown
ALEXANDER D. BROWN, ESQ.
FLA. BAR NO. 752665
adb@trippscott.com
PETER G. HERMAN, ESQ.
FLA BAR. NO. 353991
pgh@trippscott.com
TRIPP SCOTT, P.A.
110 SE Sixth Street, 15th Floor
Ft. Lauderdale, Florida 33301
Tel: 954.525.7500; Fax: 954.761.8475
*Counsel for Rapid Mobile Technologies, Inc*

MOTOROLA

# EMPLOYMENT AGREEMENT

In consideration of my employment, or continued employment by Motorola, or its subsidiaries (referred to separately or together as "Motorola") and the salary or wages paid to me, I understand and agree to the following provisions for the protection of Motorola property rights:

1. Not to disclose to Motorola, or use in my work at Motorola (a) any confidential information belonging to others, including my prior employers (unless written authorization is first obtained), or (b) any prior inventions made by me which Motorola is not otherwise entitled to learn of or to use.

2. Not to use, or publish, or to otherwise disclose to others, either during or subsequent to my employment by Motorola, any confidential information of Motorola or its customers, except as my Motorola duties may require.

3. Upon termination of my employment by Motorola, to promptly deliver to a designated Motorola representative all documents and other records which relate to the business activities of Motorola, or any other materials which belong to Motorola.

4. To assign and I hereby assign to Motorola as its exclusive property the entire right, title and interest in all my inventions, innovations, or ideas developed or conceived by me solely, or jointly with others, at any time during the term of my employment and which inventions, innovations, or ideas relate to the actual or anticipated business activities of Motorola, or result from, or are suggested by, work which I do for Motorola.

5. To make and maintain written records of all inventions, innovations, or ideas referred to in paragraph 4 above and to submit promptly such records, and supplemental oral disclosures, to designated representatives of Motorola.

6. To execute all papers, and otherwise provide proper assistance, at Motorola's request and expense, during and subsequent to my employment by Motorola to enable Motorola or its nominees to obtain patents, copyrights, and legal protection for inventions or innovations in any country.

7. I represent that the inventions identified in the . . . . pages I attach hereto comprise all the unpatented inventions which I have made or conceived prior to my employment by Motorola, which inventions shall be excluded from this agreement. (It is only necessary to list the title of such inventions and the purpose thereof, but not details of the invention itself per paragraph 1(b)). IF THERE ARE NO SUCH UNPATENTED INVENTIONS TO BE EXCLUDED, EMPLOYEE INITIAL HERE _____.

8. I further represent that I have attached hereto a copy of any agreement which presently affects my compliance with the terms of this present agreement. (Such copy must specify the other contracting party or employer, the date of such agreement, the date of termination of any employment). IF THERE IS NO SUCH AGREEMENT, EMPLOYEE INITIAL HERE _____.

This agreement replaces any existing employee agreement between Motorola and me regarding patents and/or confidential information and shall be binding on my executors, administrators, heirs, legal representatives or assigns.

This agreement may not be modified except in writing with approval of an officer of Motorola.

| WITNESS | EMPLOYEE |
|---|---|
| SIGNATURE | SIGNATURE |
| TYPED OR PRINTED NAME | TYPED OR PRINTED NAME |
| DATE | DATE 11-17-03 |

EXHIBIT A

*Distribution: White – Patent Dept, Canary – Personnel Folder, Pink – Employee Copy*

SPD 14434 (7/84)

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**Hernandez-Mondragon et al.**

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(45) **Date of Patent: Jun. 12, 2007**

(54) **RAPID MOBILITY NETWORK EMULATOR METHOD AND SYSTEM**

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(51) **Int. Cl.**
***G06F 17/50*** (2006.01)
*H04L 12/56* (2006 01)

(52) **U.S. Cl.** **703/2**, 455/423, 455/522

(58) **Field of Classification Search** .. . 703/2, 703/13, 14, 455/423, 522, 370/238
See application file for complete search history

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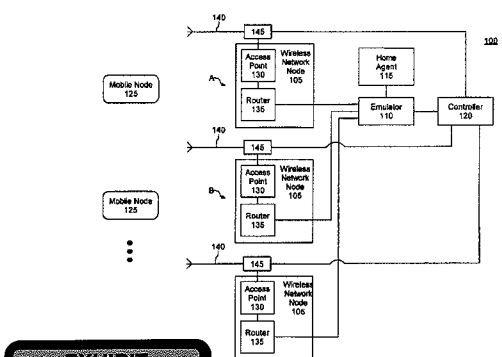
(74) *Attorney, Agent, or Firm*—Akerman Senterfitt

(57) **ABSTRACT**

A system for emulating mobile network communications can include one or more wireless nodes configured to variably adjust signal reception sensitivity and signal transmission strength, at least one mobile node configured to wirelessly communicate with selected ones of the wireless nodes; and a network emulator communicatively linked to each wireless node The network emulator can replicate attributes of a wired communications network The system also can include a controller communicatively linked with the wireless nodes and configured to control signal reception sensitivity and signal transmission strength of each said wireless node, as well as a home agent configured to interact with at least one mobile node via selected ones of the wireless nodes

