

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 May 2007 (03.05.2007)

(10) International Publication Number
WO 2007/051130 A3

(51) **International Patent Classification:**
H04L 1/00 (2006.01)

(21) **International Application Number:**

PCT/US2006/060243

(22) **International Filing Date:** 25 October 2006 (25.10.2006)

(25) **Filing Language:** English

(26) **Publication Language:** English

(30) **Priority Data:**

60/730,245 25 October 2005 (25.10.2005) US
11/392,292 28 March 2006 (28.03.2006) US

(71) **Applicant (for all designated States except US):** **QUALCOMM Incorporated** [US/US]; 5775 Morehouse Drive, San Diego, California 92121 (US).

(72) **Inventors; and**

(75) **Inventors/Applicants (for US only):** **AGRAWAL, Avneesh** [US/US]; 7891 Doug Hill, San Diego, California 92127 (US). **JULIAN, David, Jonathan** [US/US]; 17515 Fairlie Road, San Diego, California 92128 (US). **PRAKASH, Rajat** [IN/US]; 7942 Avenida Navidad, #106, San Diego, California 92122 (US).

(74) **Agents:** **OGROD, Gregory, D.** et al; 5775 Morehouse Drive, San Diego, California 92121 (US).

(81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

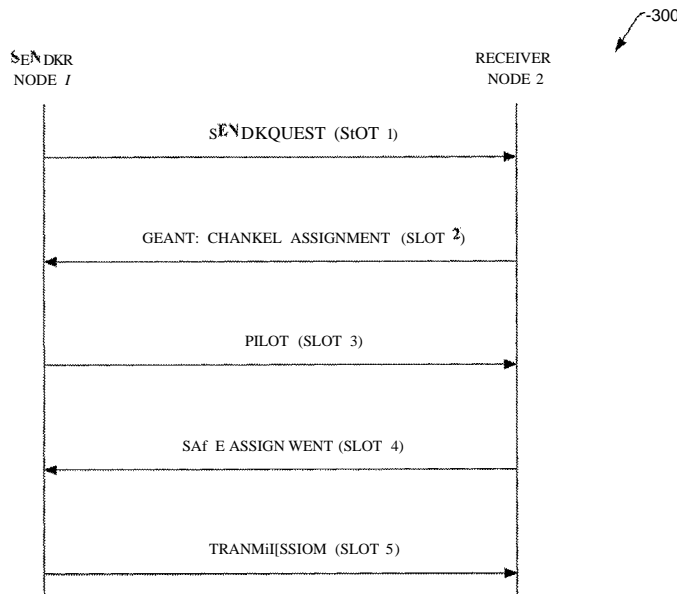
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(U))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(Hi))

Published:

- with international search report

[Continued on next page]

(54) **Title:** FOUR WAY HANDSHAKE FOR ROBUST CHANNEL ESTIMATION AND RATE PREDICTION



(57) **Abstract:** Systems and methodologies are described that facilitate enabling communication over a time varying channel with time varying interference. According to various aspects, systems and methods are described that facilitate selecting appropriate channels and identifying rates that yield optimal capacity for the selected channels. Such systems and/or methods can evaluate a signal to interference noise ratio (SINR) at a receiving node within a multinode network to facilitate selecting the rates.

WO 2007/051130 A3



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:

12 July 2007

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/060243

A. CLASSIFICATION OF SUBJECT MATTER INV. H04L1/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) H04L		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	US 2004/001462 A1 (YAVUZ MEHMET [US] ET AL) 1 January 2004 (2004-01-01) the whole document -----	1-36
X	US 2004/190507 A1 (WU QIANG [US] ET AL) 30 September 2004 (2004-09-30) the whole document -----	1-36
<input type="checkbox"/> Further documents are listed in the continuation of Box C		
<input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents		
¹ A" document defining the general state of the art which is not considered to be of particular relevance ¹ E ¹ earlier document but published on or after the international filing date ¹ L ¹ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) ¹ O ¹ document referring to an oral disclosure, use, exhibition or other means ¹ P" document published prior to the international filing date but later than the priority date claimed	¹ T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention ¹ X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone ¹ Y ¹ document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art ¹ &' document member of the same patent family	
Date of the actual completion of the international search <div style="text-align: center; font-size: 1.2em;">14 Ray 2007</div>	Date of mailing of the international search report <div style="text-align: center;">22/05/2007</div>	
Name and mailing address of the ISA/ European Patent Office, P B 5818 Patentlaan 2 NL - 2280 HV RIJSWIJK Tel (+31-70) 340-2040, Tx 31 651 epo nl, Fax (+31-70) 340-3016	Authorized officer <div style="text-align: center; font-size: 1.2em;">Borges, Pedro</div>	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/060243

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004001462 A1	01-01-2004	NONE	
US 2004190507 A1	30-09-2004	WO 2004088907 A2	14-10-2004