**21 Claims, 2 Drawing Sheets**



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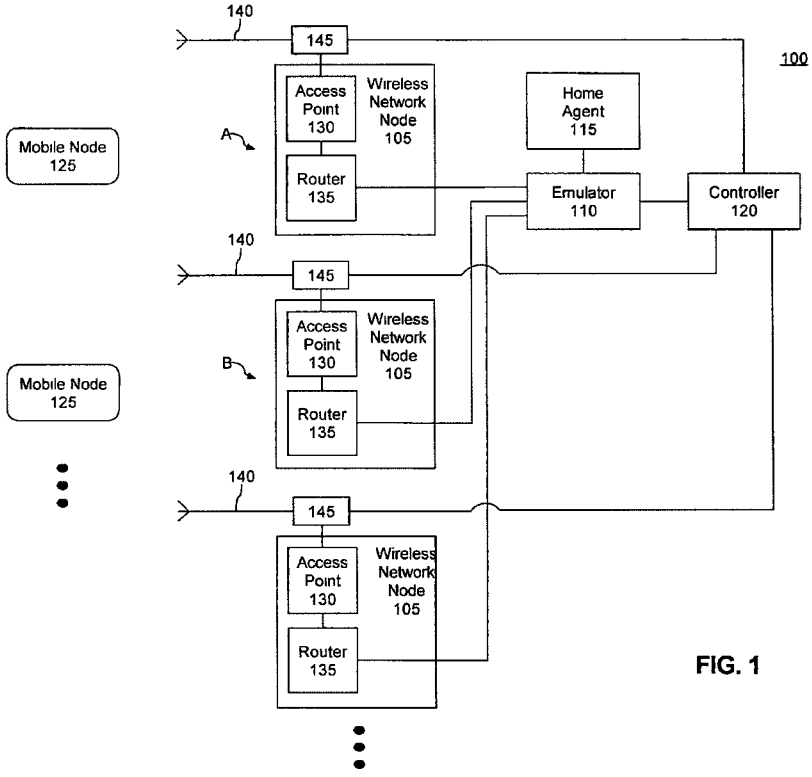
140
145
100
Access Point 130
Wireless Network Node 105
Home Agent 115
Mobile Node 125
A
Router 135
Emulator 110
Controller 120
140
145
Access Point 130
Wireless Network Node 105
B
Mobile Node 125
Router 135
140
145
Access Point 130
Wireless Network Node 105
Router 135

FIG. 1

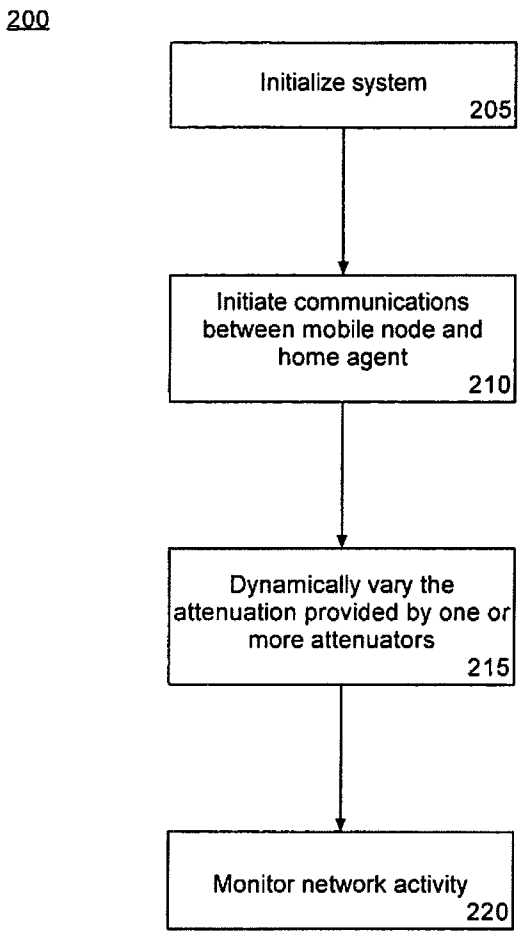
200
Initialize system
205
Initiate communications between mobile node and home agent
210
Dynamically vary the attenuation provided by one or more attenuators
215
Monitor network activity
220

FIG. 2

# RAPID MOBILITY NETWORK EMULATOR METHOD AND SYSTEM

## CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U S Provisional Application No 60/491,637, filed in the United States Patent and Trademark Office on Jul 31, 2003, the entirety of which is incorporated herein by reference.

## BACKGROUND

1 Field of the Invention

This invention relates to the field of network emulation and, more particularly, to emulation of wireless networks.

2 Description of the Related Art

Mobile computing networks provide environments and scenarios that challenge current computing paradigms Current network protocols frequently are unable to efficiently deal with mobility issues regarding both nomadic data and devices In consequence, various software-based tools, referred to as simulators, and hardware-based tools, referred to as emulators, have been developed by the research community to study and improve the performance of network protocols, determine data restriction points in networks, and reduce the cost of hardware implementation

While software-based simulation tools do provide researchers with the ability to model various networking scenarios, such systems have disadvantages One disadvantage is that the duplication of the software development process for purposes of simulation, for example to support new operating system platforms and/or newly introduced wireless technologies, is costly, time consuming, and oftentimes impractical. As an example, to support a new network technology, each component used by a software-based network simulator, from traffic generators, Transmission Control Protocol (TCP) implementation, to application level interfaces, would have to be developed and implemented as an object file within the simulator library Further development efforts would be required to use these objects or software components across different computing platforms

Another disadvantage is the amount of time simulators require for performing different simulations Typically, simulators required an amount of time that is several orders of magnitude larger than the amount of time that is being simulated For example, on average, several hours of simulation time are needed to simulate several minutes of a given real-time network scenario As software simulators already require a significant amount of time to model wired and/or wireless networks, the introduction of rapid mobility conditions and complex propagation models relating to mobile networks further challenges the utility and suitability of software-based simulators Unfortunately, efforts to improve software-based simulator performance by simplifying modeling tasks through the reduction of the number of modeling parameters used during a simulation can lead to misleading, if not erroneous results

Wire-line emulators provide researchers with a faster and more efficient alternative than software-based simulators Several different wire-line emulators have been developed to replicate the conditions of end-to-end network delays For example, the End-to-End Emulator as described in C Bolot, *End-to-End Packet Delay and Loss Behavior in the Internet*, ACM Computer Communication Review, Vol , 23, No 4, pp 289–298 (October 1993), seeks to imitate the Internet by providing end-to-end network delay using Internet Control



Message Protocol (ICMP) packets as a real time traffic source The Ohio Network Emulator (ONE) as described in M Allman, A Caldwell, S Ostermann, *ONE The Ohio Network Emulator*, TR-19972, School of Electrical Engineering and Computer Science, Ohio University (August 1997), is able to emulate transmission, queuing, and propagation delay between two computers interconnected by a router

Presently, however, wire-line emulators do not account for characteristics of rapid mobility networks or complex signal propagation models As such, conventional wire-line emulators are not available or are unable to model mobile networks.

## SUMMARY OF THE INVENTION

The inventive arrangements disclosed herein provide a method and system for modeling mobile networks More particularly, the present invention utilizes both hardware and software components to model and test various mobile network configurations and scenarios According to one embodiment of the present invention, a mobile node can be configured to wirelessly communicate with an application via one or more wireless nodes. Motion of the mobile node can be simulated by dynamically adjusting the signal reception sensitivity and signal transmission strength of each wireless node Communications exchanged between the application and the mobile node can be monitored and tracked to study the behavior of the mobile network, including the effects of motion of the mobile node upon overall network performance.

One aspect of the present invention includes a system for emulating mobile network communications The system can include one or more wireless nodes configured to variably adjust one or more wireless communication characteristics, at least one mobile node configured to wirelessly communicate with selected ones of the wireless nodes, and a network emulator communicatively linked to each wireless node The wireless communication characteristics can include signal reception sensitivity and signal transmission strength of the wireless nodes The network emulator can be configured to replicate attributes of a wired communications network The system also can include a home agent and a controller communicatively linked with the wireless nodes. The home agent can be configured to interact with one or more of the mobile nodes via selected ones of the wireless nodes The controller can be configured to control signal reception sensitivity and signal transmission strength of each wireless node

According to another embodiment of the present invention, three wireless nodes can be included In any case, each of the wireless nodes can include a wireless access point having an antenna, for example an omni-directional antenna, and a variable attenuator The wireless nodes also can include a routing device communicatively linking the access point with the network emulator

The controller can be configured to dynamically adjust the wireless communication characteristics of one or more of the wireless access points by varying an amount of attenuation provided by the attenuators to simulate motion of one or more of the mobile nodes For example, attenuation provided by at least one of the attenuators can be increased while simultaneously decreasing attenuation provided by another one of the attenuators The controller can dynamically adjust the amount of attenuation provided by at least

two of the attenuators to emulate at least one mobile network characteristic such as speed, acceleration, and/or trajectory of the mobile node

The system also can include a data logging component configured to record data throughput of one or more of the wireless nodes and/or a measure of signal strength received from at least one of the wireless nodes at one or more of the mobile nodes

Another aspect of the present invention can include a method of emulating mobile network communications The method can include initiating communications between a home agent and a mobile node via one or more wireless nodes, while the mobile node wirelessly communicates with at least one of the wireless nodes, dynamically adjusting one or more wireless communication characteristics of one or more of the wireless nodes to simulate movement of the mobile node, and monitoring communications in the mobile node and/or one of the wireless nodes As noted, the wireless communication characteristics can include signal reception sensitivity and signal transmission strength of the wireless nodes

Notably, each of the wireless nodes can include a wireless access point having an antenna and a variable attenuator The wireless nodes further can include a routing device The wireless nodes can be communicatively linked with the home agent through a network emulator

According to another embodiment of the present invention, the step of dynamically adjusting the wireless communication characteristics can include varying an amount of attenuation provided by at least one of the attenuators to emulate motion of the mobile node The present invention dynamically adjusts the amount of attenuation provided by at least one of the attenuators to emulate at least one mobile network characteristic such as speed, acceleration, and/or trajectory of the mobile node Notably, attenuation provided by at least one of the attenuators can be increased while attenuation provided by another one of the attenuators can be simultaneously decreased

## BRIEF DESCRIPTION OF THE DRAWINGS

There are shown in the drawings, embodiments which are presently preferred, it being understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown

FIG. 1 is a schematic diagram illustrating a system for modeling a mobile network in accordance with one embodiment of the present invention

FIG 2 is a flow chart illustrating a method of modeling a mobile network in accordance with the inventive arrangements disclosed herein

## DETAILED DESCRIPTION OF THE INVENTION

The present invention provides a method and system for simulating various mobile network configurations and/or scenarios In particular, the present invention utilizes both hardware and software components to model various mobile networks Communications exchanged between an application and a mobile node can be monitored and tracked to study the behavior of the mobile network

The inventive arrangements disclosed herein provide a novel approach to mobile network emulation that incorporates existing software-based network simulation with wireless network hardware Accordingly, the inventive arrangements disclosed herein provide realistic models of mobile networks and various mobile connection scenarios Using the present invention, mobility in wireless networks can be emulated by affecting the physical parameters of the network to emulate various mobile network characteristics including, but not limited to, speed, acceleration, and/or trajectory changes of the mobile node by controlling the causality between network parameters and network behavior perceived by the mobile node

FIG 1 is a schematic diagram illustrating a system **100** for modeling a mobile network in accordance with one embodiment of the present invention. As shown, the system **100** can include one or more wireless nodes **105**, an emulator **110**, a home agent **115**, and a controller **120** The system **100** further can include one or more mobile nodes **125** Thus, as illustrated, although only three wireless nodes **105** and two mobile nodes **125** are illustrated, those skilled in the art will recognize that any number of such components can be introduced or incorporated into the system **100** in order to emulate more diverse topologies and system architectures

Each mobile node **125** represents a moving network node, communications device, and/or computer system Each mobile node **125** can be a computing device having a suitable wireless communication interface The mobile nodes **125** can be implemented as general purpose computing devices, each having a wireless transceiver such as an integrated transceiver or a separate transceiver communicatively linked to the unit, for example a wireless network interface card or other wireless peripheral attachment For instance, the mobile node **125** can be a laptop or portable computer, a personal digital assistant, or portable telephone which has been configured to communicate using a suitable wireless communication protocol

It will be readily appreciated by those of ordinary skill in the art that the mobile nodes **125** can be implemented as any suitable computing device having a wireless transceiver capable of communicating wirelessly with the wireless nodes **105**. The mobile node **125** need not be a moveable or roaming component as the system **100** is configured to simulate motion of the mobile node **125** at any of a variety of different speeds, accelerations, or trajectories despite the mobile node **125** being stationary in nature If desired, however, the mobile node **125** can be repositioned at any of a variety of different locations The mobile nodes can be configured to communicate using any of a variety of different wireless communications protocols, including, but not limited to, 802 1a, 802 11b, 802 11g, 3G, Cellular-IP, and mobile-IP wireless communication protocols

The wireless nodes **105** each can include a wireless access point **130** By using actual hardware components instead of modeling the components, the complexity of coding algorithms and the computation time required to simulate wireless communication characteristics including, but not limited to, radio-wave fading, antenna propagation, or other base station implementation details can be avoided The wireless access points **130** can be high frequency wireless entry points configured to communicate using any of a variety of different wireless communications protocols so as to communicate with the mobile nodes **125** Any suitable wireless communication protocol can be implemented using the access points **130** and the mobile nodes **125** and, as such, can be tested using the system **100**.

Each access point **130** can be a wireless access point having an antenna **140** Each antenna **140** can be an omni-directional antenna so as to model base station signal transmission and reception behavior Accordingly, each access point **130** can receive wireless communications via its antenna **140** and forward received wireless communica-

tions over a wired, packet-based communications network Communications received by each wireless node **105** via the wired, packet-based communications network can be wirelessly transmitted via the antenna **140** of the receiving wireless node **105**.

Each wireless node **105** also can include an attenuator **145** disposed between each wireless access point **130** and antenna **140** The attenuators **145** can be implemented as a variable or programmable attenuator for use with antennas Each attenuator **145** can receive control signals allowing the amount of attenuation provided by that attenuator **145** to be controlled dynamically from another device Accordingly, wireless communication characteristics such as the sensitivity of the access point with respect to both signal reception and signal transmission can be modified by adjusting the attenuators **145**

For example, by increasing the amount of attenuation provided by an attenuator **145**, the power delivered from a wireless access point **130** to an attached antenna **140** for transmission as well as the power of a signal received by an antenna **140** that is delivered to the wireless access point **130** can be reduced Decreasing the amount of attenuation allows the wireless access point **130** to deliver increased power to an attached antenna **140** for transmission as well as receive higher power signals from the attached antenna **140**

The wireless nodes **105** further can include routers **135** Although a dedicated hardware router can be used, according to another embodiment of the present invention, one or more of the routers **135** can be implemented using a computer system having appropriate routing software executing therein The routers **135** also can include mobility management software providing thresholds and events notification to avoid system problems or failure, real-time updates on network events, automatic discovery of access points, tracking of network traffic and usage for analysis of network utilization, and data reporting and data export functions

The controller **120** is operatively connected to each attenuator **145** Accordingly, the controller **120** can provide control signals to each attenuator **145** of the wireless nodes **105**. The controller **120** can be implemented as a programmable computer system or as a standalone, dedicated controller unit In either case, the controller **120** can variably and continually adjust the amount of attenuation provided by each attenuator **145** by sending appropriate control signals to the attenuators **145**.

The controller **120** can include a suitable communications interface for communicating with each attenuator **145** While each attenuator **145** can be adjusted individually by the controller **120**, according to one aspect of the present invention, the controller **120** can vary the amount of attenuation provided by each attenuator **145** in a predetermined pattern so as to model the movement of a mobile node **125** By varying the attenuation of one or more of the attenuators **145** according to a given pattern, various motion related parameters including, but not limited to, speech, acceleration, and trajectory of the mobile node **125** can be emulated Additionally, the controller **120** can concurrently control and dynamically adjust the attenuation provided by each attenuator **145**

The emulator **110** can be a hardware or a software network emulator According to one embodiment of the present invention, the emulator **110** can be implemented as a software-based network emulator configured to emulate various performance scenarios such as tunable packet delay distributions, congestion and background loss, bandwidth limitation, and packet reordering and duplication For example, the emulator **110** can be implemented using a computer system executing the National Institute of Standards and Technology (NIST) emulator

The home agent **115** can be a computing environment with which the mobile node **125** can communicate via the wireless and wired portions of system **100** For example, the home agent **115** can be one or more application programs which the mobile node **125** can access, a virtual private network (VPN) configuration, virtual environment, or the like Because the network and transport layers of the system **100** are isolated from the home agent **115**, any applications and/or other virtual environments can be tested without changing application programming interfaces (API's) to any such applications and/or virtual environments

While the emulator **110**, the home agent **115**, and the controller **120** are depicted as independent components, it should be appreciated that one or more of these components can be combined into a single, more complex component For example, the home agent **115**, the emulator **110**, and the controller **120**, if implemented as application programs, can be included within a single computer system. Similarly, various combinations of the emulator **110**, the home agent **115**, and the controller **120** can be implemented in two or more computer systems

It should be appreciated that the various components discussed with reference to FIG 1 have been provided for purposes of illustration As such, the present invention can be embodied in other forms For example, according to one embodiment of the present invention, wireless nodes **105** can be provided which allow for programmatic control of signal transmission strength or power Such an embodiment also can include an attenuation mechanism for controlling the sensitivity of the receiver portion of the wireless node Depending upon the configuration of system **100**, the controller **120** also can be communicatively linked with the emulator **110** Accordingly, functions of the controller **120** can be directed by the home agent **115** if so desired

In operation, one of the mobile nodes **125** can begin communicating with the home agent **115** That mobile node **125** can establish a wireless communication link with the wireless node **105**, labeled A (hereafter **105**A) The controller **120** can be configured to initially set the attenuation level of the attenuator **145** of wireless node **105**A to a minimum, or at least set the attenuation to a level which permits the mobile node **125** to communicate with the wireless node **105**A The controller **120** can continually increase the attenuation provided by the attenuator **145** of wireless node **105**A to simulate mobile node **125** traveling away from the wireless node **105**A

The controller **120** can concurrently set the attenuator **145** of wireless node **105**, labeled B (hereafter **105**B), to maximize attenuation That is, wireless node **105**B can be set for maximum attenuation while wireless node **105**A is communicating with the mobile node **125**. Subsequently, while the attenuation for wireless node **105**A is increasing, the controller **120** can cause the attenuation of wireless node **105**B to decrease so as to simulate mobile node **125** moving away from wireless node **105**A and moving toward wireless node **105**B The emulator **110** can simulate various conditions of an attached wired network By varying the amount of attenuation provided by each attenuator **145** and the rate at which the attenuation either increases and/or decrease in each respective network node **105**, the controller **120** emulates motion of the mobile node **125** for any of a variety of different trajectories, speeds, and/or accelerations It should be appreciated that more than one mobile node **125** can be used or be active at one time

One or more data logging components (not shown) can be disposed in one or more of the various components of the system **100** For example, the mobile node **125** can be configured to record information such as the strength of the signal received at the mobile node **125** over time Similarly, the routers **135** and/or the access points **130** can be configured to record information including, but not limited to, the amount of data passing through each wireless node **105** The emulator **110**, the home agent **115**, and the controller **120** also can be configured to record transactions and component settings

Recorded information can be time stamped for purposes of comparison with data recorded from other components Additionally, each respective data logger can be configured to record the source of a received request For example, each router **135** or other data logging component of the wireless nodes **105** can record which mobile node **125** is sending and/or receiving communications from that wireless node **105**.

Accordingly, recorded information and network behavior can be analyzed with respect to time and varying attenuation settings for the various wireless nodes **105** For example, the strength of the signal received at the mobile node **125** can be analyzed and compared with the data throughput of each wireless node **105** over time Such an analysis can reveal hand-off rates between the wireless nodes **105**

FIG **2** is a flow chart illustrating a method **200** of emulating mobile network communications in accordance with the inventive arrangements disclosed herein The method can begin in step **205** where the system is initialized The wireless nodes, the controller, and the emulator are brought online and the home agent is initialized For example, an application program or other virtual environment that can interact with the mobile nodes can be executed or instantiated

One or more mobile nodes can be positioned at a location (or locations) within communication range of each of the wireless nodes. For example, a mobile node can be positioned approximately 10 meters from a perimeter established by the antennas of the wireless nodes It should be appreciated, however, that the mobile nodes can be located at any suitable distance from the wireless nodes so long as wireless communications can be exchanged between the mobile node and the wireless node when little or no attenuation is used

In step **210**, communications between the mobile node and the home agent can be initiated For example, the mobile nodes can initiate a file transfer or some other task which can either be conducted throughout the method **200** or can be performed in an iterative manner

In step **215**, the attenuation provided by one or more of the attenuators can be dynamically varied For example, the controller can decrease the amount of attenuation for one of the wireless nodes while increasing the amount of attenuation with respect to the other wireless nodes In this manner, motion of the mobile node can be emulated As noted, by varying the rate and amount of attenuation of one or more of the attenuators, different characteristics of motion such as the trajectory, speed, and/or acceleration of the mobile node can be emulated

For example, in order to emulate speed, two factors can affect the mobile node received signal strength and signal-to-noise ratio (SNR) As the SNR is defined by the Log (signal/noise), modifying the signal strength modifies the SNR The SNR also can be emulated by adding randomness to the attenuation mechanism Noise can be added in the form of a Gaussian Distribution (Normal Distribution) at a certain mean and variance In any case, these factors can be varied from the wireless access point and can be received at the client adaptor (network card) level Mobility is then emulated by increasing the signal strength and reception sensitivity of one wireless access point and decreasing the signal strength and reception sensitivity of the other two wireless access points. Signal strength and reception sensitivity of any two or more wireless access points can be varied to emulate-a predetermined path of motion, or the trajectory, of the mobile node(s) and the wireless communication scenario under evaluation Other wireless communication characteristics can be similarly varied Besides signal strength, reception sensitivity, and SNR, other communication characteristics that can be varied include, for example, a bit error rate (BER).

The controller can be programmed to vary the attenuation of one or more attenuators of each of the wireless nodes to emulate mobility scenarios where the mobile node is moving at a particular speed, at a particular directional path, and over particular terrain Equation 1 represents the path loss and the signal received by a network node at a distance d from a wireless access point

$$S_r(dBW)=S_t(dBW)+G_t(dB_i)+G_r(dB)-K_o-n\log_{10}(d) \quad (1)$$

The values of $G_i$ indicate the gains at the both ends of an antenna, using the isotropic in $dB_i$ In other words, the signal strength received at the mobile node is the summation of all the gains ($S_r$, $G_i$) minus the propagation loss due to fading of the signal This propagation loss depends on the many characteristics of the terrain and can be empirically defined as discussed in K Pahlavan, A. Levesque, *Wireless Information Networks*, John Wiley & Son's, New York (1995), using different values of $K_o$ and n, depending upon different terrain conditions at different frequency values.

The experimental values and equations used for signal propagation correspond to the modeling for indoor and micro-cellular environments, as discussed in K Pahlavan, et al , *Wireless Information Networks*, are illustrated with reference to equation 2 The empirical model indicates that the attenuation is negligible at closer distances from the antenna, and quickly, logarithmically decays at certain distances using different values of n and $K_o$ In this case, 10 and 20 are used in equation 2

$$(2)\quad A(d) = \begin{cases} 0, & d \leq R/100 \text{ and } d >= 1\ 2R \\ 10 + n\log(d), & R/100 < d \leq 0\ 9R \\ 20 + 10(n + 1\ 3)\log(d), & d > 0\ 9R \end{cases}$$

In equation 2, d is the distance between the wireless access point and the mobile node and R is the cell ratio having a value of 500 meters A square attenuation model was used to determine the handoff rate between the wireless nodes as set forth in equation 3

$$(3)\quad A(d) = \begin{cases} 0, & 0 \leq d \leq 0\ 9R \\ 128, & d > 0\ 9R \end{cases}$$

Although the attenuators can be varied to provide several different values of attenuation, acceptable values of attenuation can be determined through empirical study For example, attenuation can range from approximately 0 to 60 dB or another range so as to prevent wireless access point signal leakage.

Accordingly, attenuation of each wireless node can be varied using the equations specified above to emulate motion of mobile nodes As noted, various mobile network characteristics such as speeds, accelerations, and trajectories of the mobile node(s) can be emulated by varying attenuation levels The controller and/or the home agent can be programmed to vary attenuations to emulate a variety of different mobile network characteristics Notably, with respect to terrain, different terrains also can be emulated by mapping survey data to settings of the attenuators As used herein, the term "terrain" can be used to refer to different natural and/or man-made landscapes For example, "terrain" can be used to describe a mountainous landscape, a landscape having valleys, lakes, and the like The term further can refer to urban and/or rural landscapes as well as the landscape of a city in reference to building height, placement, and the like

In step **220**, network activity can be monitored and logged More particularly, the data throughput at each wireless node can be tracked over time and compared with the attenuation function as applied to each respective wireless node Accordingly, by analyzing the data throughput of each wireless node, the handoff rate, or the rate at which the mobile node leaves the coverage area of one network node and enters the coverage area of another, can be determined The signal strength as measured at the mobile node also can be monitored and compared with the attenuation function applied to the wireless nodes

It should be appreciated that other quantities and/or characteristics can be measured and/or monitored such as the power consumed at the mobile node, the handoff protocol performance, and protocol synchronization According to one aspect of the present invention, the performance of IP Security (IPSec) protocol and IP in IP tunneling can be evaluated, for example in the context of Mobile-IP, in conjunction with Virtual Private Networks (VPN) and Layer 2 Tunnel Protocol (L2TP) as secured links over Mobile wireless Networks Handoff performance also can be evaluated

Additionally, wireless communication characteristics such as authentication and authorization latencies, for example in the case of IEEE 802 11i, can be emulated A Radius Server (authentication server) can be co-located in one of the wired nodes such that delays can be measured and wireless authentication also can be emulated Throughput performance can be monitored for any of a variety of different communications protocols such as Mobile IP v 6 The performance of any higher-layer protocol, including but not limited to Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Universal Plug and Play (UPnP), Simple Mail Transfer Protocol (SMTP), multimedia applications over User Datagram Protocol (UDP) or TCP, and Layer-2 protocols such as WME and IEEE 802 11e can be evaluated by simply switching access points

The present invention also can emulate other wireless communication characteristics such as load and congestion by limiting the wireless point response time Network topologies can be emulated by setting (x,y) coordinates of the base stations or access points A mobile node moving from point (**x1**, **y1**) to (**x2**, **y2**) will then intercept a set of access points such that handoff will occur Depending upon the velocity equations and the location of each node in an emulated network topology, an emulated sense of location can then be acquired Location-based services can be evaluated and tested using the present invention by mapping signal strength to a (x,y) location Any application at the mobile node and the emulator can use (x,y) coordinates to perform handoff, create virtual foreign agents or wireless access points, and anticipate resource allocation

While Mobile IP and Home agent were used as examples, those skilled in the art will recognize that the inventive arrangements disclosed herein can be used to emulate any Layer 2 or 3 Mobility protocol including, but not limited to Mobile IP, Mobile IP v 6, Cellular-IP, and the like Other protocols not requiring a Home Agent can also be emulated

The various references disclosed throughout this application are hereby incorporated by reference

The present invention can be realized in hardware, software, or a combination of hardware and software The present invention can be realized in a centralized fashion in one computer system, or in a distributed fashion where different elements are spread across several interconnected computer systems. Any kind of computer system or other apparatus adapted for carrying out the methods described herein is suited A typical combination of hardware and software can be a general purpose computer system with a computer program that, when being loaded and executed, controls the computer system such that it carries out the methods described herein

One or more aspects of the present invention also can be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described herein, and which when loaded in a computer system is able to carry out these methods. Computer or application program in the present context means any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both of the following· a) conversion to another language, code or notation, b) reproduction in a different material form

This invention can be embodied in other forms without departing from the spirit or essential attributes thereof Accordingly, reference should be made to the following claims, rather than to the foregoing specification, as indicating the scope of the invention

What is claimed is

1 A system for emulating mobile network communications comprising

a plurality of fixedly-located wireless network nodes configured to variably adjust wireless communication characteristics,

at least one mobile node configured to wirelessly communicate with selected ones of said plurality of wireless network nodes,

a network emulator communicatively linked to each of said plurality of wireless network nodes, said network emulator configured to emulate attributes of a packet-based wired communications network for simulating network conditions experienced by said at least one mobile node in communicating with other nodes through the wired communications network, the emulated attributes comprising at least one of tunable packet-delay distribution, network congestion, bandwidth limitation, and packet re-ordering and duplication, and

a controller communicatively linked to each of said plurality of wireless network nodes, said controller configured to control the wireless communication characteristics of each of said plurality of wireless network nodes to simulate, without changing operating parameters of said at least one mobile node, different wireless communication conditions experienced by said at least one mobile node in actual operation

2 The system of claim 1, further comprising a home agent configured to communicatively link the at least one mobile node to said plurality of wireless network nodes and to a wired communications network whose attributes are emulated by said emulator

3 The system of claim 1, wherein said wireless communication characteristics include a signal reception sensitivity

4 The system of claim 1, wherein said wireless communication characteristic includes at least one of signal transmission strength, signal-to-noise ratio (SNR), and bit error rate (BER)

5. The system of claim 1, wherein at least one of said plurality of wireless network nodes includes

a wireless access point having an antenna and at least one variable attenuator, and

a routing device communicatively linking said access point with said network emulator

6 The system of claim 5, wherein said controller is configured to vary an amount of attenuation provided by said variable attenuator by dynamically adjusting at least one of a signal reception sensitivity and a signal transmission strength of said wireless access point to thereby simulate motion of said at least one mobile node

7 The system of claim 6, wherein said variable attenuator comprises a plurality of variable attenuators, and wherein the amount of attenuation is varied by increasing attenuation provided by at least one of said plurality of variable attenuators while simultaneously decreasing attenuation provided by another one of said attenuators

8 The system of claim 7, wherein said controller dynamically adjusts the amount of attenuation provided by at least two of said attenuators to thereby emulate at least one of speed, acceleration, and trajectory of said mobile node

9 The system of claim 6, further comprising

a data logging component configured to record at least one of a data throughput of at least one of said plurality of wireless network nodes and a measure of signal strength received at said mobile node

10 The system of claim 5, wherein said antenna is an omni-directional antenna

11 A method of emulating mobile network communications comprising the steps of

initiating communications between a home agent and a mobile node via at least one fixedly-located wireless network node connected to a controller,

while the mobile node wirelessly communicates with the at least one wireless network node, dynamically adjusting with the controller at least one wireless communication characteristic of the wireless node to simulate, without changing operating parameters of the mobile node, different wireless communication conditions experienced by the mobile node in actual operation, and

emulating with an emulator connected to the at least one wireless network node attributes of a packet-based wired communications network to simulate network conditions experienced by the mobile node in communicating with network-connected nodes through the wired communications network, the emulated attributes comprising at least one of tunable packet-delay distribution, network congestion, bandwidth limitation, and packet re-ordering and duplication

12 The method of claim 11, wherein the wireless communication characteristic includes signal reception sensitivity

13 The method of claim 11, wherein wireless communications characteristic includes at least one of signal transmission strength, signal-to-noise ratio (SNR), and bit error rate (BER)

14 The method of claim 11, wherein the wireless network node comprises a wireless access point, having an antenna and a variable attenuator

15 The method of claim 14, the wireless network node further comprising a routing device.

16 The method of claim 14, wherein the wireless network node is communicatively linked with the home agent through a network emulator

17 The method of claim 14, said step of dynamically adjusting at least one wireless communication characteristic further comprising varying an amount of attenuation provided by the variable attenuator to emulate motion of the mobile node

18 The method of claim 17, wherein the variable attenuator comprises a plurality of variable attenuators and further comprising the step of increasing attenuation provided by the variable attenuators while simultaneously decreasing attenuation provided by another one of the variable attenuators

19. The method of claim 18, wherein dynamically adjusting the amount of attenuation provided by at least one of the variable attenuators emulates at least one of speed, acceleration, and trajectory of the mobile node

20 A computer readable storage medium for use in emulating mobile network communications, the storage medium comprising computer instructions for

initiating communications between a home agent and a mobile node via at least one fixedly-located wireless network node connected to a controller,

while the mobile node wirelessly communicates with the at least one wireless node, dynamically adjusting with the controller at least one wireless communication characteristic of the wireless node to simulate, without changing operating parameters of the mobile node, different wireless communication conditions experienced by the mobile node in actual operation, and

emulating with an emulator connected to the at least one wireless network node attributes of a packet-based wired communications network to simulate network conditions experienced by the mobile node in communicating with network-connected nodes through the wired communications network, the emulated attributes comprising at least one of tunable packet-delay distribution, network congestion, bandwidth limitation, and packet re-ordering and duplication

21 The computer readable storage medium of claim 20, wherein the at least one wireless node comprises a plurality of wireless nodes, and wherein the computer readable storage medium further comprises a computer instruction for increasing attenuation provided by a variable attenuator communicatively linked to the one of the plurality of wireless nodes while simultaneously decreasing attenuation provided by another variable attenuator communicatively linked to another of the plurality of wireless nodes.

* * * * *

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3701 FAU Blvd, Suite 201, Boca Raton, FL, 33431
http //www.ramobitech com/

February 17, 2010

VIA FEDERAL EXPRESS

Mr. Aroon Tungare
Senior Director, Partnerships and Licensing
Motorola
1303 E Algonquin Road
Schaumburg, IL 60196

Re: Licensing Opportunity for Mobile Emulation Technology

Dear Mr. Tungare,

I am writing on behalf of Rapid Mobile Technologies, Inc. ("Rapid Mobile") to present Motorola with an exciting opportunity to license a revolutionary new technology solution in the field of mobile communication emulation. We at Rapid Mobile are convinced that this new technology is of an extraordinary value to Motorola, and we are anxious to forge a positive and productive business relationship that will allow it to be used and marketed for the benefit of Motorola, Rapid Mobile, and the consuming public.

More specifically, Rapid Mobile Technologies, Inc. currently holds an exclusive license to the United States Patent entitled "Rapid mobility network emulator method and system" filed in the United States Patent Office and assigned Registration Number/Serial Number 7,231,330. Together with the related software and support provided by Rapid Mobile, this method and system saves mobile device manufacturers such as Motorola countless hours and expense in drive testing new devices and provides them with the comfort of quality assurance before the devices go to market. Motorola's businesses can benefit from this technology, especially in the development of subscribe and infrastructure system in 4G LTE/WiMAX, 3G, as well as legacy CDMA, GSM, or iDEN.

You may contact me directly at (404) 245-3910 to discuss strategic partnership opportunities regarding this technology by telephone, or you may respond to this letter at the address above. Also, you may email me at michael@ramobitech.com.

Thank you in advance for your prompt attention to this matter, and I look forward to working with you.

Regards,

Michael D. Grider
Vice President of Marketing
Rapid Mobile Technologies, Inc.

EXHIBIT
C

**From:** Michael Grider [michael@ramobitech com]
**Sent:** Monday, April 12, 2010 9:07 PM
**To:** 'Ghomeshi Mansour-EMG002'
**Cc:** dkennedy@drescon.com
**Subject:** RE: Rapid Mobile Technologies

**Attachments:** 021710 Motorola Letter.pdf

021710
ola Letter.pdf

Mansour,

I would be happy to provide you some initial information, and Mr. Kennedy will be happy to follow up as well. Attached is a letter describing a licensing opportunity that I first presented to Motorola's corporate licensing department on February 17, 2010. In short, Rapid Mobile Technologies, Inc. is very interested in developing a strategic partnership with Motorola to commercialize technology that is protected by U.S. patent serial number 7,231,330, which was assigned to the University of Florida Research Foundation, Inc. and is currently licensed exclusively to Rapid Mobile Technologies, Inc.

Based in part upon a discussion I had with Motorola representatives on March 1, 2010, it appears that Motorola may be using the same or similar technology, and that others in the marketplace may be taking advantage of it as well. If true, then a strategic partnership between Motorola and Rapid Mobile at this time would afford Motorola the opportunity to acquire the rights to a proven technology for its own use, while adding to its patent portfolio, thereby securing the exclusive use of the technology and the ability to protect against infringement by Motorola's market competitors.

For these reasons, we believe that a strategic partnership between Motorola and Rapid Mobile Technologies, Inc. will create tremendous value for Motorola. Please feel free to contact David Kennedy or myself directly if you would like to discuss this opportunity further.

Regards,

Michael D. Grider
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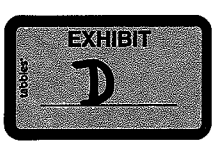
michael@ramobitech.com
www.ramobitech.com



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Thank you in advance for your prompt attention to this matter, and I look forward to working with you.

Regards,

Michael D. Grider
Vice President of Marketing
Rapid Mobile Technologies, Inc.